

Children and Scuba Diving:

**A Resource Guide for
Instructors and Parents**



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Contents

Chapter I	7
Children of the Sea	
Chapter II	27
Human Development	
Chapter III	77
Medical Issues and Children in Diving	
Chapter IV	85
Teaching Children to Dive	
Chapter V	119
Interacting with Children in Dive Programs	
Chapter VI	137
Professional Conduct in Child Interactions	
Chapter VII	147
Activities for Young Divers	
Chapter VIII	165
Case Studies	
Appendix	191

Chapter I

Children of the Sea

Childhood is supposed to be magical, full of discovery, wonder and adventure. Curious, questioning and searching, children make childhood unfold this way because they are how they are. Nurturing parents open doors so their sons and daughters experience the fullness of this magic, discovery, wonder and adventure. There are few greater gifts parents can give their children. Those who live such a childhood are truly blessed, and in some ways, will always remember it.

Karen is one of these. Under her parent's supervision, she plays with dolphins, takes underwater snapshots and tugs her big sister's fin tips to tease her. For her, biology and physics are experiences, not dreary school lectures, because she's seen sharks, frolicked with fish, raced rays and watched whales. She's noted how light loses color and her air supply goes faster at 10 metres/30 feet than at 5 metres/15 feet. Geography's no different. Karen's been diving in the Florida Keys, Bahamas and Grand Cayman, to name only a few of her adventures. On top of this, Karen is an aquanaut, having – more than once – spent 24 hours underwater and slept on the bottom of the sea in a habitat (at only 6 metres/20 feet – but she's done it).

All this before she turned twelve.

Karen is a child of the sea, one of a growing number. Escorted by diving parents, guardians, older siblings and other adult companions, youngsters are donning scuba and slipping under the waves.



Why Children are Diving

One may wonder, why are children diving? Good question. A cynical view might be that the rising participation by children in diving is nothing less than marketing – an effort by scuba manufacturers and training organizations to bolster their business by recruiting the youth market. This raises the question whether the dive community is selfishly putting youngsters at risk purely for profit.

Unquestionably, the dive industry has taken steps to better accommodate the youth market, but this is a result of demand, not the cause. When one considers that instructors take their children diving, that executives and managers of dive equipment companies and diver training organizations take their children diving, obviously profit over safety isn't the case either. There's no profit in dive professionals taking their own children underwater, and it's reasonable to assume that few – if any – would do so if they believed they were exposing their children to unreasonable risk.

Historically, there are references to children in diving going back almost 100 years, with young divers not uncommon since the birth and rise of sport diving in the 1950s and 1960s. The reason for the recent attention to children in diving is largely demographic. The biggest generation of divers has grown up and started to pass into their middle years. In the U.S. people think of this as the Baby Boom, but actually this is a global phenomenon with millions of people now parents of children in the eight to 15 age range. Mom and Dad dive. The kids see them dive. Mom and Dad want to take the kids, and the kids want to go. Millions of divers with children add up to millions of potential divers under 15 years old.

As mentioned, the dive community has responded to this demand. There's

more dive equipment suited for children, and diver education – particularly the PADI System – increasingly addresses the learning and supervisory needs of younger divers. As equipment, education and other developments address the needs of younger divers, youth participation goes up. More children are diving because there have never been so many children and parents who want it to happen.

Looking at Karen and other children of the sea, though, there's another explanation for why so many kids are diving today. It's more philosophical than logical, but somehow more satisfying: Childhood's supposed to be magical, full of wonder, discovery and adventure. Maybe many children discover the underwater world simply because they're supposed to.



*Photo Courtesy of
Alese and Mort Pechter.*

In Their Parents' Finsteps

The progression of the U.S. Baby Boomer demographic group and its international parallels into their family years has boosted diving's (and other recreations') attention on youngster participation. But, those who perceive children in diving as something new are mistaken. The fact is, there are instances of youngsters diving with their parents dating back almost 100 years.

Many divers recognize the name John Scott Haldane, whose 1906 pioneering research led to the first dive tables. In his landmark paper, "The Prevention of Compressed Air Illness" (1908, Boycott, Damant and Haldane, *Journal of Hygiene*, Cambridge, 8:342-443) appears a reference to one of the divers, noted: "Jack Haldane (age 13)." This young diver was John Scott Haldane's son, J.B.S. Haldane. Four decades later, J.B.S. Haldane would leave a bigger stamp on diving. He, along with Ken Donald, researched diving with oxygen and oxygen toxicity, establishing the foundation for oxygen exposure that remains to this day. J.B.S. Haldane also pioneered the concept of enriched air nitrox (not called that in his time), and demonstrated that the equivalent air depth concept works through experimental chamber dives. For one of the test subjects, he chose himself.

In the *Silent World* (1950) Jacques Cousteau describes taking his sons, Philippe and Jean-Michel scuba diving for the first time. At five and seven years, respectively, the boys were a bit younger than the dive community recommends today, but they took to the sea like fish – except for trying to talk incessantly. After the youngsters had swallowed a lot of water and still wouldn't quiet, Cousteau writes that he hauled them from the water.

I gave another lecture on the theme that the sea was a silent world and little boys were advised to shut up when visiting it. It took several dives until they learned to hold their volleys of chatter until they surfaced. Then I took them deeper. They did not hesitate to catch octopi with their hands.

Jacques Cousteau's not the only famous diver with young diving offspring. Actor Jeff Bridges, the son of Lloyd Bridges who played Mike Nelson in the late 1950s *Sea Hunt* television series, began diving by age 12. You can see Jeff as a youngster kitted up in scuba in Lloyd Bridges' book, *The Mask and Flippers* (1960).

Yet another example, in 1958 Arthur C. Clarke and Mike Wilson's book, *Boy Beneath the Sea*, came out. Written by Clarke and photographed by Wilson, *Boy Beneath the Sea* relates the diving adventures of two boys, approximately 10 to 11 years old, in the waters surrounding Ceylon (today's Sri Lanka). In the epilogue, Clarke says:

If you've never been underwater, we hope that these pictures have given you some idea of the exciting and interesting things that can be found there. Yet they provide only a brief glimpse of the sea's wonders, which cannot be exhausted in a single lifetime. For this reason, you cannot start diving too young; the boys you've met here were only eight when they began, and now they have a hobby which [sic] will give them pleasure all their lives.

Prior to 1987, there were no widely established minimum age requirements for scuba. Certification depended entirely on meeting the performance requirements. The diving federation CMAS (Confédération Mondiale de Activités Subaquatiques) has had standards for teaching youngsters as young as eight for decades with an excellent track record. In 2000, after careful review of CMAS and other history of children in diving, the RSTC (Recreational Scuba Training Council, which sets the industry-wide minimum training standards for recreational diving) returned the industry standards to the pre-1987 performance standard, allowing youngsters under 15 to learn to dive and dive under adult supervision. PADI then adopted a minimum age of 10 for Junior Scuba Diver with supervision by a PADI professional or Junior Open Water Diver with parental supervision, and a maximum depth of 12 metres/40 feet required. The PADI Seal Team, Bubble-maker and SASY programs allow younger participation with greater restrictions in pool/confined water only, as appropriate for the age group.

It's practically an axiom that history repeats itself in one way or another. Undoubtedly, J.B.S. Haldane would've agreed.

About This Book

Children and Scuba Diving: A Resource Guide for Instructors and Parents was written to compile, in a single place, the issues pertaining to children in scuba diving. This work particularly emphasizes PADI (Professional Association of Diving Instructors) programs, which are the world's most widely recognized and demanded recreational diver training programs.

This book's goal is to provide the information needed to make decisions about children in diving, such as assessing whether a youngster is ready for diving, and what the risks are. Although this work addresses primarily the professional scuba instructor and the parents of prospective youth divers, anyone who works with children underwater or who may potentially do so will find it useful.

As primarily a reference and resource, this guide follows a logical topic sequence. This first chapter introduces the concept of the parent-instructor-student teaching/learning partnership, a realistic appraisal of risks that parents, instructors and children must understand and accept and a look at the many benefits that come from involving youngsters in diving – some of which aren't obvious. The next chapter covers human intellectual development, which affects how children learn at various stages and ages. This chapter touches on most contemporary development theories, with an emphasis on the works of noted psychologist Jean Piaget. Teachers and instructional designers frequently apply Piaget's theory to teaching children.

Chapter III jumps into some of the medical concerns that are unique to children, or more exaggerated in children, and how limits and techniques reduce the risks these pose. Chapter IV gets into specifics on teaching children to dive, with the next chapter focusing on tips and techniques such as games, equipment considerations, etc. The next chapter looks at the codes of conduct modern society expects from professionals interacting with children, with Chapter VII going into activities that keep younger divers involved with diving. The last chapter presents two case studies of children and their involvement with diving.

Partnership in Learning

When adults learn to dive, as adults they learn relatively independently, interacting with instructional materials and with the instructor. Adult learners are expected to independently:

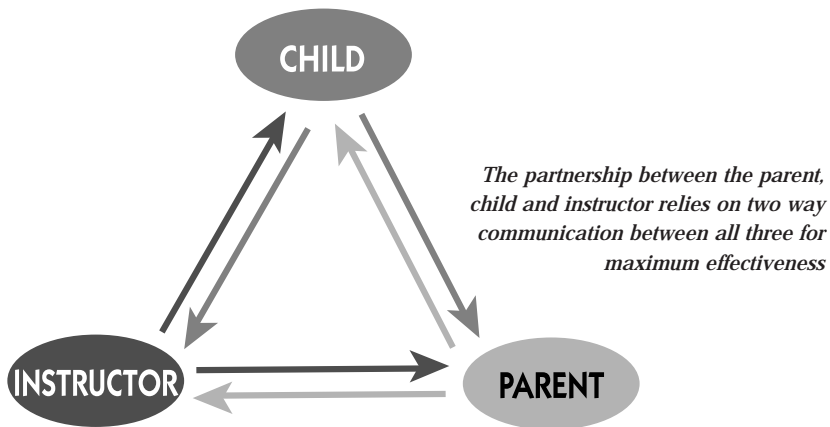
- complete assignments as directed.
- self check their learning.
- communicate difficulties with their instructor.
- restudy as necessary and/or directed by the instructor to master problem topics.

In other words, one expects adult learners to be self disciplined, to be responsible, to have basic adult learning skills and to conduct themselves as adults in the course. Children, on the other hand, don't necessarily have all these attributes. Children in the 12 to 15 year age range may have these, but not neces-

sarily developed to the adult level. (Admittedly, some adults fall short in these areas, but that's another discussion.)

The lack of adult learning skills and behaviors doesn't exclude children from learning to dive, any more than it excludes children from learning to ski, target shoot or play football. To the contrary, diving fosters overall learning and growth by putting the child in an environment that's fun, but that also asks for reasonably mature behavior, rudimentary mastery of physical and scientific principles, attention to following rules and guidelines, self control and motor-skill mastery. What makes this possible is a partnership between the parent, the child and the scuba instructor.

The Bridge Between Home and Scuba



Instructors and parents who've introduced youngsters to diving will tell you that it's a rewarding experience. Youngsters often display remarkable maturity and seriousness, typically beyond their normal behavior. They tend to master motorskills as readily or more readily than adults, and when they forget to follow procedures, it's more likely because they need reminding than because they're cutting corners (as some adults do).

But they're not adults, making it important to establish a link between the scuba instruction setting and children's broader world. This requires communication between the instructor and parents.

Parents participate in the instruction process, either as students in the same class, or by interacting with the child and the study materials. (Note: In some programs, children must have accompanying parents, depending on age.) It's beneficial, but not essential, for one or both parents to be certified or become so.

Broadly, the parents' roles (depending on age, the program and other variables) in bridging the child's home life to the scuba class include:

- assessing the child's maturity and readiness to learn to dive.

- assessing the potential risks and discussing them with the child.
- interacting directly with the instructor to find out what's expected of the child, including (but not limited to) deadlines, performance requirements and equipment needs.
- confirming that the child completes independent study (homework).
- studying and discussing the material with the child to assess that learning is taking place, assisting with mastery as able.
- informing the instructor regarding independent study areas with apparent difficulties.
- listening to instructor reports about the child's progress and how parental assistance may benefit the learning process.
- interrupting training if the child becomes incapable or unwilling to meet the requirements for any reason.
- keeping the child involved with diving after completing the program.

The instructor's roles include:

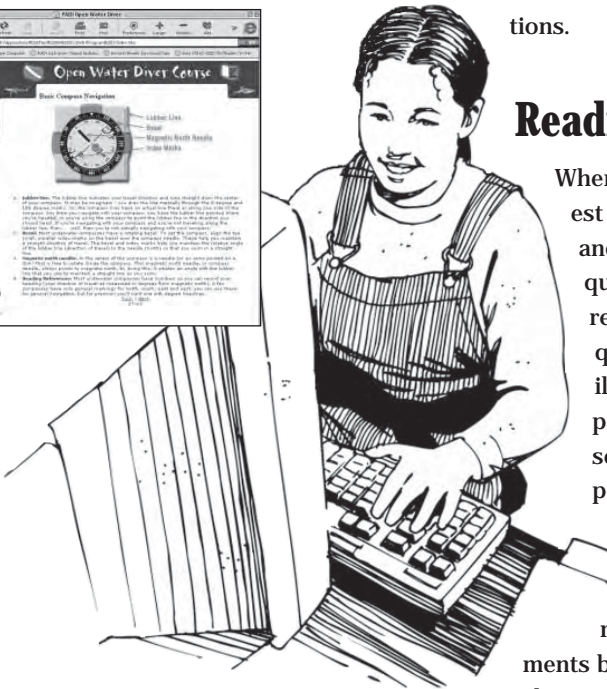
- learning the techniques for, and staying current on the issues involved with, instructing youngsters in diving.
- listening to and respecting the parents' assessment of their child's maturity and readiness to learn to dive.
- not proceeding with inwater training until parent and child acknowledge and accept the risks involved by signing the appropriate documents and acknowledgements.
- assuring that parents understand what's expected of the child, such as performance requirements, class/confined water/open water session times and dates, equipment needs, and independent study assignments.
- informing parents, as well as the child, about the conduct expected of the child during training.
- interacting with parents during the course by providing progress reports and by listening to their reports from home.
- showing the parents how they can assist or provide guidance that will help the child learn.
- respecting a parent's decision for the child to discontinue training (it's wise to discuss the policies related to this with the parent during the enrollment procedure).
- reporting any disciplinary problems with the child.
- discontinuing training if the child becomes unable or unwilling to meet performance requirements for any reason.

The child also has roles. These include:

- respecting the instructor and parents' decisions about readiness to dive.
- taking the rules, risks and procedures of diving seriously.
- listening to and paying attention to the instructor and following the instructor's directions.

- telling the instructor and/or parents immediately when uncomfortable (for any reason).
- asking questions when there's difficulty understanding what's being covered, or what to do.
- completing assignments thoroughly and on time.

Obviously these roles overlap, which is appropriate in accomplishing the unified purpose of helping the youngster successfully learn to dive. While this parent-instructor-child triangle includes many roles, they pivot on sharing information. For the instructor and parents this may simply be conversations before and after class sessions, but it may also include written reports, emails etc. – whatever's appropriate and meets the requirements. The child will interact with parents and the instructor in the normal course of things; in the youngster's case the emphasis is on speaking up about any concerns, problems, interests or help requests. In diving as in other things, young students and parents need to remember there are no stupid questions.



Readiness

When a child expresses interest in diving, both instructors and parents have a similar question: Is this youngster ready to dive? It's not a question with a necessarily obvious answer, with parents and instructors sometimes having differing perspectives.

Fortunately, PADI diver programs provide special limits, restrictions and requirements based on age. These provide some initial guidance in determining child readiness, and regardless, a child too young for a program cannot participate in it anyway.

The age, depth and supervision limits and requirements for particular programs spring from intellectual and physiological issues related to youngsters. Children of any age can qualify for snorkeling (diving with mask, fins and snorkel) or from five and up, SASY (Supplied Air Snorkeling for Youth — using a small scuba tank entirely at the surface as if snorkeling). Children aged eight and up may qualify for Bubblemaker or PADI Seal Team scuba experiences in

the pool or confined-water only (confined water is a natural body of water that's pool-like with respect to depth, calmness and clarity). Children aged 10 and up may qualify for Junior Open Water Scuba Diver certification, which qualifies youngsters for open water scuba diving within certain depth and supervision restrictions. Those 15 and older may qualify for adult-level certification. (Chapter IV details these programs.)



Age requirements help narrow down the decision, but ultimately the decision as to whether a child is ready to dive falls primarily on the parent and child, provided the child is in good normal health and the instructor will accept the child. Prudence dictates making conservative judgments with respect to a child's abilities, of course. Parents should be able to answer the questions listed below with a "yes" when considering a child's readiness, and there may be other, individually specific concerns to consider.

For snorkeling programs and SASY:

- Is this something the child wants to do?
- Can the child swim?
- Will the child follow basic safety instructions from an adult?

Assuming rudimentary waterskills and adult supervision, most kids take to snorkeling easily. Even those not entirely comfortable in water may gain confidence by being able to see as they swim and play in shallow water (though this should be the youngster's idea – someone who fears water shouldn't be forced into water).

For Bubblemaker – age 8 and older, maximum depth two metres/six feet:

- Is this something the child wants to do?
- Can the child swim?



- Is the child comfortable in water?
- Does the child have sufficient attention span to listen to and learn from short briefings?
- Can the child learn, remember and apply basic safety rules?
- Can the child feel comfortable telling an unfamiliar adult (instructor or divemaster) about any discomfort or not understanding something?

Youngsters with rudimentary waterskills qualify for the Bubblemaker program, but they should be comfortable in the water. Scuba, even at this level, is not the place to overcome fear of the water. Since this program involves using scuba, albeit at very shallow depths, participating children need to be able to take basic direction and communicate adequately with supervising adults.



**For PADI Seal Team –
age 8 and older, maximum depth 4 metres/12
feet:**

- Is this something the child wants to do?
- Can the child swim?
- Is the child comfortable in water?
- Does the child have sufficient attention span to listen to and learn from briefings?
- Can the child learn, remember and apply basic safety rules?
- Do the child's reading skills meet or exceed the expectations for the child's age?
- Can the child feel comfortable telling an unfamiliar adult (instructor or dive-master) about any discomfort or not understanding something?
- Does the child have reasonable self control and the ability to respond to a problem by following a rule and asking for help rather than by acting impulsively?



Most youngsters who qualify for Bubblemaker also qualify for PADI Seal Team. PADI Seal Team has some reading/game activities, though these are light and fun and tend to promote reading. PADI Seal Team Aquamissions (pool dives) include more skills and games, however, and youngsters may go deeper (but doing so isn't required). Going a little deeper, it becomes even more important

that the child follows rules, pays close attention to adult direction and communicates problems or discomfort immediately.

For PADI Junior Scuba Diver/Junior Open Water Diver – age 10 and older, open water diving:

- Is this something the child wants to do?
- Can the child swim?
- Is the child comfortable in water?
- Does the child have sufficient attention span to listen to and learn from class discussions, pool and open water briefings and debriefings and other interactions with an instructor?
- Can the child learn, remember and apply multiple safety rules and principles?
- Are the child's reading skills sufficient to learn from adult-level material (allowing for extra reading time, and the child may request adult help)?
- Can the child feel comfortable telling an unfamiliar adult (instructor or divemaster) about any discomfort or not understanding something?
- Does the child have reasonable self control and the ability to respond to a problem by following rules and asking for help rather than by acting impulsively?
- Does the child have sufficient self discipline to stay with an adult buddy and follow safety rules, even after becoming comfortable with diving?
- Does the child have the ability to understand and discuss hypothetical situations and basic abstract concepts like space and time?

The Junior Scuba Diver and Junior Open Water Diver certifications allow youngsters to dive with adult supervision and within depth limits, but in all other respects it has the same requirements as for the adult programs. Although the child should be adult supervised, even while diving after certification, the course performance requirements are the same for children as for adults. This includes all independent study, quiz and exam, confined water/pool and open water requirements. In addition, children under 15 must take the quizzes and exams in written format (not oral).

The required maturity and intellectual development (what Piaget called the formal operations level – see Chapter II) can be expected in many, but not all, 10 year olds. Those not quite ready for full certification at 10 may be in a year or less; in the interim they can participate in PADI Seal Team, which introduces them to many of the skills they'll learn and practice as Junior Scuba Divers or Junior Open Water Divers.



Alternatives to Diving

It's disappointing when one has to tell youngsters they're not ready for a scuba program. But while children aren't naturally patient, they are accepting, especially when they have alternatives until they are ready.

It's disappointing when one has to tell youngsters they're not ready for a scuba program. But while children aren't naturally patient, they are accepting, especially when they have alternatives until they are ready.

For the child who wants to explore underwater, the best alternative to diving is diving. That is, the child who doesn't yet have the maturity for Junior Scuba Diver/Junior Open Water Diver probably does meet the requirements for PADI Seal Team. Youngsters not ready for scuba at any level can generally snorkel.

It's more difficult when, for example, an instructor has to tell children who've been involved with PADI Seal Team that they're still too young for Junior Open Water Diver. While such youngsters can obviously continue to enjoy their present involvement level until they're mature enough to move on, other alternatives keep them involved with diving and stimulate new interest.

Course materials – Just because youngsters can't actually take the next program yet doesn't mean they can't watch the video, read the book, work with the CD-ROM, etc. They may enjoy it, and it helps them get ahead for when they're ready for the program.

Books, school library, websites, etc. – Anything about diving and the underwater world will likely appeal to children enthused with diving. These also encourage youngsters to read because it's something that interests them. Parents can find books about fish, the underwater world, diving, etc. – fact and fiction – at virtually all reading levels, but they don't need to hesitate to give children

material intended for higher level readers. It's amazing how their interest in diving will get them to read it anyway – developing their reading skills in the process.

Television and video – Nature and science channels consistently run programs about underwa-



PADI course materials: (left-to-right) BubbleMaker, PADI Seal Team, Open Water Diver and Open Water Diver CD-ROM.

ter exploration, and these programs exist on video tapes and DVDs as well. These usually interest divers of all ages, making watching the latest dive adventure a family activity.

Aquariums – Actually, this falls into two types: large public aquariums and home aquariums with pet fish. Both of these may interest kids who like diving. Home aquaria with pet fish can teach responsibility.

Glass bottom boats and tourist submarines – Many resort areas offer underwater exploration for the nondiver via glass bottom boats and submarines that give reef tours for passengers. These can be great opportunities for Mom and Dad to point out the different fish they've seen and things they've done underwater.



Activities to Prepare for Diving

When children aren't diving, there's a lot parents can do to prepare them for diving. Generally speaking, the first step is to involve them in diving by taking them to a PADI Dive Center, dive club and PADI Diving Society events, even out on the boat to watch or snorkel while Mom, Dad and big sister go diving (with adult supervision at the surface, of course). Broadly, this sparks children's interest in diving, and it also gives parents a chance to see whether their kids *want* to dive. While many, like Karen, who grow up surrounded by diving will, there will be others who will have little or no interest in it. If diving's truly something a youngster *doesn't* want to do, that's as important to know as involving them in diving.

In addition to some of the activities listed in the previous section, there are some specific things parents can do to get their children ready for diving.

Swimming – Comfort in the water comes before a child (or adult) takes up diving. For most people, learning to swim creates this comfort. Besides, it's an important skill for safety, so that really, even people who don't like water should learn how – it's amazing how often people accidentally end up in the water. For those who enjoy the water, swimming



Comfort in the water comes before a child takes up diving. Parents can develop this by having their youngsters learn to swim, and by spending leisure time around water.

opens the door to competition swimming, water polo and swimming for fitness.

Reading, mathematics and science – Diving involves all of these; the more adept children are with these subjects, the more readily they understand them when they get into diving. Most parents want their children to excel in these anyway, so tying diving to them is a good way to build interest and incentive.

Physical education – Diving isn't overly physically demanding in most instances, but neither is it sedate. Any activities that keep youngsters physically active and healthy contribute to preparedness for diving.

Risks in Perspective

Does scuba diving have risks for children? Considering that it has risks for *adults*, it would be foolish to say “no.” Obviously, scuba diving has many potential risks, which include drowning, lung overexpansion injuries, decompression sickness and middle ear injuries. There are also some theoretical concerns specific to children scuba diving because they're still growing (see Chapter III) as well.



Anyone involved in scuba diving, adult or child, faces some risk of death or permanent, debilitating injury. Nothing aside from not diving at all can completely eliminate these risks. And it's only common sense that while scuba has a very low accident rate comparable to activities like ten-pin bowling, that the potential severity were an accident to occur is much greater. Children interested in diving, and their parents, need to accept these risks before they participate. The *Youth Diving: Responsibility and Risk* video explains these risks so both parents and children can decide for themselves whether to accept them.

When faced with potential risks and hazards, the easiest answer is always, “no.” But that's not always the *best* answer. The truth is, there's no way to protect children from all risks they face in life, and even if there were, it wouldn't be a good idea. Children will grow up to be adults who face risk; effective parents raise their kids allowing them to learn to deal with and manage risk so they will be able to do so as adults. The key, as any good parent knows, is to set boundaries and to monitor the child's behavior to avoid disaster.

PADI programs involving children handle the potential risks the same way. Limiting depths, requiring specific adult supervision and setting minimum ages for differing activities effectively manages the potential risks of diving, including those unique to children. Parental involvement helps assure that children respect and stay within these limits.

The fact is, thousands of youngsters enjoy diving every year. Even with proper supervision and within limits, accidents happen – but they are rare. But in perspective, one need only look at other activities children enjoy. Riding a bicycle or a skate board, even with safety equipment and supervision, carries the potential for severe injury, permanent disability and death. So does riding

in the car with their parents, swimming in a pool (without scuba), playing on a swing, rock climbing, boating, snow skiing, gymnastics, snow boarding and hiking. These don't dissuade children from these activities, nor their parents from allowing them to participate.

Budd Riker is an avid diver, underwater photographer, PADI Instructor and father. As he puts it:

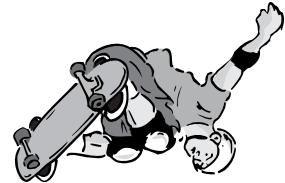
... as I look around, I see far greater dangers [than diving] facing children today: The influence of violence on television and in the movies, negative media messages, a lack of parental involvement and an absence of quality role models are, in my opinion, far greater threats to the health and welfare of children than supervised dive experiences.

... there are risks associated with most any activity. Last year, an 11-year-old boy was killed while riding a skateboard in my neighborhood, and, yes, he was wearing a proper helmet. Was he too young to skateboard? Too immature? No. What happened was terrible, but it was an accident. Should skateboarding be banned? No. Should there have been more parental supervision? Perhaps, but we can't eliminate all accidents. We just have to work to minimize them, while keeping in mind the value our children gain from such activities.

What value is there in having our children participate in scuba diving activities? What have we, as adults, learned from diving? We've learned responsibility, proper planning, respect for nature and camaraderie. We've also learned to exercise good judgment and we've learned about the importance of looking out for each other. Diving has taught us all that and much more. Isn't it valuable to replace the negative – the violence, the lack of respect and the emotional distance between parents and children – with these valuable life lessons?

I, for one, think the danger lies in not exposing our children to family experiences like scuba diving that also teach responsibility and respect for life. . . . It may not be for every child; that's a decision parents, instructors and children need to make together.

But even if it's not scuba diving, please do something with your children. Because your time is the most valuable gift you can give them, both on land and underwater.



Benefits in Perspective

One need only look at Karen's life, and the life of thousands of other children of the sea to realize that diving offers much. Through their connection to diving, youngsters gain maturity, self esteem and a sense of responsibility. Especially at the Junior Scuba Diver/Junior Open Water Diver levels, children have to apply basic science principles and some simple mathematics. This takes these

Sports Classification by Contact

Contact/Collision	Limited Contact	NonContact
Basketball	Baseball	Archery
Boxing*	Bicycling	Badminton
Diving (<i>board</i>)	Cheerleading	Bodybuilding
Field Hockey	Canoeing/Kayaking	Bowling
Football–Flag	(<i>white water</i>)	Canoeing/Kayaking
Football–Tackle	Fencing	(<i>flat water</i>)
Ice Hockey	Field–High Jump	Crew/Rowing
Lacrosse	Field–Pole Jump	Curling
Marial Arts	Floor Hockey	Field Event–Discus
Rodeo	Gymnastics	Field Event–Javelin
Rugby	Handball	Field Event–Shot Put
Ski Jumping	Horseback Riding	Golf
Soccer	Racquetball	Orienteering
Team Handball	Skating–Ice	Power Lfting
Water Polo	Skating–Inline	Race Walking
Wrestling	Skating–Roller	Riflery
	Skiing–Cross-country	Rope Jumping
	Skiing–Downhill	Running
	Skiing–Water	Sailing
	Softball	Scuba Diving
	Squash	Strength Training
	Ultimate Frisbee	Swimming
	Volleyball	Table Tennis
	Windsurfing/Surfing	Tennis
		Track
		Weight Lifting

*Participation not recommended.

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skills from the abstract to the concrete, which not only enhances intellectual development, but gives these subjects relevance and substance.

In a culture with television, the world wide web, video games and a thousand other distractions that pull children indoors and apart from activities as a family, diving offers something that takes children back outside into the real world. Because of its nature, diving makes a suitable family activity, but also something youngsters can enjoy apart from their parents with their friends

Reported Injuries Per Participant

Sport	Reported injury/ participant (%)
Basketball	2.02
American football	1.88
Bicycling	1.40
Wrestling.	1.35
Football (soccer)	1.33
Baseball and softball	1.09
Ice hockey.	1.04
Skateboarding	0.86
Boxing.	0.68
Gymnastics	0.65
Volleyball.	0.55
Martial arts	0.49
Roller skating.	0.43
Snowmobiling.	0.41
Ice skating.	0.39
Tennis	0.23
Water-skiing	0.19
Swimming.	0.17
Golf.	0.17
Fishing	0.15
Archery	0.07
Scuba diving	0.07
Bowling.	0.05
Racquetball, squash and paddleball	0.03
Billiards	0.02

Figures based on the National Safety Council's Injury Facts, 2001 Edition, based on injuries treated in hospital emergency rooms and participant estimates for each sport. The reported incidence percent does not account for participation frequency, population estimate methodologies or injury severity.

when they grow up. Either way, there's an upswing in young divers interested in diving, which is why PADI programs address the specific needs, limits and requirements for participation by children 15 and younger.

Karen's parents have given her a lifelong gift, if she wants. It remains to be seen whether diving will be something she does passionately her whole life – but it would be more surprising if not than if so. Diving is one of those rare activities that you can enjoy almost your entire life as long as you enjoy good

average health. One can start diving at eight and still dive at 80. Along the way, divers can vary their adventures so they're extreme and pulse-pounding, or sedate and relaxing. Diving adapts to whatever people want throughout their lives.

For many, diving adds direction to their lives. Today thousands of avid divers work in the dive industry to provide training and services for the millions of active divers around the world. Other young divers grow up to be involved in underwater sciences, biology, marine engineering or underwater military. Yet others have grown into underwater photographers, cinematographers and writers.

With the environment an ever-present concern, involving children in diving is an investment in the planet's future. People protect what they love and guard what they have to lose. Divers experience the frail beauty of the underwater world; they recognize its value and its vulnerabilities. Today's children who grow up with these realizations will be tomorrow's adults, striving for a planet with clean energy, recycling, reduced pollution and a healthy environment. Without these attitudes, earth will not survive.

But it is diving's simplest attributes that make it special. Diving is magical, full of wonder and discovery. That makes it something well suited to children. Of all ages.

Because I Started Diving Young

There's probably no one better to ask about what diving means to children than adults who first went underwater as kids. Here are just a few perspectives:

Shortly after I turned seven years old and my brother, Philippe, was four and a half, our father -"pushed us overboard." As we were in the process of sinking, we realized that we could breathe. That was our first experience on scuba. We were so excited, Philippe and I wanted to talk about what we were seeing. Dad kept shoving our mouth piece back into our mouths. My mother, Simone, always came along and it became a family affair. Weekends, holidays, and vacations were spent exploring the French Riviera. Possibly we were the first children scuba diving while our friends were skiing in the Alps.

We were exploring the undersea world with an ocean pioneer, who at the time was completely unknown. It was a formidable adventure of discovery. Our awareness of environmental concerns started then. More and more as we observed an increasing amount of discarded objects, we realized that the human species was using the ocean as a dump. Today 57 years later, I am horrified at what we are doing to the ocean, thus to ourselves.



Jean-Michel Cousteau



Jean-Michel Cousteau diving with his father.

Through my life I've witnessed the damage humanity has inflicted on the ocean. Diving as a child shaped my vision as an adult. It gave me a mission and a message that have the strength and credibility only possible from someone who's seen the cause with his own eyes. For the sake of our world, my children and theirs, I will always be searching for my childhood. The privileged child that I was in the 1940s will never give up trying to restore our watery backyard to what it was then.

—Jean-Michel Cousteau

Jean-Michel Cousteau is the CEO and Chairman of Ocean Futures, a not-for-profit organization dedicated to marine environment preservation, education and research. Jean-Michel is recognized as a leading advocate for the oceans in the international community, as well as an accomplished video producer. Prior to establishing Ocean Futures, Jean-Michel is recognized for his work with his late father, Jacques Cousteau and the Cousteau Society.

I started scuba diving at the age of eight years, while hanging around my Uncles Bill and Bob Meistrell's dive center, Dive N' Surf. It wasn't until I was 14 that I was officially certified through LA County; my first open water dive was off California's Catalina Island. That dive was so incredible I will always remember it.

I spent much of my teenage years surfing and diving off the California Coast, and the Channel Islands with my father Bev Morgan, who would take my brothers and me out on the family boat almost every weekend. After years and years of diving, I finally made my first dive away from California, in Hawaii, and will never forget the eerie feeling of emptiness because there was no kelp forest to accompany me.

Over the years, the underwater world has been my living, with occupations ranging from underwater tour guide in Lahaina, Maui, to performing under Captain Bean's glass bottom boat for tourists out of Kona, Hawaii, to setting nets under water as a commercial fisherman. Today, with nearly four decades of diving experiences behind me, I help my father run Kirby Morgan Dive Systems, Inc. (KMDSI) a manufacturer of commercial and military diving helmets, and masks.

— Connie Lyn Morgan



As one of the driving forces and second-generation at Kirby Morgan Dive Systems, Inc., Connie Morgan helps lead the premier and dominant commercial dive equipment manufacturing company. Started by her father, Bev Morgan, KMDSI revolutionized commercial diving with equipment innovations in the 1960s. Working with her father, Connie continues the innovation, including the new M-48 SuperMask, which is a unique fullface mask she and her father developed for the specialized needs of technical, military, scientific and recreational divers.

When I look at my behavior as a teenager, things could have turned out very poorly for me. I spent too much time doing the wrong things with the wrong people, and but for the grace of God, I could have easily ruined my future.

But as a six year old, I gained a keen interest in diving by watching *Sea Hunt*. My parents nurtured my interest. I taught myself to snorkel at 10 and began scuba diving at 12. As I went through my troublesome teens, my love of diving and the spiritual values my parents gave me saw me through a period of bad choices. Almost as soon as I could drive and get to water, I was off diving. Diving wasn't compatible with destructive behaviors and the wrong friends. With something worthwhile to do with my time, money and energy; I abruptly turned my back on the path to no where and got back on track. Some might say it was a miracle. They are right.

In college, I studied writing and photography because I wanted to become a diving writer. Out of college, I became a scuba instructor to enter the dive industry. Today, I've made more exciting dives and had more adventures than I ever imagined as a child. Amazingly, I turned out to be the diving writer I set out to be.

– Karl Shreeves.

Karl Shreeves is widely published in the dive community. Over the years, his articles and columns have appeared in Skin Diver, Sport Diver, Immersed, aquaCorps, Scuba Times, Discover Diving and the Undersea Journal. He has contributed to more than a dozen books on diving, including PADI manuals. Today he is a full time writer, manager, photographer and instructional designer for PADI's affiliate company, DSAT.



Chapter II

Human Development

Focusing on the Learner

As noted in the last chapter, a child's venture into scuba diving is a shared commitment between instructor, parent and the youngster, with this partnership crucial to success. This partnership is promoted through PADI's (Professional Association of Diving Instructors) commitment to support the qualities of clarity, consistency, and communication in the student-parent-instructor relationship, and in parents' and instructors' shared desire to provide the learner with the best possible diving education and experience. Success assumes a learning triad exists between the child, the parent, and the instructor and all three participate for the child's best interest and ultimate success in diving (or any other educational venture for that matter). This three-way partnership benefits all – especially the learner.



The Partnership between the Child, Parent and Instructor:

Clarity, Consistency and Communication

What is meant by clarity?

- Learners are clear about what they're learning and why, what is expected of them, and how they are progressing.
- Parent is clear about what the child is being taught, how, and why it is being taught, what is expected of the child, and how the child is progressing as a learner.
- Instructor is clear about how the child learns best; what the child's needs, interests and abilities are; how the child feels about learning; and how the home environment can support learning.
- PADI is clear in its expectations of the dive center/operation and dive community, and in its support of these expectations.

What is meant by consistency?

- Learners are consistent in developing strong work habits, producing quality work, and having positive attitudes toward themselves and others.
- Parents are consistent in supporting and preparing their children for the dive/snorkeling course/activity. Their support is consistent with the expectations and processes of the instructor and the dive center/operation.
- The instructor's knowledge and organization of the curriculum is consistent with course/activity guidelines, standards and procedures. Instructions, assessment and evaluation are consistent with sound professional practice. Expectations for the learner's behavior are consistent with the dive center/operation's code of conduct.
- The dive center/operation and PADI are consistent in their organization and delivery of curriculum and in their expectations of the student diver/snorkeler.

What is meant by communication?

- Children let their instructor and parents know whenever they have a question, interest, or concern about the dive center/operation or dive/snorkel course/activity.
- The parents let the learner and/or instructor know their observations about the learner's needs, interests and abilities. They remain in touch with the instructor about their child's dive/snorkel course/activity, informing the instructor whenever they have a question, concern, or significant observation about the learner's progress, conduct or experience in the dive/snorkel course/activity or dive center/operation.

- The instructor lets the learner and the learner's parents know what is being taught and why; the learner's expected work and behaviors; how performance will be evaluated; and if there are any questions, concerns, or significant observations about progress, conduct or experience in the dive/snorkel course/activity or dive center/operation.
- The dive center/operation and PADI provide effective support to promote and guide communication among learners, instructors and parents.

Focusing on the child is central to success. Focusing on the learner helps the learning triad to remain clear about their priorities and to make choices in a child's best interest. Parents and instructors adapt to the child, providing the challenge and support needed, rather than forcing conformity to a system. For the team to work synergistically, it benefits parents and instructors to understand how children develop, so it's worth taking a look at some of the most valid and reliable theories behind human development and learning. Although



*Photo Courtesy of
Alese and Mort Pechter.*

human development and learning progress quickly (sometimes surprisingly so) and continuously, researchers have identified distinct stages that reflect thinking characteristics for various maturity levels. This chapter provides a brief review of the most recognized theories behind human development and learning, and by doing so, serves as a reference regarding children's readiness and willingness to learn for the discussions to follow.

Beyond the stages of human development, however, children mature in different characteristics at different rates, and they have differing learning styles (as do adults, for that matter). Each child is unique in personality, likes, dislikes, and styles of learning. Some children watch for a long time before trying something new. Others jump in. If the parent and instructor observe how a child likes to learn, they can give the youngster opportunities to learn in those

ways. Approximately 20 to 30 percent of children remember what they hear, 40 percent remember what they see or read, and almost all children remember what they experience directly through touching, feeling and doing. To this end, it is worth looking at how children are intelligent in different ways. By looking at the many forms of intelligence parents and instructors are more able to assess a child's maturity.

Finally, all theories of human development view the maturing process as an interdisciplinary progression. That is, reading doesn't develop apart from arithmetic, nor do motor skills develop apart from cognitive skills. Learning to scuba dive fits well into this model, as the curriculum applies and integrates reading, writing and rudimentary mathematics with real world application.

The scuba diving curriculum lays down rules and demands discipline for safety. Rules and safety are clearly not arbitrary; this carries an important lesson to maturing youngsters, especially those entering their teenage years. Astute parents and instructors use the experience of learning to dive

to foster broader learning and maturity. Reading, writing and arithmetic integrate subtly throughout the dive curriculum. Consequently, it's not surprising that young student divers learn their ABC's in school with the same zeal applied in their diving adventure. There are many things parents and instructors can do to support and encourage the child as a developing learner. The selection of activities on the following pages may provide some assistance.



This Chapter: Read for Need

This chapter presents a comprehensive overview of the prevailing theories of human development. However, some readers may find the depth and scope beyond their immediate interest or need. These readers can meet the purposes of understanding subsequent chapters by reviewing the sidebars and tables, emphasizing the works of Jean Piaget and Lev Semyonovich Vygotsky. In particular, the reader will want to be familiar with Piaget's phases of cognitive thought. This will provide adequate background to follow the discussions that apply these theories.

For teachers and instructors, deeper familiarity with human development theory can be useful, which is why it's important to present these theories comprehensively. In fact, some may find they wish to further their understanding of theories and models to even deeper levels. For these readers, the sources from which this chapter draws appear in the Appendix under References and Bibliography, along with other useful resources on these topics.

Effective Application of Theories of Human Development and Learning

The reason for studying the theory behind human development and learning characteristics is, of course, to consider which scuba program provides the best opportunity for the child, and how to shape instruction for the most effective application. Chapter IV, Teaching Children to Dive, relates diver programs to chronological age and developmental stages in more detail. More broadly, understanding and applying human development and learning theory answers important questions in preparing children for and teaching them to scuba dive:

- Which diver program is the child developmentally ready for?
- How do parents and instructors best support the child in the program?
- What extracurricular activities – in diving and apart from it – foster learning?
- How does participation in the sport of diving foster broader learning and maturity?

In other words, studying theories of human development and learning helps parents and instructors decide - what is best for the learner? Some decisions made by parents and instructors affect the learner directly, other decisions affect the child indirectly. For example, the decision of parents to read the *PADI Open Water Diver Manual* or to review the *PADI Open Water Diver Multimedia* CD-ROM with their child, pausing periodically to ask questions to assess comprehension, encourages learning; it also directly enhances the child's reading and comprehension ability at school. Indirectly as the child learns, the parents learn, and the parents become informed about the demands diving places upon their child.

The third member of the triad, the instructor, receives a student diver who is prepared and eager to participate in diving. The instructor continues the learning cycle by informing the parents about their child's progress and about how their interaction benefited performance. All decisions parents and instructors make in the learning process have some effect on the child's experience in diving and apart from it. This is why understanding human development and learning theory helps to solidify the partnership between child, parents and instructor.

Theories of Human Development

Human development may be studied from a variety of theoretical frameworks, each implying in its own ways how children learn and how instructional procedures may vary to match as a person develops from a child to an adolescent to an adult. Over the years a number of controversial issues have arisen from spirited debate in the field of developmental psychology. In fact, most devel-

opment theories were formulated to address certain critical questions, and they've been evaluated based on their ability to do so:

- What roles do nature (heredity) and nurture (experiences) play in development?
- Is development a continuous process or in stages?
- Are there critical (sensitive) periods in development?

Nature-Nurture

Developmental theorists have closely studied human development, with valuable contributions coming from Arnold Gesell, Sigmund Freud, Erik Erikson, John Watson, Albert Bandura and Walter Mischel, Jean Piaget, Robert Havighurst, Lev Semyonovich Vygotsky, Richard Schmidt, and Urie Bronfenbrenner, to name a few. Perhaps the most enduring issue of child development has been the nature-nurture question. This issue is a debate over



whether development is the result of individuals' genetic endowment (nature) or the kinds of experiences they have had (nurture). In other words, do children naturally crawl at six months and walk at 12 months because they learned from the environment or because of some biological unfolding process? This is the type of question that theories are designed to answer.

Looking at the two extremes, if environmental factors *chiefly* determine development, a structured educational setting during infancy may stimulate successful development. On the other hand, if genetics predominate, early educational experiences do little. A more contemporary view recognizes that heredity and the environment intertwine, so that their interaction influences human development. Current research efforts look for the interactive mechanisms that mediate development, not on the proof or disproof of extreme positions. As you read the upcoming section, *Theoretical Views*, you are encouraged to note how each approach addresses this universal question of nature versus nurture.

Continuity-Discontinuity (Stages)

Theorists have constructed models depicting the developmental process traveled from childhood to maturity. While everyone generally agrees that with development, an individual's behavior and abilities change, different theories try to explain these changes. The notion of *continuity* reflects the view that development involves cumulative change from conception to death. Developmentalists who emphasize this view suggest that development is a

gradual, continuous lifelong process.

The other side of the coin is the *discontinuity* perspective. This perspective views development as in stages, with a series of distinct transformations in which underlying processes and structures exhibit rapid reorganization, followed by periods of relative stability. Theorists in this camp view development in terms of the individual's progress through a series of distinct stages, or periods, when common developmental milestones occur. Development appears to undergo rapid changes as one stage ends and a new one begins, which is then followed by a relatively stable period with minimal transition. It is interesting to note that although a stage may be associated with behaviors usually exhibited during a specific age period, behavior may be accomplished at varying age levels but generally in the developmental order identified.

Most theorists agree that there are continuities and discontinuities in the course of human development. Theorists try to identify which developmental processes are controlled by continuous underlying constructs or mechanisms (continuity) and which developmental processes are controlled by experiential circumstances, events, or environmental forces that interact with the individual (discontinuity).

Critical Periods

Some researchers refer to *critical periods* of development and document an optimal time for certain behaviors to emerge. During these critical periods the individual is sensitive and unusually receptive to specific environmental influences or other mitigating factors. Those who support this theory believe that specific stimuli must be present during these critical periods for normal development to proceed. For instance, some experts argue that the lack of a strong emotional bond between the child and a significant adult during infancy affects the child's emotional stability in later childhood. Although it seems reasonable that the lack of certain experiences may influence children negatively or positively, it's difficult to measure the extent of this influence.

Not everyone agrees that critical periods usefully explain development. Consider, for instance, the children born into low socioeconomic environments. They may lack food, parental guidance, education, yet many such children grow to have highly developed intellectual, social and emotional skills. Children exhibit astonishing resiliency in overcoming adverse conditions.

This book includes the notion of critical periods first because these stages are strongly present in the literature on development, and second because they provide a useful way to divide a child's expected development into stages. Regardless of what theoretical approach or approaches a teacher or parent finds the most useful, the critical challenge is to identify and foster the vital experiences and circumstances that encourage individual development, and at the same time, identify and eliminate, as much as possible, those factors that stunt a child's development. Any theories that enable adults to do this have practical value.

Theoretical Views

While no theoretical model is a comprehensive model in itself, each touches on a differing aspect of human development. Each theory may be defined as a set of concepts theorists use to organize, describe, and explain some aspect of behavior. A meaningful understanding of human development is possible only by knowing something about how individuals learn and react to their environment.

The following nine traditional and contemporary theories have earned respect by revealing something about how humans learn, react and ultimately, develop into adults. Although each view is diverse in its explanation of human development, all approach the issue of nature-nurture. Considering the question of whether each approach places more importance on the role of hereditary factors or environmental influences or a dynamic balance of nature-nurture will help in making decisions regarding the maturity of the learner, how the learner best learns, what instructional strategies best support the learner and which dive program is most suitable for the learner.

Biological-Maturation Approach

Gesell's (1928, 1952) Maturation Theory of Growth and Development

Gesell's *maturational theory* of growth and development emphasizes the physical and motor components of human behavior. Gesell's theory contends that development results from inherited factors and requires no stimulation from the external environment. The maturational view of development emphasizes the emergence of development patterns or organic systems, physical structures, and motor capacities under the influence of genetic forces. Gesell believed that growth of the intellect and motor functions ties closely to the growth of the nervous system, a perspective that underlies the fundamental understanding of genetic and developed motor behavior. Unless certain neurological and biological characteristics are sufficiently developed (matured), it may be futile to practice certain genetic skills, like walking or chewing. On the other hand, learning and experience (practice) are necessary for the existence of learned behavior, like table manners.

Gesell documented general age periods for the acquisition of a wide variety of rudimentary movement abilities that children progress through, which become important indicators of social and emotional growth. He describes various ages where children are either "in focus" with their environment (maturational periods where the child exhibits a high degree of mastery over the immediate environment, is balanced and generally pleasant), or "out of focus" (the child exhibits a low degree of mastery over situations in the immediate environment, is unbalanced or troubled in behavior and generally unpleasant).

Gesell was among the first researchers to implement a quantitative study of human development from birth through adolescence. The results of his research were used in creating the Gesell Development Schedules, which were

used to measure motor and language ability, adaptive behavior, and personal-social behavior in children. The results of these tests were first expressed as developmental age, which was then converted to a developmental quotient representing the portion of normal development that is present at any age. Developmental quotients based on Gesell's Developmental Schedules were widely used to assess children's intelligence.

The premise behind Gesell's many published works is that children develop best with reasonable guidance, rather than permissiveness or rigidity. The preeminence of Gesell's ideas eventually gave way to theories that stressed the importance of environmental rather than internal elements in child development. At that time the ideas of Erik Erikson, Jean Piaget, Robert Havighurst, Lev Semyonovich Vygotsky and their contemporaries gained prominence. Nonetheless, Gesell's timetables detailing when most children achieve certain developmental milestones are still widely used today. Gesell is an important pioneer in child development, recognized for advancing the methodology of observing and measuring behavior.



Gesell's work suggests that children learn best with reasonable guidance rather than excessive permissiveness or rigidity.

Psychoanalytic Approach

Sigmund Freud (1927) Psychoanalytic Theory of Human Behavior

Even though his work centered on personality and abnormal functioning of adults, Sigmund Freud's psychoanalytic theory of human behavior may be viewed as a model of human development. Freud's psychosexual stages of development reflect various body zones with which the individual seeks gratification of the id – the unconscious source of motives, desires, passions

and pleasure. The ego is the balancing aspect of personality, which mediates between the id and the superego – common sense, reason, and conscience. The id represents the basic urges and demands created by the body, the superego represents the non-physical ideals of being human, and the ego represents the balanced mix of being an entity with a physical body and intelligent ideals.

Freud believed that at birth, the id has full control – a baby's entire existence centers on its physical needs. As the child matures, the superego develops and becomes stronger, controlling and modifying how the youngster expresses demands arising from the id. The result – what you perceive as the personality – is the ego, a balance between the two that develops with age as the superego becomes stronger. Freud's oral, anal, phallic, latency, and genital stages of personality development represent the terms applied to the pleasure seeking zones of the body that come into play at different ages.

Freud's psychoanalytic theory has received its share of criticism due to the lack of objective validation of the theory's concepts. From an instructional perspective, this theory also lacks the structure required for practical application in a teaching context. The psychoanalytic theory is included here, however, because it served as a foundation for other notable works such as the work of Freud's student, Erik Erikson (1963), and his daughter, Anna Freud (1945).

Psychosocial Approach

Erik Erikson (1963, 1980) Psychosocial Theory of the Human Life Cycle

Erikson focused on the influence of society, rather than inherited factors or sex, to explain the cycle of human development. Erikson proposed that the way individuals cope with social experiences shapes their lives. He believed that childhood was very important in personality development. According to Erikson, personality development depends highly upon the relationship characteristics between the child and significant parent figure. Psychosocial theory supports the notion that what happens early in life plays a significant role in developing a healthy personality. Parents and significant others (such as teachers) play a major role in the development of an individual's self-concept and conscience.

Erikson accepted many of Freud's theories, including the id, ego, and superego, and Freud's theory of infantile sexuality, however, he rejected Freud's attempt to describe personality based solely on sexuality. Erikson's *psychosocial theory* emphasizes environmental factors, not heredity, as facilitators of change. Like Jean Piaget (discussed later), Erikson viewed development as occurring in distinct stages throughout a person's life span. Dividing the human life cycle into eight stages, Erikson looks to the individual's experiential background as having a primary role in development. Unlike Freud, Erikson believed that personality continues to develop beyond five years of age.

All of the stages in Erikson's *epigenetic* (change by outside influences)

theory are present at birth, but unfold according to an innate plan, with each stage building on the preceding stages, paving the way for subsequent stages. A psychosocial crisis (some emotional or interpersonal problem) characterizes each stage. The crisis arises partly from physiological development, and partly from the demands put on the individual by parents and/or society. For development to proceed correctly, ideally, each stage's ego resolves each stage's crisis. The outcome of one stage is not permanent, but may be altered by later experiences. Everyone's personality has a mixture of the traits attained at each stage, but personality development is considered "successful" if the individual has more "good" traits than "bad."

Erikson's psychosocial theory of the human life cycle is more comprehensive than Freud's psychoanalytic theory of human behavior and includes information about normal personality as well as neurotic personality. Criticism of Erikson's theory centers on the lack of generated research to scientifically objectify, quantify and validate its concepts. Erikson's theory is included here because it acknowledges factors within the individual's experiential background as having a primary role in development. Erikson clearly points out the importance of success-oriented movement experiences as a means of reconciling the developmental crises that each individual passes through.

Erikson's Psychosocial Theory of the Human Life Cycle

(Adapted from Erikson, E. (1963, 1980)

Stage 1: Oral-Sensory (Infancy – birth to 12 to 18 months)

Psychosocial Crisis: Acquiring a Sense of Basic Trust versus Mistrust

Resolution: Feeding

Experiential Factors: According to Erikson infants develop a sense of trust if parents are responsive and consistent with meeting basic needs. The need for food and care must be met with comforting regularity. When the parent provides food, rhythmic rocking, bathing, and generally plays with the infant, a trusting relationship develops. Parental consistency and responsiveness is essential to develop a sense of trust. Infants begin to understand that objects and people exist even when they cannot see them. This is when trust becomes important.

Stage 2: Muscular-Anal (Toddler – 1 to 2 years of age)

Psychosocial Crisis: Acquiring a Sense of Autonomy versus Doubt and Shame

Resolution: Toilet Training

Experiential Factors: Self-control and self confidence begin to develop at this stage; hence toilet training is one of the most important events. Active play is particularly important during this stage as children strive for autonomy. Children's autonomy emerges from the realization that they are able to control the environment and themselves. This realization is evident by their struggles to feed and dress themselves. It is essential for parents not to be overprotective at this stage. Parents should offer positive reinforcement, as shameful children will learn to doubt their abilities later in life. At this stage children begin to assume important responsibilities for self-care like feeding, toileting and dressing.

Stage 3: Locomotor (Preschool – 2 to 6 years)

Psychosocial Crisis: Acquiring a Sense of Initiative versus Guilt

Resolution: Independence

Experiential Factors: At this stage children continue to be assertive and take the initiative. They struggle for independence and are eager to accept responsibility. It is important that parents acknowledge the child's initiative regardless of how small it may be. A sense of guilt develops if children are not given the opportunity to do things on their own and will believe that what they want to do is always wrong. A four year old child helping a parent complete a house-hold chore is an example of taking initiative on the part of the child.

During this period children's conscience is becoming established and children come to realize that life has a purpose. Improvement in language helps them to expand their fields of activity and imagination. It is at this stage that fundamental movement skills are being mastered allowing children to be independent and successful at playing cultural games.

Stage 4: Latency (School Age – 6 to 12 years)

Psychosocial Crisis: Acquiring a Sense of Industry versus Inferiority

Resolution: School

Experiential Factors: During this stage children are learning to see the relationship between perseverance and the pleasure of a job completed. Children have a need to be productive and do work on their own; attendance at school fulfills this need. It is essential for the child to discover pleasure in being productive. Examples of productive work include watering classroom plants, helping a teacher distribute learning materials, washing the dishes or feeding a family pet. For the first time the child has a wide variety of events to deal with, including school work, group activities and friends. Difficulty in any of these areas results in a feeling of inferiority. Children at this stage need feelings of accomplishment for having done well. Failure is hard to accept and children will ward off failure at any price.

Interaction with peers during and after school plays an important role. Dependence on parents begins to shift to a reliance on social institutions such as school, a team or a gang. Children tend to involve themselves in organized play such as in games and sports. Boys and girls prefer to play with their own gender and towards the end of this stage play merges into semi play and eventually work.

Stage 5: Adolescence (Early Adolescence – 12 to 18 years)

Psychosocial Crisis: Acquiring a Sense of Identity versus Role Confusion

Resolution: Peer Relationships

Experiential Factors: At this stage youths are in search of an identity that will lead them into adulthood. Answering the question "Who am I?" is of utmost importance. The individual's resolutions for previous psychosocial crises serve as a foundation for the search for an identity. Only when children overcome earlier psychosocial crisis are they ready to search for an identity. Rapid growth and marked sexual maturation contributes to the confusion at this stage of development.

Adolescents need to make deliberate decisions and choices regarding vocation, sexual orientation and life in general. Conflicts frequently arise when peers say one thing and society says another. Adolescents attempt to establish their own identities and see themselves as separate from their parents. They select family friends, friends, sports heroes or other accomplished individuals in their

lives as role models. Organized sport, skill proficiency, team membership and competitive victories all contribute to developing a sense of identity.

Stage 6: Young Adulthood (Late Adolescence – 19 to 40 years)

Psychosocial Crisis: Acquiring a Sense of Intimacy versus Isolation

Resolution: Love Relationships

Experiential Factors: The most important event at this stage of development is a love relationship. The ability to relate to another human being on a deep, personal level is possible if the individual has developed a sense of identity. Individuals who have not developed a sense of identity will fear a committed relationship and may retreat to isolation. A sexual relationship is not the same as an intimate relationship involving commitment and openness. True intimacy requires personal commitment. Giving and sharing with an individual without asking what will be received in return is an example of intimacy.

Childhood and youth are at an end and young adults must develop intimate relationships with others and not being able to do so results in isolation. It is at this stage of development that an individual settles down to the task of fully participating in society with adult responsibilities. Games, sports and recreational activity serve as a medium for fostering a sense of intimacy with same-sex and opposite-sex teammates. Recreational activities are a venue for acquiring and displaying cooperative behavior and teamwork.

Stage 7: Middle Adulthood (Adulthood – 40 to 65 years)

Psychosocial Crisis: Acquiring a Sense of Generativity versus Self-Absorption

Resolution: Parenting

Experiential Factors: Generativity refers to the adult's ability to care for another person. Parenting is the most important event at this stage of development. Beyond having children the adult must have some way to satisfy and support the next generation. During this stage the adult is concerned with issues such as the environment, equality for all people and the suitability of the world for the next generation. To have and nurture children and/or becoming involved with future generations allows adults in this stage to deal with the issues they are concerned about. Not dealing with these issues can lead to stagnation in later life.

Stage 8: Maturity (Mature Adult, and Old Age – 65 years to death)

Psychosocial Crisis: Acquiring a Sense of Integrity versus Despair

Resolution: Reflection on and acceptance of one's life

Experiential Factors: Reflecting on one's whole life in a positive manner is the most important event in this stage of life. Achieving integrity means fully accepting oneself and coming to terms with death. Accepting responsibility for one's life and being satisfied with one's self is essential; the inability to do so results in a feeling of despair. Reflecting upon and analyzing accomplishments and deciding what to leave to offspring shows integrity.

Movement in the form of walking, driving or recreational sport is important during this stage of development. Movement at this stage means freedom and life itself. Looking back upon one's accomplishments, and forward at declining capabilities, is possible if one is able to meet the challenges of this stage.

Learning-Behavioral Approach

John Watson (1928) Behavioral Learning Theory

Watson believed children are the products of their parents' training. The primary motivation of development, according to the *behavioral learning* theory, is the environment. Watson believed the environment manipulates basic drives and needs by offering incentives for appropriate behavior and punishment for inappropriate behavior. For example, children will study for a spelling test if they are going to receive a good mark and candy for their effort. If the teacher suggests, in any fashion, the test doesn't count, most children in the class would not review the words with the same vigor. *Conditioning* influences behavior in this way. This view has been criticized by some who claim it accounts for the *training* of individuals but does not account for the *learning process* of individuals.

Albert Bandura (1977, 1986, 1989) and

Walter Mischel (1984) Observational Learning Theory

Bandura and Mischel are the main researchers behind contemporary arguments associated with *observational learning* and social learning theory. Proponents of observational learning contend children learn from observations they make. Through observational learning, modeling or imitation, youngsters cognitively represent the behavior of others and then are likely to adopt this behavior themselves. For example, young boys may adopt their fathers' aggressive behavior, as seen on a golf course, while playing with peers in the backyard. Girls observe their mother's behavior of getting ready for work, gathering a brief case and cell phone, and might ask for these items as a gift on their birthdays or a holiday.

The application of behavioral learning theory, plus cognitive processes in the development of learning, is known as *social learning* theory. This theory emphasizes behavior, the environment, cognition and the interaction of these elements upon one another as key factors in development. According to social learning theory, thinking individuals are likely to play through the consequences of their actions, and therefore anticipate and control their behavior, or if necessary, resist environmental influences. Both the behaviorist and social learning views may be criticized for lacking elaboration on the biological aspects of children's development. On the other hand, these theories may be considered as valid explanations of why children behave like their parents and other adult role models.

Cognitive-Developmental Approach

Jean Piaget (1969) Cognitive Development Theory

A human development theory popular among educators is Piaget's *theory of cognitive development*. Of the theories of cognitive development, Jean Piaget's efforts have perhaps had the single greatest effect on contemporary devel-

opmental psychology. Piaget's theory emphasizes the *acquisition of cognitive thought processes*. Piaget believed that the individual discovers solutions to problems primarily through interacting with the environment. According to Piaget's theory, the child is not a passive recipient of events, but, rather, the child seeks out experiences.

Piaget studies focused on the structure of cognitive thought and its orderly sequence of development. Though Piaget did not deny the significance of maturation in the development of the intellect, he did not view all of development as the unfolding of biological processes as maturational theory contends. Piaget instead viewed the developmental process as the interaction of biological maturation and environmental (contextual) experience. He believed that an innate force drives children to actively pursue cognitive *equilibrium* (balance). Piaget contends that when children feel comfortable with what they think, that is, they *assimilate* information in the environment into their existing cognitive structures they achieve a level of equilibrium. When information doesn't fit with children's existing cognitive structures, it disrupts their equilibrium. Children then *accommodate* the information by changing their cognitive structures (the way they think) to restore equilibrium. Piaget's theory is that assimilation and accommodation take children through differing stages (more about this momentarily). Piaget developed his theory by observing children, from which he documented subtle changes in children's behavior as indicators of their cognitive functioning.

The Child Through Piaget's Eyes

It's impossible to discuss human intellectual development without discussing the work of Jean Piaget (1896-1980). With more than 40 major works and hundreds of papers to his credit, probably no other psychologist has done more to further our understanding of how our minds develop.

Piaget began with a doctorate in biology and no formal training in psychology, yet found himself working on the standardization of intelligence tests for children. Quickly he became fascinated with the consistently *wrong* answers children of the same age gave. He theorized that understanding *why* children at different stages answer questions certain ways would explain how their intelligence develops. This began his life-long career studying human intellectual development.

Piaget's experiments not only broke new ground in psychology, but were based more on direct observations and conversations with children (including his own) than on statistics and more detached observation. Applying clinical techniques, he often began by asking a child a standard question or set of questions. But rather than limit research to these, he would remain flexible, following the child's thoughts depending on the answers. On other occasions, he simply watched what children did in their normal surroundings, noting behavior patterns that suggested the thought processes involved.

This *qualitative* method – like his theories on intellectual development – was somewhat controversial in the 1920s. Today, however, qualitative research is

accepted as readily as the theories it produced. In other words, Piaget was ahead of his time on two fronts: what he learned, and how he learned it.

Although modern psychology has adapted and expanded Piaget's work in some ways, it stands the test of time. His original concepts remain the foundation for understanding human intellectual development with applications in child psychology, education and practically every endeavor involving youngsters.

The Processes of Adaptation, Accommodation and Assimilation

Cognitive development, according to Piaget, occurs through a process of *organization and adaptation*. *Organization* is the building of simple perceptual and cognitive processes into higher-order mental structures. *Adaptation* is the process of continuing change that takes place as a result of the individual's interaction with the environment. Adaptation requires an individual to make adjustments to environmental conditions and intellectualize these adjustments through the process of schema formation, accommodation and assimilation.

A *schema* is the basic unit of an organized behavior pattern and related environmental stimuli (cognitive structure), or of representations of actions or concepts. A schema may be used just as it was originally programmed into memory or it may be altered in some way to meet the demands of a changing environment. This *schema* theory is one of the foremost explanations of the way motor skills are acquired (though this wasn't part of Piaget's work).

The process of *assimilation* is at work when individuals deal with the environment through their current schema. Piaget uses the term assimilation for the interpretation of new information based on present interpretations. Assimilation involves taking information in from the environment and incorporating it into the individual's existing cognitive structure. If this information cannot be assimilated into the existing cognitive structure then *accommodation* occurs.

Accommodation refers to the modification process that takes place when the structure of a basic schema changes to meet the demands of the environment, such as in the performance of an unfamiliar task. Accommodation is adaptation that the child must make to the environment when new information is added to the youngster's repertoire of possible responses. The individual adjusts responses to meet the demands of the environment. For example, a child in the shallow end of a pool learns to account for many of the physical properties and realities of the water. However, when the child ventures into deeper waters a new series of realities, such as not being able to touch the bottom, needs to be accommodated. The child's schema for "playing in water" changes with the realization that not all water is shallow enough to stand up in. Thus, adaptation is the balance between assimilation and accommodation, which provides a temporary state of equilibrium.

Probably the most significant of Piaget's contributions to developmental psychology is his notion of *stages*. Researchers today do not always agree upon

the meaning of the term “stage,” but Piaget’s broad distinctions among basic development periods from infancy through adolescence continue to be used because they’re useful categories for identifying approximate degrees of intellectual development and their underlying characteristics.

Piaget proposed that these particular periods of cognitive development are based on qualitative, structural changes that have a fixed order and cannot be skipped. Piaget viewed these structural changes as milestones in the hierarchy of cognitive development. He documented movement as a primary agent in acquiring cognitive ability, particularly in children’s early years. Piaget conducted longitudinal studies and used chronological age as an indicator to document and validate the observed behaviors. His observations served as the primary indicators of children’s ever-increasing complexity in cognitive development.

Piaget concerned himself with the cognitive development of children up to age 15 and identified four complex phases; sensorimotor (birth to two years), preoperational (two years to seven years), concrete operations (seven to 11 years), and formal operations (12 years and over). Past the age of 15, Piaget believed that highly sophisticated intellectual capabilities were developed, and that further maturity reflects continued application of those capabilities. His theory is currently among the most popular of the theories postulated by experts in the field of child development because of its clarity, insight into, and understanding of the development of cognition.

Jean Piaget’s Phases of Cognitive Development

(Adapted from Piaget, 1952)

Phase I: Sensorimotor

Approximate Age: Birth to 2 years

Characteristics: Infants construct meaning of their world by coordinating sensory experiences with movement experiences.

During the sensorimotor phase children learn to differentiate themselves from objects and others. The child learns through physical interactions with the world. The major developmental task at this phase is for the infant to develop coordination of movement activities and perceptions into a meaningful whole. The sensorimotor phase is composed of overlapping stages that begin with the use of reflexes and culminate with the development of basic cognitive function.

Phase II: Preoperational Thought

Approximate Age: 2 to 7 years

Characteristics: Children continue to discover both the environment and self through movement activities. Children are not yet able to think using logical operations to transform information, but they have developed the ability to think in images and symbols and can form mental representations of objects and events. Children display increased symbolic thinking by linking their world with words and images.

During the preoperational thought phase the real beginnings of cogni-

tion start to occur. The child can't yet mentally manipulate objects, so still relies on physical activity to function cognitively, hence, the term *preoperational*. Preoperational thought is characterized by a shift from exclusively self-satisfying behavior to socialized behavior and thinking of others. Children attempt to adjust new experiences to previous thought patterns and continue to investigate their world. However, they still interpret everything based on how they see it. Children judge events by their outward appearance, regardless of objective logic.

During this phase children ask "why?" and "how?" a lot, trying to discover what lies behind experiences. Language begins to replace physical action as the primary method of learning and expressing thoughts. They need to learn conservation of quantity and volume before they can develop the concept of numbers. At this phase the child does not comprehend time.

The preoperational child is egocentric (self-centered, viewing the world as seen from the self) and spends most waking hours playing, which is an important tool for learning. Play also serves to enact the rules and values the child learns. Children at this stage show interest in widening personal social relationships, which continues to expand as the child develops. The child begins to exhibit interest in relationships and social roles between people, such as "mother," "father," "sister," and "brother."

Phase III: Concrete Operations

Approximate Age: 7 to 11 years

Characteristics: Children begin to think in a logical manner, and although they cannot yet abstract, they are capable of thinking in terms of the concrete or actual experience. At this stage children are able to reason logically about concrete events and can classify objects in their world into various sets.

During the concrete operations phase, the child learns to distinguish between appearance and reality. At this stage they learn to think about different ways of reaching the same solution by applying their rules in thinking. This phase is called "concrete" because abstractions are still beyond understanding, and the child's mental abilities still rely on concrete (real) objects.

The concept of *reversibility* marks this phase. Reversibility refers to being able to mentally reverse a change (shape, position, number, etc.), and enables the child to relate to events or thoughts as interrelated. The child can consider a thought from beginning to end, or from end to beginning.

At the concrete operations phase perceptions become more accurate, and the child applies interpretations of environmental perceptions knowingly. To understand the physical and social world the child continues to learn from play, which becomes more a process of cognitive thought and less a way of assimilating. As a result, curiosity finds expression in intellectual experimentation.

Phase IV: Formal Operations

Approximate Age: 11 years onward

Characteristics: Adolescents and adults can think abstractly and use logical and systematic problem solving in cognitive processing. The youth is able to create a hypothesis to account for an event and then test it in a deductive fashion. The adolescent and adult are capable of reasoning more logically in abstract and idealistic ways.

Formal operations marks the end of childhood and the beginning of youth. Cognitive development becomes systematic in problem solving. The child can apply deductive reasoning based on incomplete facts and think beyond the present. Reasoning based on hypothesis and beyond observation becomes possible. The child can day dream and fantasize beyond reality.

Much of Piaget's work references movement activities and the importance of play. Piaget believed that through play (both structured and free), the child has the opportunity to test novel physical, cognitive, emotional, and social behaviors that cannot otherwise be accommodated in the real world. Higher cognitive structures are formulated through the processes of accommodation and assimilation, both of which rely on self-discovery through play and movement activity. Once the behaviors are tested through play and movement activity, they become part of memory; hence, from a cognitive perspective, play and movement activity is a medium for intellectual development.

Although many contemporary researchers agree with Piaget's basic suggestions, in recent years several revisions, extensions and new interpretations of Piaget's work have appeared. Some controversy centers over the staged character of the transformations. Many researchers suggest that Piaget underestimated how quickly children can learn certain cognitive strategies. Other neo-Piagetian theorists have extended models that offer a picture of development that is more continuous and gradual, rather than in stages. Some theorists such as Robert Havighurst (1953, 1972) extended the Piagetian theory into adulthood, another frequent noted limitation. These theorists suggest that rather than just possessing the ability to answer complex questions, adults seek out challenges and operate at a higher level of critical thinking by creating problems and discovering questions to ask.

Nonetheless, subsequent theories and models have tended to refine and extend Piaget's theory, not discredit or obsolete it. Consequently, Piaget's theory remains the most influential and foundational model of human development cited and applied – including in this book – probably due to its adaptability to practical application as well as its accuracy in predicting general intellectual capabilities at differing ages.

Developmental Task Approach

Robert Havighurst (1953, 1972) Environmental Theory

Havighurst's environmental theory of human development views development as an interplay between biological, social and cultural forces. These forces constantly adjust and change to function effectively in society. Havighurst disagrees with the theory that proposes an innate basis of growth and development. He believes that living is learning and growing is learning.

Development, then, according to Havighurst, is the process of learning one's way through life. According to Havighurst, there is a series of tasks that an individual must achieve within a certain period to ensure proper development. At each level of development the child encounters new social demands. These demands, or tasks, arise out of three sources. First, tasks arise from physical maturation. Such tasks as learning to walk, talk and get along with peers are maturation-based. Second, tasks arise out of cultural pressures of society, such as learning how to read and learning to be a responsible citizen.

The third source of tasks is oneself. Tasks arise out of the maturing personality and the individual's values and unique aspirations. According to this model, there are teachable moments when the body is ready and society requires successful completion of a task. This is particularly important to parents and educators because it describes when a person's body and self are ready to achieve a certain task. Parents and educators can make learning more effective by teaching tasks that are suitable for a particular level of development and by being aware that biological, cultural and self factors all interact with one another to influence a child's readiness to learn. Havighurst's model relies heavily on movement, play and physical activity as a means to development.

Havighurst has suggested six major periods of development: infancy and early childhood (birth through five years), middle childhood (six through 12 years), adolescence (13 through 18 years), early adulthood (19 through 29 years), middle adulthood (30 through 60 years), and later maturity (60 years and up).

Summary of Havighurst's Developmental Tasks

(Adapted from Havighurst, 1953).

(The interpretation of these tasks with respect to age should be flexible. Ages are only convenient approximations; however, significant delay in acquiring these tasks at these age boundaries would, according to Havighurst, cause great difficulties with future tasks.)

1. **Infancy and early childhood (birth to 5 years)** is marked by learning to walk and talk. Children acquire concepts and language to describe social and physical reality around them. They learn to distinguish right from wrong and begin to develop a conscience. During this stage children are developing a readiness for learning to read. Children are interested in experimenting with different foods and food groups. They have become independent individuals by taking care of personal needs such as dressing themselves and looking after personal hygiene. According to Havighurst, children are aware of the differences in sex and they practice sexual modesty.
2. **Middle Childhood (6 to 12 years)** is the period of development where children continue to seek personal independence. Youngsters of this age are working on building a positive attitude towards themselves and society. Acquiring the physical skills necessary for playing ordinary games helps in learning to get along with other children of the same age set. Attendance at school continues to challenge their reading, writing, and number skills abilities. According to Havighurst, children of this age are learning an appropriate sex role, are developing a conscience, morality and a scale of values. These are all concepts children need to develop to cope with everyday living.
3. **Adolescence (13 to 18 years)** is an emotional time for most teens. During this period of development youths learn to accept their physical appearance and adopt a masculine or feminine social role. They are busy achieving mature relationships with both sexes. The zest for independence from parents continues during this stage of development as individuals prepare for marriage

and family life. Acquiring values and an ethical system to guide behavior is foremost in achieving socially responsible behavior and attaining an economic career.

4. **Early adulthood (19 to 29 years)** is the period of development where selecting a partner and learning to live with a partner occurs. Starting an occupation is foundational for successfully managing a home, starting a family and rearing children.
5. **Middle adulthood (30 years to 60 years)** is the time most adults are satisfied with career achievement. Helping teenage children to become happy and responsible adults is a focus of adults of this age. Social and civic responsibility is achieved and adults are beginning to relate to a spouse as a person. Participation in adult leisure-time activities is evident as is the acceptance of the physiological changes of middle age. Adults in this stage of development are also adjusting to aging parents.
6. **Later maturity (60 years and up)** is characterized by the necessary adjustments to decreasing strength and health. Other adjustments include retirement and getting use to a reduced income. It is at this state that some individuals lose a spouse, and establishing relations with one's own age group and establishing satisfactory living quarters becomes foremost.

Havighurst is included here specifically for his research addressing the developmental tasks of normal adolescence. His research can illustrate the elements of the overall sense of self that adolescents carry with them as they move toward and into young adulthood. Havighurst identified eleven developmental tasks associated with the adolescent transition. According to Havighurst, adolescents progress through multiple developmental tasks, several at a time.

During the early adolescent years young people are trying to leave the dependent, secure role of a child, and establish themselves as unique individuals independent of their parents. During this developmental time there is rapid physical growth and maturation; consequently their self-concepts often focus on their physical self and their evaluation of their physical acceptability. There is also an intense focus on getting along with others and young people want to be seen as conforming to peer wishes rather than appearing different.

New thinking skills mark the emergence of middle adolescence. Although peers play an important role in development, middle adolescence is characterized by becoming more self-directed. Previous concerns regarding peers are shifted toward the opposite sex. Much of an adolescent's energy directs towards preparing for adult roles and making decisions about vocational goals. A sense of behavioral maturity and learning to control impulsiveness are very characteristic of middle adolescence.

Final preparations for adult roles mark the later stages of adolescence. The need for peer approval diminishes and the desire to crystallize vocation goals heightens. Personal identity is all but completely established as the adolescent shifts to adulthood.

Havighurst's Developmental Tasks of Normal Adolescence

(Adapted from Havighurst, 1953)

1. **The adjustment to a new physical sense of self** – At no time since birth does an individual undergo such rapid and profound physical change as during early adolescence. Puberty is marked by a sudden rapid growth in height and weight. The young person experiences the emergence and accentuation of the physical traits that distinguish the sexes. The result of this change is that the adolescent often becomes focused on his body.
 2. **The adjustment to new intellectual abilities** – Adolescents are able to conceive of their world with a new level of awareness. At this stage in development, young adults are able to deal with abstractions rather than just real and physical things.
 3. **The adjustment to increased cognitive demands at school** – School curricula are frequently dominated by the inclusion of abstract, demanding material. Not all adolescents make the intellectual transition at the same time. School can become frustrating for those who can't yet think in abstract terms.
 4. **The development of expanded verbal skills** – Adolescence must develop new verbal skills to accommodate more complex concepts and tasks. Adolescents may appear less competent because of their inability to express themselves.
 5. **The development of a personal sense of identity** – Prior to adolescence, one's identity is an extension of one's parents. During adolescence, individuals begin to recognize their uniqueness and begin to separate from their parents.
 6. **The establishment of adult vocational goals** – At this stage adolescents need to identify what their adult vocations might be and how they intend to achieve those goals.
 7. **The establishment of emotional and psychological independence from parents** – Adolescents must weigh the desire for dependence against the need to be independent. In asserting their need for independence and individuality, adolescents may respond with what appears to be lack of cooperation.
 8. **The development of stable and productive peer relationships** – Peer interaction seems to reach a peak of importance during early and middle adolescence. The degree to which an adolescent is able to make friends and have an accepting peer group is a major indicator of how well the adolescent will successfully adjust in other areas of social and psychological development.
 9. **The management of sexuality** – With increased physical and sexual maturity, adolescents must adopt a set of attributes to accommodate their personal sense of masculinity and femininity.
 10. **The adoption of a personal value system** – During this stage of development adolescents must adopt an integrated set of values and morals. Adolescents must assess parents' values as they come into conflict with values expressed by peers and other segments of society. Adolescents reconcile differences into a personal ideology.
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Socio-Cultural Approach

Lev Semyonovich Vygotsky's (1896-1934) Theory of Proximal Development

Vygotsky's work in human development centers on his reapplication of cognitive psychology and how the mind represents knowledge. Although other theorists concluded that the social world plays a primary role in the development of children's cognitive growth, Vygotsky was more concerned with the *interrelationships* between social influences. Vygotsky's theory of child development assumes that social interaction and children's participation in authentic cultural activities are necessary for development to occur.

Also, similar to how, according to evolutionary theory, new mental abilities in the human species arose out of the need to communicate and function as a collective, Vygotsky's theory places social interaction at the root of all complex, higher mental functions. His theory suggests that social interaction leads to continuous step-by-step changes in children's thought and behavior, which can vary from culture to culture. Vygotsky focused on the links between cultural and historical social factors, and those of a more interpersonal nature. Vygotsky's theory is referred to here as the *socio-cultural approach*, but, it has also been labeled the *social-historical* and the *cultural-historical* approach. This is because of Vygotsky's interest in the historical development of the human species in addition to child development.

Overview of Vygotsky's Main Theoretical Components

(Adapted from Vygotsky, 1978)

Cross-cultural Variation

Since cultures differ in the activities they emphasize and in the tools they use, higher cognitive functions in individuals vary across cultures.

The developmental or genetic method

According to Vygotsky, understanding human behavior requires examining the development of history of behavior. To really know the essence of something, one must see how it was formed developmentally.

Two Lines of Development

Vygotsky discusses two distinct planes on which child development takes place: the natural line and the cultural line. The natural line refers to biological growth and maturation of physical and mental structures. The cultural line refers to learning to use cultural tools and human consciousness, which emerges from engaging in cultural activity.

Lower Versus Higher Cognitive Functions

Similar to Vygotsky's biological and cultural lines of development, human cognitive activity can be divided into lower and higher cognitive functions. Lower cognitive functions occur in other mammalians. In contrast, higher cognitive functions are unique to human beings. They involve the use of language or other cultural tools to guide or mediate cognitive activity. Higher cognitive functions during development systematically reorganize lower cognitive functions.

General Genetic Law of Cultural Development

Vygotsky proposes that any function in the child's cultural development appears twice, on two additional planes. First it appears on the social, or interpersonal plane and then on the individual, or psychological plane. All higher cognitive functions have social origins that are eventually internalized.

Language Is Central

Language, the primary cultural tool used by humans to mediate their activities, is instrumental in restructuring the mind and in forming higher-order, self-regulated thought processes.

Education Leads Development

Formal education and other cultural forms of socialization are key in leading the child along the developmental pathway to adulthood.

Zone of Proximal Development

The zone of proximal development is the hypothetical, dynamic region in which learning and development take place. It is defined by the distance between what a child can accomplish during independent problem solving and what the child can accomplish with the help of an adult or more competent member of the culture.

Vygotsky believed that culture creates special forms of behavior that change how a child thinks. Cultural factors cause children to construct new levels in human behavior during development, changing the means and methods in their behavior and transforming natural inclinations and functions into new, specifically cultural, forms of behavior. Basically, Vygotsky's theory suggests that development depends on the interaction with people and the tools that the culture provides to help form their own view of the world.

According to Vygotsky there are three ways a cultural tool passes from one individual to another. The first is *imitative learning*, where a child tries to imitate or copy another individual. The second way of passing cultural tools is through *structured learning*, which involves remembering the instructions of the teacher and then using these instructions to guide the learner during independent study. The final way is through *collaborative learning*. Collaborative learning involves a group of peers who strive to understand each other and who work together to learn a specific skill and/or understanding.

Vygotsky postulated that one can only understand interpersonal interactions in the context of, or with reference to, the same cultural and historical forms. Learning from others with more competent, culturally appropriate skills and technologies forms the foundation to Vygotsky's educational theory. Explanation, demonstration and work guide children. They attain higher levels of thinking when guided by more capable and competent adults. Vygotsky also believed that ongoing changes in a child's thought and behavior vary between cultures.

Vygotsky's social cultural theory consists of four basic principles. Several elements underpin these basic principles of sociocultural theory of development. The first is private speech. According to Vygotsky children speak to

themselves to plan or guide their own behavior. Private speech is common among preschoolers, who have not yet learned proper social skills but rather explore the idea of it. When a task becomes difficult to solve, children often use private speech to devise a plan to proceed. It's not unusual to hear children talk themselves through a task they are unsure of accomplishing.

The second element Vygotsky uses to buttress his basic principles of cognitive development is the zone of proximal development. Vygotsky defined a gap between what is known and what is not known as the zone of *proximal development*. This “zone” represents the amount of learning possible by a child given the proper instructional conditions. The ability to attain higher levels of knowing requires moving through this zone, and is facilitated by interaction with other, more advanced peers, which for Vygotsky, generally means adults. Simply, children accomplish a task that they cannot do alone with the help from more skilled people. Once the problem solving activities have been internalized, the problems initially solved under guidance and in cooperation with others will be tackled independently. This contrasts somewhat with Piaget, who saw development based on more general interactions with the world – not exclusively or primarily adults.

Through increased interaction and involvement, children extend themselves to higher levels of learning. So, the zone of proximal development is the distance between the actual developmental level as determined by independent problem solving, and the level of *potential* development as determined through problem solving under the guidance of or in collaboration with a more competent person.

Children extend themselves to higher levels of learning through the process of scaffolding. *Scaffolding* refers to the change in social support that occurs when new understandings are developed and implemented.

Metaphorically, the child is viewed as a building, actively self-constructing. The social environment is the necessary scaffold, or support system, that allows the child to move forward and continue to build new competencies. Scaffolding

THE FOUR BASIC PRINCIPLES

Vygotsky's Social-cultural Theory

- 1 children construct their knowledge
- 2 development cannot be separated from its social context
- 3 learning can lead development
- 4 language plays a central role in mental development



According to Vygotsky, the social environment is the support system that allows the child to move forward and develop new competencies.

has two important qualities; *joint problem solving* and *intersubjectivity*.

First, effective scaffolding has children engaged in an interesting and culturally meaningful, collaborative problem-solving activity. What is important is that children interact with someone who joins in trying to reach a goal. Second, intersubjectivity, the process whereby two participants who begin a task with different understanding arrive at a shared understanding, must be present. To achieve true collaboration and to communicate effectively during joint activity, it is essential that the participants work toward the same goal. Intersubjectivity creates a common ground for communication as each partner adjusts to the perspective of the other. Parents and instructors try to promote intersubjectivity when they translate their own insights in ways that are in the child's grasp. For example, an instructor might point out to a young student diver the links between a new task and ones the child already knows. As the child stretches to understand the interpretation, the child draws toward a more mature approach to the situation. In other words, an essential element of scaffolding is that the participants in social interaction negotiate or compromise, striving for a shared view of the situation that falls within the child's zone of proximal development.

The zone of proximal development has implications for assessment. In an effort to measure readiness and willingness to learn, the zone represents the distance between the *actual* developmental level as determined by independent problem solving and the level of *potential* development as determined through problem solving under teacher guidance or in collaboration with more capable peers. Two children can differ substantially in the zone of proximal development. One child may do better alone, while another needs some assistance. Therefore, the zone of proximal development is crucial for identifying each child's readiness to benefit from instruction.

Vygotsky developed the concept of the "zone" to consider the problems of measuring mental age and predicting future development and learning. For example, if a child's zone of proximal development is known for a particular skill, one might predict how that learner will independently use that skill in the near future.

Vygotsky's discussion of the relationship between actual development and potential development also has important instructional ramifications. Maximally effective instruction occurs within the learner's zone of proximal development. Instruction directed at the level of completed development can, of course, increase the knowledge base, but will have minimal effect upon the student's cognitive ability. Instruction directed beyond the proximal level will tend to be incomprehensible thus will affect neither knowledge nor cognitive



activity. The most effective teaching is therefore, somewhat, but not too much, in advance of development.

Vygotsky believed that the zone is created in the course of social interaction. What connects the learner to the learner's social world are the meanings, tools and goals of the learner's culture. The developing child and the child's culture jointly construct the child's mental tools and goals, with the assistance of those adults more capable and competent in the use of those culturally appropriate tools and appropriate goals.

Vygotsky's model lends well to an understanding of how PADI has developed standards and limitations for youngsters learning to dive. For instance, diving instruction involves younger learners working with more capable others (instructors and parents) on challenging tasks that they cannot solve independently. The more capable participants (instructors and parents) model appropriate problem solving behaviors, present new approaches to a problem, and encourage the young learner to use already-learned skills by assuming responsibility for some parts of the task (reading the manual and answering knowledge reviews). As young student divers develop the abilities required, they should receive less assistance and solve more of a problem independently or with limited guidance. Simultaneously, the young student diver will encounter yet more challenging tasks on which they will continue to receive help.

Vygotsky's socio-cultural theory is often compared to Jean Piaget's theory of cognitive development. A close look reveals that in their visions of the role of natural or biological change and of historical and social circumstances in development, the contrast between Piaget and Vygotsky is more one of emphasis than of opposition. Thus, Piaget and Vygotsky each devised theories with natural and social dimensions and regarded neither deminsionas sufficient by itself to fully explain development.

Piaget stressed the natural side in his account of general structural change in children's thinking, and Vygotsky stressed the social side in highlighting the transforming effect of communications with more capable partners on children's naturally formed concepts. Where Vygotsky believed in the zone of proximal development and the social and cultural environment as mechanisms for cognitive development, Piaget believed that the most important source of cognition was the child. Piaget found that children act independently on the physical world to discover what it has to offer. Piaget focused on what it is within the organism that leads to cognitive change. Vygotsky, on the other hand, views the development of mental activity as the result of social learning. Vygotsky explored how social experience might cause important revisions in the child's thinking to come about. His emphasis on the role of instruction in development highlights the importance of verbal communication; however, he acknowledges that children sometimes revise their thinking by stumbling across challenges in the environment. For Piaget, instruction can refine and improve structures that have already emerged, but it cannot lead to the development of concepts as Vygotsky believed. Piaget acknowledges that members

of the child's culture can aid development through instruction and communication; however, not in the strong way Vygotsky proposed.

Since Piaget and Vygotsky share a set of basic beliefs about development, their theories are best viewed as complementing one another. Both agree that there are two lines of development – the natural and the social – that interact continuously in intellectual development. Each line is important, and cognitive development cannot be understood without both. Piaget and Vygotsky both agree that development results from experience in an environment; eventually, children become capable of transforming their experiences mentally, through internal reflection. Both agree, with slight points of departure, that the course of cognitive development involves major qualitative transformations in thinking. For Piaget, children everywhere move through a series of four stages. For Vygotsky, thinking transforms when children become capable of linguistic communication and when instruction leads them to become aware of and to master their own thoughts. Finally, both theorists agree that social influences can affect the pace of an individual's development. Recognition of shared as well as unique features of Piaget's and Vygotsky's theories allows for a unified perspective that incorporates the best features of both.

Information-Processing Approach

Richard Schmidt (1988) Information-Processing

The *information-processing theory* of human development views development in terms of cognitive activities. Cognitive activities are analyzed as successive stages of information processing. The roots of the information-processing approach to human development are in the fields of computer science (manipulation of symbols), communication theory (information coding and channel capacity), and linguistics (language). With the mass popularity of computers, researchers in this camp compare human processing to basic computer functions in which information is encoded, stored, transformed, retrieved and acted upon. In terms of information processing, these developmentalists are concerned with the way individuals use information in perceiving, making decisions and organizing activity in relationship to the demands placed on them by the environment.

Theorists who support this approach have identified terms such as attention, perception, memory, processing speed and problem solving strategies. Drawing close analogies between the human mind and the computer, researchers indicate that the human mind has a limited capacity to process information. With development, changes in the capacities of cognitive structures occur. As individuals progress toward adulthood they become able to process information in a shorter period.

The information processing approach to development has been included here because virtually all forms of human behavior involve information processing. Whether from the perspective of cognitive psychology or the acquisition and performance of a motor skill, the ability to process information is one of the major contemporary issues in human development.

Contextualist (Ecological) Approach

Urie Bronfenbrenner's (1979) Ecological Theory of Human Development

Bronfenbrenner's *ecological theory* of human development strongly emphasizes factors within the environment as being key to development. Ecological theory receives its label from the branch of biology dealing with the relation of living things to their environment and to one another. Bronfenbrenner's theory rests on the premise that it is not the environment itself that predicts behavior, but rather the individual's *interpretation* of the environment, in both time and space. Therefore, the historical period in which the individual develops is important. This means that to understand child behavior, one must understand what the environment means to the child. In other words, Bronfenbrenner places considerable importance on one's *perspective* of the activities, roles, and interpersonal relations typically displayed in a behavioral setting.

Bronfenbrenner's perspective emphasizes the broad range of situations and contexts individuals may encounter. He describes the settings or environments (context) in which individuals develop as five distinct systems: the microsystem, mesosystem, exosystem, macrosystem and chronosystem. The *microsystem* ("small system") is the setting in which the individual lives, and includes family members, peers, school, and the neighborhood. The interaction among the various settings in the microsystem is referred to as the *mesosystem* ("middle system"). Hence, parental support of the child in collaboration with the school system is an example of the mesosystem. When experiences in another social setting in which the individual does not have an active role influence what the individual experiences in an immediate context, the setting is the *exosystem* ("outer system"). An example of an exosystem is the government's education department, responsible for the quality of education opportunities. The *macrosystem* involves the culture in which the individual exists. An example of the macrosystem is the passing down of behavior patterns and beliefs from one generation to the next. The final contextual influence is the *chronosystem*, which is the patterning of the environmental events and transitions over time. For example, women today are more likely to be firefighters, members of the police force, and navy fighter pilots than they were 40 years ago.

Bronfenbrenner places an individual with unique biological and psychological makeup at the core of the contextual model. This model has been included here as it has great promise and direct implications for providing a more comprehensive explanation of human development; however, the main criticism has been the failure to adequately account for the interaction between genetic and contextual history.

What Have We Learned About Human Development?

Much of the present understanding of human development arises from various traditional and contemporary theoretical models. Earlier approaches to explaining human development were more descriptive, using a systematic cataloging of norms and age-related behaviors, more contemporary approaches

Conceptual Approaches to the Study of Human Development

Conceptual Approach	Representative Theorists	Research Focus
Biological-maturation Approach	Arnold Gesell (1880-1961)	Study of maturational processes in central nervous system development from birth through childhood.
Psychoanalytical Approach	Sigmund Freud (1856-1939)	Study of psychosexual development from birth through childhood.
Psychosocial Approach	Erik Erikson (1902-1994)	Study of life span psychosocial development.
Learning-behavioral Approach	John Watson (1878-1958) Albert Bandura Walter Mischel	Study of behavior, the environment, and cognition as key factors in development.
Cognitive-developmental Approach	Jean Piaget (1896-1980)	Study of cognitive development as an interactive process between biology and the environment from infancy to childhood.
Developmental Task Approach	Robert Havighurst	Study of the interaction of biology and society on developmental maturity from infancy through old age.
Social-cultural Approach	Lev Vygotsky (1896-1934)	Study of the links between cultural and historical social factors, and those of a more interpersonal nature.
Information-processing Approach	Richard Schmidt	Study of cognitive activities in terms of successive stages of information processing.
Contextualists Approach	Urie Bronfenbrenner	Study of development as a function of the individual's interpretation of specific environmental settings transacting with the sociocultural and historical milieu.

attempt to explain the mechanisms and processes accounting for change. While each of the previous theorists looked at human development from different points of view, there are marked similarities. Each explanation of human development emphasizes movement and play as important in human development.

The theories differ in the particular aspects of development they emphasize. Clearly, educators and parents must be aware that human development

has many dimensions and aspects; it's not appropriate to consider one theory of development and exclude all others. All models of human development acknowledge the interrelatedness of human behavior in the cognitive, affective and psychomotor domains, and that these domains develop together rather than independently.

The models of human development presented here group into nine conceptual frameworks: (1) the biological-maturation approach, (2) the psychoanalytical approach, (3) the psychosocial approach, (4) the learning-behavioral approach, (5) the cognitive-developmental approach, (6) the developmental task approach, (7) the socio-cultural approach, (8) the information-processing approach and (9) the contextualists approach of human development.

While those involved with teaching youngsters (diving or any subject) benefit from considering all the human development theories, no one has combined all the theories into a single model that instructors and parents can apply directly to the teaching process. With that in mind, as mentioned, this book draws chiefly upon Jean Piaget's and Lev Semyonovich Vygotsky's work, which apply most directly to the practical aspects of teaching and instruction.

Children are Intelligent in Different Ways

How Children Learn

To understand what is best for the learner, instructors and parents need to understand how learning takes place. In their early years, children form neural connections, or synapses, very quickly. These synapses, or learning pathways, define the brain's organization and functioning throughout life.

What causes brain cells to form learning pathways? Genes control some of the process, but experience plays a big role. Every time a parent or caregiver interacts with an infant or toddler, connections are formed. Positive interactions with nurturing caregivers profoundly stimulate young brains. This stimulation causes new learning pathways to form, and strengthens existing ones.

In the first years of life, children form extra learning pathways. A three-year-old has twice as many synapses as an adult, which means that the brain is twice as active. After age 10, as children move toward adulthood, the brain eliminates trillions of extra connections. Those synapses that have been used repeatedly in the early years have become stronger and tend to remain. Those that have not been used often enough are shed.

In adolescence, young people lose connections or synapses at a rapid rate. This is a natural process, beneficial for the human brain. It can be compared to pruning plants in a crowded garden. The ones that remain can grow larger and stronger. The result is a brain that is better organized and better suited for learning the more difficult concepts and skills that a young adult needs to master. Children whose neural pathways have been reinforced by positive early experiences will be better off when the brain's pruning process begins.

Stimulating Children's Learning

The period from pre-conception to age five is the "investment phase" of a child's life. Failure to provide the right conditions for a child's development during this time makes the brain differ physically from the brain of a child who has been well cared for. If the environment in which the child lives is safe, stimulating and nurturing, brain development will be strong. If the environment is unsafe, under-stimulating or non-nurturing, brain development will be weakened. These differences can have lifelong consequences.

New brain research confirms that reading to children, talking to them, telling them stories, singing to them, and other kinds of language activities encourage early development. These activities not only support intellectual growth, but they promote healthy emotional and social development as well.

Children are Active Learners

Not only are children physically active, but they actively seek out new experiences. They learn from hands-on experience that involves all of their senses. They learn best in an environment where they can make decisions and choices appropriate to their age and level of development.



Children learn best in an environment where they can make decisions appropriate to their age and development level.

Children Learn Through Physical Experience

Through looking, listening, smelling, tasting, and touching, children find out what things are like, how they work, and how they relate to one another. They combine these observations with more complex thinking like identifying patterns, interpreting, and drawing conclusions about what happens. These conditions either add to children's existing ideas or cause them to adjust their thinking.

Surroundings Affect Children's Learning

Children learn best when they are safe and secure. Instructors and parents create this feeling when they treat them with warmth, respect and care. A stimulating environment is also important. This is created when children are expected to learn, when they feel challenged to a level they are mature enough to handle and when they have a variety of opportunities and experiences.



Children Learn Through Social Interaction

Children are influenced by the people in their lives, especially the adults who are important to them, such as parents, other relatives and educators. They also learn through interaction with their peers. As children relate to others, they make decisions about themselves and their actions based on the reactions they receive. They decide if their thinking and actions are right or wrong and adjust them accordingly.

Children Learn Through Reflection

Children need to reflect on what they know. Caregivers can guide children to make connections between what they know now and what they want to know. This helps them to make connections between ideas and gives them clues for doing similar things in the future.

Human Development and Learning

Instructors and parents looking at children always need to remind themselves that:

- they should expect a wide range of individual variation;
- each human being has an individual rate and style of learning;
- each human being has an individual pattern and timing of development and learning;

- family experiences and cultural backgrounds vary; and
- individual variation is natural and valuable – decisions about curriculum, assessment, and participation must respond to individual needs and interests.

Learning and the Learner

1. Learning requires the active participation of the learner.
 - Learning is natural and enjoyable, but it requires effort.
 - Examining one's beliefs and knowledge is essential for successful learning.
 - Feedback to children about the learning that they demonstrate is very important.
2. People learn in a variety of ways and at different rates.
 - As children grow, learning shifts from a focus on self and reasoning based mainly on objects and personal experiences, to more abstract ways of thinking.
 - Each child's approach to learning is to some degree unique, reflecting personal interests, abilities and experience. The pace of learning also varies.
3. Learning is both an individual and a social process.
 - Learning involves the construction of knowledge and meaning by individuals.
 - Social interaction provides opportunities to examine one's knowledge and beliefs, and contributes to the motivation to learn.

Children as Learners

Many people have researched the ways people learn. The following are examples of the conclusions that researchers in education have come to about children as developing learners. These examples reflect a view of children as learners actively involved in building personal knowledge through action, experience and reflection.

- Children make meaning of their experiences through interactions with parents, with teachers/instructors and with other children.
- Children need positive, realistic self-esteem to develop their individual potential. The way they *feel* about themselves relates to their ability to learn. The classroom climate and nature of school work contribute directly to how children feel about themselves.
- Children make sense of their world based on what they've already learned, experienced and constructed mentally (their schema).
- The prime need of all learners is to find the meaning of experiences.
- Educators now avoid rote memorization because it lacks a meaningful experience – context – that yields useful learning.

- Children learn through the process of *play*. It is a natural, universal learning activity of children (and adults). Play has a significant role in a child's development and learning, and in the early years is as an important part of daily education as are project work and systematic instruction.
- Children are naturally curious. From the time they are born, children want to know and to act or interact with their environment.
- Children learn through collaboration with others. Interaction with others fosters social, emotional and intellectual development. As Vygotsky points out, all significant development and learning occurs in the context of social interactions.
- Children develop many ways of understanding the world. They use many different intelligences to describe what and how they think, know, feel or do.
- Children acquire, develop and express their understandings through language – written and oral language develops concurrently.
- Children learn best in an environment that encourages controlled risk-taking and learning from their mistakes.
- Children gain knowledge by creating relationships. Children pursue learning in a holistic way without restrictions imposed by subject area.

Differing Intelligences

Children mature in different aspects at different rates, and have differing learning styles. Each child – even an identical twin – has a unique personality, likes, dislikes, and styles of learning. In the past, parents and teachers used reading, writing and a child's ability to use numbers to reveal a youngster's intellectual ability. Current research, however, suggests that there is a lot more to intelligence than these three capabilities.

Intellectual Development – Learning Styles

According to Howard Gardner, “It's not how smart you are but how you are smart.” Gardner suggests that human beings have a repertoire of skills – intelligences – for solving different kinds of problems. Gardner sees intellectual development as the ability to use an intelligence to solve a problem or fashion a product that is valued in one or more cultural settings.

Gardner identified eight different intelligences to account for the broad range of human potential in children and adults. Gardner's *Theory of Multiple Intelligences* (1983, 1991) proposes a major transformation in the way children learn to learn. The Multiple Intelligence Theory suggests that instructional processes may be more efficient if they're adaptive, such as presenting material in a wide variety of manners (using music, cooperative learning, art activities, role play, multimedia, field trips, inner reflection, and much more). One

of the most remarkable features of the Multiple Intelligences Theory is that it provides eight different potential learning pathways. If an instructor or parent has difficulty reaching a child using more traditional instructional methods, the Multiple Intelligence Theory suggests that there are other ways to present the material to achieve learning.

Realistically, parents and instructors don't have to teach and children don't have to learn something in all eight ways. Rather, the parent and instructor benefit by recognizing what the possibilities are and then applying the pathways most appropriate for the material and most effective as teaching or learning tools. The Theory of Multiple Intelligences is intriguing because it expands the horizon of available teaching/learning tools beyond the conventional linguistic and logical methods, lecture, textbooks and writing assignments used in most learning systems.

Gardner's Eight Intelligences

Logical-mathematical intelligence: This is the ability to reason and calculate, to think things through in a logical, systematic manner. This intelligence houses the ability to see patterns and the ability to approach situations logically. Children strong in logical-mathematical intelligence tend to be precise and methodical, and tend to excel in mathematics and science. These are the kinds of skills highly developed in engineers, scientists, economists, accountants, detectives and members of the legal profession. Famous examples:

- Albert Einstein (1879-1955)
 - German-born American physicist and Nobel laureate, best known as the creator of the special and general theories of relativity and for his bold hypothesis concerning the particle nature of light.
 - He is perhaps the most well known scientist of the 20th century.
 - He studied mathematics and physics.
- John Dewey (1859-1952)
 - American philosopher, psychologist, and educator.
 - Arguably the most influential thinker on education in the twentieth century.
 - His attention to experience and reflection, democracy and community, and to environments for learning, have been seminal.
 - His belief that education must engage with and enlarge experience has continued to be a significant strand in informal educational practice.
 - His attention to exploration of thinking and reflection and the associated role of educators is profound.
 - His concern with interaction and environments for learning provides a continuing framework for practice.

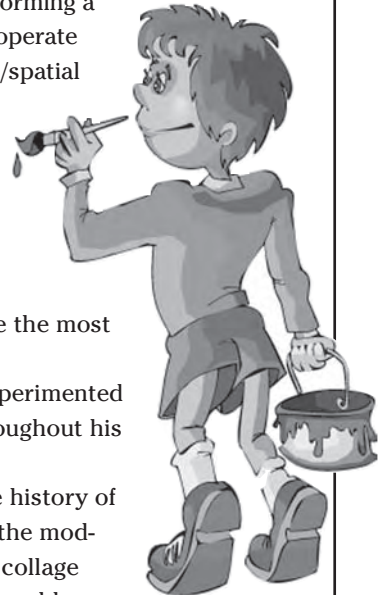
Linguistic intelligence: This is the ability to read, write and communicate with

words in many different forms. Reading and writing come easily to children with strong linguistic intelligence, and they tend to do well in school. Authors, journalists, poets, orators and comedians are obvious examples of people with gifted linguistic intelligence. Famous examples:

- Charles John Huffam Dickens (1812-1870)
 - English novelist and one of the most popular writers in the history of literature.
 - In his enormous body of works, he combined masterly storytelling, humor, pathos, and irony with sharp social criticism and acute observation of people and places, both real and imagined.
 - Some of his famous writings included: (1837-39) *Oliver Twist*, (1843) *A Christmas Carol*, (1849-50) *David Copperfield*, (1859) *A Tale of Two Cities*, (1860-61) *Great Expectations*, (1869-70) *The Mystery of Edwin Drood*.
- Lincoln, Abraham (1809-1865)
 - His reputation for debating helped him win the 16th presidency of the United States (1861-1865).
 - On 1 January 1863 during the US Civil War, he wrote and issued the Emancipation Proclamation, which declared forever free those slaves within states still in rebellion against the United States.
 - One of the great leaders in American history, a humane, far-sighted statesman in his lifetime, he became a legend and a folk hero after his death.

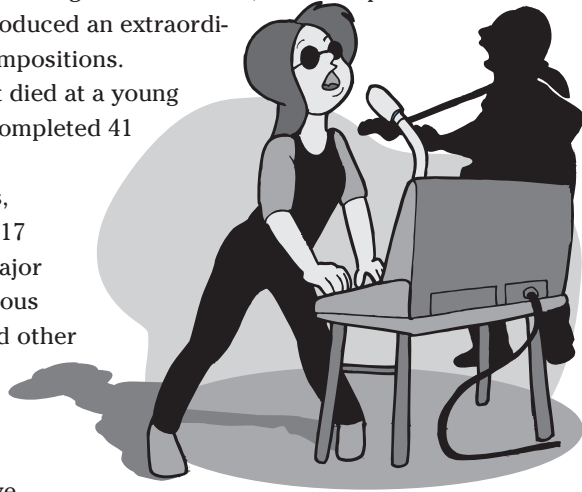
Visual/spatial intelligence: This is the ability to think in pictures, to visualize a future result and to imagine things in the mind's eye. Forming a mental model and having the ability to maneuver and operate using that model is typical. Children with strong visual/spatial intelligence think in images and pictures and often excel at representative drawings. Architects, sculptors, sailors, photographers and strategic planners are examples of people with visual/spatial intelligence. Famous examples:

- Pablo Ruiz y Picasso (1881-1973)
 - Spanish painter, who is acknowledged to be the most important artist of the 20th century.
 - A long-lived and highly prolific artist, he experimented with a wide range of styles and themes throughout his career.
 - Among Picasso's many contributions to the history of art, his most important include pioneering the modern art movement called cubism, inventing collage as an artistic technique, and developing assemblage (constructions of various materials) in sculpture.



Musical intelligence: This is the ability to make or compose music, to sing well, to understand music and to keep rhythm. It's a talent obviously enjoyed by musicians, composers, and recording engineers, though most people have musical intelligence that can be developed. Learning with a jingle or rhyme (e.g. "Thirty days has September...") draws upon musical intelligence. Children with strong musical intelligence easily remember melodies and are likely to hum and turn sounds into rhythms. Famous examples:

- Wolfgang Amadeus Mozart (1756-1791)
 - Austrian composer, who is considered one of the most brilliant and versatile composers ever.
 - He worked in all musical genres of his era, wrote inspired works in each genre, and produced an extraordinary number of compositions.
 - By the time Mozart died at a young age of 35, he had completed 41 symphonies, 27 piano concertos, 23 string quartets, 17 piano sonatas, 7 major operas, and numerous works for voice and other instruments.



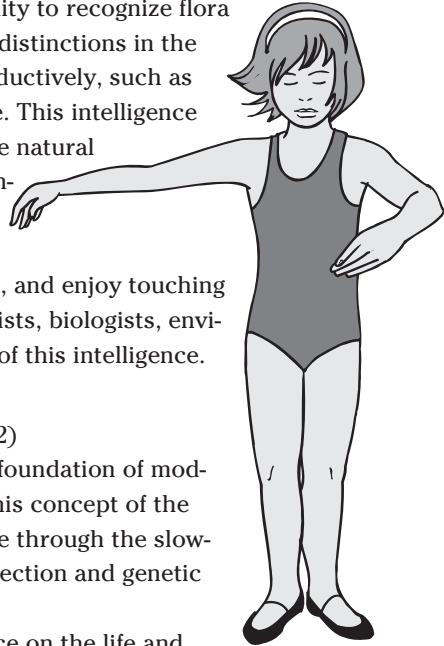
Bodily/kinesthetic intel-

ligence: This is the ability to use the body skillfully to solve problems, create products or present ideas and emotions. Those who excel at athletic pursuits, dancing, acting, artistically, or in building and construction display this intelligence. Surgeons and other physically talented people – “good with their hands” – fit among those with strong bodily/kinesthetic intelligence. Famous examples:

- Charlie Chaplin (1889-1977)
 - English motion-picture actor, director, producer, and composer.
 - One of the most creative artists in film history, who first achieved worldwide fame through his performances in silent films.
- Michael Jordan (1963- to present)
 - American professional basketball player.
 - Considered by many to be the greatest player in basketball history.
 - The 198 cm (6.5 ft) shooting guard first became known as an explosive and creative individual scorer, but as he matured as a player he adopted a more team-oriented approach to the game.

Naturalistic intelligence: This is the ability to recognize flora and fauna, to make other consequential distinctions in the natural world and to use this ability productively, such as in hunting, farming, or biological science. This intelligence includes the ability to be in tune with the natural environment and to use information gathered through the senses. Children with strong naturalistic intelligence are well coordinated, like to participate in sports, and enjoy touching things. Farmers, botanists, conservationists, biologists, environmentalists would all display aspects of this intelligence. Famous examples:

- Charles Robert Darwin (1809-1882)
 - British scientist, who laid the foundation of modern evolutionary theory with his concept of the development of all forms of life through the slow-working process of natural selection and genetic mutation.
 - His work was of major influence on the life and earth sciences and on modern thought in general.



Interpersonal intelligence: This is the ability to work effectively with others, to relate to other people, to display empathy and understanding and to notice others' motivations and goals. Children with strong interpersonal intelligence show the ability to understand the feelings and intentions of others. They work well in groups and often play a leadership role. Good teachers, facilitators, therapists, politicians, religious leaders and sales people display this intelligence. Famous examples:

- Mohandas Karamchand Gandhi (1869-1948)
 - Indian nationalist leader, who established his country's freedom through a nonviolent revolution.
- Mother Teresa of Calcutta (1910-1997)
 - Roman Catholic nun, founder of the Missionaries of Charity.



- For her humanitarian work she won the Nobel Peace Prize in 1979.

Intrapersonal intelligence: This is the ability for self-analysis and reflection, to be able to quietly contemplate and assess one's accomplishments, to review one's behavior and innermost feelings, to make plans and set goals, and the capacity to know oneself. Children with strong intrapersonal intelligence have the ability to understand their own feelings, motivations, strengths and weaknesses, and often keep journals and enjoy solitude. Philosophers, counselors, and many peak performers in all fields of endeavor have this form of intelligence. Famous examples:

- Plato (circa 428-c. 347 BC)
 - Greek philosopher, one of the most creative and influential thinkers in Western philosophy.
- Sigmund Freud (1856-1939)
 - Austrian physician, neurologist, and founder of psychoanalysis.
- (Anna) Eleanor Roosevelt (1884-1962)
 - Social activist, United States representative to the United Nations (1945-1953; 1961), and wife of 32nd U.S. president Franklin Delano Roosevelt.
 - She had an active public career before and during her marriage and continued to maintain a high profile after her husband's death.
 - Unlike any previous first lady, she held regular news conferences, wrote a daily newspaper column, represented the president and nation on foreign and domestic trips, and spoke out on a wide range of social issues.
 - She was also the nation's most prominent white opponent of racial discrimination in her time.
 - A lifelong champion of poor and marginalized people.

It is important for parents and instructors to observe children's abilities and interest areas. By identifying the strongest forms of intelligence, teachers and parents can select activities to bring out children's gifts, while gently encouraging development in the weaker. Knowing children's intelligences can help to identify the best ways to teach them. For example, a musical child will learn new information in the form of a song, a kinesthetic child in the form of a dance, a spatial child in the form of a drawing. During a diving course children with linguistic intelligence will prefer to learn from reading the text book, children with logical-mathematical intelligence will excel in discussions focusing on pressure/volume/density relationships and the dive tables, visual/spatial learners will prefer to learn by watching the video and still some kinesthetic learners will prefer to wait until they jump into the water before paying much attention to dive theory.

Most people exhibit more than one form of intelligence, and of course intel-

ligence preferences can change over time. Gardner's Multiple Intelligence categories are fluid and should be used as a guide by parents and instructors to foster learning, not as a prescription.

Learners differ not only in types of intelligences but in personality, culture, family background, and many other ways. PADI's snorkeling and scuba curricula are designed with inclusion as a commitment. That is, all learners have an opportunity to fulfill their potential and to reach their greatest success. Curricula, programs, and services are available to learners regardless of language, gender, learning style, culture, personality, intellectual ability, and physical capability. PADI's commitment is to afford all learners access to learning, to some degree, about the underwater world and how humanity affects it.

Learning to Dive Fosters Broader Learning and Maturity

Astute parents and instructors use learning to dive to foster broader learning and maturity. Reading, writing and arithmetic subliminally weave through the diving curriculum, offering parents and instructors opportunities to support and encourage the child as a developing learner.

Discovering a Child's Potential Through Diving

Instructors can collect information about a child's progress in a scuba program much as parents collect information about their child's growth and learning in a broader context. Instructors watch children in action, they look at collections of children's work and talk with children. The PADI curriculum has various opportunities to collect information on student progress. For instance, the PADI *Junior Open Water Diver Course* has *Quick Quizzes*, *Knowledge Reviews* and *Quizzes and Exams* as evidence of learning progress. Reviewing and collecting this information is referred to as *collecting authentic evidence*.

Collecting and recording the results of this information over time gives the instructor an informed picture of what a child can do and hence, with consultation with parents helps in making decisions to help further learning. This involves using criteria developed from research about child development and learning, as well as using the collective wisdom of parents and instructors. Generally, the criteria are called *widely-held expectations*, and refer to the capabilities one would expect the child to be able to develop for a given age, circumstances, prior learning and existing development.



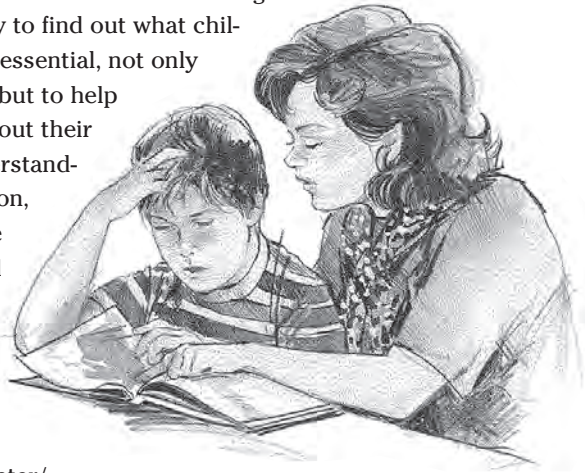
Photo Courtesy of Alese and Mort Pechter.

Watching, Talking and Listening to Children

One of the ways of finding out what children can do and their learning needs is to simply watch them. Through observation, parents and instructors learn how children connect what they already know with what they have yet to learn. This type of observation reveals the kind of direction that children need to further their learning. Discovering patterns and assessing progress contribute when planning a child's learning. When parents and instructors watch children, they learn about their learning style, learning needs, abilities and interests, problem-solving strategies, organizational skills, level of understanding, prior knowledge, attitudes, ability to work as an individual or in a group, initiative, desire to learn, likes, dislikes, and needs for assistance. Besides looking at just *what* children do, parents and instructors need to look at *how* children do things.

Talking and listening to children also offer new insights into their learning. The best way to find out what children think is to ask. This talk is essential, not only to find out what children think, but to help children clarify thinking, talk about their own learning, achieve new understanding levels, facilitate self-evaluation, feel their ideas and opinions are valued, appreciate progress and set goals, build positive learning relationships and become self-directed learners.

Conversations with children in diver training need to be a daily activity in the dive center/operation as well as at home. Conversations enhance learning in two ways. Initially, conversation lets a listener in on someone else's thinking, providing the opportunity to compare and confirm perceptions. Conversations also allow the speaker to refine and clarify thinking by putting thoughts into words. Parents and instructors need to tell children what they've done and are attempting to do so they may learn self-evaluation. It is through conversation that children learn to value what they do and what they are trying to do. This type of interaction also develops confidence in the learner, which is essential for setting personal goals.



Widely-held Expectations

Widely held expectations are generalizations about child development and learning. Parents and instructors use them as references in a general sense to observe development patterns over time, but they shouldn't be considered expectations for all children in all instances. Based on the theories and research presented earlier in this chapter, parents and instructors add their

personal wisdom and common sense, forming widely held expectations of development.

For instance, toward the end of most children's first year, they should be able to sit up, smile, eat solid foods, understand and perhaps say a few words, and should be on their way to taking their first step. These expectations are only generalizations, since they're true for some infants and not others. Taken individually, none of these expectations are particularly significant; they are snapshots or suggested profiles of a child's development at this age.



If one "expectation" isn't being met, that's probably insignificant.

Considered together, however, a child not meeting several expectations suggested for a particular age should raise concern. As parents and instructors use the widely-held expectations for a particular age and domain they are able to develop a picture of a child's progress in relation to the general development of other children of a similar age.

Widely-held expectations . . .

Provide parents and instructors with the big picture of children's growth and development over time, and:

- Form the basis of the concept of continuous learning.
- Help parents and instructors focus on the development of each individual child.
- Help instructors assess individual learners and plan appropriate learning experiences that ensure continuous progress.
- Can be used as a reference by parents for reassurance about their child's ongoing development.
- Can be used by parents in providing developmentally appropriate toys, reading materials and other opportunities to their children.

Supporting Learning

According to N. A. E. Y. C. (The National Association for the Education of Young Children) developmentally appropriate education begins by considering two questions: 1) Is the expectation appropriate for the age of the child?

and, 2) Is the expectation appropriate for this individual child? The widely-held expectations that follow give a general glimpse of children's development in three goal areas; intellectual development (cognitive domain), physical development (psychomotor domain) and emotional and social development (affective domain). Parents and instructors can use these widely-held expectations as a preliminary means of assessing a child's readiness to learn and determining the program best suited for the child. There are many things parents can do to support children's learning at home, at school, and during after school activities, some of which are suggested at the end of each goal area.

Widely-held Expectations for Intellectual Development

Children 7-9 Years

- Like to solve problems by using their fingers, blocks or other small objects that they can manipulate
- Develop an understanding of cause and effect (i.e., "if I do this that will happen")
- Develop the use of language to make others understand them
- Start to use metaphorical language
- Begin to use writing and reading for specific purposes
- Combine drawing and writing to get their messages across
- Increase their vocabulary of common words
- Increase reading ability (silent reading shows higher ability than oral reading ability)
- Learn to tell time and begin to understand the meaning of time
- Are forgetful even with increased rehearsal of information (i.e., difficulty with spelling tests)
- Continue to develop decision-making abilities (i.e., want to decide game rules etc.)
- Develop understanding of lengths and qualities through experiences (i.e., using blocks and measuring tapes)

Children 9-11 Years

- Continue to solve problems using visual aids
- Expand their understanding of cause and effect
- Use language increasingly to clarify thinking
- Use metaphorical language more
- Increase use of reading and writing
- Increase vocabulary
- Increase ability and comprehension in silent reading
- Have silent reading rate greater than their oral reading rate
- Read from a variety of genres
- Can adjust reading rate and can select appropriate reading material for pleasure
- Continue to develop an understanding of time and important dates
- Continue to develop ways of organizing and remembering information
- Continue to develop decision-making skills (i.e., choice of friends, clothing, activities etc.)
- May use understanding of length to develop ideas of measurement (i.e., simple map making skills)

Children 11-13

- Begin to develop thoughts and ideas without the use of manipulatives
- Are able to reason abstractly but still require hands-on experience
- Continue to refine cause and effects relationship
- Continue to develop language skills and are fascinated with words that have double meanings
- Continue to expand thinking through writing and reading
- Continue to develop a variety of reading skills (i.e., skimming, scanning, selecting or studying material for a purpose)
- Expand their interest in reading genres (i.e., fiction, non-fiction, poetry, chapter books etc.)
- Begin to understand that people may interpret the same material in different ways
- Are able to handle personal planning (i.e., daily journal, current events, recent events, planning for the future and thinking about career desires)
- Develop more complex schemes to increase memory
- Need ownership in decision-making with guidance from a responsible role model
- Use direct experiences to develop ideas about real objects and their properties (i.e., an object's weight, area, mass, volume etc.)

How Parents Can Support Intellectual Development

- Vary reading material to include pictures, large illustrations, games, interesting plots, different genres
- Use correct tone, vary voice for different characters, pause occasionally and ask questions to measure comprehension
- Develop a family library that includes books parents feel are important for their children to read
- Get children to read to parents; parents show them they're interested in what their children have to say
- During regular family activities provide children with the opportunity to organize, classify and recall easily remembered material (i.e., sorting groceries, laundry, school supplies, coins, cards, tools, books, etc.)
- Build a family calendar and help child fill in important dates, holidays, special events and birthdays of family and friends
- Provide space and time for children to play on their own; encourage them to create personal projects
- Help children become aware of what they are doing when they perform different actions; get them to talk their way through things (i.e., talk their way through the process of dressing in the morning, tying their shoes or crossing the street)
- Provide children with opportunities to learn by taking them on outings (i.e., walks, car trips, holidays, camping, sporting events, family events, museums, library, fairs, art shows, science center, the aquarium, church, aviation museum, the zoo and visits to the beach or lake)
- Provide children with the opportunity to tell about their personal experiences that day (i.e., what they learned, what they saw, who they played with, what was new and exciting)

Widely-held Expectations for Physical Development

Children 7-9 Years

- Continue to refine fine motor development
- May experience a slow rate of physical growth
- May experience some visual difficulties
- Continue to develop hand eye coordination; willing to try more complex tasks
- Develop an ability to coordinate right and left sides of the body (i.e., throwing with the right arm, kicking with the left leg)
- Gradually increase ability in fundamental motor skills (i.e., accuracy in running, climbing, throwing, kicking, catching, and jumping)
- Begin to understand the differences in body parts and their uses
- Develop an understanding of personal hygiene and the basic idea of nutrition
- Begin to develop an understanding for rules and the concept of safety
- Experience times of high energy and become very tired quickly
- Like to participate in most physical activities
- Like to play in groups, however, the group and activity change frequently

Children 9-11 Years

- Continue to refine fine motor development
- May experience a growth spurt before puberty
- May experience some visual difficulties
- Skill level for physical activity depends on the continued development of hand-eye coordination
- Develop an ability to coordinate right and left preferences
- Show increase coordination of fundamental motor skills, however, growth spurts may interfere with performance
- Develop figure ground relationships (i.e., ability to hit a ball)
- Develop a more sophisticated idea of different body parts and their function
- Increase awareness of personal hygiene and ideas of nutrition and growth
- Begin to understand the notion of pacing in activities demanding high energy
- Understand rules of the game and safety precautions but will take risks
- Begin to show a preference for some physical activities
- Continue to show a preference for a physical activity and like to remain in same sex peer groupings

Children 11-13 Years

- Generally experience rapid and uneven growth rate in arms and legs
- Motor ability continues to develop
- Change in eyesight continues
- Combine coordinated hand eye skills into routines for participation in sports and games
- Continue to refine right and left preferences and may show an increase in strength and physical size of one hand/arm/foot
- May show awkwardness in performance, poor coordination, poor posture due to increase rapid physical growth
- Develop an advanced understanding of body parts, their function and the body as a system

- Continue to enjoy participating in sports and group activities
- Continue to develop a more advanced understanding of game rules and safety precautions
- Are aware of risk consequence but continue to take risks
- Appear to prefer more complex group games and sports; loyalty to group or team evident
- Continue to be interested in more formal group or team activity; show loyalty to same-sex group or team

How Parents Can Support Physical Development

- Encourage children to participate in new and interesting activities
- Point out various safety hazards involved with different activities; demonstrate and discuss ideas about safety (i.e., crossing the street, dealing with strangers)
- Provide encouragement when children want to try something new but also provide an explanation of risk and the background necessary to understand the activity in terms of safety rules and how to use equipment
- Give children opportunities to develop fundamental movement skills at home (i.e., design an at-home obstacle course, outside gym)
- Involve children in both individual and team sports; model expected sportsmanship behavior for children
- Help coach a team and model loyalty and perseverance for children
- Encourage children to help in food selection and discuss with them healthy eating
- Discuss ideas of nutrition and a healthy body with children
- Ask children to come up with safely rules, rules of the game and consequences for misconduct.
- Don't expect children to become involved in an activity for a long time; with a short attention span and continued muscle and bone development children often initially find it difficult to stay with one activity.
- Provide access to different types of music during play sessions. Children have a tendency of pacing their activity, being more energetic and adjusting their movements to music.



Widely-held Expectations for Emotional and Social Development

Children 7-9 Years

- Tend to show bursts of emotion less frequently
- Become both judgmental and critical of themselves and others
- Continue to feel anxiety around large groups of unfamiliar people and unfamiliar places or settings
- Begin to develop friendships with same-sex, same-age peers
- Become more inquisitive and outgoing
- Show an increased sense of self-confidence
- Are eager to try new tasks and activities they are likely to be successful in
- Generally will not take risks
- Define themselves as having a particular hair and eye color, body type etc.
- Are sensitive to criticism
- Will display feelings of success or failure depending on adult response
- Continue to develop the ability to share possessions with friends and take turns

Children 9-11 Years

- Tend to appear at peace with themselves
- May have periods of anger, sadness or depression but these moments are generally short lived
- Will often appear overconfident in an effort to hide anxiety when introduced to new experiences
- Continue to be very sociable and spend time with family and close same-sex friends
- May develop a relationship with a special same-sex friend
- Are generally very positive about themselves
- Are able to comment about what they are and are not good at
- Often vary between sexes in their view of what are important dress and physical characteristics
- Often refer to themselves by physical characteristics, possessions and likes and dislikes
- Are sensitive to criticism
- Will display feelings of success or failure depending on adult response
- Continue to develop the ability to work and play with others
- May become so focused on an activity they do not want to be disturbed

Children 11-13 Years

- May become emotional showing anxiety and moodiness
- May cry or anger easily
- Continue to hide feelings of anxiety with friends and family
- Often appear overconfident with a know-it-all attitude
- Continue to get along with most of their peers and often show an interest in having a best friend
- May fight and argue with friends from time to time
- Start to question adult authority
- Often put themselves down in front of others
- Begin to describe themselves in terms of beliefs, opinions, and values
- Develop a sense of self by attempting to copy fads of the culture and time (i.e., may want special clothes, listen to certain music or want to participate in a particular sport)

- Begin to gain independence from parental guidance
- Are sensitive to criticism
- Will display feelings of success or failure depending on reactions from others
- May become self-critical
- May begin to become possessive with own belongings
- Do not want to share belongings with siblings
- May view younger brother or sister as a nuisance when involved with peers

How Parents Can Support Emotional and Social Development

- Read and discuss books about friendship with child.
- Talk to children about friendship; what it means to have a friend, how friends should act with each other, how to develop a friendship, and the characteristics of a good friend.
- Involve children in family routines such as getting dressed, making breakfast, setting the table or putting together lunch kits for school. It is important to get child to be successful in performing everyday tasks.
- Guide children in making decisions regarding clothing choices, family menus, books or web sites to read, videos and/or television to watch, sports to participate in, the choice of extra curricular activities and healthy snacks.
- Help child to create a poster, scrap book, or journal using drawings, photographs, magazines etc. to show a sense of "Me." Comment on children's good qualities and help children decide how to improve other not so good qualities.
- Encourage children to write an e-mail or send a letter to a pen pal or relative in another country as a way of developing another friendship.
- Assist with child as a volunteer in the community (i.e., community functions, recreations, hospital, and church group). Participating as a volunteer will help children realize the contribution to society that can be made. This will also give children greater self-confidence.
- Maintain a stable routine and set responsible limits that children can anticipate such as mealtimes, family commitments, homework time, after school activity time etc. Assist children in developing a personal schedule incorporating productive behavior centered on this routine.
- Sharing special times with children is important for self image. Show care by providing hugs, smiles, a walk in the park, reading a favorite story or help children finish home work. Personal discussions are important and contribute to development.
- Ask children to talk about personal preferences regarding decisions such as the choice in clothes, hair style, dancing and music or art lessons, participating in a particular sport, boys or girls clubs, after school activities. Discuss how these decisions will affect children and others. Determine how these choices may affect other hobbies and keeping a family routine.
- Focus on positive behavior but also give attention to non-productive behavior. Use an informed and honest approach to show children how to deal effectively with issues or problems as they arise. Remember, it is always more productive to show children the desired behavior.

Children and Danger Awareness

Two published studies examined the extent to which children are aware of the dangers in several situations provide interesting information relative to training children how to dive. The studies indicate that eight to 11 year olds can understand and identify danger.

The first study, published by Knowles, Streimer and Donoghue (1988) of the Department of Psychology, California State University, Northridge tested thirty-seven grade-three children (seven to nine years old) by showing them drawings of children engaged in ten activities. Researchers asked students what the children in the drawings were doing and how they could get hurt. Depending on the drawing, 84 to 100 percent of the students identified the activities depicted appropriately, and 85 to 100 percent identified significant dangers in the situations depicted. The researchers concluded that in general, students tested appeared quite knowledgeably about the hazards.

A second study published in the *British Journal of Psychology* (1991), 82,487-505 was published by Ampofo-Boateng and Thomson, Department of Psychology, University of Strathelyde, Glasgow, Scotland. This study, "Children's perception of safety and danger on the road," investigated the ability of 64 children between five and 11 years to select safe places to cross the road. The study presented children with situations that were either extremely safe or manifestly dangerous and asked them to correctly identify them. All the experiments showed a similar pattern of results. Five and seven year-olds exhibited very poor skill in identifying dangerous road-crossing sites. Nine year-olds showed a higher level of ability and 11 year olds showed good skill in these judgments. The results suggest that young children up to about nine years do not have the ability to recognize a location as dangerous.

Although similar studies have not been performed with children for scuba diving, the studies do have application for teaching scuba diving to children. The results infer that with training, children can be made aware of and capable of identifying dangers and hazards associated with an activity. Using all of the visual, audio and live delivery media available may benefit children by presenting the information in multiple formats and contexts, which helps accommodate differing learning styles and maximize hazard recognition.

Chapter III

Medical Issues and Children in Diving

The editors would like to acknowledge Simon Mitchell MD PhD, Director of the Wesley Centre for Hyperbaric Medicine, Brisbane, Australia and Executive Committee Member of the Undersea Hyperbaric Medicine Society for his contribution in writing this chapter.

It's perhaps predictable that discussing diving and younger people raises expressions of concern about safety from various quarters, including the medical community and parents. Since little published data exists about the medical aspects of children in diving, much of the adverse commentary springs from theory, speculation and, sometimes, emotion. It's important to carefully consider these speculative concerns along with the potential benefits of diving by children to reach a rational approach that neither places children at unacceptable risk, nor deprives them of participation in a rewarding and educational activity.

Most of the basic rules that determine the appropriateness of diving for any person apply to both children and adults. Obviously, any medical problem that would make diving unsafe or less safe for an adult would also do so for a child. Other dive references, such as the *Encyclopedia of Recreational Diving*, cover the broader diving fitness issues with some detail for those interested in them.

There are concerns specific to children and these arise from the myriad of physical, physiological, pathophysiological and psychological differences

between adults and children – an issue complicated by the difficulty in strictly defining a “child.” Many of the relevant characteristics evolve with age along a gradual continuum, with adult characteristics acquired at different ages in different individuals. So, we need to make any generalizations with caution.

Physical Differences

Stature and strength – The most obvious difference between a child and an adult is size. Children usually have smaller and less powerful statures than adults. Because scuba gear is heavy out of the water, this can be an issue, especially for smaller children who may find it difficult to handle the weight of a scuba. In the water, swimming with bulky scuba equipment also requires strength and stamina, which can be a consideration for youngsters.

Fortunately, careful equipment selection and configuration can offset these problems. With an ever-increasing range of options in sizes and styles of scuba

packages, it’s not too difficult to find equipment scaled to children. Nevertheless, physical limitation can be an important safety issue in open water, where, arguably children might easily find themselves in a situation where they have trouble coping because they’re beyond their physical limits. This concern is one of the reasons that certified adult supervision is required at the Junior Open Water Diver level (ages 10-15). Besides scaled down cylinders and other equipment, it may also be appropriate to use controlled seated entries or don the scuba unit in the water to accommodate strength limitations. When exiting, removing the scuba unit and weight system in the water may be appropriate as well.

Adults accompanying Junior Open Water Divers must recognize the need to match dive environments and dive plans to the divers’ physical capabilities. In addition and notwithstanding adult supervision, it is important that instructors carefully appraise each child’s ability to cope with the physical demands of diving. Junior Open Water Diver candidates who can’t meet performance requirements for physical reasons (or any other reason) should



Careful equipment selection can offset problems caused by youngsters’ smaller sizes.

not be certified. However, this is often far less of an obstacle than it may seem because children mature quickly. Children who couldn't qualify due to physical limitations may grow out of their limitations and qualify later – sometimes in less than a year.

Motor skills – Coordination and dexterity may be less well developed in children, although by Junior Open Water Diver age, most children should be capable of performing dive skills at a standard comparable to adults. Even PADI Seal Team divers (ages 8-10) may have adequate motor skill control for diving. Those who've taught youngsters to dive seem to find that they frequently have fewer skill development challenges than adult divers.

Nonetheless, student divers of all ages may have difficulty mastering a dive skill, which may or may not be age related. Regardless of the reason, the instructor must make sure student divers meet all performance requirements prior to certification.

Thermal concerns – Broadly speaking, children have a higher surface area to body weight ratio than adults. For this reason, their core temperature drops more rapidly when immersed or exposed to wind in a wet exposure suit. This means children have a greater risk of hypothermia. It's important to address this with adequate exposure protection, ample rewarm time between dives and by paying attention to comfort, especially when diving in temperate environments.

Keeping children warm may be complicated because youngsters grow rapidly, so a wet suit that fits today may be too small tomorrow. The concept of buying "something they will grow into" doesn't really work well either, because it's too big until the child grows. One solution is to rent wet suits; families with multiple children can pass wet suits down to their younger siblings.

Obviously, thermal considerations are not insurmountable, but they need attention. Regular breaks with adequate rewarm time, depending on water and air temperatures, can prevent excessive cooling.

Confined water environments – Almost paradoxically, equipment concerns may be less relevant to Bubblemakers, PADI Seals (ages eight to 10) or SASY (Supplied Air Snorkeling for Youth – younger than eight) who only use scuba in confined water.

By using equipment tailored to the small stature of the participants in this program, and donning it only when standing in the water, equipment weight out of the water isn't an issue. Skill requirements are minimal for SASY, and Bubblemaker/PADI Seal Team divers are usually old enough to master the skills needed for pool/confined water diving. Hypothermia isn't as likely to be a concern, first because these programs are conducted in fairly warm water, and second because youngsters can easily leave the water, dry off and warm up if they get cold.

Physiological Differences

Physiological differences that concern children in diving typically relate to how exposure to pressure and dissolved gases may affect developing tissues, or how undeveloped functions affect diving abilities. There are certain theoretical concerns, but the true significance of most of these is far from certain, especially where the diving activities are conservative in nature and tailored to the needs of the child.

Bone growth – Most people realize that one difference between children and adults is that children are growing, though many people don't realize that some individuals continue to grow until as late as 20 years. Height changes in children occur mainly as the body's long bones lengthen. Bones grow at their ends, in a region called the *epiphysis*. The epiphysis lies just behind the *articular surface* that helps form the joint that connects one bone to another. Bone growth occurs in a manner analogous to large roading machines that move slowly forward laying down completed road behind them: the epiphysis moves forward leaving completed bone behind. At some point in the late teenage years, the epiphyses close and bone elongation stops permanently.

It has been suggested that epiphyseal tissue might be vulnerable to bubble formation during decompression. If true, the concern would be that any such bubbling might damage the epiphysis and cause premature closure, inhibiting growth. However, there appears to be no data from animal or human studies that support this theory. Moreover, there have been many thousands of dives by Junior Open Water Divers (12 to 15) plus thousands more of Open Water Divers between ages 15 to 20, and clinical reports of apparent epiphyseal damage are conspicuously absent, even when decompression illness has occurred. Therefore, there doesn't seem to be enough evidence to support this theory, nor to justify altering recommendations about diving. If this were really an issue, it would have to apply to any diver younger than 20.

The issue is not really relevant to Bubblemakers or PADI Seals because the brief inert gas exposure in two metres/six feet to four metres/12 feet isn't enough to cause bubble formation in any tissue on ascent. Any theoretical concerns about this risk in Junior Open Water or Open Water Divers younger than 20 years can be minimized by encouraging conservative dive practices.

Equalization – Eustachian tube function is critical for equalizing middle ear pressure, and is often less developed in children up to ages 12 to 13. This is one of the reasons why young children commonly suffer protracted ear infections. By Junior Open Water Diver age, there should be little difficulty in teaching candidates to equalize effectively, though some youngsters may take longer to master it than others.

However, youngsters in the Bubblemaker age range may be at greater risk of ear barotrauma. Even if it is assumed that Eustachian tube function is normal, it may be difficult to teach young children to equalize reliably. This is one

of the most important factors underpinning the choice of two metres/six feet as the maximum depth for the Bubblemaker program. Most experienced instructors teaching at Open Water Diver level would agree that in teaching confined water sessions it is usually necessary to go deeper than two metres/six feet to teach trainees to equalize.

Thus, a descent to two metres/six feet is unlikely to result in ear barotrauma, even without equalization. Going deeper may increase risk and it follows that Bubblemaker experiences should never be conducted deeper than the maximum of two metres/six feet, and PADI Seal Team Aquamissions to the maximum of four metres/12 feet only after assuring divers have mastered ear equalization and acknowledge that they should stop descending if they cannot. It helps if the instructor doesn't simply signal "okay?", but points specifically to the ears to confirm that they're equalizing without problem.



Pathophysiological Differences

Just as there are some diseases that are more common in adulthood, other illnesses are more common in childhood. An important category in this regard are the atopic (allergies) diseases and colds.

Allergies include asthma, hay fever and eczema. Most dive instructors know that asthma may predispose the diver to pulmonary barotrauma and potentially life threatening complications due to air embolism and other lung overexpansion injuries. Most physicians believe that children with a history of asthma should not scuba dive. While this may be disappointing to the affected child, the brighter side is that about 50 percent of those with childhood asthma grow out of it at or soon after puberty. At that point, the child and parents can consult a physician and revisit the issue of diving. Also, by this age the child will be better able to understand the issues of risk and discretionary determi-

nations regarding dive fitness as a previous or very mild asthmatic. This isn't just a diving issue, but would have bearing on participating in many sports and activities.

Children with active hay fever or a cold shouldn't dive any more than an adult should. These conditions can interfere with equalization, therefore raising ear and sinus barotrauma risk. Chest congestion carries some risk of lung over-expansion injuries, and also prohibits diving until fully well and all congestion clears the lungs and breathing passages.

Psychological Differences

In the debate over children and diving, few issues are more vexing than the differences between adults and children in their abilities to learn, solve problems, react to stress and apply judgment. As the rest of this book deals with these issues in greater detail, there's no reason to duplicate them in detail here, but they include that:

- youngsters tend to have short attention and concentration spans, and are less able to stick to a plan.
- youngsters are more impetuous than adult divers – if some underwater marvel captures their attention, they may be more likely to swim off to explore without worrying about where a buddy is.
- youngsters may be less able to cope with stress and may have a lower panic threshold.

These psychological issues, perhaps more than any physical ones, determine that children need adult supervision when diving. Adults supervising



Bubblemakers, PADI Seals and Junior Open Water Divers are prudent to not assume that young divers vigilantly monitor dive parameters such as air consumption, time and depth. Nor should they assume young divers will always

carefully adhere to the buddy system. Therefore, the adult's aim for the dive should be successful supervision of the Junior Open Water Diver; not, for example, filling a catch bag with seafood.

The other side of the coin, however, is that individuals in the 10-15 age group are well motivated, enthusiastic learners. The benefits include:

- diving may foster maturity and learning
- diving applies the mathematics and science they learn in school giving these subjects concrete relevance
- diving is an activity where following rules and sticking to plans is important for safety reasons; for many youngsters, learning to dive is a growth experience that fosters self-discipline and self-control

So, while adults must never assume young people will dive with the discipline of adults, many will exhibit a surprising level of maturity when they go underwater.

Since Bubblemakers and PADI Seal Team divers do not venture outside the highly controlled, confined water situation, concerns over psychology and thinking skills are perhaps less relevant. However, it has been argued that inattention and poor appreciation of risk may increase the risk of pulmonary barotrauma (lung overexpansion). It is impossible to say that divers of any age are at zero risk of pulmonary barotrauma and its life threatening complications, or other injuries, even when diving in two metres/six feet or less. But the risk can be minimized by ensuring that the Bubblemaker experience always begins in a depth where the child can stand, that the two metre/six foot maximum depth is strictly adhered to, that PADI Seal Team divers demonstrate and acknowledge the rules (don't hold your breath, equalize, stop descending if you can't, etc.) before going deeper than two metres/six feet and that the instructor closely supervises participating candidates at all times.

Bottom Line

The listing and discussing of risks has a way of making an activity sound dangerous. As discussed in Chapter I, there's no denial that there's risk when children dive, just as there is for adults. No one can argue that ear barotrauma or pulmonary barotrauma is never going to occur in a Bubblemaker, PADI Seal Team diver or Junior Open Water Diver. No one can suggest that it would be impossible for a Junior Open Water diver to become separated from a supervising adult and get into serious difficulty. Eventually, all of these events will occur, because as much as we'd like to there's no way to eliminate all risk in diving except by never diving.

However, detailing and listing the problems and risk may be disproportionately alarming. The truly important questions are "What is the incidence of these potential complications?" and "What incidence is unacceptable?" Parents

subconsciously make risk-benefit decisions about “risky” activities every day. Many allow their children to ride a bike to school, even though every year many children are seriously injured and sometimes killed in road accidents. Thousands of children play hard contact sports like American football, hockey or rugby, despite the well-understood risk of injury – which can be permanent.

Diving is no different in this regard, and there is at least some data that helps answer the question of risk. First, the Confédération Mondiale des Activités Subaquatiques (CMAS) has run a program similar to Bubblemaker for some years now and has recorded almost one million exposures without serious injury. Secondly, PADI issued 122,298 Junior Open Water Diver certifi-

cations between 1988 and 1998 and is aware of only one fatal accident involving a Junior Open Water Diver. These general figures indicate that the true risk of serious injury in these dive activities is probably very small. Intuitively, most parents familiar with diving



would be more comfortable with their nine-year-old experiencing scuba in a 1.5 metre/4 foot pool under close adult supervision than riding a bicycle on a public road.

On the basis of the available data, it’s reasonable to say that the Bubblemaker, PADI Seal Team and Junior Open Water Diver programs can provide rewarding underwater experiences that, while not risk free, are comparatively safe when measured against many of the other outdoor activities youngsters routinely enjoy, and when conducted within the appropriate limits and with the adult supervision required.

Chapter IV

Teaching Children to Dive

When Tricia and Marc each turned 11, they petition their respective parents for scuba lessons. With parental agreement, Tricia and Marc both ended up in the same PADI Open Water Diver course, Tricia enrolled with her father and Marc accompanied by his mother. Both Tricia and Marc are at the same school level and do well in their classes. But soon after the course starts, their parents and their instructor Immi discover that they're in different developmental stages, which will affect how they learn.

Most significantly, Immi notes that Marc has some difficulty following hypothetical discussions, whereas Tricia understands them with little effort. More broadly, Tricia functions easily with abstractions, whereas they're still a challenge for Marc. Tricia is well into Piaget's Formal Operations phase, applying a systematic approach to problem solving and using deductive reasoning in hypothetical situations. Marc, on the other hand, is in transition, still somewhat in the Concrete Operations phase as his mental actions are still tied to concrete (real) objects and abstractions are still difficult to comprehend.

This doesn't mean Tricia will succeed and Marc won't. Rather than this being a setback for Marc, Immi and Marc's mother use diving to move Marc forward in his intellectual development. Aided by Marc's mother, Immi learns to make the abstract more concrete with "pretend you are" questions and statements, such as, "Marc, let's pretend you are swimming on a reef with your Mom. You look at your gauge and you see you only have 35 bar/1250 psi left. What should do you do?" Abstract ideas stated in a more concrete form not only help Marc master the learning objectives, but they form a bridge in his intellectual development that will help him mature mentally.

One might assume that teaching Tricia's easy compared to teaching Marc, but Immi discovers a challenge. Tricia doesn't like books. Her father reports that she's good about watching the *Open Water Diver Video* with him, but he has to constantly cajole her to stop playing with her computer and do the exercises and knowledge reviews in the PADI *Open Water Diver Manual*. Immi solves this one with the PADI *Open Water Diver Multimedia CD-ROM*; Dad ends up watching the video alone, but doesn't care because Tricia's doing all her course study – video and reading – without prompting. It's not that Tricia doesn't read, but that she likes learning in a more nonlinear, integrated format – plus she loves computers, and likes typing rather than handwriting the exercises and knowledge review answers.

Philosophically, a PADI professional's goal is to help all students reach their goal of becoming and excelling as scuba divers, and that means adapting teaching and instruction to enable them to reach mastery. Tricia and Marc typify how scuba instruction may have to vary to accommodate age, but it's no different from the fact that every day, instructors accommodate differences students have in learning style, language, or physical or mental challenges. Within reason, age is just another variable in the learning process.

The learning principles that PADI Instructors apply in conducting PADI programs apply just as much to working with youngsters as adults, though with accommodation to match less intellectual development. A look at these principles and the adaptations to age form a foundation for teaching youngsters to dive. Student participation ties in closely, with different expectations for each age range. Learning styles affect teaching youngsters just as much as they affect teaching adults.

Based on learning principles, participation characteristics and learning styles, PADI Instructors apply different programs with different limits that accommodate younger divers. There's a practical association between differing PADI programs, the corresponding target ages and the expected intellectual

development as defined by Piaget and others. Looking at each program and age range uncovers specifics that instructors and parents, teamed with the child, can apply to make learning to dive and participating in diving both effective and fun.



Principles

Events of Instruction

Modern instructional system design recognizes nine basic events of instruction, or conditions of learning, that optimize the teaching process. Lacking one or more of these doesn't mean someone won't learn, but that the learning process is less ideal and there's a greater chance that the student won't learn and will need to repeat the instruction. These nine events, based on the work of Robert Gagné and other instructional designers are:

1. Gaining attention – making sure students direct their senses to the presentation.
2. Informing the learner of the objectives – letting students know what they're supposed to be getting out of the presentation.
3. Stimulating the recall of prerequisite learning – a quick review of foundational material that facilitates integrating the new material with previously learned material.
4. Presenting learning material in small segments – the presentation delivers information in distinct, small sections or clusters that are easily categorized and remembered in the learning process.
5. Providing learning guidance – the presentation provides not only the material students need to learn, but ways to think about it or remember it for superior recall and use later.
6. Asking for the performance – the instructional process asks students to do whatever the learning objectives set out to have them learn to do, typically by answering questions or demonstrating something.
7. Providing performance feedback – this is letting students know how they did, with corrections and guidance, and further practice if appropriate.
8. Assessing performance – this is a check for mastery, that students can meet the performance as stated by the learning objectives.
9. Enhancing retention and transfer to actual application – the instruction directs students to do things that increase their ability to remember and to use what they've learned; typically this involves applying the new information to something or for motor skills and procedures, additional practice in a variety of settings.

The nine events apply to teaching kids as much as grown ups, though youngsters bring new dimensions to each.

Gaining Attention

When it comes to youngsters, the good news is that the younger they are, the easier it is to get their attention. The bad news is, it is also harder to keep it.

Youngsters have shorter attention spans, which is apparently both a

time perception phenomenon and a mental skill phenomenon. Time goes by slower for youngsters, so a 15 minute presentation that seems like nothing to a 28-year-old may seem like eternity and a day to an eight-year-old. The child's attention wanders because perceptually, a lot of time passes. Also, paying attention is a mental skill, which like all skills requires practice. Children, especially those younger than seven or eight years old, have only just started developing this skill.

Instruction with youngsters is therefore an almost continuous process of gaining attention. Asking questions or intriguing questions gain adults' attention, but will have only limited success with youngsters, especially as time goes on during a presentation. Greater success comes by continuously introducing new stimuli, such as short videos, models that illustrate principles and things

youngsters can interact with directly. Toys work well, too, with the caveat that they can become distractions if children focus on them to the exclusion of the primary lesson. Whatever the instructor uses, the attention devices need to continuously steer attention back to what the lesson's covering.

Example: In discussing the flutter kick, using a diver doll with moveable legs to show how the leg rises and falls at the hips. Bringing the doll into place introduces something new, which regains attention.



Informing the Learner of the Objectives

With adults, it's possible to tell students the learning objectives with a simple statement, "By the end of this lesson, you will be able to [whatever] . . .," though it's also common to state knowledge development objectives as questions a student should be able to answer. Informing the learner of the objectives has two purposes. First, it tells the student what the required performance will be – what the student needs to demonstrate having learned.

Second, it directs students to develop the specific performance instruction seeks, enhancing the teaching process by guiding student focus to particular knowledge and skills.

A *benefit* or *value* frequently ties to objectives. This tells students why they're learning something so they pay attention and remember. People are less likely to do either if they believe there's little purpose to what's being taught. Instruction may present objectives and values in clusters that precede each instructional segment, or may intersperse them through the presentation to precede the relevant material.

Objectives and values are just as important for young divers, but the presentation needs to reflect the intellectual development of differing ages. Children younger than about eight years old (preoperational thought phase) tend to have difficulty understanding what's meant "by the end of this session you will be able to..." Youngsters this age still don't think logically and they still view the world exclusively from their own point of view. Children in the eight-to-ten bracket (concrete operations phase) may understand such a statement, but it's not a type of thinking they have a lot of experience with yet.

For these age sets, one can expect stating the objective and values to be most effective as questions with a student-centered point of view.

Example: For an objective that says, "The student will be able to properly adjust a snorkel," the instructor might ask a group of kids, "Who knows how to adjust *your* snorkel? Can *you* show us?" To establish value, the instructor might ask, "Why do *you* want to adjust *your* snorkels like this?" and affirm correct answers or demonstrate the answer.



Attention span interrelates with objective presentation. Because children tend to have shorter attention spans, it's generally preferable to ask objective questions and follow them with the presentation (as answers) immediately rather than present all the questions and follow them with a longer presentation. Following the question-answer, question-answer format is easier for preoperational children to understand, and contributes to constantly regaining student attention.

Stimulating the Recall of Prerequisite Learning

As mentioned previously, this step helps the student retrieve previously learned information that the new information will build on; in fact, this sentence is itself an example of doing so. Typically, this is simply a reminder or brief review, which children at the concrete operations level and older will benefit from. This may not be as effective with preoperational children (approximately ages two through seven), however, because they don't yet think logically and they may not understand the logical connection between the prerequisite material and the new material. They don't understand reversibility of operations, have difficulty with classification and lack other characteristics of intellectual development – more basically, they're still learning how to learn.

However, stimulating recall with preoperational children has its place, particularly when learning sequential information.

Example: When teaching children how to put on masks and snorkels, the instructor might start with a previously learned, connected step. The instructor might ask the group what they learned to do first when putting on their mask and snorkel. When the kids answer, "Get them wet," the instructor says, "Right!" then have all the kids wet their masks before going on to the next step.

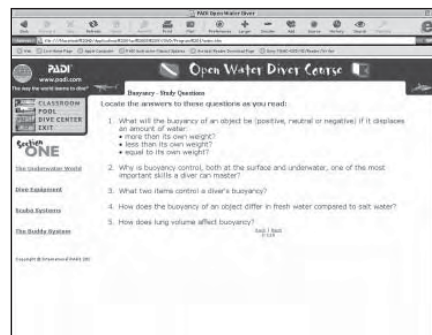
Presenting Learning Material in Small Segments

Instructional designers prepare instruction so that the teaching presentation gives students information in small, logical blocks that allow them to integrate and remember the material more easily. How big a "small segment" is depends partly on the subject matter and partly on the learner.

Within the scope of PADI courses, the presentation segments are small and interrelated so that youngsters at the formal operations level can generally handle the segments as presented. Speaking more broadly, adult-level teaching materials that lack comparable instructional design may be difficult for younger learners without instructors and parents helping subdivide presentations and materials.

If in doubt about presentation size for younger divers, there's little risk in breaking up presentations into smaller segments. It may make it easier for some students (including adults) to learn, and is unlikely to create a detriment for those who don't need further segmentation.

Example: When teaching youngsters to don masks, the instructor first covers how to do it and has them do it, followed by covering and practicing strap adjustment and finally, demonstrating actually putting on the masks each as separate steps.



Providing Learning Guidance

This step assists learning by showing students ways to remember and recall what they're learning. These can be recall acronyms, like ROY G BIV to remember the light spectrum (Red, Orange, Yellow, etc.), or recall strategies based on integrating the new knowledge with existing knowledge. An example of this might be, "You'll always remember to put your snorkel on the left by thinking about your regulator, which comes from the right. You want a hand for each, so the right hand handles the regulator and the left hand your snorkel." A catchy phrase may help with memorizing and recall, such as "Left gets it right," as a reminder that a weight belt buckle should be in your left hand when donning to assure the standardized right hand release configuration.

This is an area where dive instruction can do much to contribute to children's intellectual development. Even at the formal operations level, youngsters are still learning to learn – developing the skill of assimilating new information and skills. Learning guidance presented in a diving context shows kids mental strategies that they can apply to learning anything. Recall acronyms, integrated knowledge and catchy phrases are hardly exclusive to diving; youngsters who master these learning strategies in diving will likely apply them in their schoolwork and in other contexts.

Because youngsters are still learning to learn, instructors and parents may enhance learning effectiveness and speed by suggesting learning strategies throughout a scuba program, at a frequency greater than one would expect for an adult. Parents in particular can assist with this because they may be more familiar with references and contexts that their children can draw on for analogies and comparisons.

Example: To help youngsters recall to always blow bubbles when the regulator's out of their mouths, tell them, "Remember we're a bunch of bubbleheads. There should always be bubbles coming out of our heads – so don't forget to blow bubbles when the regulator's not in your mouth."

Asking for the Performance and Providing Performance Feedback

When instruction asks for the performance, it's looking for an initial confirmation that students have learned the material presented. This isn't considered a test of mastery, typically (though it can be, depending upon what's being learned), but a chance for students to know how well they're learning and to remediate as necessary. It may, depending on the instruction methodology, also give instructors the chance to see how well students are grasping the lesson, but it is primarily for the student.

During Knowledge Development, the manual exercises provide this step. Students answer questions immediately and then check to see how they did. Instructors also confirm and repeat this by reviewing the Knowledge

Reviews and reviewing incorrect answers. The PADI Open Water Diver Course Prescriptive Lesson Guides work especially well for this by going straight to the relevant material, which helps with children's shorter attention spans.

Example: During a class briefing while reviewing students' work, asking "Juan, what is the most important rule in scuba diving?"

In many cultures, people, and especially children, are sensitive and somewhat apprehensive about being tested. Instructors can avoid much of this by how they approach the initial performance check and what they call it (if they need to call it anything). In an instructor delivered presentation, the instructor might simply follow with some questions that assess learning, or for a skill, suggest that everyone give it a try.

Youngsters and adults alike benefit from immediate results, so they know whether they are or are not learning what they need to learn. Children sometimes lack the ability to judge their own performances, either being too critical or too generous. It's important that instructors and parents guide them to gauge their performances accurately when necessary.

Another point is that this initial assessment is primarily to determine how much students need further practice and study before moving on. When students don't succeed, it's important to not undermine their confidence by emphasizing that this isn't the final test, and that they're not through practicing. This may be especially important with children, who may not easily recognize the difference between trying a skill, for example, and being assessed for mastery. In most situations, the easiest strategy is for the parent or instructor to take failures lightly so students will, such as, in a case of not clearing a mask the first try, saying something like, "Okay, you held the top right, but you didn't tilt your head back enough. No big deal, let's try again."



Assessing Performance

This *is* the test, though it may be one of several times the instructor and the instructional process confirm mastery. Within the context of several segments, assessing performance is confirming mastery prior to moving on to subsequent lessons. Some types of learning combine the previous performance with this step, as in learning motor skills underwater. Students practice under instructor supervision, with the instructor and their own awareness providing information about their performance after each trial. The instructor assesses the performances at the same time; when satisfied that each student can reliably and correctly perform the skill, the class moves on to the next skill. Other instruction separates the confirming assessment.

Example: A diver studying with the PADI *Open Water Diver Manual* completes short exercises after reading each subsection in the manual. The exercise gives the diver a way to immediately and independently assess learning progress and understanding. Later the diver takes a quiz, which is how the instructor assesses performance. Later quizzes, more comprehensive exams and applying knowledge while diving recheck learning and confirm retention and the ability to apply what was learned.

Assessing the performance doesn't have to be as formal as a quiz, however. During a PADI Seal Team briefing, an instructor might simply ask the group what the most important rule in scuba diving is and make sure everyone gives the correct answer. Discussing something with a diver may be sufficient to assess mastery, depending on what's being learned.

With youngsters, informal performance assessments work well because there's less test anxiety because they're less likely to be perceived as tests. In the Junior Open Water Diver course, however, youngsters take quizzes, and there's no question in their minds that they're being tested. By age 10 in most cultures, youngsters will be used to taking tests; parents and instructors can help reduce anxiety by emphasizing that if they prepared properly, they should do well, and that if they do have a problem, they'll have a chance to catch up and then take the quiz – not get thrown out of the class.

Enhancing Retention and Transfer to Actual Application

Having learned something, both students and instructors want it to stay learned, and for it to be used when needed. Both retention and transfer to actual application benefit by giving students practice in a variety of circumstances. Rote repetition will improve remembering, but not as well as contextual practice, nor does it promote applying what was learned.

Most PADI programs rely on building new information on top of previously learned information. This process retrieves and contextually reapplies information throughout instruction. Written quizzes, exams, Knowledge Reviews, etc., also enhance retention by giving students another chance to interact with the

material. Motor skill retention benefits from repetition, and transfers to real application best with variety of practice. For instance, students may practice sharing air with an alternate air source first in shallow water, then in deep water, each with a different buddy. Performing the skill in open water (as in the Junior Open Water Diver course) adds contextual practice and further repetition.

Teaching youngsters at the formal operations stage versus adults differs little philosophically with this component of learning. However, children in the concrete operations stage still think primarily in the present and less easily transfer a concept from one context to another. However, they can do so given enough repetitions that they can clearly see the common aspects in multiple situations. As an every day example, parents don't have to reteach a five year old how to drink from a glass when they go from their kitchen to a restaurant; however, they may have to reteach manners that the five year old follows well at home.

Example: During the PADI Seal Team program, PADI Seals master mask clearing kneeling on the pool bottom. Later, the instructor interrupts a game of catch and has Seal Team members practice mask clearing where they are. Two AquaMissions later, the instructor has PADI Seal Team members take snapshots of each other practicing mask clearing.

Student Participation

As much as people sometimes wish otherwise, teachers cannot simply pour information into either adult or child students. Learning requires student participation. Even if no teaching's intended, learning takes place when someone attends to learning, and no learning takes place when someone refuses to learn, no matter how much "teaching" appears before that person.

While this is obvious, instructors and parents must realize that children's participation in the learning process may differ in some respects – primarily emphasis on certain learning styles – from an adult's. The younger a child, the truer this is.

In one sense, learning is automatic and begins practically at birth. According to Piaget and other human development theorists, newborn infants begin learning about their bodies, initially unaware, for example, of their own limbs. It may appear a two week old baby just eats and sleeps, but moving a finger or eye is an active learning experience at this age. By four months they've developed self awareness and learn to apply familiar information (experiences) to new situations. From about one year to 18 months, they begin to enact behaviors that demonstrate creating new thought patterns based on new situations. At about 18 months, infants begin thinking about their actions *before* they act. The infant who repeatedly pushes a toy off the table is testing the behavior and reliability of *gravity*.

None of these developments are taught (in the formal sense), but they are learned through the “students” participation as well as through interactions with adults (parents). In the early years, all learning is based on interactions with the real world, and could be described as primarily requiring *experiential participation*.

In contrast, much adult education is based on learning with primarily mental participation either initially or entirely, depending on the subject. Often, there’s little or no interaction with the actual subject. For instance, many people reading this book don’t have children or have had no real interaction with children. They probably don’t have children at hand with whom they’re demonstrating the theories presented here. Yet presumably, these readers are learning a great deal about child development and teaching children.

Adults have learned to learn, plus have a larger mental database for both context and prerequisite knowledge than children. Adults can therefore assimilate information more easily, and often with less experiential interaction (depending upon what’s being learned, of course). When adults need active participation, such as in learning motor skills, their strong mental participation may accelerate learning because they may understand more by watching and listening than a child may, and they may be better able to visualize the desired motor behavior. As adults, much learning is based on being presented the knowledge indirectly (as in a book or lectures), and could be described as primarily *internalized participation*.

This means there’s an evolution with age in how people participate in learning, gradually shifting from a highly experiential participation (touching, feeling, seeing, doing) as an infant, to less experiential, more internalized participation (reading about, hearing about, remembering about) as an adult. It’s when children enter Piaget’s concrete operations stage, which typically begins around ages six or seven, that they begin to be able to carry out physical operations mentally, adding internalized participation to their learning skills. It’s also at this stage that basic logic develops; it’s probably no coincidence that in most cultures, primary school begins at approximately the age most children enter the concrete operations stage.

Instructors and parents need to account for the evolution in how children



In the earliest years, people learn through interactions with the real world. Much of what adults consider “play” is actually learning through experiential participation.

interact with learning when conducting dive programs. A nine-year-old may be mentally closer to an adult than an infant in learning style, but without the same mental skill development and knowledge acquisition, will likely still be more experiential-learning focused. And, it's worth noting that while not always necessary, as demonstrated by the nine events of instruction, even adult learning benefits with more experiential participation with the subject.

Adjusting Student Participation

The younger the participants or students, the more important experiential participation becomes in the learning process. As any kindergarten teacher knows, this doesn't mean everything has to be a field trip or game, but that it's important to use more training aids, discussions and other ways of engaging youngsters in seeing, saying and doing than might be necessary with adults for comparable learning.

Based on age groups, one can generalize the degree to which learning

depends on interactive participation, keeping in mind that some individuals mature faster than others, and that some types of learning always require experiential participation.



Preoperational thought phase –

As mentioned in Chapter II, this stage is approximately age two through seven, and is characterized by thinking that depends on the child's perception and experience. All contexts are egocentric, and while reading commonly begins at this stage, learning is

most effective when it is experiential, based on doing things, discussions, games, seeing new things and so on. A briefing on how to snorkel will typically be lost on the preoperational child, but a guided approach based on showing how followed by the child trying it can be expected to be more effective.

Concrete operations phase – This stage (approximately age seven through 11) is characterized by being able to mentally carry out physical operations, and the rise of logic. Children become less egocentric and start to be able to conceive points of view other than their own. However, children in this stage are still limited in that they have difficulty conceiving and mentally manipulating abstracts or physical objects that aren't present.

Children in concrete operations can learn through internalized participation, but still require more experiential participation than do adults. However,

“experiential” becomes a broader term as children develop skill with increasingly abstract concepts like mathematics; the experience can be doing math problems, discussing material that’s been read, writing short reports based on read material, etc.

In a diving context, short interactive briefings (instructor questions, discussions) followed by opportunities to apply what they learn is the most appropriate approach for children at this stage. Learning from brief readings, followed by activities can also be expected to be successful. For instance, a short briefing on how to put on snorkeling gear, followed by guided practice and the chance to ask questions based on the briefing would work well. After students demonstrate that they’ve learned, the instructor can move on with another briefing and practice session, and so on. A long briefing prior to any practice would be expected to be only partially remembered.

Formal operations phase – Children in this stage (approximately ages 11 and up) have rudimentary adult thinking skills and, in that sense have the intellectual skills of an adult. However, while they have the skills, they’re still developing their abilities to use them. They lack the experience and base knowledge of an adult, and they’re still learning to learn.

It’s reasonable for instruction to be structurally similar to adult instruction at this level, but with attention to some key differences. Youngsters may need more time for reading, taking quizzes, etc., and, due to smaller vocabularies and a smaller base of general knowledge, will likely need more guidance and explanation to understand concepts. Parents and instructors can bolster learning at this stage by being available to explain and assist understanding; prudent parents review independent study assignments well ahead of scuba class meetings to assure ample time for remediating and reviewing any areas of learning difficulties.

From a practical point of view, youngsters in this stage can typically be expected to learn from the skill briefings given to adults. While there may still be some difference between youngsters and adults in how long a briefing can be and still be effective, learning scuba skills is an experiential learning process even for adults. Therefore, briefings tend not to be overly long even for adults.

Affective Education

Children rely on emotion and intuition in learning; the younger they are, the more this is true, especially in the preoperational stage. Adult education also involves emotion and intuition to varying degrees, but adults also have and apply (or are supposed to) logic. Preoperational children don’t really know how to think logically – their reasoning typically lacks systematic connections, and they often jump to false conclusions based on invalid comparisons. They still rely on what’s physically present, to a large extent, to think and reach conclusions.

Even in the concrete operations and formal operations stages, emo-

tional context may play an important role. Being relatively inexperienced and unskilled with using and applying logic, children may rely on how they feel about something or someone to reach conclusions, and, based purely on emotion, may reject logic and facts. *Calvin and Hobbes*, a popular U.S. comic strip featuring a six-year-old boy named Calvin, illustrated this point. In one story, Calvin had to write a paper about whether the dinosaur *Tyrannosaurus rex* was a fierce predator or a scavenger. His report read, "I say tyrannosaurs were predators, because it would be so bogus [i.e. disappointing] if they just ate things that were already dead." It's humorous because adults recognize this as a common reasoning error among children – deciding that something is true just because that's what they *want* to be true. In this example, Calvin concludes that tyrannosaurs were predators because the idea of them being scavengers runs contrary to what he enjoys envisioning them to be. The facts are irrelevant, and the child's conclusion rests entirely in emotion.

While emotional influence recedes as children develop skill with logic and a knowledge base, it may continue in other forms. Adolescents in the formal operations stage may be very good at deceiving themselves about themselves,

such as what they ought to do or not do (rationalizing). In fact, the ability to reach conclusions without emotional interference and to be self honest are primary characteristics that indicate adulthood, though admittedly, no adult is perfect at either, and unfortunately some remain essentially children with respect to these traits.

Affective education concerns itself with teaching emotions, decisions and choices. Since children may learn even a non emotional subject (to an adult) in a somewhat emotional context, applying affective education techniques is an appropriate tool for teaching diving and many other endeavors. The two main affective education techniques relevant to children in diving are *role modeling* and *discussions*.



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Role Modeling

Role modeling is teaching by setting a good example. If kids respect the instructors, they will not only do what instructors say, but they will copy the instructors' behaviors. Good role modeling benefits adult students, too, of course, but it can be particularly powerful with youngsters.

Instructors need to realize that for children, the role model function never

stops. This makes it incumbent on the instructor and staff to behave as role models in all contexts when children are present, not just diving contexts. Parents can assist by establishing the instructor as a role model with children; likewise, instructors bolster their effectiveness as role models by treating parents with high respect.

Instructors need to realize that the role model function never stops. This means behaving as role models in all contexts when working with children.



Photo Courtesy of Alesé and Mort Pechter.

Discussions

Earlier it was noted that question-and-answer presentations help hold attention with youngsters; expanding these into discussions that meet learning objectives take it a step further by attending the emotional context of learning. For example, with children in the eight to 10 year range, if the objective were, “The student will be able to list four reasons to stay near a dive buddy,” the instructor might ask, “Why should you stay near your dive buddy?” If one of the reasons sought is “to help each other with equipment” and that reason doesn’t come forth, rather than simply provide it, the instructor might start a brief guided discussion:

Instructor: Ernle, what would you do if you couldn’t get your snorkel adjusted?

Ernle: I guess I’d keep trying.

Instructor: Suppose you’re Ernle’s buddy, Dolores. Could you help?

Dolores: Yeah. Maybe I could see what he’s doing wrong.

Instructor: Of course you could. So what does this tell us about staying with your buddy?

Ernle: Uh . . . a buddy can help me adjust my snorkel?

Instructor: Right, but more than that. A fourth reason to stay with your buddy is that you and your buddy can help each other with all your equipment, not just your snorkel.

With younger (preoperational) children, the questions may have to be more leading with yes-and-no answers, because the children don’t have the same deductive skills. The instructor takes students through the thinking process step-by-step. Using the previous example for comparison:

Instructor: Abe, if you couldn't get your snorkel adjusted, Emma might be able to help you, couldn't she?

Abe: I don't know.

Instructor: Emma, maybe you could see what Abe's not doing right, couldn't you?

Emma: Yeah.

Instructor: So is it a good idea for buddies to stay together so they can help each other with their gear, Abe?

Abe: Yes.

Discussions promote the emotional aspect of learning because students derive the conclusions themselves with guidance rather than simply have material given to them. This enhances the perceived credibility of what's being taught because what they learn becomes what *they* conclude is important or beneficial. In the previous example, children don't simply learn to stay with their buddies, but they deduce for themselves that they should stay with their buddies. It also benefits intellectual development by guiding reasoning.

Affective education through discussion applies only to topics where the students (adult or children) have enough knowledge to answer questions and form conclusions based on the discussion. Some topics, like Boyle's Law of pressure/volume relationships in the Junior Open Water Diver course, wouldn't typically be good discussion topics because they lack an emotional context and because students aren't typically in a position to deduce the answers itself. Interactive questions and answers based on *applying* knowledge after presenting it – e.g., According to Boyle's Law, if you go to 10 metres/33 feet, what will happen to the volume of air? – would of course be very appropriate. Although this isn't an emotion-driven topic, the learning still benefits from a positive emotional context when students correctly answer questions, which boosts confidence in what they're learning. This helps motivate learning and attention.

Learning Styles

People of all ages have different styles of learning, just as they differ in the ways they may accomplish many things. Some individuals learn more by what they read or hear (auditory learners) and others learn more by what they see (visual learners) – although most people involve both seeing and hearing/reading when they learn to varying extents.

The PADI System of diver education presents material in a way that accommodates multiple learning styles. Most programs cover visual learning (demonstrations, flip charts, video) and auditory learning (briefings, reviews, descriptions). This accommodates the individual learning styles of most people, with flexibility for instructors to emphasize one or the other to address student needs.

Interestingly, there's an apparent trend toward differing preferences in learning media, with divisions along cultural and age lines. Specifically, the

computer has made multimedia CD-ROM training available, which youngsters in computer-oriented cultures tend to prefer. Multimedia combine video and text into an integrated presentation. Cultures where computers predominate seem to prefer this to the conventional manual and separate video, even though they contain identical material. Similarly, in those cultures young people and children (who've grown up with computers) seem to prefer learning on the computer via multimedia, when it's available, more than older people.

Obviously, instructors and parents don't want to assume that anyone would or wouldn't prefer multimedia to learning with a conventional manual and video based on culture or age. It's beneficial to consider trends and options that facilitate learning, but the instructor's job is to use the best tools available for the individual student.



Coaching Group and Individual Learning

Learning dive skills is both an individual and group process. Individual aspects concern skills and an individual's role in a group. Group aspects include multiple person dynamics, as well as the dynamics of learning in a group.

Those who work with youngsters know that understanding group dynamics is particularly important with children. In group situations, children can, as a unified body, become very cooperative, uncooperative, spirited, demoralized and so on.

Many instructors and parents control both individual and group dynamics through *coaching* techniques. These are techniques that maximize learning, control and performance by demanding respect, challenging youngsters and giving them confidence.

Coaching techniques include:

- Setting behavior and ground rules at the outset, with a clear explanation of consequences for breaking them. An instructor who does this involves the parent, and then enforces these rules without exception, with the parent supporting it.
- For individuals, praising success *the first time*, praising success in reaching a higher standard *the first time*, and praising notable improvements *the first time*. Praising only first time success, reaching a new standard or making special improvements gives praise tremendous value because it only comes with actual accomplishment.
- For individuals, *not* praising failure (but affirming correct aspects) and

not praising repetition (simply doing the same correct thing again – but affirming correctness is fine.) Praising every attempt, no matter how poor or how little progress it shows, actually diminishes the value of praise because it's not necessary to accomplish anything to get it.

- For individuals, *not* identifying specific causes failure during the mastery trials. Rather than listing what went wrong, the coach simply says, “Okay, try again” and allows the student to figure it out. Students feel more accomplishment and confidence as they discover they can diagnose and correct their own problems. However, the instructor *does* identify a specific cause if asked about it by the student, if the student appears significantly demoralized, or if the cause continues to repeat without the student finding it.
- For groups, giving general praise for successful overall group-related *individual* performances *the first time*. For instance, if five out of six students have successfully cleared their masks, but the sixth still needs practice, general group praise for accomplishing the skill is still appropriate.
- For groups, withholding praise to the entire group if even a single individual failed to meet the performance requirement for *group-related* performances. For instance, if five out of six students found a buddy and performed a pre-dive check, but a sixth didn't because no one would buddy with that student, then the instructor withholds praise and instead *corrects* the group's behavior. This shows the group that they have a responsibility to each other and cannot succeed unless they meet it.

PADI's Approach to Children in Diving

While it's clear that children have a place in diving, it's also clear that from several perspectives, children aren't just little adults. Compared to adults, they have both physical and mental limitations that extend to the teaching environment. However, these differences don't differ philosophically from potential divers of any age who face physical or intellectual challenges; provided they meet the minimums to participate they may do so, and provided they meet the course performance requirements, they earn the credential irrespective of what challenges they overcame in doing so.

The approach PADI takes with respect to youngsters in PADI programs and courses reflects the same philosophy, with adaptations to limits and supervision based on maturity and development. These include limiting student-to-instructor ratio in PADI courses and programs, observing shallower maximum allowable depths and considering the practical effects of equipment and water on children. The limits relax as the diver ages and qualifies to participate in programs suited to more mature individuals.

Required Paperwork for Youth in PADI Programs

All PADI programs have paperwork to assure that participants reasonably understand and accept the potential risks involved. Some forms, such as the medical form, reduce risk by alerting participants to potential conditions that require a physician's attention prior to diving activities.

Because youngsters and their parents need to agree together on the potential risks, PADI programs require that participants and their parents/guardians complete various forms, depending on the program. The following lists the most common forms signed by children and parents/guardians, but these may vary with the program and change based upon revisions and local regulations:

- *Liability Release and Express Assumption of Risk (Certificate of Understanding and Assumption of Risk Agreement* in the United Kingdom). Different programs may have slightly different versions of this document.
- *Standard Safe Diving Practices Statement of Understanding* for those participating in the Junior Open Water Diver course, or the *PADI Scuba Diver Statement of Understanding* for those in the Junior Scuba Diver course.
- *Medical Statement*
- *Youth Diving: Responsibility and Risks Acknowledgement* is required for all scuba programs for participants 11 and younger.
- *Discover Scuba/Discover Scuba Diving Statement* for the Discover Scuba or Bubblemaker program.
- *Supplied Air Snorkeling Liability Release and Assumption of Risk* for participating in the SASY program.
- *Discover Snorkeling/Skin Diver Statement* for participating in Discover Snorkeling or the PADI Skin Diver course.
- *PADI Seal Team Statement*, which combines the medical statement and liability release and express assumption of risk into a single form specifically for the PADI Seal Team program.

Broadly, PADI Instructors adjust their teaching methods to accommodate youngsters. In addition to teaching considerations, they assess dynamics such as motivation and the ability to help assure that children have fun, learn effectively and participate for the right reasons. The PADI Instructor Manual, which lists the training standards PADI Members must follow, requires instructors to involve parents with train-



ing and progress updates and, if necessary, any training/disciplinary issues. Instructors enforce water safety rules and, as necessary and appropriate, assign added supervision such as lifeguards and/or other staff.

There are four age-related stages within the PADI System: snorkeling stage, Bubblemaker stage, PADI Seal Team stage and Junior Open Water stage. Each of these programs involves youngsters based on age/intellectual development, physical development, limits, supervision, and the roles of the instructor, parent and child. The discussion on readiness in Chapter I applied these stages.

Discover Snorkeling Stage: No Minimum Age

Snorkeling is appropriate for the youngest children interested in diving and underwater fun. Because it does not involve breathing compressed air at depth nor is it necessary to leave the surface, snorkeling reduces the physical and intellectual concerns related to very young children diving. There is no minimum age for snorkeling, with participation based solely on desire and the physical ability to do so.

Knowledge Development

In the PADI System, Discover Snorkeling is not a course but an experience, with knowledge development only that which participants need for safety and to have fun. These include basic water safety rules, such as staying within a given area, not touching unfamiliar wildlife (in open water), how to signal for help, etc. Pointers and tips might include setting up snorkeling gear, avoiding sunburn and where to look for things.

The same format applies to adults and youngsters, though children may or may not be expected to follow or remember the guidelines and suggestions provided. With respect to safety rules, assuming children as young as four or five years old, parents and tour leaders (instructors) function primarily as rule enforcers and safety supervisors. The child is primarily a participant rather than a “student.” The instructional approach is to give the rules and limits, along with consequences for failing to follow those rules.

Children in the preoperational stage generally judge acts based on their consequences rather than on intention or potential consequences. The adult may say, “Don’t snorkel into the deep end because you can’t stand up there and I don’t want you to have an accident if you get tired” states a consequence that adults and older children (concrete operation stage and up) would reasonably understand. Preoperational children may not actually understand this, so supervising adults need to assure that all rule violations have consequences. The supervising adult might add, “So if you go into the deep end, I’m going to make you get out of the pool for half an hour,” and then enforce it. Since they have more ability to understand potential consequences, imposed consequences may or may not be required for children in the concrete operations

stage and up, though would be appropriate if youngsters fail to follow rules and requirements.

Waterskills Development

As a simple experience, the Discover Snorkeling program doesn't need any specific waterskill performance objectives. Instructors and leaders generally show those who've never snorkeled before the basics, such as how to adjust and don equipment, kicking techniques, how to inflate a snorkeling vest and how to drain a snorkel or mask at the surface. Any more advanced skills provided, such as surface dives, ear equalization or blast clearing a snorkel, are purely optional and intended only for those who might want to try them (generally, older children and adults).

Parents and instructors "instruct" preoperational children primarily by showing them how to do things, encouraging them to try, and directly or indirectly supervising them close at hand (depending on the environment and child comfort). However, supervising adults need to be prepared to do things for preoperational children, such as equipment adjustment. Preoperational children may know how to swim, but when snorkeling in water too deep to stand up in, should generally have some form of flotation and immediate adult supervision in the water with them. In



shallow water where they can stand, with immediate adult supervision at hand they can enjoy hours of playing with only mask, fins and snorkel.

Integrating Instruction

Although not a course, Discover Snorkeling offers opportunities for alert parents to teach preoperational youngsters concepts beyond swimming. In open water snorkeling, adults can point out fish and compare them to fish that youngsters may know from a home or kindergarten aquarium. Youngsters in the six or seven year age range can enhance reading skills and learn a bit about aquatic biology by looking up fish names on ID slates while snorkeling.

Physical education can also benefit by encouraging good swimming technique. Teaching four-to-six year olds to kick without bending their knees may seem hopeless because they seem to forget in about five minutes, but gentle

repetition slowly sinks in. Perhaps the most important lesson about snorkeling is teaching youngsters to respect, but not fear, water. This is the foundation for developing swimming skills and ultimately, scuba skills when older. Even if diving proves not an interest for some children, at the very least developing swimming skills and establishing water safety concepts with them affords greater safety around water.

SASY

SASY is Supplied Air Snorkeling for Youth, a “snorkeling” system that provides air through a small compressed air cylinder and a regulator similar to that used on scuba gear. SASY looks like scuba gear – quite similar to that worn by adults – but instead of a deflatable BCD, the system has a permanent flotation jacket that cannot deflate. Consequently, a youngster in a SASY unit cannot descend



and is, in effect, snorkeling.

SASY offers several advantages. Because air comes from a cylinder, unlike with a snorkel, children can turn in almost any position and still breathe. Most youngsters find it easier to clear a flooded SASY regulator than a flooded snorkel. Because it looks and functions like scuba gear, SASY helps satisfy youngsters who want to scuba dive “like mom and dad.”

Supervising adults like SASY because it provides flotation. Kids obviously enjoy playing with it, and it establishes comfort with scuba-type equipment for when they’re older and ready to get into scuba diving.

The primary drawback to SASY is that the cylinder needs to be refilled after use, whereas a snorkel has an unlimited air supply.

Bubblemaker/ PADI Seal Team/ Skin Diver

Stage: Ages eight to 10

The PADI Bubblemaker experience Team program are aimed at young- to 10 years old. Bubblemaker is scuba diving, with an emphasis on simply enjoying being underwater. Team program goes beyond simply through a series of structured dives with education and skill objectives, and recognition for accomplishment. The PADI Skin Diver course is a course for age eight through adult, and philosophically might be described as scuba diving without the scuba. All three are suitable for kids who've entered the concrete operations stage.



and PADI Seal sters age eight an introduction to trying scuba and The PADI Seal introducing scuba

Bubblemaker is an adaptation of the popular PADI Discover Scuba program, which allows nondivers to try scuba diving in a pool or pool-like environment.

To suit the experience for eight to 10 year olds, the maximum depth is two metres/six feet with four participants allowed per instructor in a pool-like environment, or six participants in a pool. The instructor reviews some basic concepts and safety principles before the dive, then introduces some scuba skills for

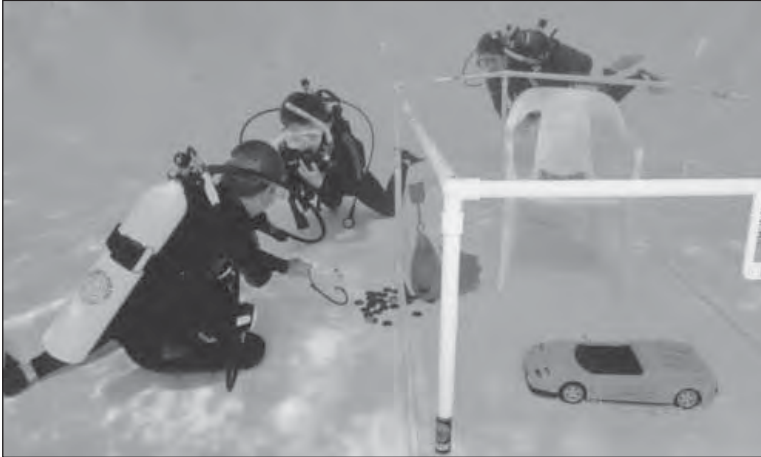


participants to practice in shallow water.

After demonstrating that they understand the rules and principles, and that they've learned to perform the skills, then they may scuba dive as deep as two metres/six feet with direct supervision from a PADI Instructor or Assistant Instructor.

The Bubblemaker program is intended primarily as a way for youngsters to try scuba, though they may repeat the experience as many times as they want. However, rather than continually repeating Bubblemaker, a better option is for youngsters to join the PADI Seal Team program. PADI Seal Team consists of five required AquaMissions (pool dives) to qualify as PADI Seals, followed by Specialty AquaMissions that introduce activities including simulated wreck dives, underwater snap shots and navigation. Youngsters who complete 10 of the specialty dives qualify as PADI Master Seals.

The first five PADI Seal Team AquaMissions develop basic scuba skills and concepts, making it suitable for participants to dive as deep as 4 metres/12 feet with direct supervision by a PADI Instructor (diving beyond two metres/six feet isn't required, however). The program is social and recognition oriented, somewhat like Scouts or similar youth organizations, with awards based on accomplishment and learning. PADI Seal Team keeps youngsters in the eight to 10 year age set involved with diving, prepares them to become certified divers



and integrates with their broader general education.

Another program suited for this age set is the PADI Skin Diver course, which involves breath-hold diving with mask, fins and snorkel. While it may seem that skin diving and snorkeling are the same thing, they actually differ. Skin diving is considered a serious underwater pursuit in which participants dive to moderate depths while holding their breath. They must equalize their ears and sinuses, and apply other skills used in scuba diving. Snorkeling is more casual, being primarily observing the underwater world from the surface, and requiring few skills shared by scuba diving. The PADI Seal Team program also includes a skin diving AquaMission.

Because it involves more motor skill and knowledge development, but doesn't involve scuba, the PADI Skin Diver course is an excellent choice for youngsters with a strong interest in diving in the eight to 10 age range. The course develops many facets of diving information and dive skills, making it an excellent foundation for scuba diving. Because it may include (but doesn't require) open water dives, it's appealing to younger divers who on scuba, are limited to pool diving.

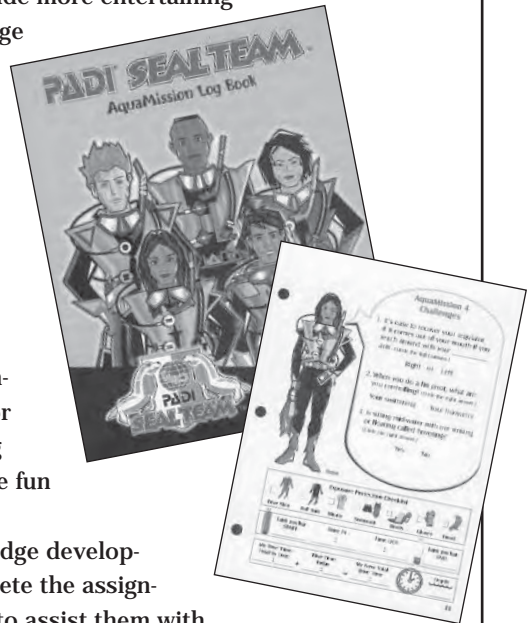
Knowledge Development

For youngsters in the concrete operations stage, the instructor and parents approach knowledge development for the Bubblemaker, PADI Seal Team and Skin Diver programs in much the same way, with variation based on each pro-

gram's scope.

Bubblemaker – In the Bubblemaker program, knowledge development centers on basic safety concepts that apply to limited, shallow diving such as not holding one's breath, recognizing low air and ear equalization. This is typically handled by a short video and/or instructor presentation that covers the concepts and previews skills participants will practice. Instructor and child interact through discussion and questions until the instructor is confident that the child understands the rules and requirements. Although not required, a participating parent can help this process by providing added personal attention to the youngster. This also informs the parent about what's required in the program.

PADI Seal Team – The PADI Seal Team program includes specific learning objectives for each dive (AquaMission). The format is similar to a scuba course for certification, but kept briefer and made more entertaining as appropriate for this age set. Knowledge development is based on reading a short section in the PADI Seal Team Aqua-Mission Logbook that corresponds to the coming AquaMission. The child completes some questions in the logbook, then attends a short briefing by the instructor. Given that youngsters at this stage still learn in an emotional context, and because it holds attention, this briefing is intentionally highly interactive with the instructor stimulating discussion by asking leading questions. The program's designed to be fun as well as educational.



The parent's primary role in knowledge development is to insure that youngsters complete the assignment in the AquaMission Logbook, and to assist them with understanding what they've read. Parents also interact with the instructor, who informs them about their child's progress and areas where they may assist with learning. Because the PADI Seal Team program seeks to build self esteem, confidence and enthusiasm by acknowledging accomplishment, parents also play a pivotal role by praising youngsters for their successes.

Skin Diver – As previously discussed, unlike a Discover Snorkeling experience, the PADI Skin Diver course is a course, meaning it has specific performance objectives that students must meet to earn certification. The course leaves the knowledge development component highly flexible so the instructor (PADI Assistant Instructors and Divemasters may function as instructors for this course) may adapt and accommodate diverse student needs. Although the

scope and format may vary, the course covers information on equipment, diving science, the environment, problem management and safe practices for skin diving in the local area.

Instructors typically cover knowledge development through discussions and presentations, though may assign reading in manuals or viewing sections of videos. Parents may have differing roles in supporting a child's learning. If the course has been set up for adults as well as children, parents, child and instructor may need to discuss whether an adult level presentation will be within the youngster's comprehensive and attentional abilities. A PADI Skin Diver course set up for kids, on the other hand, will likely present information at the appropriate level.

Prior to either Bubblemaker or PADI Seal Team activities underwater, youngsters and their parents also watch the video, *Youth Diving: Responsibility and Risks*, to allow them to make and agree on an informed decision to participate in scuba.

Waterskills Development

Bubblemaker – Because it's a shallow water, limited experience, the Bubblemaker experience requires few skills. Essentially, the participant needs only to be able to breathe properly (continuously), recover and clear a regulator and equalize the ears (and with a two metre/six foot maximum depth, ear equalization isn't a major concern for Bubblemakers). By design, then, Bubblemaker doesn't develop much in the way of waterskills because they're unnecessary to the experience.

However, some waterskill development may take place. Depending upon age and comfort in the water, the instructor may introduce one or two easy scuba skills, not because they're required, but for entertainment. Waterskill development also occurs naturally as participants swim and play underwater. Parents and instructor can also praise and reinforce appropriate behaviors that weren't necessarily taught, such as if two young divers on their own accord show each other their air gauges regularly.

PADI Seal Team – Each PADI Seal Team AquaMission has specific waterskill development goals. The first five AquaMissions develop, in a rudimentary sense, most of the basic scuba skills a student in a PADI Open Water Diver course would have after successfully completing the course's first confined water dive (in fact, PADI Seal Team members can be credited for this when they move on to the Junior Open Water Diver course). Addressing the age range, however, the PADI Seal Team program divides these over five sessions rather than one, plus mixes in games to keep participants motivated as well as entertained.

Skill development in the PADI Seal Team AquaMission is primarily an interaction between the kids and the instructor(s), with the instructor demonstrating a skill and then the kids practicing it for the instructor. After demonstrating

mastery, they move on to the next skill; after covering all skills, the first five AquaMission games provide a context for gaining familiarity with the new skills and being underwater in general. After the first five AquaMissions, the specialty AquaMissions integrate the basic scuba skills with specialized activities, such as using buoyancy control to simulate weightlessness, or BCD operation to assist a tired buddy at the surface. PADI Seal Team members may also dive as deep as 4 metres/12 feet provided they've mastered equalization and demonstrate that they understand to notify the instructor and stop going down if they have difficulty doing so. The deeper dives are not program requirements.

Although parents aren't typically involved directly with waterskills development, they play an important role. By praising child performance based on instructor reports, they reinforce learning and what they're accomplishing. Dive centers sometimes make the Master Seal qualifying AquaMission an event for parents to attend, and a chance for kids to show their skills. For many PADI Seals it means as much to have their parents there as it does for other kids to have their parents attend their championship ball match.



Skin Diver – The PADI Skin Diver course has specific waterskills objectives that students must meet to earn the certification. As with all courses, the PADI Skin Diver course is performance-based, meaning students progress based on their individual abilities to master the skill objectives. The course is more strenuous than a snorkeling experience, and has specific requirements for surface diving underwater holding one's breath, maintaining buddy contact, signal recognition, BCD use and so on. These are all within the capabilities of many, but not all, eight to 10 year olds, especially when conducted at an adult learning pace. The course typically applies the traditional training format of introducing and demonstrating a skill in shallow water, followed by individual student practice and mastery.

As with knowledge development in this course, parents can contribute

significantly to the learning process, especially if the course is set up for adults as well as children. A participating parent (even if already a certified scuba diver) can assist the



instructor by providing personal attention, keeping the youngster focused and by providing reminders or explanations. However, it's equally important that parents be careful to not cross the line between *guiding* their child and doing something for their child. A PADI Skin Diver course especially for youngsters tends to take longer than one for adults, but this accommodates the less developed learning skills youngsters have.

After demonstrating skill mastery in a pool or confined water, the PADI Skin Diver course has an optional open water dive. This may appeal to many kids too young to scuba dive in open water; it's also important to parents because it allows this age set to join them in open water activities. Youngsters often enjoy the fact that they earn their first certification with this course.

Integrating Instruction

The PADI Seal Team program and Skin Diver course offer the most opportunities to tie what youngsters learn in diving with what they're learning in school. The PADI Seal Team specialty AquaMissions do this intentionally, with each specialty AquaMission providing perspective on topics ranging from the manned space program to underwater archaeology to environmental science. Parents in particular can take advantage of interest stimulated in the Seal Team program by helping children connect to more information on these topics via the internet or a local or school library.

Junior Open Water Diver Stage: Ages 10 to 15 / 12 to 15

The Junior diver courses (which includes the PADI *Junior Scuba Diver*, *Junior Open Water Diver*, *Junior Advanced Open Water Diver* and *Junior Rescue Diver* courses) are in most respects the same as the corresponding adult-level courses, with reasonable accommodation in the learning process for age.

However, the performance requirements for certification are the same regardless of age.

Success in the *Junior Open Water Diver* course typically requires a youngster who has matured into the formal operations stage with respect to most behaviors and areas of intellectual development. Some 10-year-olds will have this maturity level, whereas in some cases even children as old as 12 or 13 will not.

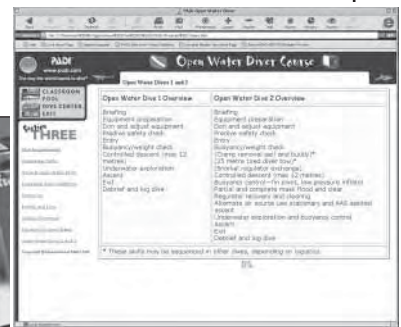
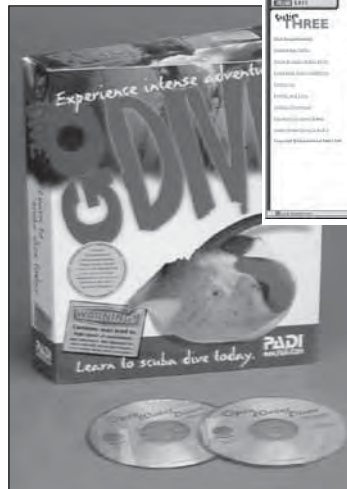
For most youngsters in this age range, motorskill mastery will be less of a concern, with the issue resting primarily in sufficient intellectual development to understand and apply abstract concepts (like gas laws), safety rules (like never hold your breath) and self control (like responding to stress according to training instead of panicking). Children still in the concrete operations stage think in terms of the present and that which is concrete. With formal operations comes the ability to think about abstract concepts and their application, the future, possible situations and other examples of flexible thinking and logic. Children need these characteristics – not necessarily at full adult level though – to succeed in the Junior Open Water Diver course.

As noted in Chapter I, it's important that parents and instructors assess whether a youngster is ready for the Junior Open Water Diver course. Because the transition from concrete operations to formal operations occurs in the 10 to 11 year age period, the child who's not ready at the moment may be ready in a few months.

Knowledge Development

Typically, children taking the Junior Open Water Diver, Junior Advanced Open Water Diver or Junior Rescue Diver course do so as part of a course for adults, though courses exclusively for youngsters aren't uncommon. While mixing adults with children may seem a difficult mix instructionally, the truth is that the instructional model applied in PADI course materials makes doing so possible and effective. With respect to diving, the most common place for marked differences

between adults and youngsters in learning speed is in knowledge development – which, fortunately, is also where it's easiest to compensate for the differ-



With the Junior Open Water Diver course, the most effective approach is to take full advantage of independent study using the PADI Open Water Diver Multimedia CD-ROM.

ences.

During the junior courses, the parent-child-instructor triad works together to assure that the child keeps up with the class and meets the required performance objectives. With the Junior Open Water Diver course, the most effective approach is to take full advantage of independent study using the PADI *Open Water Diver Manual* and *Video*, or *Multimedia* CD-ROM. Higher level Junior courses have the corresponding manuals and videos, too.

By studying knowledge development independently, children and adults in the course read, learn and watch at their own paces. They establish basic mastery of the material and arrive to class meetings ready for a short review, some specific application of what they're learning to their individual needs and circumstances, followed by a short quiz so the instructor can assess mastery. By applying independent study, there is no effect on the schedule if, for instance, it takes an adult 10 minutes to understand pressure-volume gas relationships, but it takes an 11-year-old 30 minutes. Both reached the same understanding level at their own paces on their own time.

Parents play an important role in this process. Children of all ages, depending on study habits, motivation and competing activities, may need reminders and prompting to do their diving "homework" by watching the video, reading the manual and completing exercises and knowledge reviews well ahead of class meetings. *Adults* who don't do this have difficulty with the course, so this is essential.

Parents can greatly aid learning by reviewing their children's answers in exercises and on the section knowledge reviews, checking for errors or blanks that indicate they don't understand and/or have not studied adequately. Answering questions and assisting youngsters in reviewing and learning *before* the next class meeting will help them progress through the course successfully and keep up with adults. Actually, with good parental supervision and guidance, youngsters will usually *outperform* adults who failed to study adequately. Obviously, the level and type of parental guidance will vary with a youngster's maturity; a 10-year-old may need help understanding some of the physical properties of the underwater world, whereas a 14-year-old may need reminding to complete Section Four before going out skateboarding.

The instructor assesses mastery with children to the same criteria as for adult students. In working with Junior students, optimal learning takes place when the instructor interacts with parents, letting them know their children's strengths and weaknesses. Parents in the class (and confined water and open water) can assist the instructor and child by quietly helping the youngsters when they have difficulties. This keeps the younger learner from falling behind and gives the instructor greater flexibility to attend to all students in the class.

Prior to any activities in the water, as with the Bubblemaker and PADI Seal Team programs, youngsters and their parents also watch *Youth Diving*:

Responsibility and Risks to allow them to make and agree on an informed decision to participate in scuba diving.

Waterskills Development

Most instructors who've worked with children say that as a group, children learn diving motor skills faster than adults. Several possibilities may explain this, including that a child who's uncomfortable in water isn't likely to be in a scuba course (whereas it's not uncommon among adults), children usually do exactly what the instructor says (whereas some adults do their own version of what the instructor says) and children are in the learning stages of life (whereas many adults have relative disuse of their learning skills). Children are also more physically active than adults.

This isn't to say that youngsters in the Junior Open Water Diver course won't have their challenges. With the younger 10 to 11 set, equipment fit and warmth are likely issues. With the 12 to 15 set, the physical issues are less likely a concern, but the application of judgment in waterskills may be an issue. At this age, children begin *testing* limits and the consequences rather than simply *weighing* them.



Children in this age set may know what they're *supposed* to do – like stay with their buddy – but may push the envelope a bit, testing both the buddy-system concept and the instructor/parent enforcement of it.

The roles of the parent and instructor vary with the child's maturity. Ten and 11 year olds commonly need closer attention, which is why the Junior Scuba Diver and Open Water Diver courses limit the confined and open water portions of the course to no more than two 10 and 11 year olds amid no more than four students, per instructor. This is also why, after certification, a child this age must dive with a parent (or legal guardian) or PADI Professional, whereas Junior Open Water Divers 12 and older may dive with any certified adult. Also based on age considerations, junior divers 10 to 11 may only dive to 12 metres/40 feet, and may only participate in specific dives in the Adventures in Diving program. The minimum age for Junior Rescue Diver is 12.

Waterskill development in the Junior Open Water Diver course typically involves a skill briefing by the instructor, a demonstration of the skill and then

student practice in shallow water. Youngsters tend to have few difficulties with the basic scuba skills, and those that occur are often equipment-related, such as difficulty with removing and replacing a regulator because of mouth-piece size. Kids who have difficulty mastering a skill generally respond well to encouragement and positive, confidence building comments. Younger children (10 to 12) may look more awkward and clumsy than older kids, but grace isn't a requirement. These kids generally look more polished as they mature and their coordination becomes more refined.

The bigger challenge during waterskills development tends to be integrating the dive skills with knowledge development concepts into the broad skills that diving entails. This means bridging the gap between knowing and doing, such as staying close to a buddy throughout a dive. Emotional maturity plays a role; a child who can clear a mask perfectly in 1 metre/3 feet of water but panics with a flooded mask in 2 metres/6 feet of water may have skill mastery, but has not integrated it into the behaviors required of a certified diver.

Adults help youngsters learn to integrate skills and knowledge into the broader skill of being a diver in several ways. Children in formal operations are learning to weigh the consequences of their actions (and will begin to test these as they grow into teenagers). If potential consequences are severe enough, a youngster who understands isn't likely to "test" the limit intentionally. The important steps instructionally are to assure understanding and mastery of the concepts, to use reminders so they're not forgotten, and to make the desired behaviors habitual through training. The latter is particularly important to reduce errors under stress and to help avoid doing the wrong thing while panicked, despite having demonstrated mastery of the proper behavior in a lower stress context.

As discussed earlier in this chapter, teaching divers to follow their training is the ninth event of instruction, enhancing retention and transfer. Repetition in a variety of circumstances increases recall, and the variety makes students increasingly confident with their abilities to apply their skills. This offers a teaching strategy for developing responses based on training instead of instinctive panic.

Using the youngster who can clear a mask in shallow water but panics in deeper water as an example, an instructor might first have the child practice in shallow water until the skill is nearly effortless, in water that requires the child to kneel to get underwater. Then, the instructor might take the youngster deeper, but still shallow enough to surface by standing. The child would practice mask clearing several times, with the instructor adding some variation by having the child swim and clear, stop and clear, remove, replace and clear, etc. This might be followed by mask clearing practice at a depth where standing up, the child would just barely be completely submerged, followed by deeper still, and so on, gradually taking the youngster to the deepest portion of the pool to demonstrate the skill. Because self confidence is the central issue, the strat-

egy is to continuously stretch the youngster's comfort zone by extending only slightly past it, but cautiously avoid causing fear and panic. (One bad experience can negate many successes leading up to it.)

This may appear to be more practice than an adult would need for the same skill, but actually the same approach would be appropriate for an adult. With subsequent skill, the child gains confidence with personal diving ability and it's expected that there's less practice required for comparable confidence and mastery. Parents can aid learning through praise for good performances and effort.

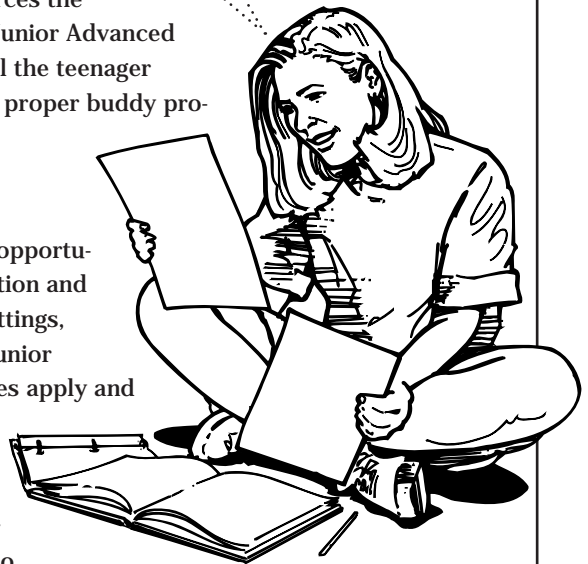
The issue of youngsters testing rules with no immediate consequences (like taking liberties with the buddy system) takes the same instructional response as with the preoperational child, who judges based on actual rather than potential or intended consequences: provide consequences. The young teen who has to repeat an Adventure dive for failing to maintain buddy contact may attempt to excuse the behavior, but will not forget the point when the instructor enforces the consequences by withholding the Junior Advanced Open Water Diver certification until the teenager repeats the dive and demonstrates proper buddy procedures.

I know this...
I learned all about Jacques Cousteau during my PADI Seal Team training.

Integrating Instruction

The junior diver courses offer any opportunities for furthering broader education and development goals. In academic settings, the Junior Open Water Diver and Junior Advanced Open Water Diver courses apply and relate to principles children learn in studying biology, physics and physical education, among others. It's not unusual for schools to offer programs in which students learn to dive as a means of participating in biology, ecology or other marine sciences.

Parents can facilitate instructional integration by steering their children to apply diving-related topics to school assignments. For example, a child learning to report on something about gases might choose to write about Boyle's Law and gas/volume relationships. Or, a biographical assignment might offer the option to report on a



Parents can facilitate instructional integration by steering their children to apply diving-related topics to school assignments.

famous underwater explorer. Integrating diving and general education extends children's knowledge regarding diving, but also raises interest and enthusiasm in mainstream coursework. Young people, especially teens, sometimes question whether what they're learning in school – like mathematics or biology – has anything to do with “the real world.” Applying these concepts while diving builds the connection between education and reality.

At all age levels, instruction integrates with the skills and maturation children need to become functional adults. This is especially true at the Junior Open Water Diver stage, which coincides with the formal operations stage and intellectual development to adult-level thinking.

- following rules and accepting consequences
- applying abstract and hypothetical concepts to real situations
- persisting in the face of difficulties until successful
- functioning as a responsible, contributing partner or group member
- applying judgment to make sound decisions
- respecting those in leadership positions
- applying self discipline

Parents and instructors can bolster the benefits diving brings to these areas by rewarding the growth youngsters demonstrate in diving, and by holding them accountable where necessary. Children who decide to take a Junior Advanced Open Water Diver course, for example, shouldn't be allowed to skip reading their assignments any more than a parent would let them skip regular school work. Enforcing the assignments reinforces accepting consequences (they chose to take the course) and applying self discipline; the reward comes

when they attend the Adventure dive and find they have more fun because they're properly prepared.



Chapter V

Interacting with Children in Dive Programs

Thirteen-year-old Daniel disrupts the dive computer discussion with an off-color quip about an improbable use for a computer by a member of a local ethnic group. The joke catches instructor Pierre momentarily off guard. Some other youngsters laugh at the outburst, and Pierre's instinct is to rebuke Daniel, but there's a problem: it's all Pierre can do not to laugh, and even the other adults are biting their lips. Like many bright youngsters around the world, Daniel is funny, though in this instance culturally insensitive and sarcastic. Pierre doesn't want to reward the interruption nor the prejudice it perpetuates, but Daniel's comment hangs there with the class waiting for Pierre's response. Fortunately, Pierre also knows something about kids, so he takes an unexpected tact.

"Well, I'm not sure that's a recommended use for a dive computer, but it would work in theory, wouldn't it Daniel?"

"Uh. . . I suppose so," [Daniel guesses, now himself off guard as his joke becomes a line of serious inquiry.]

"Why?"

[Daniel hesitates and then shrugs.]

"Because it involves pressure, just like being underwater. Dive computers measure depth by measuring pressure, so in your situation, Daniel, the dive computer would calculate the pressure the same as if the diver were in water instead, right? But the depth it reads might differ from the depth you get measuring with a tape. Who can tell me why?"

[From here Pierre carefully steers the class back to the main discussion.]

As was evident in Chapter IV, Teaching Children to Dive, teaching children diving differs from teaching adults in some respects. How much and in what ways depends on the child's age and other variables. Not only does instruction need to accommodate these factors, but both instructors and parents need to interact with youngsters in ways that differ from how they might interact with adults. This is one of the challenges of teaching children *anything*.

Yet the challenges of teaching kids carry rewards. Teachers who capture the attention and respect of children know it's a remarkable feeling. When they can hang on to that moment, they sow seeds of learning in fertile ground. Children often lack the preconceptions and cynicism that create challenges when teaching adults. When their minds open, they open wide and unobstructed. Establishing rapport, setting goals, instilling responsibility, solving problems, applying creativity, providing praise and critique, and maintaining appropriate supervision differ in ways subtle and obvious compared with adults. Parents and instructors benefit by understanding techniques they can adapt and apply to the challenges in teaching youngsters.



Developing Rapport

For those who've never worked with youngsters, the first question is how to start. Establishing rapport with children may differ from doing so with adults in that a professional respect doesn't necessarily exist just because the teacher holds an instructor certification. There's a bit of a trade – younger children don't understand, much less respect, credentials, but they tend to respect adults just because they're adults. With intellectual maturity, youngsters tend to see less authority from mere adulthood and more from what the person stands for.

Even when the respect is there the instructor may have challenges.

Children may feel some trepidation or intimidation that can interfere with learning, especially if the instructor has a large physical presence and doesn't take steps to soften it. The goal is for children to respect the instructor so that they carry out the instructor's directives and listen attentively, yet with enough rapport that they feel like they can ask questions, express concerns and even make mistakes without fear.

For most instructors, the technique is to simply be open, honest and caring. Children have an uncanny way of seeing through rhetoric and lip service to recognize who's genuine and who's not. Youngsters recognize people who sincerely care about them and give their attention and respect in return. But while they may intentionally or unintentionally challenge authority, kids want a strong adult overseeing activities like diving.

It's not uncommon for adults to patronize children in an attempt to address their level of intellectual development and learning. This is a mistake. Rather, the strategy is to talk to children with the same respect one gives adults, but using concepts, language and principles within their understanding level. The savvy instructor working with youngsters talks with them, not down to them.

Rapport begins from the first, "hello," just as it does with adults, and also as with adults, it helps to find common ground. An ice-breaking technique used by teachers and leaders in many applications is to ask children what they like to do. They ask about what sports they play, what interests them—skateboarding, reading, collecting, etc. Getting the children to explain what they like to do sets a positive tone for what you're about to teach, and it provides the common ground the instructor can draw upon in explaining dive concepts.

Understanding what youngsters do and what they like to do is especially helpful when children are nervous. Talking about what interests them is disarming, and relating unfamiliar concepts to familiar ones can be reassuring. For instance, a youngster who bicycles and who expresses fears about snorkeling may be reassured by comparing how bicyclists avoid problems by following the rules, and that snorkelers do the same. An advantage of teaching youngsters over adults is that youngsters are less prone to hang on to their fears, and once reassured, quickly brighten up and forget what was bugging them only moments before.

Goals and Success

Goal setting and defining success are skills that develop as a child matures. Kids learning to dive may not be able to set realistic goals, and fantasies or wishes – while *potentially* goals – may be confused with real goals. Self-esteem issues may drive unconscious goals, and children may have difficulty separating failing at an attempt to do something from failing altogether. Depending on the situations in which they've been raised, some youngsters may fear failure so much that they fear trying.

Goals

Goal setting is a skill that is taught and often begins with simple things such as being allowed to have a favorite desert when finishing the rest of the meal, or being allowed to go some place special on Saturday if the bed gets made every day during the week. Goal setting is complicated by the children's extended time perceptions; the younger a child, the longer a day, a week or a month seems. Therefore, children tend to be more immediately focused because next week or next year is so far away.

With respect to scuba diving, the general approach is for adults to get agreement on the broad goal, such as becoming a PADI Seal Team member or a Junior Open Water Diver by the end of next month. Instructors set the intermediate goals leading to the broad goal, such as clearing a mask during this pool session, because youngsters have no basis for doing so. Once children understand what they're going to accomplish, then they can participate in learning.



One difference in training children versus adults, though, is that younger children may be less inclined to ask why they have to do something. In the concrete operations stage, children see adults as authorities, with rules simply being rules because their parents or teachers say so. If they're

told they have to learn to clear their mask, then that's that – and it may not occur to them to ask *why* they need to know how and when they might do it. For youngsters in the eight to 10 or 11 age range, it's a good practice to constantly remind children why they're learning to do something.

On the other side of the coin, older children in the early stages of formal operations may ask why they're learning a skill when an adult may not, or question the reason if they can't follow the logic. It's easy to mistake genuine curiosity for a challenge when such a child asks "Why?" or proposes an alternative logic, and in any event, an instructor may be at a loss for words if there's *not* a reasonable explanation.

As one example, in the early days of scuba training, instructors would have students hold all their gear in their arms, then jump in the pool and put it all on underwater. Such a skill has no real purpose and apparently existed simply because someone made it up and then it passed from one instructor to the next. When asked why they were doing it, the traditional explanation became, "If you were on a dive boat that caught fire, you could grab all your gear, jump

overboard and then get your stuff on in the safety of the water.” After hearing that justification, a twelve year old innocently torpedoed that “explanation” by asking, “But why not grab the fire extinguisher and put the fire out?”

Other goals may lie within learning to dive. Children may dream of becoming world class dive travelers, marine scientists, underwater videographers or envision some other career involving diving. It’s the responsibility of parents and adults to fuel such dreams through positive attitudes and nurturing. The latest book on dolphin research may inspire the youngster dreaming of being a marine scientist, or the aspiring young underwater filmmaker may discover hours of enjoyment with a DVD that provides behind-the-scenes information about the making of an underwater blockbuster movie.

In their enthusiasm, children with such dreams may not separate the fantasy from a true goal, and in fact the fantasy may never leave and actually become both goal and destiny (see *Because I Started Diving Young...in Chapter 1*). Children



may add things that relate to their dream to their dive instruction, such as the hopeful underwater magazine photographer toting an underwater snapshot camera in the pool.

As Piaget pointed out, this is part of how children “try on” possible careers and stations in life. As adults it may seem these fantasies are childish nonsense, because adults know such notions come and go. Disillusioned adults who never realized their dreams may not see children’s fantasies as practical or realistic. Yet to children, these dreams are very real; making light of them or dismissing them casually can damage children’s self image and their ability to reach for and attain their dreams. So, if the snapshot camera doesn’t interfere with learning, the best course may be to allow the youngster to have it. If it does, then an approach may be to set the camera aside for now assuring the youngster that this is necessary to concentrate on learning the dive skills that world class underwater magazine photographers need.

Adults need to remember that those who grow up to make their childhood dreams real have some of the most fulfilling and rewarding lives, and some children picture that life before they finish grade school. This should give any adult pause before dismissing a child’s fantasy as nothing but a wish.

Success and Failure

One reason a child's future fantasies have such strength is that they're so far in the future that, in the youngster's mind, failure isn't conceivable. Current learning goals, on the other hand, provide an immediate challenge and have direct bearing on subsequent learning. Children who succeed at something challenging will try again and attempt more challenging skills. Children who feel free to fail will also try, and will at least try a few times until they succeed or give up. Children who fail and suffer self-esteem loss over failure are likely to quit and get little out of the activity. More broadly, all of these contribute to a youngster's overall personal view and world view of the consequences of trying and failing.

Current goals – the knowledge and skill objectives for the diving program – must be set so they're achievable and realistic for the child's current skill level. While the PADI System provides the performance requirements, the instructor and parent present the requirements in context with a youngster's present skills. Success should be measured against each child's self, and not against others in the program.

Self-esteem is an issue, however, and children *will* compare themselves to others. There's nothing a parent or instructor can do other than to encourage a more introspective comparison, nor is some competitive element necessarily bad. Life has its competitive dimensions. Parents and instructors need to ensure that children have goals that are appropriate and attainable; these will often displace inappropriate goals driven by misconceptions or self-esteem. For example, a child may try to out swim a larger classmate simply for self-esteem reasons. A more appropriate, achievable goal would be to swim the pool circumference without stopping, without getting tired and without breaking the surface or touching the bottom. The esteem issue may be eliminated or moderated by pointing out that swimming fast isn't important to divers, but pacing and buoyancy control are the marks of accomplished divers. In other words, redirecting the energies related to self-esteem to meaningful and appropriate directions.

Handling failure may be delicate. Children need guidance when things don't happen as planned: For example, when clearing a mask of water becomes more of an experience in inhaling water, the astute instructor helps the child achieve success by breaking down the skill into smaller skills – the same technique used with adults.

More so than an adult, however, the child needs praise for correct aspects of the skill. For example, the instructor may repeat mask clearing step by step so the youngster sees the distinct sub skills. After each trial, the instructor reinforces the correct aspects, then corrects the incorrect aspects if asked for them, or if the youngster isn't obviously picking up on them: "You're holding the top of the mask *perfectly*. But when you blow, you're blowing out your mouth, not your nose. Blow out your nose and you've got it."

Reinforcement builds a sense of success amid the process and the impetus to go to the next step. After demonstrating mastery, child and instructor move on to the next skill; the number of trials it took to get there is irrelevant and neither instructor nor parent have any reason to bring it up. Doing so only breeds fear of failure and a fear of trying, whereas emphasis on trying until successful breeds persistence in the face of setbacks. The message should be that only giving up is failure.



Unfortunately, other children won't be so discrete and in genuine pride or in bolstering their own self image, may point out (to continue the example) that *they* cleared their masks on the *first* try. If this causes a self esteem issue for a youngster who needed several tries, empathy and redirection to the real issues may help. If the instructor privately told the child, "Just between you and me, I couldn't clear my mask the first time either," the child may immediately realize that in scuba diving what's important is success and not the number of tries. After all, if the *instructor* couldn't do it the first time either, then how important could clearing it the first time be?

Self Responsibility

Teaching children to assume responsibility for themselves is what the process from childhood to adulthood is all about. Scuba instruction can play a significant role through the need to adopt and demonstrate dive safety and responsibility. Self awareness, equipment awareness and working in a buddy team are all components of entry level scuba courses. One cannot become a certified scuba diver without demonstrating mastery of specific learning objectives in these areas.

Children, along with their parents, become aware of what is expected of them as responsible participants in diving by watching the *Youth Responsibility and Risk* video. The video outlines what they must do in terms of following rules, staying focused, respecting equipment and following the instructor's direction. The video also tells them the consequences when they don't.

Children come to scuba training with varying backgrounds and levels of responsibility. The typical child will not be uniformly responsible, but show

high responsibility in some areas and less in others (which is true for many adults). For some, diving will be the first time they're expected to follow rules with what could be quite serious outcomes if they don't. Interestingly, even quite young children jump at the chance to take on responsibility and show that they can be trusted with it. Even eight year old children know they can't breathe water and that scuba diving entails some risk, so they tend to take their responsibilities seriously.

Self responsibility develops when youngsters look after their own well being and benefit accordingly. Taking on scuba diving responsibilities (and similar responsibilities for other active pursuits for that matter) may contribute to normal, healthy maturation and transition to adulthood. Children who take responsibility for themselves as divers in everything from preparing their equipment, pre-dive planning, communicating with a partner, monitoring depth and time and diving the plan can take satisfaction in the fact that their dives are fun and safe because they did what it takes to make them that way.



Creativity and Humor

Laughter is a tension reliever and goes a long way in making children feel comfortable, making it a useful tool for the scuba instructor. Because sense of humor grows with the child, the approach has to match child maturity. Very young children may find slapstick humor funny, children in the concrete operations stage will understand jokes but may have trouble understanding humor based on abstracts, and children in the formal operations stage can follow adult level (clean) humor.

Instructors needn't be comedians to teach children, but those who can poke fun at themselves during difficult situations demonstrate good role modeling and help children relax and enjoy the experience. It's always safer for

instructors to make fun of themselves than of youngsters, no matter how gently or carefully done.

Older children express humor in broader ways than young children, including use of sarcasm. This can catch an instructor off guard, but taking a moment to understand what's behind the thought may avoid hard feelings. The important thing in dealing with humor from youngsters is to allow everyone to enjoy the moment (assuming it's appropriate humor, of course), while maintaining control and keeping the class on track.

Hand-in-hand with humor, creativity helps engage children in the underwater experience. As noted in Chapter VII, many everyday games children play can be played underwater.

Board games, relay races and so on – underwater – can add to the fun children have learning to dive. This accomplishes several goals. When focus is on fun (the game), children become more comfortable with their gear, allowing fears and difficulties to fade through experience. Other games, such as a mask exchange relay race, may be fun but foster the real dive skills of mask clearing, buddy team work and familiarity with different mask styles.

Creativity can manifest itself in many forms. For example, children have a natural affinity toward animals and toys. An instructor teaching children to “swim like a dolphin” (dolphin kick) might illustrate the concept with a battery powered toy dolphin. Or, one may add weighted fish toys to the pool just to give youngsters something to look at. A plastic fish or puppet unveiled from a BCD pocket during a training session may surprise and delight young divers. Parents who know their children's favorite underwater animals or toys can assist by tipping off instructors and providing ideas.

Not all creativity has to be elaborate, underwater and purely entertaining. A relevant underwater video to open a class session or PADI Seal Team meeting can stimulate discussions that illustrate and lead into the topic at hand. The point is that by using some creativity, instructors and parents can open young minds and make learning more meaningful for young divers.



Recognition

While both adult and child student divers benefit from recognition for their accomplishments, typically recognition goes farther and means more to kids. Certification cards, certificates, log books, activity logs, emblems, stickers, etc., for various PADI programs can mean surprisingly much to youngsters, at least partly because they like to share their accomplishments with parents, siblings, friends and peers. Scuba certificates, certification cards and emblems help youngsters define themselves, just as uniforms, trophies and team photos do for those involved with other sports.

Because of this, sincere and appropriate recognition for a child's achievements can set the stage for a greater sense of self worth. This not only encourages further development in diving, but more broadly contributes to a confident self image as a child matures into adulthood. As

with adults, recognition must be sincere and based on real merit, but diving offers ample opportunities for both instructor and parents.

Besides providing certificates, certification cards, etc., the dive center catering to families and young divers can provide added recognition, such as a bulletin board with each youngster's picture and



current diver status. T-shirts that identify kids as XYZ Dive Center PADI Seal Team Members or PADI Master Seals evoke pride. Even asking an older child to mentor a younger one (with appropriate adult supervision still in place, of course) recognizes that child's accomplishments in diving.

Parents offer recognition by allowing kids to put PADI stickers on their school notebooks or emblems on their jackets (assuming this poses no issues with school standards). If both parents couldn't be present for a class or PADI Seal Team dive, it may mean a lot if the present parent reports on the youngster's accomplishments. Instructors can bolster youngsters' pride by finding something worth praising in front of their parents.

Small recognitions fit into training as well. For example, the PADI Seal Team pair who best follows buddy system procedures may be put in charge of the group's toy mascot dolphin for the next dive, or the buddy team that watches its air supply the best gets to make the first dive on the AquaMission wreck, etc. This not only gives recognition, but reinforces desired performances.

Common Challenges

Teaching youngsters to dive has common challenges. Working together, parents and instructors can overcome most of these with relative ease.

Equipment Fit

Small people need small equipment. Mask, snorkels and fins are readily available in child's sizes. Manufacturers have been making small wet suits, BCDs, cylinders and other scuba gear for many years.

The dive center catering to families and youngsters takes size into account when selecting equipment for rental stock or class use. Parents may find it worth investing in gear, even though a youngster will grow out of it, if there are younger siblings or if the dive center will accept equipment on trade toward new gear as the diver grows.

Many children are used to dealing with being too small for things intended for adults, and will therefore try to adapt to oversized dive gear without protest. Why not? After all, they do it with everything else, so it may not occur to them to speak up if fit is a challenge. Alert parents and instructors watch sizes as youngsters kit up, especially for the first time, making sure that the equipment they use fits adequately.



Body Temperature

As mentioned in Chapter III, Medical Issues and Children in Diving, youngsters tend to cool more quickly than adults. Adults need to be careful not to use their own comfort to gauge children's comfort, and to minimize chilling by assuring appropriate, well fitting exposure suits. Even with kids in wet suits, heated pools can be warmed a bit higher than adults typically need, and frequent breaks to dry off and rewarm go a long way to keeping snorkeling or scuba fun for kids. Warm beverages take the chill off and when served with healthy snacks make a big difference in boosting energy levels, particularly during open water dives.

Good rapport with children also heads this problem off by having kids tell the instructor or staff when they're too cold – especially if they begin to shiver. With flexible planning, the instructor can be ready to interrupt the session quickly to allow rewarming without significantly affecting the training schedule.

Strength and Stamina

With physical ability spanning a wide range in people, adapting to those with less stamina and strength is not a new concept for most scuba instructors and

their staff. There's no difference on this issue with children diving than with adults who are small in stature or who have a physical challenge or limitation. Because they're smaller, children don't consume as much air and therefore may use smaller cylinders more proportionate to their sizes.

Assistance with heavy equipment is reasonable (particularly when getting in and out of the water), and is an accommodation divers make for each other irrespective of age. While weaker than adults, for their size and weight children may be disproportionately strong. The same techniques that apply to less statured adults, such as gearing up in water or seated to reduce carrying the weight, apply to younger divers.

Dive sites that do not require long swims, strong current, or depths beyond 12 metres/40 to 18 metres/60 feet make appropriate sites for youngsters, depending on age. Look for areas that are appropriate for children and rate your dive sites accordingly. Designated family sites not only welcome young divers, but help guide parents and supervising adults to those areas.

Impulsiveness

As mentioned, many children see diving as a means to live out fantasies they read about in books, magazines or online, or see in movies, video games or on television. Or, they can visit a future they fantasize about. Impulsiveness is the other side of the coin. With differing concepts of time and short attention spans, some youngsters will lose focus or interest on their present activity and discontinue. Or, they may get an idea and act on it without thinking further about whether it's a good idea or the possible consequences.

Impulsiveness varies with maturity, age and individuals. With early and clear ground rules and enforced consequences for not following them, impulsiveness is seldom a major issue with children old enough to participate in various scuba programs. Nonetheless, parents need to assess their youngsters' maturity, particularly the ability to pay attention and follow rules. A child with ADHA (Attention Deficit Hyperactivity Disorder), for example, would probably not be ready for scuba diving until reaching a stage where the child controls and manages the condition.

The *Youth Responsibility and Risk* video articulates the expectations of children taking PADI and diving programs (listen to the instructor, tell the instructor if you're not feeling well, do what your instructor tells you, etc.) Parents and the instructor build onto the video's information by describing – in specific, easy-to-understand terms – pool and open water rules, and behavior expectations. This explanation includes the consequences of not following those rules, which doesn't simply mean possible scuba hazards, but enforcement consequences. For instance, an instructor can tell youngsters that if they leave sight of their supervising adult, diving's done for the day. As most parents know, such rules have to be enforced – often amid excuses and promises not to repeat the behavior – or children will learn to ignore them.

A structured approach to rules and enforcing them may seem militaristic, but it actually puts children more at ease by establishing limits. It gives instructors and parents a means to enforce the rules before fun in the water becomes a safety concern.

As mentioned earlier, reward systems in addition to consequences go a long way to keeping children focused and reducing impulsive behavior. This can range from keeping everyone focused by agreeing that if skills get done quickly they can play with a favorite underwater toy to rewards for never being more than a metre/three feet from a buddy during the entire session.

Attention Span

Some of the impulsiveness children have comes from short attention spans. As noted, this results in part from time perceptions; the younger a person, the longer a given interval seems. At adult ages there's little perceived difference in an hour for a 30 year old and a 40 year old, but an hour may seem quite a bit longer to an 8 year old.

Attention may also wander for the same reasons it does in adults. When children appear chilled (and remember, they may not speak up for awhile), it's time for a break just as it is with adults. Likewise, the need to use the bathroom, too much sun exposure or anything else that causes physical discomfort can contribute to distraction.

A short-term goal makes it easier to maintain attention, so the wise parent or instructor breaks sessions into small subsections, with frequent breaks as needed. Fun goals may foster broader goals. For example, if youngsters don't seem comfortable in the water in scuba gear, they can play a find-the-ball or catch or some other activity together in shallow water. This creates a new focus, allowing the kids to pay attention to the game rather than their gear. This helps equipment skills become more automatic and diving becomes less about simply being gear management (this technique works with adults, for that matter).

When the adult ends the game to begin a new learning task, attention again shifts to a new point (the adult). This fresh attention point is a good time to introduce concepts or skills that require focus, such as equalization while going down an incline into deeper water.

The same ground rules that reduce impulsiveness increase attention to specifics. If failing to follow certain rules will result in no more diving, children have incentive to pay attention to those rules. If, as in the buddy system rewards example, attention to a skill produces something kids want, they're more likely to give it their attention.

Because many children take to the water like fish, and the water environment provides many stimuli, it may actually be the classroom where attention will wander. Those who teach youngsters know that kids don't learn well from the long continuous presentations that adults can follow. Rather, the key is to

interact with children continuously to keep their attention, by asking questions, having them explain certain points. If children know the instructor may call on them, they're more likely to listen and pay attention.

Independent Study

Youngsters enrolled in the PADI Junior Open Water Diver or Junior Scuba Diver courses typically read the PADI Open Water Diver Manual and watch the PADI *Open Water Diver Video* (do both with the CD-ROM) independently. The student-parent-instructor triad can be crucial to assure that the work gets done



Parents need to enforce scuba course homework requirements, check for understanding and be prepared to help just as they would for school assigned homework.

and to assist with understanding. Children who show up unprepared because they either failed to do the work, or did it but had many significant understanding gaps, will generally slow and complicate the session.

Parents need to enforce homework requirements, check for understanding and be prepared to help just as they would for school assigned homework. Hopefully, youngsters embrace their diving homework with more enthusiasm than the typical youngster has for regular homework. Before the start of a class, it's wise for the instructor to speak with parents about this so they know that their assistance and support play an important role in their children's

Adult Dependency

success. As with adults, children who get behind typically end up requiring make up sessions or recycling to another class.

Some question teaching children to dive with respect to a certified diver's responsibility to respond to a partner requiring assistance.

Actually, it doesn't have to be a problem. Any given set of dive partners will have varying abilities. Part of dive planning is to plan for the least able or least qualified diver in the team in terms of dive profiles, sites and emergency plans. Considering incidents involving toddlers who activate EMS when a parent has a medical emergency, it's clear that even very young children (too young to dive) can be surprisingly resourceful and competent, within reasoned limits.

But there's little argument that children will depend more on the adult

team member than vice versa. It's a judgment call as to how dependent they are and what is appropriate for certification. Children enrolled in scuba programs must, within the limits of the program, 1) take responsibility for themselves, 2) follow the course rules set for them, 3) adhere to diving rules, and 4) meet the performance requirements. If a youngster can meet these four criteria, then that youngster meets the requirements for participating and (if applicable) certification.

Being realistic, supervising adults need to accept there may be circumstances in which a youngster is qualified to dive, but may be unable to assist an adult in the event of a major problem. Such an instance might be a substantially larger adult while diving away from added supervision (such as a charter dive boat). In this instance, the adult must accept some added risk, albeit moderated to some degree by the less challenging nature of dive sites appropriate to young divers. Or, it may be appropriate to add an adult to the dive team, so both adults have someone of sufficient physical strength to help in a worst-case situation.

Determining supervision within PADI programs is somewhat simplified, in that a PADI Instructor has depth and supervision limits based on age set by program standards. As necessary, the instructor reduces the numbers to be even more conservative if circumstances or individual needs call for it. The instructor's assisting staff provides additional supervision.

The other form of adult dependency is typically accidental, and occurs when a parent or other adult takes a course with a youngster and does things that the youngster should do personally, such as set up equipment. Even when a parent sets out planning to simply "help," if a child falls behind and seems to be holding everything up, there's sometimes a tendency to do it for the youngster to keep things moving. Close communication between instructor and parent can avoid this as the instructor reminds parents that their children have to grow and demonstrate mastery, and by reassuring them that any delays are less important than learning. Once this is clear, parents will not help their kids inappropriately, and at times may even suggest that the instructor not help with something they know their kids can manage.



The different depth and supervision requirements in PADI programs account for what one can reasonably expect from different aged divers. As necessary, the instructor adjusts to accommodate individual needs.

Different Age Groups

Age mix can be a challenge for the dive professional. If two families enroll in diving, resulting in an age mix of 8, 11, 13 and two 15 year olds, plus two moms and two dads, accommodating everyone may be tricky.

Handling this depends on logistics, staffing, resources and dive site availability. Creative thinking may allow everyone to not only participate, but participate as a single group. Everyone in the group, except the eight year old, is eligible for the PADI Discover Scuba Diving, and Scuba Diver and Open Water Diver programs.

One option might be to start off with a Discover Scuba program, limiting the 8 year old to Bubblemaker depth and supervision limits. Everyone gets started in scuba together. Later, the majority of the group goes into Discover Scuba Diving and takes a shallow, supervised dive, with the 8-year-old joining the fun on the surface with a SASY unit or a Discover Snorkeling excursion (guided by a PADI professional). Other variations exist depending on prior training and whether they consider staying together as a single group important or not. Fortunately, PADI programs embrace diving at wide age, physical and intellectual levels, making it easy to accommodate differing needs within program requirements.

Demanding Parents

Certified diver parents may have a compelling desire to dive with their children and picture family diving akin to Jacques Cousteau and his sons. Much like when training an unwilling spouse dragged into diving, if this desire is only a parent's desire, and not a youngster's, problems may result. There's a difference between gently nudging children to do something to overcome the ease of doing nothing, versus making children do something they really don't want to do.

Children, like anyone else, should be willing and eager before they participate in diving. The child who isn't interested is also typically not ready to bear up to the responsibilities diving entails. Instructors learn to listen to students and watch for the nonverbal signals and attitudes. Someone who doesn't want to dive doesn't belong in a scuba course, regardless of age.

With children, the instructors may end up in an awkward place if they have to tell demanding parents that their children aren't ready for diving. The wise parent will listen, disappointed or not, and remember that time brings about growth, maturity and change. The instructor dealing with a parent who doesn't want to hear this can only muster up the best diplomatic counseling skills and as gently as possible, tell it like it is. The instructor may suggest bringing the youngster back after age and maturity change, and if necessary, refuse to accept the child for further training.

Time

Parents and instructors need to realize that typically, courses and programs that include child participants will take a bit longer, depending on how many, the ages and the individual skills of each. All adults in the learning process need to plan for it and set children up for the best chance for success at their individual paces. This may require some added sessions or other scheduling issues, and parents need to recognize that these may result in some added costs.

Informed Choice

Any one under legal age (as defined by local regulations) must have a parent or guardian consent to participate in scuba diving. This means parents must read and sign the same forms the student diver does for a program. Unless the parent and child understand the program requirements, its potential risks and participant responsibility, they cannot make informed decisions as to whether the program's reasonably within the child's ability and both of their risk tolerance.

Many dive operations do this with a special session with parent and child. If this isn't a regular practice, the instructor or parent can request one in any case. Typically the session includes the *Youth Risks and Responsibility* video (required in PADI programs for children ages 10 to 11, but useful for any-aged child), which clearly defines these points. If logistics don't allow video use, the instructor or other dive operation employee may also cover the same information in the related flip chart. At this point, instructor, parent and child have the opportunity to ask questions, and begin the student-parent-instructor learning learning triad that's essential to success. Typically, parent and child sign the Youth Risk and Responsibility Acknowledgement Form (again, required in PADI programs for children 10-11) and other required forms as part of this session.

Assessing and Counseling

The parent, child and instructor together determine whether or not a child is ready to take a scuba course, progress in continuing education or even try scuba. Both parent and child make initial decisions by interacting with the instructor, as well as the initial administrative paperwork or orientation needed to begin training. Once training or participation begins, it is the instructor who assesses how the child is doing and makes decisions along the way. Does the child demonstrate the maturity required? What problems are there, and can they reasonably be overcome?

The instructor makes decisions about child readiness and aptitude throughout a program, but so do the child and parent. All three need to communicate with each other honestly about successes and problems. If the instructor involves the parent and various approaches to a challenge still leave

the child falling short of the performance requirements of the course, then the appropriate action may be for the instructor and the parent to channel the child into a less-demanding program until the child's more mature and ready.

The final decision about whether or not a student is ready to move on or become certified is the instructor's, but also the youngster's and the parent's. If the instructor's training and experience suggest counseling the child into a less rigorous program, the instructor should do that. Likewise, even if a child meets all requirements for certification, if the child or parent have doubts and want further training, then they should arrange for it before accepting certification.

General Safety Rules

Though children and water typically make a wonderful combination, parents, instructors and dive operations must have and enforce water safety rules. These may include:

1. No running in the pool area.
2. No glass in the pool area.
3. No youngsters under 15 allowed in the water without an adult present. If the adult must leave, even for a moment, everyone gets out of the water.
4. No youngsters under 6, or who cannot swim, allowed in the pool area at all without an adult present.
5. Gates restricting children from pool access remain locked.
6. No diving or jumping into shallow areas.
7. No youngsters allowed on small boats without an adult present.
8. Children under 15 on a small boat (generally considered any open boat or a boat smaller than 10 metres/30 feet) wear personal flotation devices (PFDs) at all times.

(This is the recommendation for all people on such boats, regardless of age. Some areas have specific laws or regulations about children and PFDs.)

Chapter VI

Professional Conduct in Child Interactions

Child abuse is a serious problem in many cultures and societies. Since 1976 in the U.S. when the statistics were first kept, the number of reported cases has increased so that today, more than three million reports of child abuse come in annually. Of these, about half a million reports are for *child sexual abuse*. Child abuses, and avoiding the appearance of child abuse, are significant issues that parents, instructors and even the children themselves cannot ignore. The issues apply to anyone associated with children, and they're not limited to diving.

Most societies believe that children's welfare is everyone's responsibility. It's cliché but still true that children are the future. One needs only consider that, untreated, frequently an abused child grows up to be an abusive adult.

Types of Child Abuse

What is child abuse? Child abuse can be loosely defined as harm to children caused by intentional acts or unreasonable failure to act, and it takes several forms: neglect, physical abuse, emotional abuse and sexual abuse. An abused child is one who is harmed or threatened physically, mentally or both.

Neglect

Children are neglected if the persons they depend upon do not provide reasonable food, clothing, shelter, medical care, education, or supervision. This may be inadvertent, such as parents or guardians who are so overwhelmed by or focused on their own needs that they don't recognize or set aside the needs of their children. Lack of supervision is one the most common forms of neglect, caused when children frequently have no one to care for the basic needs (food, hygiene, safety) they're too young to provide for themselves, or when parents or guardians leave children in another's care, and that person fails to provide the supervision.

Physical Abuse

Physical abuse is the *deliberate* injury of a child. Physical abuse typically stems from unreasonable punishment or punishment too harsh for the child. For example, a child acting up at mealtime may be sent to bed without dinner; that's punishment. Unreasonable punishment may be making a child eat garbage, and too harsh punishment may be not allowing the child to eat for two days. Physical abuse may be more direct and brutal, however, such as striking a child hard enough to cause injury.

Sometimes physical abuse occurs when caregivers react to stress, taking out their own anger, insecurity and frustrations on a child. Drinking and drug abuse by caretakers are common contributing factors in physical abuse cases.

Physical abuse injuries can include bruises, broken bones, burns, and abrasions. Children experience minor injuries as normal part of childhood, usually in places such as the shins, knees, and elbows. People who work with children have learned that injuries found in soft-tissue areas on the abdomen or back, or that don't seem to be typical childhood injuries, may be signs of physical abuse.

Psychological Abuse

Psychological abuse is harder to recognize than physical abuse, but may be just as harmful. Psychological abuse damages the child's self-esteem and, in extreme cases, causes developmental problems and speech disorders. A child suffers from emotional abuse when constantly ridiculed, rejected, blamed, or compared unfavorably and disproportionately with brothers, sisters or other children.

Expecting too much from the child in academics, athletics or other achievements is a common, though typically unintentional cause of emotional abuse by teacher, coaches and parents. When children can't live up to these expectations, they feel they are not good enough and it undermines their self-esteem and growth. The adult trying to urge children to excel needs to be cautious not to cross this line.

Psychological abuse can also be more direct. A parent or guardian may

inappropriately withhold affection to manipulate a child or to exert control. The adult may have significant psychological problems that cause this behavior. As with physical abuse, drug abuse and alcohol often contribute to emotional abuse.

Sexual Abuse

When an adult or an older child uses authority or dominance over a child to involve the child in sexual activity, it is child sexual abuse. Sexual abuse includes any activity performed for the sexual satisfaction of the molester, including acts ranging from exposing one's self (exhibitionism), observing another's sex organs or sexual activity including fondling and rape. Because young children have little or no knowledge about sex, the activity does not have to be against the child's consent to qualify as abuse or rape.

The following facts regarding child sexual abuse in the U.S. are sobering:

- Sexual abuse occurs to as many as 25 percent of girls and 14 percent of boys before they reach 18.
- Most sexual abuse in children occurs between the ages of 7 and 13.
- Children are most likely to be molested by someone they know and trust.
- Few sexually abused children tell anyone that they have been abused.
- Some do not even know that what happened was wrong or inappropriate.
- Many fear their parents will get angry and therefore say nothing.



Signs of Abuse

Anyone who works closely with children may notice certain signs that may disclose abuse, but it's not always easy to recognize an abusive situation.

Indications that a child may be abused include:

- Unexplained or suspicious injuries such as bruising, cuts or burns, particularly if on a part of the body not normally prone to such injuries. Irritation of genital or anal areas.
- An injury for which the explanations seems inconsistent.
- Child descriptions of what appear to be an abusive act involving himself.
- Expressions of concern about the child's welfare.
- Unexplained changes in behavior (e.g. becoming withdrawn or displaying sudden outburst of temper).
- Inappropriate sexual awareness.
- Seductive or provocative behavior—acting out adult sexual behavior or using sexual language a young child is unlikely to know.
- Distrust of adults, particularly those with whom a close relationship would normally be expected. Refusal to go to a friend or relative's home for no apparent reason; for example, "I just don't like him anymore."
- Difficulty in making friends.
- Lack of socialization with other children.
- Variations in eating patterns, including overeating or loss of appetite.
- Loss of weight for no apparent reason.
- Increasing dirtiness of child.

This list is not exhaustive, and the presence of one or more signs doesn't prove that abuse is taking place. For example, while it's not typical for a child to get bruised on the back during normal play, that's not to say it never happens. Still, all suspicions and allegations of abuse should be taken seriously, investigated immediately and responded to appropriately.

The Parent's Role in Protecting Children from Abuse

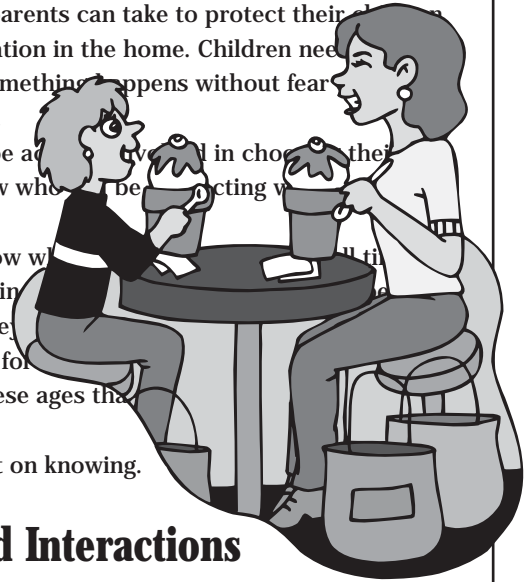
In many cultures parents may feel overwhelmed when it comes to protecting their children from abuse. The truth is that parents can do a lot.

The first step is for parents to discuss abuse with their children. Children need to know what adults may and may not do, where they may or may not be touched and so on. They also need to know what to do if an adult attempts inappropriate behavior in various situations – where to go, who to get help from, and so on. Research has shown that children whose parents talk to them about preventing abuse are more effective at fending off assaults.

Perhaps the most important step parents can take to protect their children from abuse is to have open communication in the home. Children need to know like they can tell their parents when something happens without fear of punishment or reprisal – no matter what happened.

The second step is for parents to be actively involved in choosing and supervising their children's activities. They need to know who they are interacting with and under what situations.

The third step is for parents to know where their children are going. As youngsters grow and become more independent (through various stages, from informal to formal operations stages), they should be asked where they're going to be, for how long, and when they'll be back. Yet it is at precisely these ages that child abuse occurs – making it imperative that parents insist on knowing.



Professionalism in Child Interactions

Worldwide, many youth organizations, such as teachers associations, Scouts and youth sporting organizations have established guidelines and policies to protect children from abuse and to protect its members from the appearance of misconduct. Parents should look for organizations and professionals interacting with their children to have and to follow policies similar to these:

Perhaps the most important step parents can take to protect their children is to have open communication.

Adult Supervision

Youngsters should have adequate supervision. It helps when the staff receives training, when possible, to make them aware and sensitive to potentially abusive situations. In many countries, local authorities or organizations offer programs like these.

Supervision commonly includes a minimum of two adult leaders. Having two adults present helps avoid situations where a child is alone with a nonparent/non-guardian adult. When travel's involved, many organizations involve the parents to ensure both adequate adult supervision and the added protection of parental involvement.

Privacy

An appropriate code of conduct respects child privacy, particularly in situations such





as changing clothes and taking showers. Youth leaders should intrude only to the extent that health and safety require.

Attire

The staff maintains a sharp and modest appearance appropriate for their roles and their culture. The dress is generally role model, though it may be youth oriented and fashionable to a degree to help establish rapport with youngsters (as appropriate in the local culture).

Professional Conduct

Those interacting with youngsters should maintain a professional conduct, which includes avoiding off-color jokes or stories, offensive language and the like. It also includes not permitting such behavior among participating children. Professionalism includes courtesy and attention to participant needs.

Complaint Process

Youth organizations should have an established complaint procedure in place. Parents or guardians and children should know how and to whom to bring a concern. Supervisors should be sensitive to any concerns about abuse and act on them immediately and appropriately – whether misunderstandings or genuine abuse. An effective complaint procedure allows parents to feel like they can speak up without fearing reprisals if their concerns prove to be wrong, and that their concerns are always taken seriously.

The PADI Position on Child Interactions and Abuse

The PADI organization believes the health, safety and welfare of children is paramount and should never be compromised. Children deserve the same respect and treatment regardless of age, culture, disability, gender, language, racial origin and religion, just as adults do.

As part of this position, every PADI Instructor's training includes responsibility toward kids, and other issues related to children in diving. All PADI Dive Centers, Resorts and Instructors are bound to a code of conduct to insure a child's security:

Youth Leader's Commitment

Working with children is both a privilege and a responsibility. Therefore, in all instructional activities involving children, PADI Members:

- look after the child's health, safety and welfare.
- ensure appropriate supervision during all instructional activities.
- whenever possible, meet the child's parents or guardians and share program goals and objectives.
- strive to keep parents or guardians involved and informed through verbal reports and updates as often as possible.
- treat children, parents or guardians with respect regardless of age, race, gender and religious affiliation.
- honor all commitments made to children.
- discuss disciplinary problems with parents or guardians.
- not engage in inappropriate contact with children.
- respect a child's right to privacy and intrude only when health and safety demand.
- whenever possible, ensure two adults are with children at all times.

Parents should know that not only do PADI dive operations enforce this position, but also the PADI organization at large does through the Quality Management procedure. Although it's usually more directly effective and faster to contact the appropriate people at the dive operation, if actions don't seem forthcoming a parent can call PADI Americas or other regional PADI office directly, or download and submit a quality assurance report form from padi.com.

Staying Above Reproach

Child protection issues in any youth program is a concern for instructors and youth leaders as much as for parents. Especially in litigious cultures like the U.S., it is prudent for all youth leaders, instructors and organizations to not only protect children from abuse, but to protect themselves from unfounded accusations relative to child abuse. It's grossly unfair, but true, that with society's growing intolerance with child abuse (a good trend) is a growing trend to make judgments without all the facts (not a good trend). The fact is, a false accusation of child abuse can ruin a business or reputation. For this reason, there are some perfectly reputable, responsible and capable dive professionals who won't work with youngsters out of fear over being falsely accused.

The solution is for all those participating and leading youth to be above

reproach by following established codes of conduct. Setting and following guidelines similar to those listed above establishes credibility for adults supervising youngsters. Guidelines may include:

- Adults should be in the open when working with children and avoid situations where an adult and a child are completely alone.
- If any form of manual support or manipulation (touch) is required, it should be provided openly and with forewarning.
- Where possible, parents should take on the responsibility for their children in changing rooms. If groups must be supervised in changing rooms, the supervisors work in pairs in an open environment with no secret/secluded spaces.
- Where there are mixed gender youth groups away from home, they should be accompanied by mixed gender staff members.
- Rough or physical games involving adult leaders should not be tolerated. Rough or physical games are tolerated among the youngsters only to the degree that they're appropriate to the activity and approved by parents (for example, American football can be a rough, physical game). Sexually provocative games should not be tolerated at any time.
- A single adult should never share a room alone with a child.
- Adults should never touch a child inappropriately.
- Children should not be able use inappropriate language unchallenged.
- Adults should never make sexually suggestive comments to a child, even as a joke.
- Adult leaders should never allow allegations made by a child go unrecorded or not acted upon.
- Adults should never do things of a personal nature for children that the children can do themselves.
- Adults should not take children to the home where they will be alone with the adult.
- Adults should avoid taking children anywhere alone, however briefly.

It may almost seem an adult can't interact at all with children, but this isn't true. In the realm of scuba, nothing in the above list would preclude or even markedly inconvenience learning to dive or diving programs. The idea is to zealously avoid anything that may accidentally cause a child stress or create the impression of child abuse.

Nor is this to say that there's no flexibility. Rather, anything that deviates from the above guidelines needs forethought and other steps to assure appropriateness. For example, it may be necessary for a supervising adult to do things of a personal nature for children, particularly if they are young or physically challenged. These should only be done with the full understanding and consent of the parents and children involved. This is particularly important with any dressing or undressing of outer clothing, where there is a physical contact of lifting or assisting a child to carry out a particular activity, or if the

child needs assistance with anything involving hygiene. Again, involving two adults may help offset concerns at these times.

Likewise, an adult leader should avoid taking a child alone anywhere, but it could conceivably be necessary, supposing something like a medical emergency with only one other adult available to stay with the unaffected children.

If an adult leader accidentally hurts, scares or distresses a child in any manner or misunderstands or misinterprets something, the adult should report the incident as soon as possible to another colleague and make a brief written record of it. Someone should inform parents of the incident, as well as any supervisors who may be part of the organization. These actions reassure parents and ultimately the child that the situation was unintentional and taken seriously. It also alerts those involved to prevent a similar situation in the future.

Schools, sports and other youth groups should have a policy that ensures children are protected and kept safe from abuse. Even small operations can benefit if they develop and follow a policy procedure manual that makes it unambiguous what's expected of its staff members. A procedure manual can help prevent both child abuse and situations that could be mistaken for child abuse. These manuals may include a clear policy for hiring or recruiting those who will work with youngsters, such as reference checking as required or encouraged by local law. The manuals should also outline what a staff member should do if there are concerns about abuse.

Suspected Child Abuse

By following the previous guidelines and local regulations, the typical PADI professional or parent involved in a dive class (or other youth activity) is more likely to be worried about what to do if confronted with a child who may have been abused or neglected, than by worries about being accused of abuse or neglect. The adult may notice certain things that raise concerns, or a child may tell a trusted third party adult about abuse occurring in the home or elsewhere. It is important therefore, that youth leaders know how to respond appropriately. When a child discloses that abuse is occurring, the adult should:

- stay calm and not overreact, so as not to frighten the child.
- assure the child it was right to tell, and that the situation's not the child's fault.
- take the child seriously.
- keep questions to a minimum to ensure a clear understanding of what the child said.
- *not* promise confidentiality, which may not be feasible, but offer reassurance.
- make a full record of what the child said, (or what was heard or seen) as soon as possible.

- report findings to the person in charge of the dive center or directly to the authorities, as appropriate.

If an adult suspects a child may be abused, the first step is to check with local authorities to determine the appropriate course of action. In some locations, there's not only a moral duty to report it, but also a legal obligation. It's not the observing adult's responsibility to prove abuse is occurring, but to report the concern appropriately. When passing on information, authorities typically want:

- the nature of the concern.
- a description of any visible bruising or other injuries.
- the child's story, if any.
- any times, dates or other relevant information.
- a clear distinction between fact, opinion and hearsay.

It's reassuring to realize that within the realm of diving, child abuse has not appeared as a major issue. Nonetheless, precautions are necessary, first because there may be child abusers in almost any large group, and second because ignorant behavior can cause inadvertent abuse, or behaviors mistaken for abuse. It's hoped that this chapter will make parent, instructor and child alert for the former, and vigilant to prevent the latter.

Chapter VII

Activities for Young Divers

Stefan is 12 years old. He's qualified as a PADI Master Seal in the PADI Seal Team youth diving program, and he's been a Junior Open Water Diver for a year now. He loves diving. When an underwater show airs on Discovery Channel or National Geographic, he has the family VCR set to catch it. He subscribes to two diver magazines, which he reads and rereads cover to cover, at least when Dad's not borrowing them. And he bought his own regulator with a computer and alternate air source, thanks to a productive summer mowing lawns and helping paint a neighbor's house. (Stefan actually came up a little short, but pleased with the growth he demonstrated by saving up, Mom covered the difference.)

But there's a problem. At 12, Stefan is three years from qualifying to dive without an adult supervision, and four years from being able to drive. He depends on adults to go diving, so how does Stefan stay connected to diving?

Parents of young divers and the dive professionals who serve them share Stefan's dilemma. It frustrates youngsters, instructors and parents alike to bring children into diving, and then find few avenues to enjoy and pursue it. Fortunately, options exist to keep youngsters involved in diving, and also fortunately, since some aren't inwater activities (but diving related) not all require immediate adult supervision.

There are four primary opportunity types to consider when looking for activities for young divers: organizational, pool, open water and nondiving. Each of these offers differing involvement levels and differing advantages and disadvantages.



Organizational Activities

Organizational activities are not so much a type like pool, open water or non-diving activities, as much as an avenue for involving youngsters with those types. In most cultures, children become involved with different organizations ranging from sport teams to clubs to schools even before they reach eight years. Many of these offer youth involvement in diving, aquatic sports and/or undersea science involvement much as they might enable involvement with ball sports, wilderness exploration or land-based environmental sciences.

Involving youngsters in diving through organizations has several advantages:

- Parents may not need to be present (depends partly on ages and specific activity), which may open youngster participation despite restrictions on their parent's time.
- Many youth organizations have established programs with broader goals that include developing new skills, leadership, values and maturity. Participation means more than simply diving; it's a growing experience.
- Youth organizations may include multiple activities, so that participating children experience different sports, skills and potential interests, not just diving.
- Through community involvement, sponsorships and/or simple economies of scale, youth organizations often provide a good value for the money.
- Reputable organizations adhere to strict conduct codes with respect to adult-child interactions. For many parents, this greatly reduces concerns about with whom they're leaving their youngsters.
- Organizational diving activities typically create a social context that puts

kids of about the same age together. Being involved in a dive program especially for their age set is often a primary social motivator for staying involved in diving.

To be fair, from a diving involvement perspective, there are also some potential drawbacks:

- Youth organizations that involve large numbers of children may present diving too superficially for those youngsters with the most avid passion and interest in diving. For instance, a “try-it” scuba experience for a young teen group probably wouldn’t excite someone who’s been scuba diving since age nine.
- If the main purpose is diving, youth groups that include diving as one of many things won’t qualify. However, there are youth organizations where diving/diving-related activities are the focus.
- Schedules for big organizations tend to be less flexible and have fewer options than activities aimed at small groups and individuals.
- Adults running organizational activities for kids sometimes don’t recognize scuba as an activity with numerous options appropriate for youngsters. One way dive professionals address this is by giving adult leaders, parents and supervisors a chance to try diving, and to explain the scope of reasonable youngster involvement.

PADI Dive Centers and Resorts

A local dive center or resort is the first and most obvious place to look for organized youth diving activities. Dive operations that service diving families and youngsters often have diving activities for children, or arrange to include them in activities for all aged divers.

PADI Seal Team – Dive operations that offer the PADI Seal Team program may offer organized games and activities for kids who’ve completed all the Aquamissions to qualify for PADI Master Seal. Many dive operations have a PADI Seal Team club, which may offer additional Aquamissions, other activities, and various opportunities to practice the dive skills with fellow PADI Seal Team members.

The PADI Seal Team program creates a social structure that encourages diving. Dive centers have noted that PADI Seal Team divers old enough to begin Junior Open Water Diver or Junior Scuba Diver training often want to continue with their PADI Seal Team Aquamissions and involvement in the PADI Seal Team program. Although the program’s aimed at the 8 to 12 age range, it’s not unusual to have PADI Seal Team divers aged 14 and older.

On the other hand, youngsters who go directly into Junior Open Water or Junior Scuba Diver, bypassing PADI Seal Team, tend to resist participating in PADI Seal Team after the fact. It appears that these divers see it as just “diving in a pool” because they’ve not experienced the camaraderie of carrying out

AquaMissions with their own age set. It would seem a useful strategy for parent and instructor to involve youngsters 10 and older in PADI Seal Team before, or at the same time as, Junior Open Water Diver or Junior Scuba Diver training. This may make them more receptive to PADI Seal Team activities later, even after certification as Junior Open Water Diver or Junior Scuba Diver.



Dive clubs for kids – Some dive operations have special children's' programs ranging from general pool aquatics to scuba diving for the older kids. These diving-for-kids clubs or programs may overlap with the operation's adult dive club activities, which is a great way to involve parents while allowing the younger set to have something special just for them.

Scouts and Similar Organizations

Boy and Girl Scouts and similar organizations run a myriad of activities that may include snorkeling, skin diving, scuba diving and other aquatics. In the United Kingdom, for example, the Scout Association includes PADI Seal Team dives, with water skills badges available for PADI Bubblemaker, Junior Open Water Diver and Junior Scuba Diver. The local scout group

arranges for these activities through a participating PADI Dive Center.

The activities available tend to vary by age group as well as location, but youngsters in these programs may be able to earn credit towards various recognition awards through participation in aquatics.

Sea Camps

Sea camps are youth day or overnight camps that specialize in aquatics and/or marine sciences for youngsters. Typically, but not exclusively in coastal areas, sea camps may offer boating safety, swimming, snorkeling, skin diving, scuba diving, sailing and the like as activities, often blended with marine sciences such as underwater archaeology, environmental research, marine zoology, microbiology and similar sciences.

Sea camps may be independent entities, or tie to other organizations, such as scouts, a local aquarium or science center, or a school system. These programs not only offer participation in diving and aquatics, but tie to broader education, fostering learning and application in math, science and physics in a fun, challenging real-world context.

Pool Activities

One of the best things about children is that they know how to have fun. As many parents can tell you, kids who love water only need a swimming pool and their imagination to stay entertained for hours. This opens pool diving, combined with suitable interesting, entertaining activities, as one avenue for keeping young divers in the water. Some of the activities described may appeal to some ages more than others, with a few popular with “kids” well over 21.

Supervision

“Continuous supervision” is the safety rule when it comes to youngsters and water. While a pool provides a fairly controlled environment compared to open water, it doesn’t preclude the need for adult guidance. When scuba’s involved the prudent call is direct underwater supervision by an adult diver, particularly for youngsters under 12. This may be a diving parent, an instructor or other adult diver willing to enable the fun by joining in or at least being nearby in the water to watch.

The degree of supervision varies with the activity, the children’s abilities and the pool. Adult supervision from poolside is generally appropriate for swimming and snorkeling for youngsters who know how to swim and who’ve demonstrated comfort in the water, leaving nonscuba activities as viable options when there’s no adult scuba diver available. Younger children or those less comfortable may need an adult in the water with them while swimming or snorkeling. When in doubt, the best course is to be conservative and cautious.

Regarding sun exposure: Kids can play in the pool for hours, and with the coolness of water, may not notice the sun. Supervising adults should have children wear waterproof sunblock and reapply it every couple of hours, or as advised by the manufacturer. Wet suits also help. Note that t-shirts reduce, but do not eliminate sun exposure, so children should wear sunscreen under t-shirts.

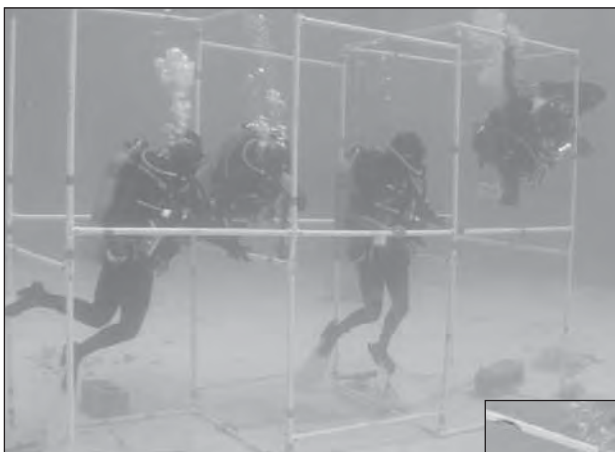
Games

Turn’em loose – For kids in the eight to 10 range, one of the most effective games is (for the adult) the easiest. Just turn them loose to figure out their own games. In a child’s mind, dipping down a metre in the shallow end to grab a coin can be a descent to the bottom of the Mariannas trench in pursuit of Blackbeard’s missing treasure. (Not an easy adventure for an adult to top.)

To adults, “let’s pretend” games seem fun and innocent, but lacking any real value other than entertainment. Psychologists disagree. Child psychologist Piaget once said that a child’s work is his play, meaning that in playing, children learn about reality, how to think and their coming life as adults. In their concrete operations years (seven to 11), symbolic play allows youngsters to imagine experience in a variety of roles and situations based on impromptu

rules that give the play structure. Through this kind of play, children learn to empathize by putting themselves in another's place, and they develop their creativity as they stretch their imaginations.

Youngsters "playing" diver can explore all kinds of fantastic underwater situations, practice fighting a shark or pretending to rescue a buddy held hostage in an enemy submarine. Snorkeling is generally suited to make-believe games, since it allows youngsters to frolic through their imaginative adventures without too much concern about real scuba rules. However, with adult guidance and more structure, a make-believe dive that follows real diving can be educational in both the real and imaginative sense. Essentially, this is what the PADI Seal Team wreck and other AquaMissions are.



Construction games can be quite challenging for both adults and children, and take several dives to complete. The NASA Extreme Environment Mission Operations (NEEMO) group used a complex PVC construction underwater to study assembly dynamics that apply to manned space flight.



Construction games – Simple, but effective, underwater construction tasks make great games for several reasons:

- Many existing toys, puzzles etc. are waterproof (plastic) and require little or no effort to take and use in a pool.
- For variety and a change of scale, one can create large construction games built from PVC tubing and similar materials.
- To increase complexity, a construction game can be made from many parts, and a mix of parts that sink and parts that float.
- Construction games may tie into other learning dive skill development. An example of this is the PADI Seal Team weightlessness AquaMission, in which PADI Seal Team divers may assemble pieces of a PVC "space station" while staying neutrally buoyant, off the bottom like an astronaut/

cosmonaut. This teaches neutral buoyancy while performing a task.

- Construction games build communication and teamwork skills. This is especially true with a larger or more complicated game in which the divers have to follow laminated diagrams underwater.

With some ingenuity, construction games can take several dives to complete, and be quite challenging. In fact, the NASA Extreme Environments Mission Operations (NEEMO) group used large and complex PVC structure construction underwater to study assembly dynamics that apply to manned space flight.

Board games – Kids can play most of the same board games underwater that they do topside, though some modification is often needed. Paper/cardboard items need plastic lamination, and game pieces may need weighting so they don't float off or swish off the board too easily.

It's an interesting phenomenon, but the game that kids tire of above water take on new excitement underwater. Whether it's chess, checkers, Go, Monopoly or something contemporary, the underwater dynamic adds some new dimensions that add to the challenge and develop diving skills. The most immediate of these is communication, since the players can't talk, teaching kids to improvise with hand signals.

Supervising adults can use scuba applications that also enhance dive skills and reinforce dive behaviors, such as a player losing a turn for failing to check the SPG after each move (reinforces monitoring air supply), or a penalty for touching the bottom while playing the game (reinforces buoyancy control).

Board games also work well with snorkeling youngsters. Typically they play in shallow water and take turns holding their breath to descend and move. This develops airway control and breath-hold capacity. To make sure kids come up when they need to, it's best to avoid game incentives for holding the breath as long as possible and instead let free diving ability develop naturally.

Underwater hockey – Underwater hockey can be an intense, demanding and aggressive game played by adults. Today it is an international sport with formal teams, recognized rules and both regional and international championship tournaments. While you're not likely to see it on your local sport report, it has a huge and growing following.

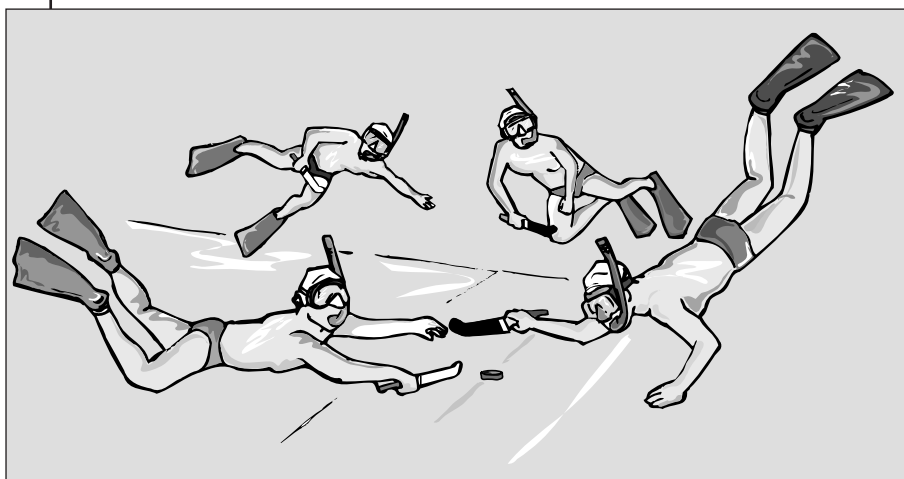
But just as youngsters play American football, football (soccer), rugby and other contact sports in a manner adjusted to their age, so can they play underwater hockey. As a guideline, underwater hockey probably isn't suited to very young children, but for those about eight and up (give or take depending on



physical development and water skill) it's a suitable diversion, provided supervising adults keep appropriate limits and rules in place.

Because players swim, ascend and descend quickly, scuba is generally inappropriate for underwater hockey. As a snorkeling game, it's good exercise and offers a team sport for those interested in athletic competition. As in traditional hockey, players use hockey sticks (short, specialized underwater ones) to push, pass and flick a metal puck through the opponent's goal. Because of water's density, it tends to be more of a push-and-hand-off game than a flick-and-pass game

At the adult level, underwater hockey typically uses the pool length. Teams switch goals at each period so teams defend the deep and shallow goals alternately. You may not use your hands, so maneuvering the puck requires not only coordination, but breath holding skill and timing with other teammates so there's always someone on the bottom controlling the puck. This play level



is probably appropriate for mid to late teenagers, but for younger players, it's more appropriate to use the pool width in the shallow end.

Because it's widely popular, local dive operations and clubs may already have organized underwater hockey games. However, it's also fun to play impromptu, just as kids may simply choose sides and play ball in an empty lot. There are a few basics supervising adults will want to ensure to keep the game fun:

- All players should wear sturdy reef gloves to protect against scrapes on the pool bottom when pushing or passing with the hockey sticks.
- Traditionally divers made their own underwater hockey sticks (see illustration for basic pattern), although today they're available for sale, too. If using homemade sticks, it's important that the sticks have no rough edges that can accidentally cut someone or give splinters during play.



Hockey stick is about 12 inches long, made of wood and painted black or white to distinguish each team. Use this diagram to make your own hockey sticks.

- Divers commonly use a weight as a puck. A coated weight is harder to pass and shoot, but will not mark up the pool bottom as badly. Actual hockey pucks work, too, but float up into the water more (which may or may not add to the fun). Typically, coated weights also mark the goals.
- In the enthusiasm to take control of the puck, players can get a little rough. To keep this under control, an adult referee typically enforces rules such as no grabbing or holding a player (so no one's accidentally held underwater) and only incidental stick contact permitted between players.

For informal games, the rules are pretty basic and common sense. However, one can locate international rules, collegiate rules, tournament rules etc. at a local dive operation, or on the internet.

Treasure hunt – While it's conceivable to have a "treasure hunt" in open water, doing so in a pool may seem difficult or impossible because there are not many places to hide things. Actually, it's not only possible to hide things in a pool, but some may be very difficult to find.

One method is to hide the search object inside other objects. For instance, a hunt can consist of dozens of weighted plastic eggs on the pool bottom, with only a few holding a prize or token. Competing buddy teams have to open and check each egg in their search, closing and replacing those without the prize as they go.

Another version (similar to one of the PADI Seal Team AquaMissions) is to mix the pieces of several different plastic puzzles together and scatter them throughout the pool. The divers have to assemble the one puzzle you designate (underwater) by finding the right pieces. Wrong pieces must remain, or be put back, where participants find them. For variation, two or more buddy teams can assemble different puzzles at the same time from all the mixed pieces. For competition, it can be a race to see who finishes first (but following all scuba safety rules to avoid disqualification). To teach cooperation, each team must assemble its own puzzle, but the goal is for all teams to finish before a certain time. In this way, teams signal each other where they've seen pieces for each other's puzzles.

For older kids (12-14), a real challenge can be hunting down a hard contact lens lost somewhere in the pool. (It may be necessary to cover grates on bottom filter inlets and turn off the filtration system during the game). While this is difficult, it can be done and teaches divers to work as a team, to be very careful to avoid kicking toward the bottom, to use tight search patterns and to observe closely.

Commercial diver – In Mark Twain’s American classic novel *Tom Sawyer*, Tom Sawyer gets the chore of whitewashing a fence. Rather than do it begrudgingly, Tom makes it into a game and soon the other kids want their turn white washing the fence and trade him toys for a chance to do it.

Similarly, vacuuming a pool is a chore – but it becomes a game when youngsters do it underwater. Not only is it more interesting because they see the vacuum doing its job up close, but it’s typically faster and more effective because kids can see more dirt and where it is better than when standing on the pool deck.

The supervising adult introduces the game by going in to clean, with scuba, and invites the youngsters to come along to watch and help. After a few minutes, the adult signals “do you want to try?” and usually they will. Similar chores that can qualify as entertainment include pool bottom sweeping and scrubbing algae.

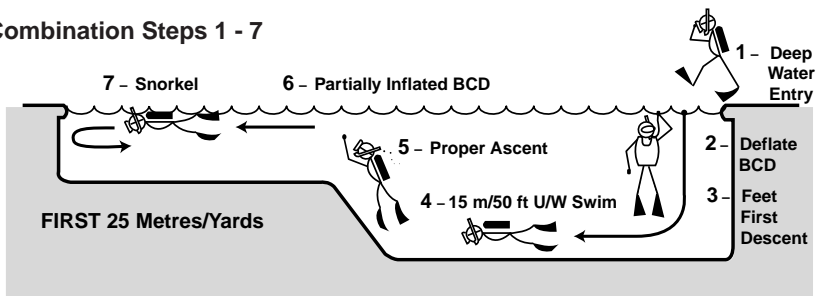
This game generally works well when there are only one or two youngsters, and they should already be experienced and comfortable with scuba at depth (typically the deepest part of the pool). Nonetheless, kids aren’t stupid. It’s a game until the novelty wears off, and then it’s a chore again. Trying to convince them it’s not isn’t going to change how they feel about it. But, as in the case of a privately owned pool, it may be a chore that’s more palatable if the child can do it underwater (under adult supervision).

Skills

Skill circuit – Young divers and adult divers alike benefit from practicing their dive skills, especially if it’s been awhile since they last went diving. Just as adults may want to brush up in a pool once in awhile, so do youngsters.

As when conducting a Scuba Review or a skill assessment, a simple tech-

Skill Combination Steps 1 - 7



nique is to use the skill circuit from the PADI Open Water Diver course. This is appropriate with Junior Open Water and Junior Scuba Divers. For PADI Seal Team, instructors can use a modified circuit based on the skills learned during the Aquamissions.

Boat dive – Many instructors use a simulated boat dive during the Open Water Diver course, and it makes a good way to entertain young divers while reviewing skills. For PADI Seal Team divers, it's a way to introduce boat diving skills such as gearing up in a confined space, using a current line and so on. Relevant details – like having a divemaster, a dive briefing and so on – add to the learning benefit and make the simulation more fun.

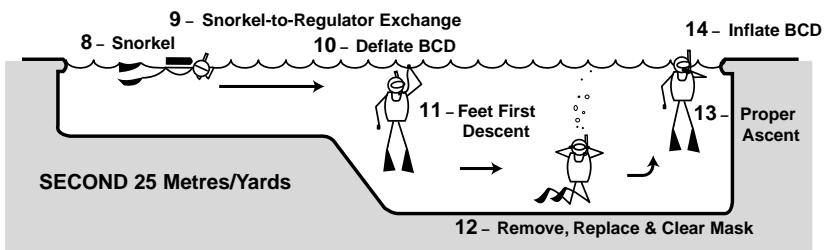
Underwater photography – For the adult underwater photographer, the pool environment's the place to check exposure, focus and confirm equipment function. For the young underwater photographer, the pool is a place to capture pictures of friends enjoying their diving adventures, particularly during the PADI Seal Team experience, hence the AquaMission Snap Shot Specialist. After learning the basics, many youngsters love to keep taking pictures to show their friends at school, etc.



Depending on a child's age and interest, with adult guidance the pool environment is a great place to learn more than snap shooting, however. Youngsters can learn about photography basics as well as underwater photo principles, composition and how to set up and maintain an underwater camera (see the PADI *Underwater Photographer Manual*). Submerged toys can serve as subjects though other divers engaged in other games or skills, or just swimming around make suitable subjects.

For parents, one down side to underwater photography as a pool hobby is

Skill Combination Steps 8 - 14



the cost of film and processing. Fortunately, the digital age provides the answer – a digital camera in an underwater housing. After the dive, the youngster (and/or adult) uploads the photos to a computer and then erases the memory card, ready to go for the next dive. This is an especially suitable cost saver if Mom or Dad already have a digital camera and housing for open water diving.

Although not as common, underwater videography is well suited to the 12-14 age range (maybe even younger in some cases). As with digital imaging, tapes can be reused to keep costs minimal, provided the family already has an underwater video system. Alternatively, it may be possible to rent one.

Night dive – A simple but fun pool exercise is diving in the dark with underwater flashlights. It adds a bit of excitement, and adults get a kick out of it, too. Youngsters can simply swim around playing games, or they can practice a simulated night dive – off a simulated boat to make things even more interesting.

Generally speaking, a good rule of thumb is to be sure there is enough light at the surface to be able to enter/exit the water, even with the underwater torches (flashlights) turned off. This is a good precaution in case a light fails or gets lost.

Snorkeling and SASY

PADI Bubblemakers and Seal Team divers call for direct adult supervision, even in a pool. That's a drawback sometimes, in that there may not be an adult qualified or interested in scuba diving. Snorkeling in shallow water, on the other hand, generally only requires poolside supervision (depending on individual comfort and water skill, of course), making it an option when an adult isn't available for scuba. It's also the activity for the younger-than-eight set.

Besides conventional snorkeling, SASY (Supplied Air Snorkeling for Youth) lets the younger than eight set play at scuba diving while not leaving the surface. It develops scuba familiarity, and kids never seem to tire of it – at least not until they're old enough to scuba for real.



Open Water Activities

Although kids can have hours of fun in a swimming pool, open water is usually more fun and more interesting, just as it is for adults. (Note: Very young children, however, may be intimidated by open water and be more comfortable in

a pool until they mature more and develop their comfort in water.) While 10 is the minimum age for scuba, open water activities include snorkeling, making open water fun for any youngster who enjoys snorkeling, irrespective of age.

Supervision

All water activities call for adult supervision, and open water adds some elements that bear consideration. Scuba divers under 15 require an accompanying adult scuba diver (a parent or dive professional if 10 to 12) for supervision. Adults can supervise snorkeling from the surface, just as they might poolside, but they should be aware that youngsters could be further from assistance should they need it.

For the younger and less skilled snorkelers, an option is to have the child wear a wet suit (no weights) or buoyant snorkeling vest to assure flotation (this also works in the pool, of course). In some environments waves and surf may be an issue, but also part of the fun for youngsters. Water temperature can be an issue, with precautions important to make sure that youngsters stay adequately warm. Again, the rule is to be conservative with respect to children and water.

Another consideration is the adult's safety. Even certified divers as young as 10 have demonstrated air sharing and other foundational rescue skills, but the size difference between a youngster and an adult may be a realistic concern should the adult need major assistance. When this is a realistic concern, the prudent option would be to have two adults as well as youngsters in a dive team.

Safe guards regarding sunburn, as discussed in the last section, are also important.

Continuing Education

Moving on to the next training level is an obvious open water activity for a diver of any age. PADI Seal Team divers age 10 and up may move on to Junior Open Water Diver or Junior Scuba Diver; Junior Scuba Divers complete Junior Open Water Diver, and Junior Open Water Divers (age 12 and up) may begin the PADI Junior Advanced Open Water Diver course. Besides the core courses, courses in specialized activities like underwater photography, peak performance buoyancy and navigation are open to younger divers. Most (but not all) PADI Specialty Diver programs permit 12 year olds with Junior Open Water Diver certification to enroll.

Continuing education courses make suitable family activities if the child's parent or parents haven't completed the next course or a mutually interesting specialty diver course. For the dive operation that caters to families, parents and two siblings interested in say, the Underwater Videographer course, maybe all they need to run the course. Some dive operations will extend special scheduling or other advantages to a family of four or more because it's essentially an instant minimum-students-required class for anything that the operation offers.

For the younger set, kids who've mastered snorkeling in the pool may be ready to take the PADI Skin Diver course in open water. This begins developing dive skills and comfort in the water that will benefit them later as scuba divers.

General Diving Activities

With the rise in family diving and children involved in diving, more and more dive operations consider youngsters in their offerings. Dive resorts may offer youth-oriented sites (limited depth, calm conditions, etc.) either regularly, or by request. Cruise ships and some resorts will give parents time to themselves by taking the kids snorkeling. For Junior Open Water Divers over 12, this option may be arranged for scuba diving through a dive resort or other dive operation.

Even when there are no special arrangements for youngsters, diving with one or more parents isn't out of the question. Regular boat trips or shore access diving may be within limits and in conditions appropriate for younger divers escorted by their parents. However, it remains the supervising adult's responsibility to assure the dive stays within the child's limits and experience. This may be particularly an issue where slopes or walls give ready access to deeper water, for example.

Games

Games are an option in open water just as in the pool environment. There tends to be less emphasis on games, however, because the typical open water environment presents ample challenge and interest to make them unnecessary. But, sometimes a game adds something new to a familiar dive site. There are many possible games, as in a pool environment, but the two most common tend to be treasure hunts and underwater navigation contests.

Treasure hunt – Underwater treasure hunts are more like traditional, topside hunts in that there are usually plenty of places to hide things. Generally, youngsters hunt for objects in exchange for prizes or recognition. Alternatively, the game may be to use a search pattern to locate a single object, with all divers working together toward the effort.

A few considerations apply when having youngsters participate in an open water treasure hunt.

- The environment needs to be one that won't be affected by human contact, which tends to be common and frequent as youngsters peer into holes and crevices. Lakes, quarries and temperate rock reefs work well. In tropical environments, the more resilient locations tend to be shallow, dead coral reef and sand.
- The environment also needs to be reasonably free of hazards. Adult supervisors should check the search area thoroughly to be sure there's

little potential injury or hazard from reaching into holes etc. to grab markers. Nonetheless, gloves for participants are a wise precaution.

- Control may be an issue. If the environment doesn't provide natural boundaries, a rope boundary enforced by adult divers does the job. If youngsters know that there are no markers outside the boundaries, they're not likely to intentionally stray. Depending on the number of divers and the size of the hunt area, it may be necessary to have several adults monitoring different area sections. Another option is to have an adult escort each youngster buddy team.
- Safety rules can tie to the contest so they're less likely to be overlooked as children focus on finding markers. For instance, the contest may disqualify divers who don't stay with their buddies, who surface with too little air or who cross the area boundaries.

Orienteering – Underwater navigation games add interest and challenge while developing diver navigation skills. These games generally involve following a marked course in shallow water, using underwater compass, kick cycles and other navigation methods. The winner may be determined based on time or least number of errors, or there may be no winner with each team competing against itself on successive runs.

With young divers, the simplest supervision for orienteering is to have an adult diver swim with each buddy team. Since compass use and navigation skills may be relatively new to participants, orienteering courses for them are usually smaller and simpler than those for adults. It's common to provide adult guidance using the compass on land to follow a course and make similar turns. See the PADI *Underwater Navigator Manual* for more on underwater navigation.



Orienteering games develop navigation skills while providing a surprisingly challenging competition.

Underwater Cleanups

Underwater cleanups make worthwhile diversions for young divers because they help the environment and provide education about pollution and the environment. Underwater cleanups can range from a few divers getting together to remove trash from a popular dive site to broad internationally coordinated events that track types and amounts of litter to try to determine where it came from and who produced it.

An underwater cleanup sounds like it's little more than swimming along

and picking up garbage, but a successful one involves several things.

- Gloves, slate and mesh bag are standard equipment for cleanups. The glove and bag functions are obvious, and divers use the slate to keep a list of what they find and where.
- To make sure that divers remove as much trash as possible, it's common to assign divers to specific areas and use search patterns that minimize gaps in the cleanup areas (see the PADI *Search and Recovery Manual* for more about search patterns).
- Organizations that sponsor cleanups know that both adults and youngsters benefit through educational outreach tied to the cleanup. Details on who will compile data and use it, how much trash everyone found and how much was found internationally (if part of a global effort) stimulates enthusiasm and interest. It's a lot more rewarding to pick up trash when participants understand they're making a meaningful difference to environmental health and not simply removing an underwater eyesore.



PADI Dive Centers typically have current information about underwater cleanups. The Project AWARE Foundation, not-for-profit foundation involved in underwater cleanups (as well as many other environmental efforts) has information at projectaware.com

Nondiving Diving Activities

Once enthused with diving, some youngsters would dive every day, given the chance. But as any adult knows, that's almost never possible and in fact, most youngsters will not be able to dive as much as they want (which puts them in the same situation as most adult divers).

But just because children can't dive on a given day or weekend doesn't mean they can't do something that relates to diving. And, most of these activities don't require the level of adult supervision as diving does, making them much more feasible logistically. They also allow diving youngsters to involve their nondiving friends.

Seaquariums

Public aquariums interest divers, but they may especially fascinate child divers. There's a certain pride when a child can say, "I've been swimming with one of those." Aquariums also provide a learning context, with signs, tour guides or other media explaining what youngsters see and what it means. This can translate to more meaningful diving experiences later, when the children understand what they're looking at and the significance within the environment.

In addition to parents taking the family, many seaquariums work with local schools so kids can visit as part of school field trips. Some seaquariums even have hands-on activities up to and including snorkeling in special "tide pools."

Cinema and Television

Children of the sea relate to the latest underwater adventure show (assuming it's within their maturity range as viewers, of course) as readily as adults – perhaps more so in that they'll enjoy the diving even if the story isn't that good. Young divers will play and replay their favorite diving shows on DVD or videotape, allowing a connection to diving with minimal adult involvement.

But from a parent or teacher point of view, an interest in diving opens a door to more educational television. At this writing, the majority of diving-related television isn't fiction, but documentary and science. Whether it's the exploration of the Titanic or the natural history of sharks, an interest in diving sometimes gets youngsters tuned to television stations they normally wouldn't watch. It often takes adults noting and directing children to programming involving diving, but if they're interested, they'll watch. These documentaries are also available on videotape and DVD. If they're not at a local PADI Dive Center, parents and teachers may check museums, seaquariums or the web.

Home Aquariums

More than one diver (adult and child) has set up an aquarium as a way to have a small glimpse of diving at home. A home aquarium affords several learning opportunities for young divers, some of which extend well beyond diving.

On a diving level, the home aquarium often resembles an idealized dive site miniature, complete with toy diver and shipwreck. Children can watch an aquarium for extended periods, imagining that they're tiny divers exploring their creation. In doing so, they become familiar with their pet fish, learning about fish behaviors including feeding, aggression, defensiveness, fear and territorialism. Parents can expand this learning by providing books and materials about the fish – where they're found in nature, how big they grow, etc.

Aquariums teach broader lessons much as any pet can. Children learn responsibility in that the fish get sick and die without feeding and care (with an aquarium, youngsters *will* see things die). Younger children with aquariums generally require parental supervision and enforcement (especially after the novelty wears off), whereas children in the midteens and older typically understand enough to keep up with the hobby themselves.

For the parent considering a home aquarium, perhaps the best advice is to not get one that's too small. The larger the aquarium, the more rewarding and easier it is because there's more water and room for error. Most aquarists recommend about a 75 litre/20 gallon size as a good starter size. The investment is only moderately higher than a 40 litre/10 gallon, but usually less trouble and more rewarding for the time and money.

A point for thought, however, is that some – but not all – sources of fish and animals for aquariums have significant negative effect on the environment. This is especially true for salt water aquariums. To responsibly avoid this prob-

lem, aquarists should procure their pets only from authorized and licensed (as required by local law) suppliers.

Multimedia

In many cultures, the older generations grew up with television, but today's youngsters have their computers. Among their diversions are games and edutainment (games with a learning purpose), which includes several diving and marine sciences titles. For the avid young diver, a program like the PADI *Encyclopedia of Recreational Diving Multimedia* can provide hours of learning and fun at the same time.

Similarly, children especially take to learning from the PADI *Open Water Diver Multimedia* CD-ROM, which combines both the PADI *Open Water Diver Manual* and *Open Water Diver Video* into a single medium. Since many children are used to computer media, they may prefer it to a conventional manual, just as many adults prefer regular books like they grew up reading. From an instructional point of view, both contain the same information, so the best choice is that which the student learns from best.

Web Sites and the Internet

As with multimedia, children in those cultures where computers prevail use the world wide web and internet as a means for research and entertainment. Kids interested in diving and the ocean will find the topic virtually inexhaustible, whether they want to search for the latest on whales, updates on underwater hockey scores or an opinion about different regulators.

Parental supervision is unquestionably required, however. Whereas the web sites of dive equipment manufacturers, resorts, dive centers and the like are almost all kid-friendly and professional, other private sites dedicated to diving may not be. Under a guise of being "objective," some such sites provide highly biased, questionable and/or uninformed reports about dive gear, training methods and even individuals in diving. At times, even the facts they report to support their views are wrong. Bulletin board threads and email lists often contain coarse language, and may not only be inaccurate, but insulting and laden with emotion well beyond a reasonable perspective.

To be fair, other sites are reasonable, prohibit insulting and crude language, and debate things in a friendly, unemotional manner presenting both sides of a question. Such sites are careful to report facts as facts accurately, and to present opinions as opinions.

The wise supervising adult checks out different diving web sites a child wants to visit, and blocks access to those that demonstrate an unreasoned bias and permit inappropriate language and personal attacks. Likewise, the adult monitors child email lists and assures that youngsters stay off diving mailing lists with similar messages. It's important that youngsters understand that just because a web site or an email says that the XYZ regulator is "dangerous," or that XYZ courses "are worthless," doesn't make it so. This ties into teaching youngsters to be discerning listeners on a broad scale, such as when viewing television advertising.

Chapter VIII

Case Studies

This chapter describes two case studies of youngsters in scuba diving. One involves a nine-year-old girl and her experiences in the PADI Bubblemaker and PADI Seal Team programs. The other is about a 12 year old boy who's wanted to dive since he was five, and his adventures in the PADI Junior Open Water Diver program.

Both case studies are fictional, but based upon real experiences, so that a single case blends many traits and circumstances into a single description of the individual, the instructor, parents and other influences. Both case studies show how the shared commitment between the instructor, parents and youngsters is critical for success. This partnership was driven by the qualities of clarity, consistency and communication.

The three "Cs" are fundamental in providing learners with the best possible diving experience. Both cases include background theory that was applied, or could have been applied,

mistakes made and lessons learned by all involved. Both cases show how, with proper supervision and guidance, scuba can be not only a viable recreation for youngsters, but an avenue for growth, education and emotional maturity.

The three "Cs" are fundamental in providing learners with the best possible diving experience.

Case One: Madison

Madison is nine years old. She loves to swim, bicycle and play with Nova, the family dog, and recently, she's become enthusiastic about anything involving the ocean and going underwater. She constantly petitions her parents – neither of whom dive – for scuba lessons. Finally, her mother, Sara, relents and visits Silent Realm Explorers, a local dive center, where she learns that Madison isn't old enough for scuba lessons. But, from the manager and lead instructor Rodney, she learns that Madison is old enough for the PADI Bubblemaker and

PADI Seal Team programs. Rodney gives Sara a brief description of both.

Of course, Madison says she's ready for any and all of it, but Sara isn't so sure. Not being a diver, she's not sure what the risks are. Rodney handles this by showing Sara and Madison the *Youth Diving: Responsibility and Risk* video. This satisfies Sara, much to Madison's relief.

“One of the rules is that if you don't understand something I ask you to do, you have to tell me that you don't understand. I promise I won't ever get mad, but you have to promise that you'll tell me you don't understand something, or if something's bothering you, okay?”

The next question is whether Madison should try the Bubblemaker experience, or go right into the PADI Seal Team. She's old enough to do either.

“Let me ask you a few questions,” Rodney suggests. He basically follows the questions in Chapter I of this book, “Madison, why do you want to do this?”

“Uh, “ she replies shyly, “Because I think it will be really cool to go underwater and see stuff. Like on TV.”

“Okay,” nods Rodney, now confident that this is Madison's idea – no one's pushing her. “Do you know how to swim? Do you like the water?”

“She's like a fish,” Sara says, “You'll have more trouble getting her out of the pool than into it.” Madison nods her agreement.

“Good.” He addresses the next one directly to Sara. “Madison will have to pay attention to my briefings and follow some basic safety rules. Does she pay attention well and do what she's told?”

“Yes, she's pretty good about that. I mean, she doesn't *always* do what I ask, but when it comes to things like not riding her bike in the street, she follows the rules.”

“I see. Madison, in diving, if you don't follow the rules, you know you can get hurt, right? So it's important that you do what I say when we go to the pool. That's the first thing you have to learn if you want to be a diver – follow the rules. Got it?” he asks with a smile.

“Sure, I got it,” says Madison.

“One of the rules is that if you don’t understand something I ask you to do, you have to tell me that you don’t understand. I promise I won’t ever get mad, but you have to promise that you’ll tell me you don’t understand something, or if something’s bothering you, okay?”

“Okay. I’m afraid of sharks.”

This makes Rodney laugh, but it also assures him that Madison is willing to speak up about her fears and concerns. “Don’t worry, we’ll take all the sharks out of the pool,” he teases.

“I didn’t mean I think you have sharks *in* the pool!” Madison protests, but she knows she’s being kidded and there’s clearly a rapport building with Rodney.

He directs the last question at Sara. “How would you rate Madison’s self control under stress? If she had a problem, would she react instinctively or would she do what she was taught to do?”

“Hmmm, I’d say somewhere in between. But she’s really good in the water. It really depends on the situation, I think.”

From this conversation, Rodney’s confident that Madison’s ready for a Bubblemaker experience, which he didn’t really doubt to begin with. Although AquaMission One of the PADI Seal Team program allows the instructor to observe youngsters’ reactions in water shallow enough to stand up, he decides to take advantage of the dive center schedule to get Madison diving right away, and get an idea of how well she does in the water.

“Tell you what,” says Rodney, “There’s a PADI Seal Team AquaMission One next Wednesday, but why wait to give it a try? We can take you on a Bubblemaker scuba experience tonight, Madison. How does that sound?”

“Great! Mom, can I?”

“You can do it with her,” Rodney suggests.

“Me?” Sara responds. “No, I’m working on my master’s degree. Class tonight. But maybe your father can bring you.”

A quick telephone call confirms that Madison’s stepfather (and legal guardian), Porter, will bring Madison back that evening, and he’ll also be doing the Bubblemaker experience.

“Great,” says Rodney, telling Madison, “You’ll both need a bathing suit and towel. I’ve got everything else.” He tells Sara the time to arrive, which allows for paperwork etc. prior to going to the pool.

The Experience

Porter and Madison arrive right on time, where they meet Doug and his sons Rick and Warren, eight and 10 respectively,



who are also there for the Bubblemaker experience. Doug is already a certified diver and has come to watch his boys make their first scuba dive.

Rodney begins by handing out the paperwork, which includes the medical statements. Reviewing them, Rodney finds that Porter has checked that he has a history of asthma.

“I’ve not had an attack in years. Does this still mean I can’t dive?” Porter asks when Rodney discusses it with him.

“Well, not necessarily. That’s something you and your doctor need to determine. But scuba diving with asthma can have potentially serious risks, so you need to have your physician’s approval first.”

“No way that’s going to happen in the next half hour,” says Porter, clearly not happy to find this out at the eleventh hour.

“I’m really sorry. But even though you can’t scuba dive, there’s no reason you can’t get in with a mask and snorkel and watch. We’re going to be in the shallow end the whole time anyway, so you’ll be right there with Madison.”

Although not entirely happy with the circumstances, Porter accedes so as not to disappoint Madison. Rodney puts on *Scuba: Experience Your First Breath* for Madison, Rick and Warren. At Rodney’s request Porter and Doug watch as well.

At the pool, everyone gets changed in the locker rooms. Since Madison’s the only girl, Rodney makes sure she has the women’s room to herself, with two female assistants (working with an instructor teaching on the other side of the pool) at hand if Madison needs assistance for any reason.



Rodney starts with the three kids sitting on the pool edge with their fathers on either side. First he passes out masks and fins; with the parents helping – especially Doug – everyone tries them on and find ones that fit. Rodney helps Porter with a snorkel as well; Doug has his own mask, fins and snorkel.

At this point, Rodney has everyone set the gear aside and pulls out the Discover Scuba Diving Flip Chart. He reviews what

everyone saw in the video, and uses set up scuba gear as a training aid, and to introduce it.

Rodney briefs interactively. As part of the regulator clearing briefing, he says, “So, what did we say the most important rule in scuba diving is, Madison?”

“Never hold your breath?”

“Right! So when we’re practicing regulator clearing, why do we blow bubbles? Rick?”

“Cause you tell us to!”

“Well, that’s true, and a good reason, Rick,” Rodney laughs, “but why do

you think I tell you to do that? Got an idea, Warren?”

“You blow bubbles so you don’t hold your breath,” says Warren.

“Right, and if you forget, I’ll do this.” Rodney reaches out and gently brushes Warren’s cheek with his finger. “That’s just so you remember to follow the rules, so don’t bite me, okay?” Everyone giggles.

The rest of the briefing continues similarly. Rodney keeps it as brief as possible, but spends time on important safety items and topics Madison, Rick and Warren didn’t pick up fully from the video, while moving more quickly through topics they clearly understand.

After concluding the briefing, Rodney becomes more serious and lays down some ground rules for safety, such as no running on the pool deck, paying attention and doing what they’re told. “I don’t want to sound mean, but these are very important rules so you stay safe,”

Rodney keeps it as brief as possible, but spends time on important safety items and topics Madison, Rick and Warren didn’t pick up fully from the video, while moving more quickly through topics they clearly understand.

Rodney emphasizes. He makes sure Doug and Porter hear him, too, so they can support him. “I’ll remind you once. If I have to mention it again, then you’re out of the pool and no more scuba for the day. Does everyone understand?”

All heads nod somberly.

“Great!” he says, lightening up again, “Everyone ready for some fun?”

Next, everyone gets into the shallow end of the pool and puts on scuba units, assisted by Rodney, Doug and Porter. Knowing their approximate sizes, Rodney had preselected three proper-sized BCDs with a lot of adjustability latitude (though he has some smaller and larger ones standing by in case he’d misjudged). With their gear on and checked, he moves into the skill briefing, beginning with breathing underwater. He quickly describes what they’re going to be doing, getting them to recall what they’ve learned.

“. . . and if you have a problem, just wave to me and stand up. One last thing before we go underwater. What is the most important rule in scuba diving?”

“Never hold your breath,” they say together.

“What?” Rodney says, humorously feigning hard of hearing, “I didn’t quite hear that.”

“NEVER HOLD YOUR BREATH!” they shout gleefully.

“You got it. Everyone, regulators in your mouths, and let’s go.” With that Rodney assists them in descending and getting settled on the bottom. No one has any problems with this.

Rodney covers the regulator clearing skill similarly. During practice, Rick and Warren perform the skill without any real difficulties, though Rick forgets to blow bubbles when the mouthpiece is out. Rodney corrects him by touching

his cheek, as reviewed in the skill briefing. To this point, Madison has had no difficulties, but with this skill she has trouble holding her breath long enough to replace the second stage on her first attempt. She stands abruptly out of the water, and pushes off her mask, coughing a bit.

"You okay?" Rodney asks.

"Yeah," she says weakly, still coughing a bit.

"You did the first parts great," Rodney says, "and you remembered to blow bubbles."

"What did I do wrong?"

"You blew out too fast and ran out of breath. Just blow out slowly, like you're humming. You ready to try again?"

"I don't know. I guess so."

"Good. If you need to, just stand up again. But don't just jump up. In scuba diving, we go up slow."

"What if I can't do it?"

"Whaddaya mean can't do it?" Rodney says in a reassuring, teasing tone, "You almost did it that time. *Of course* you can do it. You just need to practice."

Madison tries again, but still doesn't quite get it, jumping up abruptly. Although she's coughs and appears stressed, Rodney simply says, "That was much better. You've almost got it. Ready to try again?"

"Not yet."

"Okay. Rest a second. I'll be right back." Rodney goes down to Rick and Warren, who are right there but still just underwater. He signals "Okay?" and they signal "Okay!" right back. He returns to Madison.

"Ready? Bet you get it this try."

This time, guided by Rodney she does acceptably, and on the next she accomplishes the skill well. Rodney gives her the High Five Way To Go, and then brings everyone up. There're now ready to swim around and have some fun.

"That's great, Madison. See? You just needed to practice." He redirects his remarks to the group. "Okay, now you get to swim around and have some fun. I've got some underwater toys I'll show you how to use, and you can play with those. Who's a good photographer?"

No one volunteers.

"Bet you are, Madison." He gives her a submersible snapshot camera. "Take some pictures and then let someone else take some. Just wind it and push the button." Rodney finishes with a review of the safety rules and signals, and then turns serious a moment.

"Now, we have to stay in the shallow end. See that line at the top of the slope? That's as far as you can go. If you cross that line, no more scuba diving for the rest of the day. It's that important." He pauses. "So, if you cross that line, Rick, what happens?"

"You're in trouble."

"Right. And then what."

"You have to get out of the pool."

“Right. Now, let’s go have some fun.

The rest of the Bubblemaker experience is fun, with Porter and Doug joining in a game of underwater catch using a toy windup torpedo, and the kids taking turns with the camera. Rodney takes a shot of everyone, just to be sure everyone’s picture gets taken. There are no significant problems, though Rodney notices that Madison tends to jump up abruptly when water gets in her mask. Rodney urges her to just take her time and come up slowly (mask clearing isn’t required in the Bubblemaker experience), but the behavior continues.

Afterward, Rodney meets with Porter privately while Madison changes out of her wet clothes.

“She did pretty well,” Rodney says, “and I think she’s ready for the PADI Seal Team program starting next week. There’s another girl about her age and I think they’ll do well together.” Porter nods in agreement, and Rodney continues, “The only thing that she needs to work on is that she still just bolts to the surface when she gets water in her mask. But the Seal Team program handles that. The first three AquaMission are in the shallow end, and we won’t take her into water deeper than she can stand until she demonstrates that she’s not going to try for the surface every time her mask drizzles.”

Having changed, Madison joins Rodney and her father.

“Madison, you did really well,” Rodney says. “I was just telling your Dad that you’re ready for the first PADI Seal Team AquaMission next week. How does that sound to you?”

“Cool!”

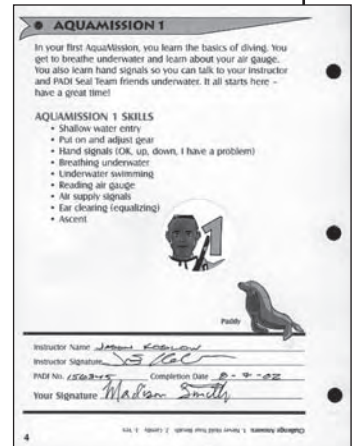
“Good,” Rodney hands her the PADI Seal Team AquaMission Logbook, open to AquaMission One. “Between now and then, you need to read about AquaMission One and answer the questions. Your Mom and Dad can help if you need help.” Rodney makes sure that Porter’s catching this.

“We’ll make sure she has it done,” Porter confirms.

“Thanks. And if you can come in early, or stop by sometime between now and then, we need to take care of the registration and paperwork.”

“No problem. Madison and either her mother or I will probably drop by this weekend. Doug was saying that Madison might be more comfortable with her own mask and fins, so maybe we can take care of that, too.”

Before Porter and Madison leave, Rodney gives them a copy of the medical form for Porter’s physician so that if allowable, Porter will be able to scuba dive at the next opportunity.



PADI Seal Team

On the night of AquaMission One, Madison and Sara arrive on time. Earlier, the previous Saturday, they'd visited Silent Realm Dive Center and filled out the remaining paperwork, handled registration fees and so forth. Madison has her new mask, fins and snorkel with her in a mesh gear bag.



"Here's my husband's signed medical," Sara says when she greets Rodney. "His doctor says that since it was just childhood asthma, he's not concerned about it. Porter thought you might put this on file for when he can do the Discover Scuba thing."

"No problem. It's good for a year, assuming there's no change in his medical condition," says Rodney, who then asks Madison for the AquaMission One Challenge from her AquaMission Logbook, which he checks over.

"Looks good. We'll go over it with the whole team after the dive. Did you have any trouble with this?" Rodney asks her.

"No. Mom helped me some."

"Well, I helped her get around to *doing* it," Sara teases, "But she picked it up once she sat down to it."

As with the Bubblemaker experience, Rodney has everything set up in advance for the PADI Seal Team. Madison meets her five other teammates, including Rick and Warren, and another girl about her age, Sunni. Rodney assigns Madison and Sunni to be buddies. Rodney also has a PADI Assistant

Instructor, Donna, helping out.

Rodney conducts AquaMission One as outlined in the *PADI Instructor Manual*. They establish ground rules like staying in the shallow end, review safety rules and then

He and Donna do and demonstrate everything exactly as the team is supposed to do it.

cover AquaMission One skills individually. He and Donna do and demonstrate *everything* exactly as the team is supposed to do it. Everyone has fun and Madison and Sunni become fast friends. Madison handles the new skills easily, though Rodney notes that Madison still tends to pop up impulsively when she gets water in her mask, instead of just coming up slowly to drain it. He reminds her again to come up slowly.

After the AquaMission, Rodney talks with Sara privately about Madison's performance.

"She's doing really well. She had no problem with any of the skills we covered tonight," he explains, "But water in her mask is still an issue for her. I'm thinking if she had some time just to swim around in her mask, fins and snorkel, she'd become more comfortable. Would it be possible to take Madison to a pool to do that before our next PADI Seal Team session?"

Sara says this is no problem, since Porter normally takes Madison and

her little brother to the pool on weekend mornings anyway while she studies. Having finished drying and changing, Madison joins Rodney and her Mom.

“I was just telling your Mom how good you are at watching your air gauge and signaling before you get low,” Rodney tells her. “Do you have your Seal Team Logbook?” Rodney puts the AquaMission One completion sticker in it for her. “You’re off to a good start, Madison. Your Mom tells me you get to go to the swimming pool Saturday morning. Why not take your mask, fins and snorkel when you go? You and Sunni can get ahead of the boys! Don’t forget to do the Challenge for AquaMission Two.”

Porter brings Madison to AquaMission Two. A quick conversation confirms that Madison spent about two hours swimming around in her snorkeling gear, and that she protested when they had to leave! As in the prior session, Rodney reviews the Challenge in her AquaMission Logbook. He meets similarly with other parents and PADI Seal Team participants, then along with Donna gathers the team in the shallow end of the pool. He conducts AquaMission Two as outlined, and everyone does well and has a great time. Rodney notices that Madison still pops up with water in her mask, but not nearly so quickly, nor so often. He also notices that she doesn’t react to a minor bit of water in the mask like she did before. Nonetheless, he reminds her to take her time when she needs to come up, which, he notes, she now does in all other circumstances aside from having more water in her mask than she’s comfortable with.

After the session, Rodney reports Madison’s improved performance to Porter, suggesting that more pool snorkeling, if possible, would be helpful. Porter doesn’t see any problem with this.

During AquaMission Three, the team learns to clear a partially flooded mask. Rodney has Donna demonstrate the skill, then has the team do it, starting with Sunni, who is strong in the water. Sunni clears the mask effortlessly, first try. After signaling “good job,” Rodney has her repeat it. Rodney goes

to Madison next and directs her to let water seep into her mask, but stops her at the point that he’s seen her swim around unconcerned. Then he signals for her to blow the water out. Tentatively at first, Madison does so, and succeeds. Rodney gives her the High-Five-Great-Job and then signals for her to repeat. This time, he has her let water in until the mask is half full, right below her eyes. Madison appears somewhat stressed, but clears the mask successfully.



During the underwater games portion of the AquaMission, Rodney notes as Madison pauses, clears water from her mask and then resumes the game. The issue of bolting to the surface is over. After the session, he reports this to Sara, and reinforces Madison's good job by praising her in front of her Mom.

Several weeks later, Madison, Sunni, Rick, Warren and the rest of the team complete their tenth AquaMission, wreck dive, qualifying as PADI Master Seal Team members. Bringing in some extra staff for the event, Rodney invites Doug to bring his scuba equipment and watch underwater, and arranges a Discover Scuba experience for other parents who want to do the same. Porter eagerly joins in. A staff member with an underwater video system tapes the dive, as well as the closing ceremony during which Rodney presents all the new PADI Master Seal Team members with their Master Seal certificates.

Case Analysis

This example is somewhat idealized to show how parents, children and instructor can interact to maximize child enjoyment, learning and reward. In this case, the instructor and dive center both have significant interest and experience in working with children. Madison is a willing and cooperative learner,

with two parents who team up with and support Rodney fully.

Instructor strategy and role –

From working with Bubblemaker/PADI Seal Team aged youngsters, Rodney knows that he can't teach the same way he does with older children and adults (formal operations level). His strategy is to rely on short, interactive discussions followed by doing. He also knows better than to patronize kids, but to also stay at their level. Interacting

as a coach, Rodney boosts youngsters' confidence by watching for and working with their strengths, enabling them by helping them offset weaknesses.

Rodney is also keenly aware that he has both a role model function and an adult supervisory function. He positions himself with the kids like a good schoolteacher – someone who is an approachable friend, but who deserves respect and cannot be treated like a playground chum.

Specifics – Going through the scenario, Rodney uses particular techniques and procedures to carry through Madison's training.

- He begins by including Madison in the discussions about her participation. This establishes that Madison's opinion is as important to him as Sara's. It also lets him confirm that Madison is there because she wants to be (she's not being pushed into it).



- By telling Sara what will be expected of Madison in the initial conversation, he establishes the instructor-parent connection in the process. He immediately sets the stage that he's relying on parental participation.
- Although Madison would have been fine going straight into the PADI Seal Team, Rodney goes for the first available opportunity to get her diving. He knows that several days seems longer to a nine year old.
- One thing Rodney could have done better was send the medical forms for Madison and Porter home with Sara. That way, there may have been time for Porter to get his doctor's approval. However, Rodney handles the issue well by still involving Porter in Madison's experience.
- To assure professional conduct, Rodney assigns two female assistants to be present with Madison in the locker room if called. This wasn't an issue for Rick and Warren, since their father was with them.
- Although they saw the video, Rodney reviews the flip chart. He knows that youngsters have a shorter attention span, so this provides a chance to review and assess what they saw, and do so in a question-answer discussion manner that holds attention and fosters learning.
- Trying to build confidence, Rodney avoids outright saying "wrong" to an incorrect answer to his questions, but instead builds on the merits of it to lead to the answer he's looking for.
- Rodney isn't afraid to use humor and tease in a good-natured way to establish rapport and relieve tension. He's cautious to be sure that any teasing is light and clearly understood as humor.
- To establish control, especially with regard to safety and rules, Rodney becomes clearly serious. He is *specific* about what the rules are and what the consequences are for not following them. He does so parents can hear so they will support and stand behind him. It wasn't shown in the case study, but Rodney follows through with the consequences when necessary, without anger and without exception.
- Silent Realm Dive Center shows its familiarity with kids by maintaining youth-sized BCDs, wet suits and other gear.
- Rodney uses his humor and teasing as a way of reinforcing learning, as in playing hard of hearing so they repeat and yell the most important rule of scuba diving.

By telling Sara what will be expected of Madison in the initial conversation, Rodney establishes the instructor-parent connection in the process. He immediately sets the stage that he's relying on parental participation.

- When Madison has trouble with the skill, Rodney reinforces what she did right. He doesn't tell her what she did wrong until she asks, which indicates she still doesn't know. He uses his humor to bolster her confidence.
- On the second unsuccessful trial, Rodney follows good coaching and does not reinforce what she did right the first time, but only the improvement. While paying attention to her state of mind, he doesn't overly address her coughing and stress, because doing so highlights it and undermines self-confidence. If she believes he doesn't see it as significant, then she may decide it's not either.

When successful, Rodney rewards the success and rewards the process of overcoming difficulty to attain the success.

- When Madison says she's not ready to go back down, Rodney doesn't want to disregard it, but neither does he want to give her time to dwell on it. He goes underwater for a second primarily to let her see that he's not ignoring the request, but comes back quickly

and gets her going before her mind magnifies her fears.

- When successful, Rodney rewards the success *and* rewards the process of overcoming difficulty to attain the success.
- Rodney discusses the one concern he has about Madison (bolting with water in her mask) privately with her parents so they can be aware of her progress. He also makes a point of praising her in front of her parent.
- In discussing the assignments for the PADI Seal Team, Rodney does so in a manner that enlists the parents, both so they know what's expected of Madison, and so they can assist if necessary.
- During the PADI Seal Team AquaMission One, Rodney buddies Madison and Sunni primarily because they're at an age where most youngsters still interact primarily with their own gender. It really has nothing to do with skills or abilities.
- Rodney and Donna are aware that kids in this age group learn by watching, especially when they're not sure based on what they were told. They're careful to role model everything exactly as they expect the PADI Seal Team participants to do it.
- Following AquaMission One, Rodney continues to follow up with Madison's parents. In this case, he gets their help with a strategy that will increase Madison's comfort with water in her mask. He also reinforces specific behaviors by praising those behaviors in front of Sara.
- After AquaMission Two, Rodney reports on Madison's progress and enlists her parents in continuing the strategy, which seems to be benefiting her.

- Knowing that mask clearing may be an issue for Madison, Rodney applies visual learning, good coaching and role modeling to help her succeed. First, he has Donna demonstrate the skill. As a female role model, Madison may identify with this performance more closely than Rodney's. Second, knowing that Sunni will have no problem, he has her do the skill first. This is because he wants to begin the practice with a success for everyone – especially Madison – to see. He chose Sunni because she's also female and Madison's friend, again hoping it will help Madison identify with success. He has Sunni clear her mask *twice* because he already knows he's going to have Madison do it twice, and he doesn't want to raise Madison's stress by making her feel like she's being singled out. Based on observations, he knows about how much water Madison can have in her mask without concern. He has her clear that much first so she proves to herself she can do it, before stretching her comfort zone on the second trial.
- He reports the success to Madison's parents and reinforces through praise as before.
- For the final PADI Seal Team AquaMission, Rodney makes an event of it that involves the parents and encourages the youngsters to take pride in their accomplishments. This is not only fun for everyone (and good marketing), but a good move to maximize the return on the time and money invested by parents and children. Because the kids can take pride in what they've learned and accomplished, they're more likely to stay involved with diving.

For the final PADI Seal Team AquaMission, Rodney makes an event of it that involves the parents and encourages the youngsters to take pride in their accomplishments.

Case Two: Harris

Harris has just turned 12 years old, and for his birthday, he asked for scuba lessons. He's been fascinated by diving since five, first interested in it from watching cartoons. As he grew older, he always preferred toys, comics, television and youth fiction about diving, submarines and undersea exploration. His parents, Matt and Marsha, have bought him masks, fins and snorkels – actually several sets as he's grown – and he's adept at snorkeling and free diving, though with no real open water experience. He's been asking for scuba lessons for two years, but the local dive center has said that due to class-size logistics and a primarily adult local market, 12 is the youngest it accepts anyone into its

regular PADI Junior Open Water Diver courses. Matt and Marsha haven't been willing to pay what private instruction would have cost, but now that Harris is old enough, they enroll him in the regularly scheduled Junior Open Water Diver/Open Water Diver course. It meets weekly on Wednesday nights for five weeks, followed by a weekend at a nearby quarry for open water training.

When Matt and Marsha enroll Harris, Tony, the dive center's instructor helps them. He explains the required video, reading and knowledge review assignments, and he makes sure they take home the medical form to complete and have signed by Harris' physician if necessary. Tony explains that students need to provide their own mask, fins, snorkel and weight belt for the course. Harris shows what he has, and Tony verifies they're fine; Harris only needs a weight belt, which they will set him up with.

Tony next describes the PADI course materials and presents the PADI Open Water Diver Crew Pak with video and the PADI *Open Water Diver Manual*. Harris, however, spends a lot of time on the internet, including padi.com and asks for the Crew Pak with the *Open Water Diver Multimedia* CD-ROM.

"I'll have to order that in," says Tony, "But that's not a problem because you don't have to have the first section done until our second class meeting. The first meeting's class is an orientation, so we have more time in the pool. I'll have the CD-ROM in plenty of time."

"What if it's late or something? Won't Harris get behind?" Matt asks.

"No problem. If it's not here by the first meeting, I'll lend him a manual and video to use until it shows up."

Tony has Harris fill out the student record file, and gives him the rest of the Crew Pak to take home. In addition, he asks Harris and either parent to read and sign the store's learning agreement. Among other things, the agreement tells them that the student is responsible for completing each section's reading, video and knowledge review prior to the class meeting and pool dive for that section. If this isn't done, the policy is to shift the student to join the next regularly scheduled class with an available spot.

"Harris, you know that sometimes we have to get on you about doing your homework for school. This isn't going to be a problem, is it?" asks Marsha.

"Mom, it's summer and school's out. I've got *plenty* of time to get it done," Harris insists.

"Uh huh. Tony, could I look at one of the manuals a second? Just so we can see what Harris has to do?"

Marsha and Matt flip through the PADI *Open Water Diver Manual* and determine that it's a little higher level than what Harris normally reads, but not beyond his ability.

The first meeting night, Matt drops off Harris at the dive center about 20 minutes before class. Tony greets him and introduces him to his classmates: Edgar, Sofia, Espie, Kurt and Nathan. The youngest of these is Kurt, who's 19, and the oldest is Sofia, who's in her 40s. The *Open Water Diver Multimedia* CD-ROM is in, which Tony gives to Harris.

During the classroom session, Tony opens by collecting final paperwork and introducing Dawn, another of the store's PADI Open Water Instructors who may be teaching some of the course. He has all students give a little personal background about their interest in diving and why they're taking the course. He then explains they'll be going to the pool shortly, but to get a jump on the knowledge development for the next meeting, they're going to look at gear set up first.

He brings out a BCD, cylinder and regulator and demonstrates how to set them up. Then, based on what the students said about their diving interests, he brings in other examples of each from the sales floor to show how different features match differing interests and needs. Tony divides the group into buddy teams, pairing Harris with Kurt, and they all take turns setting up scuba units.

At the pool, Tony has scuba equipment set up and ready to go. The smallest BCD available is just a bit big on Harris, even cinched all the way down, but manageable.

"I'll see if I can get something smaller next time," Tony promises.

Tony takes the class through the confined water dive skills in shallow water, briefing each and demonstrating it followed by student practice. For Harris, these are a breeze; some like clearing a partially flooded mask, he already knows, having taught himself while snorkeling. His waterskills are demonstrably stronger than several of the adults. After the confined water dive, Tony reminds everyone to complete watching the video, reading the text and completing the knowledge reviews for both Sections One and Two by the next meeting. Harris' father picks up Harris and finds him excited and thrilled with his first experience scuba diving.

During the intervening week, Harris works on Sections One and Two of the *Open Water Diver Multimedia*. Enthused by his excitement in diving, he breezes through both sections, watching the video more than reading each subsection, and answering some, but skips some of the exercises interspersed throughout – especially the pressure, volume, density relationships and the effects of increasing pressure.

Early in the afternoon on the following Wednesday, Marsha asks if he's done his scuba "homework."

"Yeah, I finished it a couple of days ago," Harris says. Marsha asks to see it.

"Whoa, hold on here," she says looking over the knowledge reviews, "What's with these unanswered questions."

He has all students give a little personal background about their interest in diving and why they're taking the course. He then explains they'll be going to the pool shortly, but to get a jump on the knowledge development for the next meeting, they're going to look at gear set up first.

"I couldn't figure out the answers."

"It looks like you didn't even try. Why didn't you ask me for help?"

"I was going to ask Tony for help."

"You can ask Tony if you and I can't figure it out. You're supposed to have most of this down before you go to class. Go turn on your computer and figure them out now, while we have time."

"But Mom"

"But what? If you want to take this course, you have to do what you agreed to do. So go do it."

About 30 minutes later, Harris comes back to Marsha with the knowledge reviews completed. He has everything done, except the question on pressure/volume/density relationships.

"They weren't that hard," Harris admits sheepishly, "but I'm having trouble with this one."

"Let's take a look." Marsha joins him in reviewing the material on the CD-ROM and helping him understand the concepts.

"Oh, I've got it now," Harris exclaims with a burst of insight. "I was thinking the volume went down by half with every atmosphere. But all you do is put a one over the number of atmospheres and that gives you the fraction of what you had at the surface."

That evening, Harris does well on the first two course quizzes, but he can't answer a couple of Tony's questions during the review and elaboration until Tony repeats them. After this, Tony directs more questions at Harris, which he answers correctly and without repetition.

In the pool, as before Harris masters most of the water skills effortlessly, and he continues to shine as a "natural" diver. However, although Harris correctly demonstrates the five point descent, on subsequent descents he just starts down. After this happens twice, Tony calls him aside for a moment at the surface.

"Harris, what are the five steps for a proper descent?"

"Uh, check where you are, check with your buddy, put the regulator in

your mouth and then...something...and then you let the out of your BCD and go down."

"Check the time is the one you forgot. I'm asking because you're not doing the five points before you descend."

"But we already did that. You want me to do that every time now?"

"Yep."

"But we already did that. You want me to do that every time now?"

"Yep."

"In a pool?"

"Yeah. You're practicing what you'll do on a real dive, right?"

"In a pool?"

"Yeah. You're practicing what you'll do on a real dive, right? So you do

everything here that you'd do diving in open water."

"Okay. What was the one I forgot again?"

"Time. Remember 'otters dive' – O - T - R - S - Dive. O for orient yourself, T for time check, R for regulator in mouth, S for signal buddy and then dive. Got it?"

"Got it."

"Good. Let's drop down and rejoin Dawn and the rest of the group."

Harris does the five point descent with Tony, and they join the group on the bottom together. Later on in the session, the group practices the five point ascent. Tony notes that Harris does it correctly and subsequently makes all ascents using the five points.

When they begin the giant stride entry, Harris runs into his first real problem with a skill. He's not big for his age and finds the cylinder he's wearing, while not difficult in the water, difficult to carry while standing dry. Kurt catches him as he almost loses his balance.

"Hmmm, looks like you can use a smaller cylinder," observes Dawn, who's assisting with the divers standing on the pool deck, while Tony waits for them floating at the surface in the water.

"I don't *want* a smaller one. I can do it with *this* one," Harris insists. Somewhat staggering, he waddles to the pool side and makes a proper, if not elegant, giant stride entry.

"Not bad," Tony says. "But when we get out for your open water dives, you'll have farther to go. So you'll do the controlled seated entry off a dock, like we did before. Don't sweat it; when you get bigger, it'll be easy to stand with your tank on."

After the confined water dive, Harris goes to the locker room to dry off and change. When he emerges, he finds Marsha and Tony talking together.

"Hi, Mom. I thought Dad was picking me up."

"Oh, I told him I'd do it. Tony says you aced the quizzes tonight."

"Yeah," Harris says, trying but failing to conceal his pride.

About a week later, the day before dive class, Marsha checks Harris' knowledge reviews. He hasn't even started them.

"I was going to do them tomorrow."

"I'm working tomorrow and want to see your knowledge reviews before you go."

"Mom, you're treating me like a baby. I'm going skateboarding with the guys this afternoon. I'll do it."

"Last week you said you were done and you weren't. When I see you get these done without me having to ask, then I'll stop asking. So go do them now, then you can go skateboarding."

"Then it will be too late."

"Well, the more time you sit here arguing with me, the later you'll finish. Tony made it clear that you're going to have these done before you show up. So you can either go do the knowledge reviews, or you can quit the scuba

class.”

“Oh, all right,” relents Harris. He trudges sullenly to his computer.

About an hour later, he brings the knowledge reviews to Marsha. They appear complete and accurate.

“See, that wasn’t so tough,” she says. “And your friends haven’t even shown up to go skateboarding yet.”

The next evening, Harris does well on the third quiz, but again Tony notes his attention wandering. Tony brings him back by asking questions and stimulating discussions.

At the pool, Harris predictably has no difficulties with most of the water-skills. The tired diver tow at the surface presents a challenge, and Harris gets out of breath trying to tow Nathan, who is in his mid30s, as fast as Nathan towed him. He accomplishes the tow, but he’s very exhausted.

“Good job, everyone,” Tony says when everyone’s successfully completed the exercise. “Some of you got a bit winded doing that. What if your buddy had leg cramps and needed to be towed even farther? You’d never make it. But all you need to do is slow down. No one says you have to hurry – take your time so you don’t get tired, too. When we do this skill in open water, I don’t care how long you take – I just care that you cover the distance, okay?” Six heads nod.

Prior to the fourth scuba course meeting, Harris has his Knowledge Review completely filled out the day before. It took him longer than usual because he had to learn to use the dive tables, but while it took longer, he didn’t find it particularly difficult. Marsha checks it over and shows it to Matt. They both agree that it’s done properly, and they note two other things. Harris didn’t need prompting this time, and that he’s reading and learning from adult-level material without much help.

During the confined water dive, Harris buddies with Espie. Tony isn’t there, but as an Open Water Scuba Instructor, Dawn is completely qualified to conduct the session. Since the fourth confined water dive doesn’t have a lot of scuba skills, Dawn’s practice is to cover the skills, then give the students a lot of free time to practice previously learned skills and gain underwater experience and comfort.

Shortly into the free time, Dawn notices Harris playing with a small bottle. Harris inverts it, adds a little air, playing with its buoyancy and making it hover. Espie practices mask removal and replacement; in removing it, she accidentally drops it behind her head. As luck has it, it snags on her tank valve so that when she turns around to locate it, it’s not there. She gropes for a couple of minutes and then waves to Harris for help. Occupied with his game, Harris doesn’t see her.

Dawn gives Harris a minute to catch on, but he’s too occupied. Swimming up to him, she snatches the bottle out of midwater and signals “Look at your buddy.” At first Harris looks startled, not recognizing what to do. Dawn shrugs as if to say, “well, don’t just sit there,” so Harris joins Espie, who finally gets

the message across that she's missing her mask. Since Harris didn't see it hang up behind her, they both look for a few moments before Harris catches sight of it and returns it to her.

Once they have their masks on, Dawn signals an assistant instructor to keep an eye on the group and then takes the pair to the surface.

"Hey, remember Tony's discussion about the buddy system? You're supposed to be practicing that, too. Espie, you should be sure you're buddy's with you before you start doing something, and Harris, you should be right there. No one should have had to tell you Espie needed a hand."

"I was just playing," offers Harris lamely, "Sorry."

"Having fun's fine – diving's supposed to be fun. But it has to be safe first, and that means not getting so distracted that you can't help your buddy. Remember, buddies need to agree on what you're doing, and then do it together. You've got some responsibility to help each other and watch out for each other."

"We understand. What do want us to do now?" asks Espie.

"Do what you were doing – but as a buddy team," then softening a bit, Dawn adds, "The thing with the neutrally buoyant bottle looked pretty cool, Harris. Maybe we can share it with the class."

For the rest of the class, Harris and Espie stick together like glue, even while the whole class watches him make the bottle hover.

Harris completes the final classes and confined water sessions without any learning issues. He remains attentive during classroom discussions and earns a 94 on the final examination. He does well during the confined water dive. At the close of the final session, Tony asks to meet with Matt or Marsha to discuss the coming open water training weekend.

Matt meets with Tony when he picks up Harris. Tony fills him in on the location, times and schedule, what Harris needs to bring, equipment considerations, costs and so on, and provides Matt with a pre-printed sheet summarizing everything. Matt agrees says that he'll come along to watch for the day, if that's okay. It's perfectly fine with Tony, of course.

"So Harris is ready for this?"

Matt confirms.

Tony glances at Harris and smiles wryly, "He's ready. I wish everyone were as ready as he is. One mark of a good diver is a diver who knows the safety rules and follows them. Harris has been doing that in the pool, so I think he's going to do great at the quarry."



This time, Harris doesn't attempt to hide his pride.

At the quarry the following weekend, Harris arrives a little bit late, but Matt apologizes to Tony that he made a wrong turn. Harris is otherwise fully prepared with everything on the list as Tony specified.

Tony pairs Harris with Kurt; they've become friends and made a good buddy pair in the pool. Tony expected they'll do well together as a team on the first dive. During the dive, Harris proves a role-model student, sticking closely to his buddy and watching Tony. As Tony knew, he has no difficulties with most of the skills. The surface compass swim proves a challenge momentarily, primarily due to unfamiliarity with reading the compass. Once he understands what it's telling him, however, Harris executes the swim proficiently.

Between dives, Tony gets a moment to talk privately with Matt. Then they invite Harris over.

"I was just telling your Dad that I'd like to see you in our PADI Junior Advanced Open Water Diver course next weekend. Would you be interested in that?"

"Would I? Wow! Can I Dad?"

"It's okay with me, but you better let Tony tell you what you'll need to do."

"First, you've got to finish this weekend successfully, but I'm not worried about that. Just keep doing what you're supposed to. Next weekend, you'll be making five dives – a navigation dive, a night dive, a scooter dive, a photography dive and a peak performance buoyancy dive," Tony shows them the *Adventures in Diving Manual*, "You need to read the section on each of these, watch the video and complete the knowledge reviews by next weekend."

"I'm on summer break. That's plenty of time," Harris says.

"Not if you wait until Friday to start," Matt teases him. "If you want to do this, you have to agree to start Monday and do at least one section every day."

"Sure, I'll do that," says Harris, excited, "Do you have this book and video..."

"...on CD-ROM?" finishes Tony. "Figuring you'd ask, I've got one in my truck."

Harris finishes his PADI Junior Open Water Diver training enthusiastically,

doing everything not only well, but the best he can. In his excitement, he even talks Kurt into signing up for the Advanced Open Water Diver course on the coming weekend.

In many markets this is a somewhat self fulfilling perspective, in that a place that doesn't cater to youngsters will not have much of a youth market.

Case Analysis

This scenario involves a dive operation that doesn't specifically cater

to the youth/family market. Reasons for doing this range from local market conditions, to the logistics of reduced allowable in-water ratios when training

Junior Open Water Divers and Scuba Divers younger than 12. In many markets this is a somewhat self fulfilling perspective, in that a place that doesn't cater to youngsters will not have much of a youth market. Admittedly, though, some markets really are primarily young singles markets (such as around some military bases).

Nonetheless, kids 12 and up (and in the beginning of formal operations stage) usually integrate well into an adult oriented class. Coupling the PADI Open Water Diver course and its support materials with independent study allows flexibility in study habits, paces and styles, making it feasible for people with differing learning speeds to progress in the same class. The instructor must be reasonably accommodating (but that's normally a given, considering adults need reasonable accommodation, too), and parents need to keep reasonable tabs on their children's performance and independent study habits.

Instructor strategy and role – Tony's strategy is to teach an adult Open Water Diver course, accommodating Junior Open Water Diver students in primarily the same ways he accommodates the differing learning challenges adults have – by adapting to their needs and helping them overcome learning and mastery impediments. He counts on his students to be reasonably self-directed, with parental guidance as necessary for youngsters.

The other is that if a youngster fails to do what's required and must reschedule or catch up, the parents need to know why.

Tony is an experienced instructor who intuitively uses coaching techniques as part of his teaching. He has worked with youngsters before, but doesn't really consider himself a "kid person." However, because he's open and sincere with everyone, he has little difficulty building rapport with and understanding adolescents. This is one reason why he has a parent sign the learning agreement. The other is that if a youngster fails to do what's required and must reschedule or catch up, the parents (who generally pay for the course) need to know why.

Specifics – These points, techniques and ideas come out of Harris' scenario:

- During enrollment, Tony makes sure Matt and Marsha understand what Harris must do by having them sign the learning agreement. This makes it easier for them to understand if he has to hold Harris accountable. It also makes it easier for them to check on Harris' work if they feel it's necessary.
- Sending the medical form home, well ahead of class, is good customer service. It affords time to get a physician's approval, if necessary.
- Requiring a mask, fins, snorkel and weight belt isn't unusual in entry-level scuba programs, and it benefits the students by allowing them to dive in equipment that most influences comfort (the mask particularly) selected

particularly for them.

- Since the dive center considers its market an “older” market, it’s not surprising they primarily stock the PADI *Open Water Diver Manual and Video* as conventional book and tape, rather than as a multimedia CD-ROM. However, younger people are more receptive to computer learning, and much of the adult market is, too. The multimedia version has all the content of both the book and the video.
- It’s not clear whether Tony fails to pick up on the clue from Marsha that Harris doesn’t always do homework willingly, or whether based on the conversation he believes that Marsha and Matt will be keeping an eye on it. Tony doesn’t really do anything to check Harris’ reading level, but Marsha and Matt do.
- The in store gear demonstration is an effective way to teach gear setup on an orientation night. It allows students to see and hear about the variety available for differing needs, plus it’s very hands on, visual and doing-oriented, making it an excellent technique for teaching youngsters.
- Scuba class equipment that’s too big for kids can be common; it’s something a dive operation needs to pay attention to, though youngsters can be surprising in their ability to comfortably learn and dive in gear that’s a little too big.
- Kids Harris’ age who like the water, who are comfortable in mask, fins and snorkel and who are excited about diving generally have few problems

in the water. They commonly excel and perform better than some of the adults.

- Among adolescents, study problems are more typical than water problems. In this case, Marsha knows Harris and follows up to be sure he’s

Among adolescents, study problems are more typical than water problems.

doing the work, and finds he has difficulties. Parental involvement makes independent study especially effective when it closes gaps in study habit discipline. Marsha wisely enforces doing the work, which reinforces its value, the need for self discipline and the responsibility of doing what you’ve agreed to do. She’s holding Harris to an adult conduct standard, which helps him mature.

- Studying gas volume/density/pressure relationships is an example of how scuba certification applies abstract concept thinking. By mastering this concept, Harris exercises his skill in mentally manipulating cause and effect. This is a formal operations characteristic.
- Tony, knowing that Harris did well on the quizzes, correctly determined that Harris didn’t answer his class briefing questions because he’s not paying attention. This isn’t unusual for youngsters who’ve learned something well. By directing more questions to him, Tony holds his attention better.

- Harris and his failure to use the five point descent point up an interesting aspect of his developmental stage. He's old enough to have his own judgment, which coincides with beginning to question adults. Through cause-and-effect reasoning (formal operations), he realizes that it's ridiculous to need a five point descent in a swimming pool. However, his analysis shows his inexperience; he fails to account for the cause-and-effect of practice in a pool developing habits necessary for open water dives. Tony drives this point home. The mnemonic is a good idea; such memory devices help adults and youngsters alike, and often those learned as children stay with a person through life.
- Although he doesn't see himself as a "kid person," Tony responds to the cylinder size issue very well. Harris is at the age when he begins to develop an adult self image. He's conscious of peer pressure, and he doesn't want to be seen as less of a diver by having to wear a smaller cylinder than they. Since there's no compelling safety or learning issue with the cylinder he's wearing, Tony accommodates Harris without intruding on his self image.

- As a responsible parent, Marsha follows up to see how Harris did. She wants to confirm that her insistence and assistance met the mark. On the one hand, Tony could have already established a procedure for communicating Harris's progress with Marsha and Matt. That would have been appropriate. However, Tony treats Harris as an adult and expects adults to take care of these things themselves;

He's at the age where he begins to separate his identify from his parents; therefore, he doesn't want it to be a big deal that his mother is proud.

- given Harris' age and the responsibilities of a Junior Open Water Diver, this isn't unreasonable either. Marsha's intervention is logical in that she knows that any knowledge development problems Harris has would most likely be a study discipline problem, rather than a learning ability problem.
- Harris' attempt at humility ties into the cylinder size issue. He's at the age where he begins to separate his identify from his parents; therefore, he doesn't want it to be a big deal that his mother is proud.
- As most parents know, a single correction is seldom a complete fix when handling adolescents. They're at an age where they begin to test limits, including disciplinary ones. Marsha responds as a good parent – refusing to yield and making it clear that Harris will live up to his commitments. The issue isn't negotiable or flexible.
- The attention issue isn't over, but Tony has this figured out with Harris. He keeps Harris' attention by keeping him stimulated through discussions and questions. At 12, Harris is just transitioning to formal operations and adult thinking. He's still very much an experiential learner — by doing;

learning by hearing and thinking abstractly are newer skills.

- When correcting Harris on the tired diver tow, Tony uses the technique of not singling out a particular person, and instead giving the critique to the entire group. This allows everyone to learn from the mistake, and it avoids threatening self esteem.
- Following an experience like diving, it's not unusual to see growth in study habits and other adult behaviors. Harris loves diving, he's doing well with it and he's enthusiastic. He shows growth in both self discipline and in reading level, both propelled by his love for diving.
- Dawn uses a different correction technique from Tony's, but like Tony, also treats Harris as an adult while recognizing that he's not. She takes the hard line to correct the buddy system behavior, but she wants to lighten things up to maintain rapport without compromising the discipline, her authority or the lesson. To do this, she changes to another, related topic (the bottle) to restore rapport.
- Being held to adult standards, Harris rises to them. This is commonly seen with youngsters in adult activities – when they realize that to “play” with adults that have to behave as adults, they commonly grow to fill

Tony quite intentionally equates “following the rules” with “mark of a good diver” in complimenting Harris. Harris takes pride in this, which creates an incentive to follow the rules to the best of his ability.

adult shoes – at least with respect to that activity.

- Tony's preprinted sheet about the open water dives is a great customer service for all student divers, but especially useful for youngsters because it communicates to parents well. Meeting with Matt about the specifics for the weekend is a good move on Tony's part; it assures the parent knows everything that must be taken care of. This may be especially important when the parents provide the financial support for the program, and need to know what must be paid for.
- Tony quite intentionally equates “following the rules” with “mark of a good diver” in complimenting Harris. Harris takes pride in this, which creates an incentive to follow the rules to the best of his ability.
- Tony knows that personally inviting someone to an Advanced Open Water Diver course both compliments that person and tends to sell the program. However, he wisely realizes that he can set Matt up to be the bad guy if there's some reason Harris can't participate, and it would dampen Harris' enthusiasm. Instead, Tony tells Matt what a gifted diver Harris is

proving to be, and gets his approval first. When he asks Harris about the course, Matt is ready to support it.

After Word

The book has touched on key areas related to teaching children to dive: developmental theory, medical perspectives, practical discussions, professional conduct and case studies. These are all relevant, useful and practical to those involved with children in diving. But there's a critical element that parents and educators need to assure never gets lost amid the pragmatic: the magic.

Diving embraces discovery, wonder and adventure – the very magic of child – making it a special gift parents and instructors can give children who want to touch the sea. And in so doing, there's an immeasurable, rare gift for the parents and instructors.

For awhile, they see through the eyes of a child again.

Appendix

Reverences, Bibliography and Suggested Readings	193
Index	197

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www.newhorizons.org

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Index

A

- “abuse, signs of”, 140
- activities to prepare for diving, 18
- affective education. 97
- allergies, 81
- alternatives to diving, 18
- aquariums, 163
- attention span of children, 89, 131

B

- “Bandura, Albert”, 32, 40, 56
- biological-maturation approach, 34, 56, 64
- “Bridges, Jeff”, 10
- “Bridges, Lloyd”, 10
- British Journal of Psychology, 76
- “Bronfenbrenner, Urie”, 32, 55, 56
- Bubblemaker, 16, 80, 84, 107, 167

C

- child abuse, 137, 145
- child’s roles, 13

- cinema and television, 162
- “Clarke, Arthur C.”, 10
- CMAS, 10, 84
- coaching, 101, 175
- “cognitive development, phases of”, 43
- cognitive-development approach, 40, 56
- collaborative learning, 50
- conceptual approaches to the study of human development, 56
- concrete operations phase, 44, 95, 96, 108, 113, 122
- Confédération Mondial de Activités Subaquatiques - see CMAS
- contextualist approach, 55, 56
- continuing education, 159
- continuity-discontinuity, 32
- Cousteau Society, 25
- “Cousteau, Jacques”, 10
- “Cousteau, Jean-Michel”, 10, 24
- “Cousteau, Philippe”, 10, 24
- critical periods, 33
- cultural-historical approach, 49

D

- danger awareness, 76
- “dependence, on adults”, 132
- developmental task approach, 45, 56
- developmental tasks of normal adolescence, 48
- Discover Snorkeling, 104
- discussions, 99
- “Donald, Ken”, 9

E

- epigenetic theory, 37
- equalization, 80, 108
- equipment, 129
- “Erikson, Erik”, 32, 35, 36, 56
- events of instruction, 87

F

- formal operations phase, 44, 90, 97, 113, 116, 122, 185
- “Freud, Sigmund”, 32, 35, 37, 56

G

gaining attention, 87
games, 127, 151, 160
“Gardner, Howard”, 61
general genetic law of cultural development, 50
general safety rules, 136
“Gesell, Arnold”, 32, 34, 56
goals, 121, 124

H

“Haldane, J.B.S.”, 9
“Haldane, John Scott”, 9
“Havighurst, Robert”, 32, 35, 45, 56
humor, 126

I

imitative learning, 50
independent study, 132
information-processing approach, 54, 56
“injuries, reported per participant”, 23
instructor’s roles, 13
internalized participation, 95
internet, 164
interpersonal intelligence, 65, 66

J

Junior Advanced Open Water Diver, 159
Junior Open Water Diver, 17, 84, 93, 100, 110, 112, 149, 159, 177
Junior Scuba Diver, 17, 149, 159

K

“Kirby Morgan Dive Systems, Inc.”, 25

L

learning guidance, 87, 91
learning principles, 86
learning styles, 61, 100
learning triad, 27, 31

learning-behavioral approach, 40, 56

linguistic intelligence, 63

logical-mathematical intelligence, 62

M

“material, presentation of”, 87, 90

“Mischel, Walter”, 32, 40, 56

“Morgan, Bev”, 25

“Morgan, Connie Lyn”, 25

multimedia, 164

multiple intelligence theory — see theory of multiple intelligences

musical intelligence, 64

N

National Association for the Education of Children, 69

naturalistic intelligence, 65

nature-nuture, 32

neglect, 138

nondiving activities related to diving, 162

O

“objectives, informing learner of”, 87

observational learning, 40

Ocean Futures, 25

organizational activities, 148

P

PADI Seal Team, 16, 81, 93, 107, 149, 171

PADI’s approach to children in diving, 102

“paperwork, required for youth in PADI programs”, 103

parent’s roles, 13

“partnership, child-parent-instructor”, 28

“pathophysiological differences, children compared to adults”, 81

performance assessment, 87, 93, 135

performance feedback, 87, 91

“performance, asking for the”, 87, 91

physical abuse, 138

“physical differences, children compared to adults”, 78, 129

“physiological differences, children compared to adults”, 80

“Piaget, Jean”, 32, 35, 36, 40, 53, 56, 94, 123
 preoperational phase, 43, 89, 96, 97, 99, 104
 prerequisite learning, 87, 90, 95
 “processes of adaptation, accommodation and assimilation”, 42
 “professionalism, in child interactions”, 141
 psychoanalytic approach, 35, 56
 psychological abuse, 138
 “psychological difference, children compared to adults”, 82
 psychosexual stages of development, 35
 psychosocial approach, 36, 56

Q

qualitative method, 41

R

“rapport, developing”, 20
 recognition, 128
 Recreational Scuba Training Council, 10
 “retention, enhancing”, 87, 93
 reversibility, 44
 “Riker, Budd”, 21
 risks, 20, 135
 role modeling, 98
 RSTC, 10

S

SASY, 15, 106, 158
 scaffolding, 51
 “Schmidt, Richard”, 32, 54, 56
 “scouts, boy and girl”, 150
 sea camps, 150
 seaquariums, 162
 self responsibility, 125
 sensorimotor phase, 43
 sexual abuse, 139
 “Shreeves, Karl”, 26
 skill circuit, 156
 Skin Diver course, 107, 159
 snorkeling, 15, 158

APPENDIX

social learning theory, 40
social-historical approach, 49
socio-cultural approach, 49, 56
“sports, classification by contact”, 22
structured learning, 50
student participation, 94
Supplied Air Snorkeling for Youth - see SASY

T

theory of multiple intelligences, 61
“transfer, enhancing”, 87
“transfer, enhancing”, 93

U

underwater cleanups, 161
underwater hockey, 153
underwater navigation, 161
underwater photography, 157

V

“value, of objectives”, 89
visual/spacial intelligence, 63
“Vygotsky, Lev Semyonovich”, 32, 35, 49, 56

W

“Watson, John”, 32, 40, 56
widely-held expectations, 67, 70

Y

Youth Diving: Responsibility and Risk video, 20, 110, 114, 125, 130
youth leader’s commitment, 143
zone of proximal development, 50