Adapting to the Underwater World

Above water, you see, hear and move about in a familiar and comfortable manner that seems "normal" because you're used to it. But underwater, you're in a new world where seeing, hearing and staying warm differ from in air. You probably noticed this during your first confined water dive (or you will).

Water is about 800 times denser than air, which is why light, sound and heat act differently in water. Let's look more specifically at some of these differences so you can begin adapting to them during your dives.

Seeing and Hearing Underwater

You reach for your buddy and . . . you miss. What happened? Underwater things sometimes look closer than they really are.

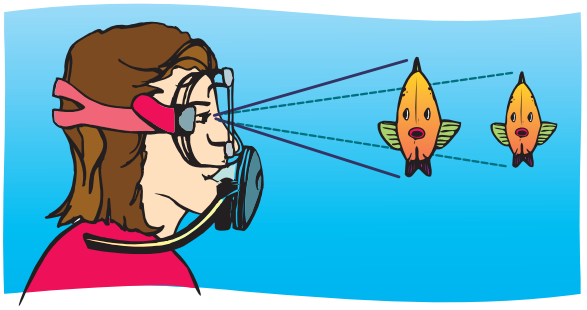
As you learned in Section One, the human eye needs air to focus, which your mask provides. However, even though your eyes can focus, you still have some optical effects because light travels at different speeds in water and in air. When light changes speed going from water to air (like when it enters your mask), it shifts its course slightly (this is called *refraction)* which magnifies every-

MAIN Objectives

Underline/highlight the answers to these questions as you read:

1. **How does looking at something underwater affect its apparent size?**
2. **How does water affect light intensity and color?**
3. **How does being underwater affect hearing?**

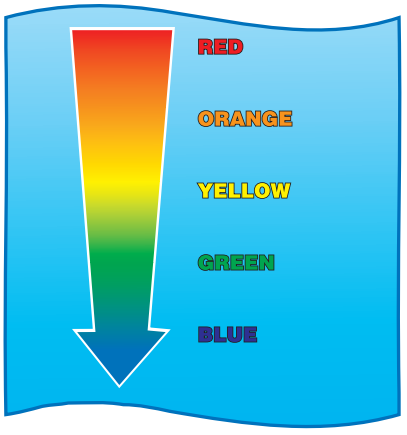
thing about 33 percent. This makes things look larger and/or closer, depending on your perspective.



What big eyes you have.
When light changes speed going from water to air, it shifts its course slightly, magnifying everything about 33 percent. This makes things look larger and/or closer, depending on your perspective.

Water affects light in other ways. As you descend, you've probably noticed there's less of it. This is because light reflects off the water's surface, scatters off particles in the water, and the water absorbs it directly. However, water doesn't absorb light uniformly.

White light, such as sunlight, consists of all colors mixed together. As white light travels through water, the water absorbs colors one by one: first red, followed by orange and yellow. Since each color makes up part of the total light, less light remains as depth increases and the water absorbs each color. This makes deeper water darker and less colorful. Red, orange or yellow objects often appear brownish, gray or black. To see more vivid colors on deeper dives, you may want to take an underwater light, which provides unfiltered light and reveals color.



Rainbow.
As white light travels through water, the water absorbs colors one by one: first red, followed by orange and yellow, with green and blue last.

Water also affects sound. You'll quickly realize that the underwater world is not a silent world. You'll hear many new and interesting sounds, like snapping shrimp, grunting fish, and boat engines passing in the distance. Sound travels farther in water than in air, so you'll be able to hear things at distances that you can't in air.

Sound also travels about four times faster in water than in air. This makes it difficult to tell where a sound comes from. Underwater, sound usually seems to come from directly overhead, like listening to a mono recording through headphones.

Unless you use special electronic communications gear, you won't be talking much underwater. You can attract attention vocally, and a few divers can even make themselves under-

standable yelling through a regulator, but you'll usually limit underwater communication by sound to attracting your buddy's attention. The easiest way to do this is to rap on your tank with your dive knife or something else solid. Your buddy will hear the rapping, but may have to look around to figure out where the sound comes from.

Heat Loss Underwater

Being cold takes the fun out of diving, and beyond enjoyment, there's the potential for a serious health threat if you get too cold. In air, you lose body heat as it transfers from the skin into the air, and as perspiration cools the skin through evaporation. Water conducts heat about 20 times faster than air does, meaning that for a given temperature, water cools you much faster. In air, 30°C/86°F is warm, but in water it becomes chilly after a while.

Left unchecked, body heat loss can lead to *hypothermia,* a serious condition in which your body cools so much it can't function normally. To avoid this, you use insulation (wet suits and dry suits), especially when diving in water colder than about 24°C/75°F. To stay comfortable, you may want to wear a wet suit in even warmer water.

Exposure suits don't really "keep" you warm, but slow down heat loss enough that you stay comfortable throughout the dive. This means that even with an exposure suit, you will chill if you stay in the water long enough. Continuous, uncontrollable shivering is your body's warning signal that heat loss has reached a critical level.

Quick Quiz — Self Assessment 1

1. Underwater, what you look at will be:
- ☐ a. reduced 25%.
- ☐ b. reduced 33%.
- ☐ c. magnified 25%.
- ☐ d. magnified 33%.

2. Water absorbs light, causing (check all that apply):
- ☐ a. it to get darker as you go deeper.
- ☐ b. colors to become more vivid with depth.
- ☐ c. colors to become less vivid with depth.
- ☐ d. None of the above.

3. Underwater, sounds:
- ☐ a. don't travel very far.
- ☐ b. are easy to locate.
- ☐ c. often seem to come from directly overhead.

How'd you do?
1. d. 2. a, c. 3. c.

Main Objectives

Underline/highlight the answers to these questions as you read:

4. **How does the rate of body heat loss in water compare to the rate of body heat loss in air?**

5. **What should you do if you begin to shiver continuously underwater?**

Quick Quiz

Self Assessment 2

1. Water absorbs heat about _____ times faster than air.
   - ☐ a. 10
   - ☐ b. 15
   - ☐ c. 20
   - ☐ d. 30

2. Beginning to shiver continuously means
   - ☐ a. you should swim faster to warm up.
   - ☐ b. you should immediately end the dive, dry off and seek warmth.

How'd you do?
1. c. 2. b.

Main Objectives

Underline/highlight the answer to this question as you read:

6. How should you move underwater to compensate for the increased resistance of water?

When you begin to shiver continuously, get out of the water immediately, dry off and seek warmth.

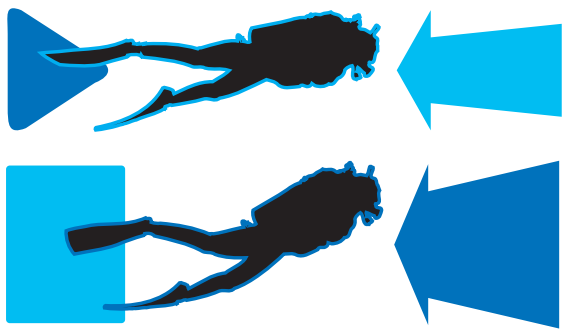
An important point is that modern wet suits and dry suits do an impressive job — even in fairly cool water, you don't have to get cold. If you feel cold while diving, you're probably not wearing enough insulation. Ask your PADI Professional for advice when buying your exposure suit.

Motion in Water

One of the interesting things about diving is that it's exciting and relaxing at the same time. You want to avoid getting out of breath, and there's little reason for hurrying anyway.

Water's density makes it resist movement. If you've ever tried to run in waist-deep water, you've experienced this. So, you conserve energy by moving slowly and steadily. Avoid rapid or jerky movements that waste energy and cause you to use air faster. Take your time and you'll stay under longer and go farther.

Your profile in the water relates to this, too. If you streamline yourself by swimming level and keeping your hoses and equipment tucked in close, you save



Sleek = easy.

Streamlining by swimming level and keeping your hoses and equipment tucked in close saves energy by reducing drag. Wearing more weight than you need pulls your hips down and requires extra air in your BCD, which creates more drag. Your PADI Professional can help with suggestions on streamlining your equipment.

Quick Quiz

Self Assessment 3

1. The best way to move underwater is:

☐ a. as rapidly as possible.
☐ b. slowly and smoothly, relaxed.

How'd you do?
1. b.

Summary Points

In this subsection on Adapting to the Underwater World, you learned:

- ▲ Objects are magnified 33 percent when you see them underwater, making them look closer and/or larger.
- ▲ Water absorbs light and colors.
- ▲ It's hard to tell sound direction underwater.
- ▲ Water absorbs heat about 20 times faster than air.
- ▲ If you start to shiver continuously, get out of the water, dry off and seek warmth.
- ▲ It's best to move slowly and stay relaxed underwater.

energy because there's much less drag against the water. On the other hand, if you wear more weight than you need, it tends to pull your hips down, and you don't swim horizontally. You need more air in your BCD, which raises your upper body and creates more drag. All of these cause you to use air faster and tire quickly.

Even when you're streamlined and weighted properly, swimming fast or working causes you to tire quickly. Learn to pace yourself, take it easy and relax while diving.

Respiration

You probably noticed that you can't breathe water. Hence the tank. But even though you breathe air underwater when you scuba dive, it differs a bit from breathing at the surface. Let's look at why it differs, and how you breathe most effectively while scuba diving.

Breathing Efficiency

Each breath you take contains oxygen, which your body uses to create energy. This is why you need oxygen to live.

Main Objectives

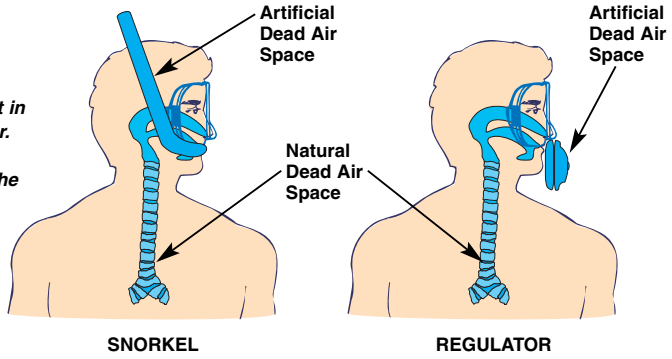
Underline/highlight the answer to this question as you read:

7. How do you breathe underwater for maximum efficiency?

When the air reaches your lungs, your blood absorbs the oxygen and carries it throughout your body as it circulates. It picks up waste carbon dioxide from the cells and returns it to the lungs, so when you exhale, the waste carbon dioxide leaves.

The oxygen and carbon dioxide transfer only within your lungs. The air passages to and from your lungs — your mouth, throat and windpipe — contain air

Dead air.
Your mouth, throat and windpipe contain air that plays no direct part in oxygen and carbon dioxide transfer. These are called dead air spaces. Snorkels and regulators increase the dead air space.



Quick Quiz — Self Assessment 4

1. For maximum efficiency, underwater you should breathe:
   - ☐ a. slowly and deeply.
   - ☐ b. quickly and shallowly.

How'd you do?
1. a.

Main Objectives

Underline/highlight the answers to these questions as you read:

8. **What are eight symptoms of diving overexertion?**
9. **How do you prevent diving overexertion?**
10. **What should you do if you become overexerted while diving — either at the surface or underwater?**

that plays no direct part in oxygen and carbon dioxide transfer. These are called *dead air* spaces. Snorkels and regulators increase the dead air space by increasing the volume of the air passages.

When you inhale, the first air that reaches your lungs is air left in the dead air spaces from your previous breath. This air is high in carbon dioxide. If you take shallow breaths, you inhale proportionately little fresh air and proportionately high carbon dioxide. You essentially rebreathe the air from your dead air spaces. Shallow breathing isn't efficient because so little of the air you move actually takes part in oxygen and carbon dioxide exchange.

On the other hand, with a deeper breath you draw in proportionately more fresh air. This means deep breathing is more efficient breathing. For maximum breathing efficiency, you want to breathe slowly and deeply underwater. When using scuba, inhale and exhale more slowly and deeply than normal — not an exaggerated amount, but a bit more than usual. Breathe the same way when using a snorkel, but you may need to exhale sharply and rapidly from time to time to blow out water.

Overexertion

If you try to maintain an elevated activity level while diving — like swimming against a current, swimming long distances or carrying excessive weight — you may experience *overexertion*. The

Stop!

If you experience overexertion symptoms underwater, stop all activity, breathe deeply and rest. Catch your breath. Hold on to an object for support, if possible, and relax.

symptoms include fatigue, labored breathing, a feeling of suffocation, weakness, anxiety, headache, muscle cramping or a tendency to panic.

Overexertion results when your body demands air faster than breathing can deliver it. This can happen more easily underwater because you're breathing dense air, you're moving against water resistance, and scuba regulators have limits on how much air they can deliver.

Obviously, you want to prevent overexertion. Know your physical limits and pace yourself to avoid breathlessness. Move slowly and avoid prolonged exertion. If you experience overexertion symptoms underwater, stop all activity, breathe deeply and rest. Catch your breath. Any further activity only adds to your body's oxygen demand. Hold on to an object for support, if possible, and relax until your breathing returns to normal.

If you experience overexertion at the surface, establish buoyancy (by dropping weights, if necessary) and stop moving. Rest and catch your breath. Signal for help if necessary. Once you recover, proceed at a slower pace.

Airway Control and Breathing Goals

You'll find that it's not unusual to have a small amount of water in your regulator or snorkel, particularly after clearing it. No problem — you use

Quick Quiz — Self Assessment 5

1. Symptoms of overexertion include (check all that apply):
- ☐ a. labored breathing
- ☐ b. euphoria
- ☐ c. anxiety
- ☐ d. a feeling of suffocation

2. To prevent overexertion (check all that apply):
- ☐ a. wear a lot of weight.
- ☐ b. pace yourself.
- ☐ c. know your limits.
- ☐ d. avoid prolonged heavy exertion.

3. If you become overexerted:
- ☐ a. stop all activity and rest.
- ☐ b. swim rapidly into the current.

How'd you do?
1. a, c, d. 2. b, c, d. 3. a.

MAIN Objectives

Underline/highlight the answer to this question as you read:

11. What are three techniques used for airway control?

airway control to avoid accidentally drawing a few drops into your throat.

Proper airway control means to: 1) Always inhale slowly if water enters your regulator, snorkel or mouth, so you don't pull it into your throat; 2) always inhale cautiously and slowly after clearing your snorkel or regulator; and 3) use your tongue as a splash guard by putting the tip on the roof of your mouth when you breath past small amounts of water. Looking downward slightly helps keep the water in the second stage and out of your mouth. After you breathe slowly past the water, exhale sharply to expel the water from your mouth, regulator or snorkel. With practice, you'll find you can use airway control to breathe past a surprising amount of water.

If you ever accidentally inhale some water, you'll choke and cough a bit. Not to worry, this is how your body keeps water out of your lungs. Stay calm, hold your snorkel or regulator in place with a hand and cough into the mouthpiece as you need to. Each cough helps clear the regulator/snorkel, so you're solving both problems at once. Swallowing may help you to stop coughing, resume breathing and regain airway control. Airway control typically becomes a natural habit with a little experience.

Quick Quiz

Self Assessment 6

1. Techniques for airway control include (check all that apply):
- ☐ a. inhaling slowly if water enters your regulator or snorkel.
- ☐ b. inhaling cautiously after clearing your regulator or snorkel.
- ☐ c. using your tongue as a splash guard.

How'd you do?
1. a, b, c.

To summarize, your breathing goals underwater: **Always breathe slowly and deeply and continuously when using scuba. Strive to develop airway control.**

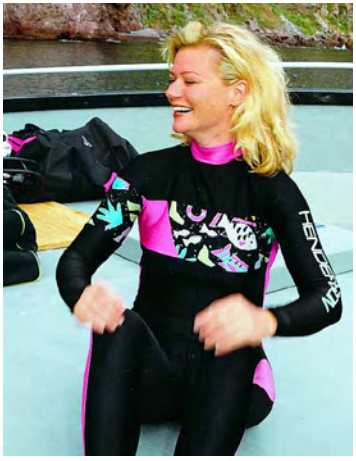
Dive Equipment

In the last section, you learned about masks, snorkels, fins, BCDs, tanks, valves, regulators, and the SPG. That's not a bad start, but as you know there's more. Let's look at exposure suits and their accessories, weight systems, alternate air sources, dive knives,

Summary Points

In this subsection on Respiration, you learned:

- For maximum efficiency, breathe slowly and deeply.
- Overexertion symptoms include fatigue, labored breathing, a feeling of suffocation, weakness, anxiety, headache, muscle cramping and a tendency to panic.
- You prevent overexertion by staying relaxed and knowing your limits.
- If you become overexerted, stop all activity and rest.
- Airway control lets you breathe past small amounts of water.



Form fitting.
Made from colorful Lycra, nylon or a similar material, body suits provide full-length abrasion and sunburn protection. They don't insulate much, so they're primarily worn in tropical waters.

equipment bags and dive instruments.

Purpose. You'll want to use an exposure suit in virtually all diving activities for two basic purposes: to reduce heat loss, and to protect you from minor scrapes, stings and abrasions.

Styles. You can use three basic styles of exposure suits, each with its own characteristics of how much exposure protection it provides: the body suit, the wet suit and the dry suit.

Body suits — Made from colorful Lycra, nylon or a similar material, body suits provide full-length abrasion and sunburn protection. They don't insulate much, so they're primarily worn in tropical waters. You may wear a body suit to help you slide into a wet suit more easily and for extra warmth in a wet suit. Body suits fit your figure closely, and you can get them in bright colors and patterns.

Wet suits — Wet suits are by far the most common form of exposure suit. You can get them in many styles, patterns and thicknesses, making them suitable for insulation in water as cold as 10°C/50°F to as warm as 30°C/86°F.

MAIN Objectives

Underline/highlight the answers to these questions as you read:

12. **What are the two reasons for wearing an exposure suit while diving?**
13. **How do dry suits and wet suits insulate divers?**
14. **Why must a wet suit fit snugly?**
15. **What two properties may an exposure suit lose due to increased water pressure at depth?**
16. **What three factors should you consider when selecting an exposure suit?**
17. **What four procedures apply to caring for an exposure suit?**

Exposure Protection Doesn't Mean Reef Protection

When you explore the fragile environment around corals, sponges and other aquatic life without exposure suit protection, you tend to be cautious. After all, you need to watch what you touch to prevent abrasion or a minor sting.

Wearing exposure suits takes away this incentive, which can mean harm to the environment unless you keep its welfare in mind. Hopefully, you wouldn't intentionally kick, kneel on or bump against fragile aquatic life, but exposure suits make it more difficult to tell when you do it accidentally. Realize that even a light touch can harm or kill some organisms. Break a 25 cm/ 10 in piece of coral, for example, and you've destroyed a decade of growth.

By being aware and using some simple techniques, you can minimize accidental damage:

1. Swim next to the reef rather than above it. This avoids damage from your fin kicks.

2. Watch your buoyancy, and don't dive overweighted. Stay neutral to avoid the tendency to drag along the reef where your legs and feet can destroy things.

3. Turn sideways when you look under ledges. Your tank adds some height, and it's not always easy to estimate how much. If you turn sideways, you reduce the likelihood of bashing your tank against the reef.

4. If you need to swim over the reef, swim well above it.

5. Keep your hoses secured and don't let anything dangle.

In general, avoid touching living organisms underwater. Keep in mind that just because you are safe from the reef doesn't mean the reef is safe from you.

PROJECT AWARE

Wet suits reduce heat loss by putting a layer of insulating foam neoprene over your skin. Wet suits get their name because you get wet while wearing them — water enters at the wrists, ankles and neck and gets trapped between your skin and suit.

Your body quickly heats the water, and then as long as it remains trapped, you only lose heat as it radiates slowly through the wet suit material. If water circulates in and out of your suit, however, you lose a lot of heat to incoming cold water. This is why wet suits have to have a snug fit. You can get wet suits in many colors that go with the rest of your kit.

Dry suits — Dry suits can provide more insulation than wet suits by keeping you dry. They provide the most thermal protection of all suits used by recreational divers, and make a noticeable difference in how long you stay comfortable at temperatures of about 18°C/65°F. In water colder than about 10°C/50°F they're the main option for a comfortable dive.

Air conducts heat relatively poorly, so the dry suit insulates you with a layer of air, plus insulating material that may be an undergarment within the dry suit, or the dry suit material itself. Unlike a wet suit, in a dry suit everything between your skin and the water reduces heat loss, and also unlike a wet suit, they fit relatively loosely.

You read earlier that since dry suits create an air space, you need to equalize them just like any other air space. You also need to release expanding air as you ascend. To do this, dry suits fill with air directly from your cylinder via a low-pressure inflator similar to the one on your BCD. This adds another hose to your regulator. Dry suits also have an exhaust valve for releasing air as you ascend.

Diving with a dry suit isn't difficult, but it requires some special instruction — a short course you can usually complete over a weekend. If you'll use a dry suit during this course, your instructor will orient you to its use during one

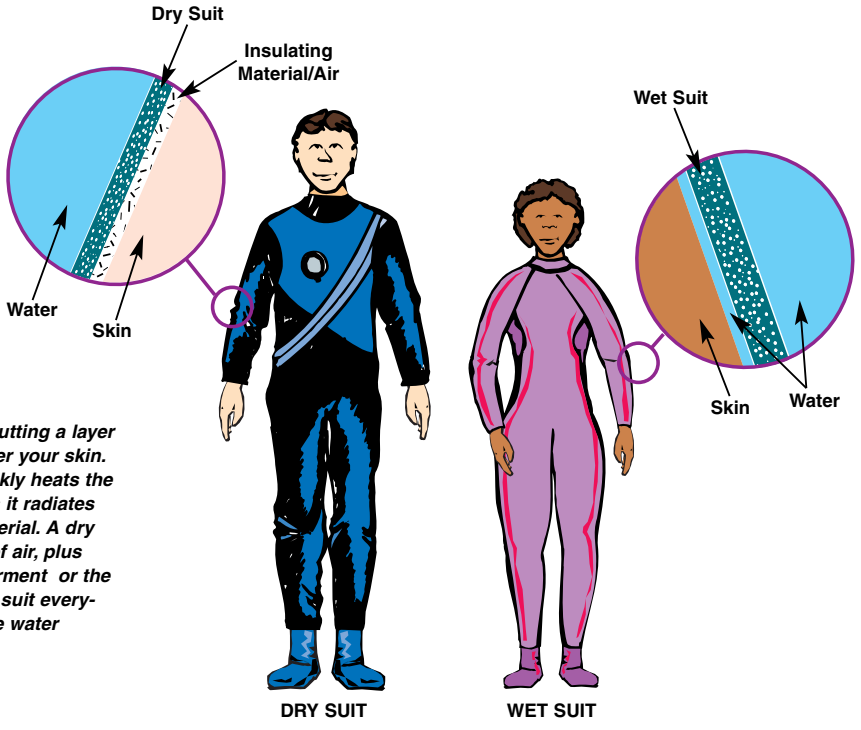
Versatile.
Wet suits are by far the most common form of exposure suit. You can buy them in many styles, patterns and thicknesses, making them suitable for insulation in water as cold as 10°C/50°F to as warm as 30°C/86°F.

Max insulation.
Dry suits provide the most thermal protection of all suits used by recreational divers, and make a noticeable difference in how long you stay comfortable at temperatures of about 18°C/65°F. In water colder than about 10°C/50°F they're the main option for a comfortable dive.

of your confined water dives. In any case, remember that cold water *doesn't* take the fun out of diving — *being cold* does. With a dry suit, you can dive in surprisingly cold water in reasonable comfort, which is a good thing because you find some of the best dive sites in water below 15°C/60°F.

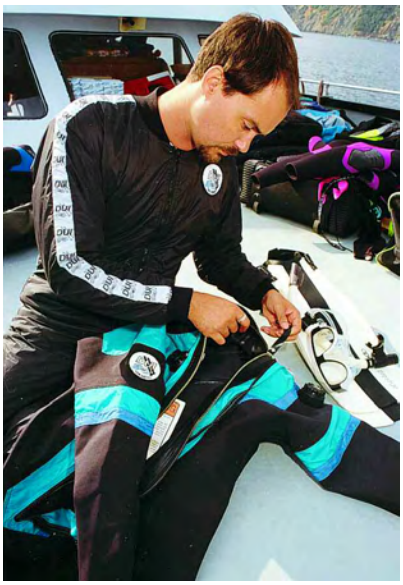
Features. Of the three styles of exposure suits, the wet suit has the widest array of available features. This is because of the very diverse environments in which you can use a wet suit. Common wet suit options include length, one-piece or two piece, long sleeve or short, thickness, color, pads for the knees and elbows, pockets, and zipper position. Dry suits also have most of these options, but since they're intended for cooler water, they cover your entire body.

Materials. As mentioned earlier, body suits, which are the simplest exposure suits, are made of thin nylon or Lycra. Wet suits are made from closed-cell neoprene foam lined on both sides by nylon or another material (for strength and appearance). Closed-cell means that the bubbles in the foam differ from sponge foam



How they hold heat.

Wet suits reduce heat loss by putting a layer of insulating foam neoprene over your skin. You get wet, but your body quickly heats the water and you only lose heat as it radiates slowly through the wet suit material. A dry suit insulates you with a layer of air, plus insulating material (an undergarment or the dry suit material itself). In a dry suit everything between your skin and the water reduces heat loss.



Suit in a suit.
In addition to a dry suit itself, you need a special undergarment like the one this diver is wearing. The undergarment provides the insulation, and the dry suit keeps you dry.

in that the bubbles don't connect. Neoprene foam won't soak up water like a sponge, nor will water flow through it.

It's the thousands of tiny closed-cells that make wet suits buoyant. If you've not tried it yet, even a partial wet suit has enough buoyancy to float you comfortably at the surface. Without weight to offset the suit's buoyancy, it's quite difficult to get below the surface.

The gas trapped in the neoprene foam bubbles provides excellent insulation, but as you descend, they compress from water pressure. Consequently, a wet suit loses buoyancy and insulation the deeper you descend. You compensate for reduced buoyancy by adding air to your BCD; to stay warm, choose a wet suit based on the depth you'll be diving.

You can find dry suits made from several fabrics, including neoprene. All dry suits have a special watertight zipper and neck and wrist seals to keep the water out.

A neoprene dry suit gets most of its insulation from the neoprene and the air inside it, while dry suits made from other fabrics insulate with special undergarments — in fact, without the undergarments, you'd chill in these dry suits, even in moderately warm water. The advantage is that you can vary the undergarments to suit the temperature, so you can use the same suit whether you're diving in water 24°C/75°F or 2°C/36°F.

Because you fill them with air, dry suits tend to be more buoyant than wet suits. However, with modern suits and undergarments, they're not that much more buoyant in most cases. Another advantage of a dry suit is that with most types, you don't lose buoyancy or insulation with depth. As you go deeper, you add air to the suit, maintaining both normal buoyancy and insulation.

Selection and Purchase. You buy an exposure suit based almost entirely on the environment you intend to dive in. The most important considerations — regardless of whether you choose a body suit, wet suit or dry suit — are warmth (insulating ability), fit and comfort. Fit is especially important with wet suits; if

a stock suit doesn't fit you well, a custom wet suit doesn't cost that much more, yet makes a huge difference in comfort.

Don't underestimate how important your exposure suit will be — your comfort depends on it. Look at the total picture. For instance, the two primary drawbacks of a dry suit are that it's a higher initial investment than a wet suit, and it requires more predive and post dive care. But if you live in a cooler climate, the added insulation may mean you make longer dives, dive for a longer part of the year, and make more dives in a day. Your PADI Instructor, Dive Center or Resort can recommend the best exposure suits for your needs and where you'll be diving.

Preparation. Body suits and wet suits generally require no special preparation before use. Some dry suits do require preparation, however, this varies from suit to suit. Consult the owner's manual included with the suit.

Maintenance. All exposure suits have four basic maintenance steps: 1) rinse, 2) dry inside out, 3) store and 4) lubricate dry suit zippers periodically. Store wet suits on a wide plastic or wooden hanger (not wire); store dry suits folded gently with the zipper on top, or as directed by the manufacturer. Always dry and store suits out of direct sunlight.

Avoid leaving your wet suit tightly folded or

Quick Quiz

Self Assessment 7

1. The two reasons for wearing an exposure suit are (check two):
   - ☐ a. thermal protection.
   - ☐ b. so you can disregard whether you bump into the reef.
   - ☐ c. to protect against minor scrapes, abrasion and stings.

2. A _____ suit insulates you with a layer of neoprene against your skin, whereas a _____ suit insulates you with a layer of air and other insulating material.
   - ☐ a. dry, wet
   - ☐ b. wet, body
   - ☐ c. body, dry
   - ☐ d. wet, dry

3. A wet suit must fit snugly to:
   - ☐ a. maintain streamlining.
   - ☐ b. keep the suit from coming off.
   - ☐ c. minimize water circulation and retain heat.

4. As you go deeper, a wet suit may lose what two properties?
   - ☐ a. fit and comfort
   - ☐ b. buoyancy and comfort
   - ☐ c. buoyancy and insulation
   - ☐ d. insulation and fit

5. When purchasing an exposure suit, you need to consider (check all that apply):
   - ☐ a. fit
   - ☐ b. comfort
   - ☐ c. thermal protection
   - ☐ d. looking really attractive

6. To care for your exposure suit, you should (check all that apply):
   - ☐ a. hang it on a wire hanger.
   - ☐ b. rinse it after each use.
   - ☐ c. dry inside out.
   - ☐ d. store on a hanger (for wet suits).

How'd you do?
1 a, c. 2. d. 3. c. 4. c. 5. a, b, c. d is a consideration, but not a necessary consideration. 6. b, c, d.

packed for extended periods. At the creases the closed-cells collapse, reducing their ability to insulate. Coated-fabric dry suits may stick together if folded or stored too long; storage recommendations for dry suits vary, so consult the manufacturer's literature.

Modern wet suit zippers seldom need lubrication if you rinse them properly after use. You lubricate dry suit zippers with a special zipper wax — never use silicone lubricant on a dry suit. Minor suit repairs can be made easily with special cement available from dive stores.

Exposure Suit Accessories

In cooler water — below about 21°C/70°F — you need exposure protection for your head, hands and feet as well as the rest of you, and you may prefer these in warmer water. You also need to protect your feet and hands from cuts and abrasion. You get this protection through exposure suit accessories — namely hoods, gloves and boots.

MAIN Objectives

Underline/highlight the answers to these questions as you read:

18. Why do you need a hood and what are the three basic types of hoods?

19. Why should you avoid an excessively tight-fitting hood?

20. What are two reasons for wearing dive gloves?

21. What are three reasons for wearing wet suit boots while diving?

Hoods. Your head can account for up to 75 percent of your body heat loss if you leave it uninsulated. You may want it in warmer water, but you definitely want to consider a hood any time you dive in water below about 21°C/70°F. Hoods provide some abrasion protection as well.

Wet suits, and most dry suits used by recreational divers, use neoprene wet suit hoods. You can choose from a variety of thicknesses in three basic types: bibbed hoods, nonbibbed hoods and hooded vests.

Over head.
Bibbed hoods (right) flare into a broad flange, or "bib" that you tuck under the neck of a wet suit jacket, or into a special collar on some dry suits. Dry suits with insulated neck seals use nonbibbed hoods. (left)

Bibbed hoods flare into a broad flange, or "bib" that you tuck under the neck of a wet suit jacket, or into a special collar on some dry suits. In wet suits, the bib creates a snug fit between your neck and the jacket and minimizes water circulation. In dry suits, the bib insulates the neck seal to eliminate a cold spot. Dry suits with insulated neck seals use nonbibbed hoods. Some divers use a hooded vest, which gives you all the

benefits of a bibbed hood, plus extra insulation for your entire torso.

Divers who live in cooler climates may not select a separate hood at all, but may instead choose an exposure suit with a permanent attached hood. You can find both wet suits and dry suits with this configuration.

Tender fingers.
You want to protect your hands on virtually every dive. In warmer water, you may use lightweight noninsulating gloves ("reef" gloves, left); in moderately cool water, wet suit gloves provide insulation and protection (center); thick wet suit mitts may be worn in coldest water (right).

Select a hood that fits snugly, **but not too tightly**. A hood that's too tight can compress arteries in your neck (the carotids), which your brain perceives as high blood pressure and responds by signaling your heart to slow. This can cause light-headedness and, if you keep the hood on, fainting and unconsciousness. A hood this tight will be uncomfortable, so don't try to endure it and wear it anyway. Purchase your hood based on comfort and fit.

Gloves. Your hands don't have much natural insulation, making them susceptible to heat loss. In colder water, they may become numb and lose dexterity if you don't protect them. You may find it difficult to operate your equipment and perform other safety-related tasks. In warmer water, your hands may soften after you've been in a short time, making them especially vulnerable to scrapes, cuts and stings.

Put your foot in it.
Typical boot construction consists of neoprene foam with semirigid soles molded from hard or semihard rubber, with textured surfaces for traction and protection.

So, you want to protect your hands on virtually every dive. In warmer water, you may use lightweight noninsulating gloves ("reef" gloves); in moderately cool water, wet suit gloves provide insulation and protection. In the coldest water, you might want to buy thick wet suit mitts, or with a dry suit, dry gloves (common in commercial diving, but not so common in recreational diving).

Although gloves provide protection, don't treat them as a license to touch anything you want. First, you can still get cut or stung through gloves, and second, your touch can damage or

injure aquatic life. Use common sense, and be careful to protect the underwater environment.

Boots. Even if you dive exclusively in tropical waters, you may still want to purchase wet suit boots (also called "booties") for three reasons: Warmth (particularly in water below 21°C/70°F), protection against cuts, scrapes and bruises while walking to and from the water, and for comfort when wearing adjustable-strap fins.

Typical boot construction consists of neoprene foam with semirigid soles molded from hard or semihard rubber, with textured surfaces for traction and protection. In some models, the sole wraps up over the heel and toe for protection and longer wear. Some boots have side-entry zippers, which helps when putting them on.

Dive boots fit either by shoe size or S, M, L, XL, XXL, etc., and should be comfortable without being excessively large or small. Your instructor, resort or dive center can help you choose properly fitting boots.

Overheating

An important note regarding wet suits, dry suits and their accessories: Because they're such good insulators, out of water on a warm day you can overheat in them. You can follow these points to avoid overheating:

1. Set up all your equipment before putting on the exposure suit. Put the suit on at the last possible moment.

2. Once you have the suit on, limit your activity as much as possible.

MAIN Objectives

Underline/highlight the answer to this question as you read:

22. In what six ways can you prevent overheating before a dive when wearing an exposure suit?

Quick Quiz

Self Assessment 8

1. You need a hood because as much as _____ percent of body heat loss can occur there.
   - ☐ a. 25
   - ☐ b. 50
   - ☐ c. 75
   - ☐ d. 90

2. A bibbed hood:
   - ☐ a. does not get tucked into a wet suit jacket.
   - ☐ b. is never used with any type dry suit.
   - ☐ c. None of the above.

3. An excessively tight hood:
   - ☐ a. can cause you to faint, so you shouldn't wear it.
   - ☐ b. will be the warmest, so it's the best bet.
   - ☐ c. usually loosens in water, so you'll find it comfortable while diving.

4. You wear gloves for insulation and:
   - ☐ a. to protect your hands.
   - ☐ b. so you can touch anything you want.

5. Wet suit boots (check all that apply):
   - ☐ a. insulate your feet.
   - ☐ b. provide protection against cuts and scrapes.
   - ☐ c. provide comfort with adjustable strap fins.

How'd you do?
1. c. 2. c. 3. a. 4. a. 5. a, b, c.

Quick Quiz

Self Assessment 9

1. To prevent overheating before a dive (check all that apply):
   - ☐ a. exercise to promote perspiration.
   - ☐ b. put your exposure suit on at the last possible moment.
   - ☐ c. keep your hood off as long as possible.
   - ☐ d. cool off in the water.

How'd you do?
1. b, c, d.

Main Objectives

Underline/highlight the answers to these questions as you read:

23. What are two types of weight systems?

24. What's the most important feature of any weight system?

25. How do you determine how much weight you need for a dive?

3. Stay out of the sun as much as possible.

4. Keep your hood off, or at least pulled back off your head as long as possible.

5. Leave your jacket unzipped as long as possible.

6. Cool off by entering the water, or spraying down with a hose (common on dive boats) as much as you need.

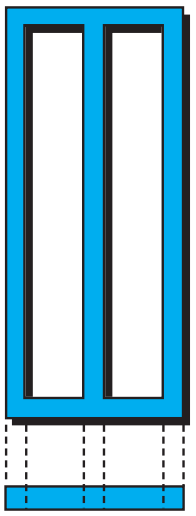
Weight Systems

Purpose. If you ask most people why divers strap lead to themselves, the most likely answer would be, "To make you sink," which would be a logical, common-sense answer. A *wrong* answer, but logical and common sense anyway. If you're like most people, you naturally float, and if you wear a wet suit or dry suit, you **will** float. So, you'll often wear a weight system to *let* you sink — not *make* you sink. This isn't splitting hairs — you want to *just offset* your positive buoyancy, which *allows* you to sink. If you're properly weighted, you do *not* sink like a stone.

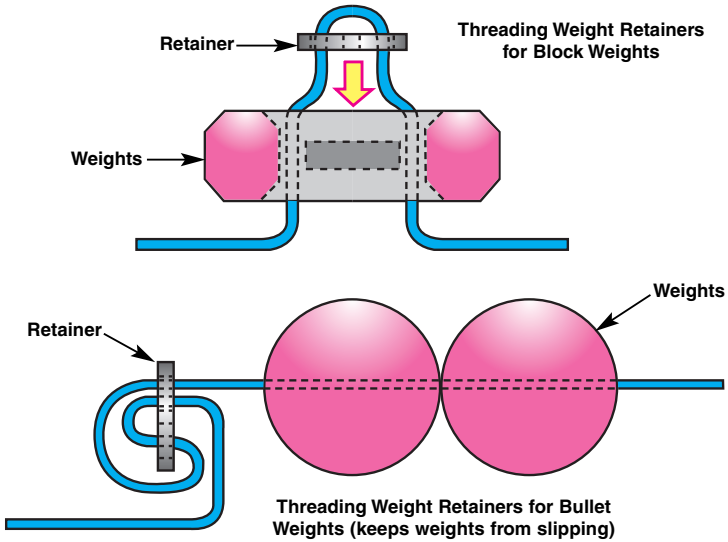
Styles, Features and Materials. You can get two basic weight system types: the weight belt, and the integrated weight system. Both use lead weights, and both have a quick release that allows you to release your weight with one hand in an emergency. *The quick release is the most important feature on any weight system.*

Weight belts have the longest history as weight systems; they're the most common, though divers use other weight systems more and more. The typical weight belt consists of 5 cm/2 in nylon webbing threaded with weights and a quick release buckle. Variations include different belt material and pocketed belts that you can adjust more easily. A few belts use lead shot for comfort, either in specific weight pouches, or in one

Setting Up a Weight Belt



WEIGHT RETAINERS



If you select a weight belt as your weight system, you'll want to set it up so that it's comfortable, and so the weight stays where you put it. Some divers who wear a lot of weight also put part of their weight in an integrated weight system, and part on a belt, distributed so that ditching either results in ample positive buoyancy in an emergency.

First, determine how long you need the belt to be. The free end should protrude about 15 to 20 cm/6 to 8 inches from the buckle when you're wearing it. You'll probably need to trim yours — but don't do it until you've figured out the right amount of weight you need on it. Alternatively, many weight belt buckles let you take up slack at the buckle end and route it back under the belt. This way you don't have to buy a new belt if you need more weight and length later. If this isn't an issue, trimming the belt eliminates excess webbing.

Either way, measure the belt with all the weights and the buckle on it as it fits around your wet suit. After cutting the belt to the right length, you singe the cut edge to keep it from unraveling. A butane lighter works well for this. Before singeing, you may want to round the corners first, to make it easier to pass the end of the belt through the buckle.

Try to distribute the weights evenly, so the sides mirror each other. Leave a space in the center of your back where the tank goes, and leave about 10 cm/4 in clear next to the buckle so you can work it easily. Finally, after you're happy with the weight distribution, use retaining clips so they stay put.

Ballast on board. ***Weight belts are the most common weight systems, though divers use other types more and more. The typical weight belt consists of 5 cm/2 in nylon webbing threaded with weights and a quick release buckle. Weight systems usually integrate with the BCD and have a quick release or releases for one hand weight ditching in an emergency.***

giant pouch with exactly the weight you need. The latter is very comfortable, but much more trouble to set up.

Weight systems usually integrate with the BCD, though a few integrate with a separate harness you wear under your BCD. They vary widely, but like the weight belt, they also have a quick release or releases for one hand weight ditching in an emergency.

Remember that you need to wear your weight system so it's clear of all other equipment and you can release weight quickly with one hand in an emergency. Note that some integrated weight systems will have *two* quick releases — that's fine because you don't have to be able to release all your weight, but enough weight to assure positive buoyancy in an emergency.

Selection and Purchase. Whether you buy a conventional weight belt or a weight system depends on your preferences, and how much weight you'll need (usually more in cooler water to offset the buoyancy of your exposure suit). It's something to consider when selecting your BCD, since that's where you'd probably have an integrated system.

Preparation. See the sidebar for weight belt basic setup. Integrated weight systems vary, consult the manufacturer literature. An important part of setup is determining how much weight you need. Here's how you do it — you'll practice with your instructor during the confined water dives:

1. Enter the water with all your equipment on and your estimated weight requirement.

2. Keep your regulator in your mouth, and staying at the surface, deflate your BCD and hold a normal breath. Be ready to kick or hold onto something in case you've got too much weight.

3. You should float at eye level. If not, add or subtract weight until you do. You can hold weights while you figure out how much you need, then adjust your weight system.

4. As a final check, exhale. You'll begin to slowly descend if you're properly weighted.

5. If you're using a full cylinder, now add a small amount of weight (usually about 2 kg/5 lbs). Why? Remember, air has weight (that's why it causes pressure). As you use up the air in your tank, the tank gets lighter. Using a single cylinder, adding about 2 kg/5 lbs compensates so that you'll have about the proper weight at the end of your dive with a near-empty cylinder.

Maintenance. Most weight systems require very little maintenance, aside from a brief rinse after use. Integrated weight systems may have additional requirements, so consult the manufacturer instructions.

Do handle weight systems carefully. Dropping a weight belt can break gear and cause injury. Scuba units with integrated weight systems usually won't stand well, even

Self Assessment 10

1. The two types of weight systems are the weight belt and the integrated weight system.
☐ True ☐ False

2. The most important feature of a weight system is:
☐ a. comfort.
☐ b. fit.
☐ c. a quick release.
☐ d. easy adjustment.

3. If you're properly weighted, you will:
☐ a. sink quickly.
☐ b. float at eye level with an empty BCD and holding a normal breath.
☐ c. None of the above.

How'd you do?
1. True. 2. c. 3. b.

on level solid ground, so be sure to lie them down or secure them in place.

Alternate Air Sources

Purpose. If you pay attention to your SPG and plan your dive conservatively, it's unlikely that you'll run out of air underwater. Nonetheless, you need to be able to handle such an emergency; you'll practice a few responses during your confined water dives. Among the most desirable options is to use an alternate air source, which you practiced using during your first confined water dive. An "alternate air source" is any second stage you may use, other than your own primary second stage, to ascend while breathing normally.

Just in case.
The extra regulator second stage is the alternate air source second stage, also called an "octopus." For ease of use, it typically has a hose longer than the primary second stage that you put in your mouth.

Styles and Features. The alternate air sources most recreational divers use require your buddy's help, though you can use some on you own.

Alternate air sources that require another diver include the alternate air second stage and the alternate inflator regulator.

The extra second stage on your regulator is the alternate air source second stage (also called an "octopus") type. For ease of use, it typically has a hose longer than the primary second stage that you put in your mouth.

MAIN Objectives

Underline/highlight the answers to these questions as you read:

26. What's an alternate air source?

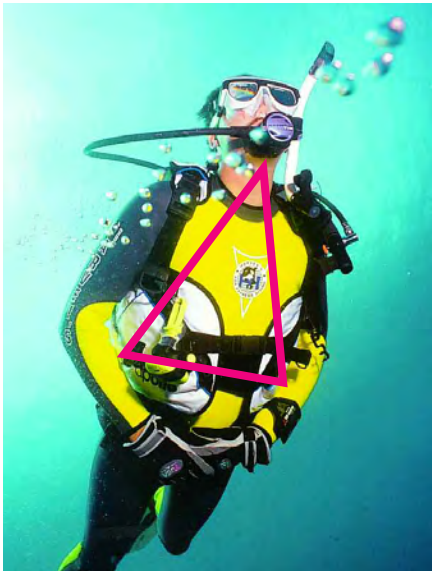
27. What two types of alternate air source require the help and cooperation of another diver?

28. What type of alternate air source does not require the help and cooperation of another diver?

29. Why it is important to specially mark an extra second stage used as an alternate air source?

30. How and where should you attach your alternate air source?

One for two.
An alternate inflator regulator combines the functions of a low-pressure BCD inflator and a second stage, so you find it on your BCD hose. With this alternate air source, the donor usually gives the buddy the primary second stage and switches to the alternate inflator regulator.



Know where to look.
Mark your alternate air source so your buddy can identify it quickly. Secure the alternate in the triangle formed by your chin and the lower corners of your rib cage.

An alternate inflator regulator combines the functions of a low-pressure BCD inflator and a second stage, so you find it on your BCD hose. With this alternate air source, the donor usually gives the buddy the primary second stage and switches to the alternate inflator regulator.

In either case, with this type of alternate air source, your alternate allows you to assist your buddy, or your buddy to assist you. Obviously, having an extra second stage doesn't do you any good if there's no air in your tank.

The pony bottle is an alternate air source that you can use independently. It's a small scuba tank normally strapped alongside your main tank, with its own regulator. Another alternate air source you can use is the self contained ascent bottle, which is a small air cylinder with a very simple regulator that has just enough air to reach the surface. You usually strap these to your BCD in a special holster. Most divers who have a pony bottle or self contained ascent bottle also have an alternate second stage for sharing air with an out-of-air buddy.

Help yourself.
The pony bottle (upper) is a small scuba tank with its own regulator. The self contained ascent bottle (lower) is a small air cylinder with a very simple regulator that has just enough air to reach the surface.

Selection. Most divers prefer alternate air source second stages and alternate inflator regulators because they cost less and have less bulk and maintenance than pony bottles. Some divers, though, prefer the added security that a pony bottle offers in some diving situations. Your instructor can help you choose the most appropriate alternate air source for the type of diving that interests you.

Preparation. Whichever alternate air source you select, you want to make it easy to see and secure it so it doesn't drag. Marking it clearly makes it easy to identify quickly and without

Quick Quiz — Self Assessment 11

1. An alternate air source is any mouthpiece, other than your primary, that you can ascend with while breathing normally.
☐ True ☐ False

2. The _____is an example of alternate air source that requires buddy assistance.
☐ a. alternate second stage
☐ b. self contained ascent bottle
☐ c. None of the above.

3. The _____ is an example of an alternate air source that you can use independently.
☐ a. alternate second stage
☐ b. alternate inflator regulator
☐ c. None of the above.

4. It's important to mark your alternate air source clearly so:
☐ a. your dive center can recognize it during servicing.
☐ b. you or a buddy can locate it without confusion in an emergency.

5. You want to secure the alternate air source on the front of either shoulder securely so it doesn't drag but comes loose with a firm tug.
☐ True ☐ False

How'd you do?
1. True. 2. a. 3. c. 4. b. 5. False.
Locate it in the triangle formed by your chin and the corners of your rib cage.

confusion in an emergency. To make it conspicuous, you can select a bright color second stage (yellow is popular) or have a bright color hose, or both. You secure the alternate to your chest in the triangle formed by your chin and the lower corners of your rib cage, which gives you or a buddy quick and easy access to it.

Don't let your alternate air source drag or dangle. This can damage it, and the environment, and it can fill with sand or mud, making it difficult or impossible to use if needed. You want to secure it so that it remains in place, but releases quickly for use with a firm tug. Your dive center should have quite a few devices that do this.

Maintenance. Care for your alternate air source like any other regulator and/or scuba tank.

Low Pressure Inflator

Purpose. You're probably familiar with low pressure inflators, which you use to quickly and easily inflate your BCD with one hand. Like the SPG and the alternate air source, the low-pressure inflator is mandatory equipment.

Styles, Features, Materials and Selection. When you select a BCD, it will have a low pressure inflator, so you don't normally have to choose it separately. Although you can get different varieties, operationally most low pressure inflators are more similar than different. An exception might be if you decide to invest in an alternate inflator regulator; most BCDs don't come with these as standard equipment, so your dive center or resort would install it for you.

Main Objectives

Underline/highlight the answer to this question as you read:

31. Why do you need a low pressure inflator?

Preparation. When you get your BCD and regulator, you'll need the low pressure hose installed on your regulator. This should be done by your PADI Dive Center or Resort. The only other preparation is to connect the low-pressure inflator during equipment assembly, which you'll do several times during this course.

Maintenance. Following the normal maintenance procedures for your BCD will cover the maintenance of the low-pressure inflator.

Dive Knives

Purpose. You carry a dive knife or tool so you have a practical tool at hand, for safety and for convenience. Besides the obvious use — cutting — you can measure, pry, saw and pound, always being mindful not to harm aquatic life. Your dive knife isn't a weapon. In some areas, local law prohibit or regulate divers' knives, or prohibit dive centers and resorts from selling them.

MAIN Objectives

Underline/highlight the answers to these questions as you read:

32. Why do you need a dive knife or dive tool?

33. What three features should you consider when selecting a dive knife or dive tool?

Styles, Features and Materials. You can choose from a variety of dive knives, ranging in material, size and features. They differ from other knives primarily in the metal used to make them and the design of the blade and handle. At minimum, a diving knife should: 1) be made from stainless steel (or titanium), 2) have both a sharp cutting edge and serrated sawing edge, and 3) come with a sheath or holder.

Selection and Purchase. Beyond those three minimum features, you may also want to consider the sheath design and where you carry the knife (inside of your calf, on the thigh, arm or weight belt, attached to an instrument console, etc.). Be aware that some countries

Comes with the package.
When you select a BCD, it will have a low pressure inflator, so you don't normally have to choose it separately. There are different varieties, but most low pressure inflators are similar.

Quick Quiz **Self Assessment 12**

1. You need a low pressure inflator
   - ☐ a. to allow you to quickly and easily inflate your BCD with one hand.
   - ☐ b. to control the BCD inflation pressure to a low setting.

How'd you do?
1. a.

require a license for possession of a knife.

Maintenance. Most dive knives are made from stainless steel, but they still rust. Rinse your knife in fresh water after use, and carefully sharpen and clean it as needed according to the manufacturer's instructions. You can choose some higher end dive knives made from titanium, which require less maintenance.

Gear (Equipment) Bags

Purpose. You'll want to buy something to get your dive equipment to the dive site and that something is a gear bag or equipment bag. On a boat, it keeps your equipment together so you don't lose it and so someone else doesn't pick it up by mistake.

Look sharp.
You carry a dive knife or tool so you have a practical tool at hand, for safety and for convenience.

Styles, Features, Materials and Selection. It's tempting to think that any large sack will work, but think again. Dive gear can be heavy and salt water corrodes conventional zippers, quickly destroying luggage not intended for the purpose. Choose your equipment bag by picking one large enough for everything except your tank, weights and dry suit if you have one. (Tanks and weights would damage other gear, and dry suits travel separately because the zipper needs protection.) The bag should be made of heavy-duty fabric that resists rotting and have a large zipper that won't corrode. Many equipment bags have features such as shoulder straps, pockets and padding. A good gear bag

Quick Quiz — Self Assessment 13

1. You need a dive knife (check all that apply):
   - ☐ a. as a practical tool.
   - ☐ b. for safety.
   - ☐ c. as weapon for self defense.

2. The three features to look for in a dive knife include (check all that apply):
   - ☐ a. smooth edge
   - ☐ b. serrated edge
   - ☐ c. sheath
   - ☐ d. butt cap

How'd you do?
1. a, b. 2. a, b, c.

isn't cheap, but will cost less in the long run because it lasts, and because you're less likely to lose or damage the contents. Options include backpack designs that let you carry them hands free, or designs with wheels to make life easier in airports and parking lots.

MAIN Objectives

Underline/highlight the answers to these questions as you read:

34. Why do you need an equipment bag?

35. How do you pack an equipment bag before a dive?

Right tool for the job.
It's tempting to think that any large sack will work as a gear bag, but diving quickly destroys luggage not intended for the purpose. Choose your equipment bag by picking one large enough for everything except your tank, weights and dry suit if you have one.

Preparation. You prepare an equipment bag by packing properly. Pack for diving with your equipment in the reverse order in which you'll need it. This way you don't have to pull everything out of the bag to get kitted up. When getting out of your gear after the dive, put it right into your bag to avoid losing it or getting it mixed in with other diver's gear.

Maintenance. Empty and rinse your equipment bag after each use. Allow it to dry before storing it.

Quick Quiz

Self Assessment 14

1. You need an equipment bag to carry your gear to the dive site.
☐ True ☐ False

2. The ideal way to pack your bag for diving is:
☐ a. with items of the same color together.
☐ b. in the reverse order in which you will need it.

How'd you do?
1. True. 2. b.

Dive Instruments

Since you're not a fish, you don't have instincts that tell you everything you need to know underwater: time, depth, direction, temperature and air supply (not that fish would need an air supply). You use dive instruments to provide this information at a glance.

Underwater timepieces. As you progress through this course, you're going to learn that you can't stay underwater an unlimited time, even if you have enough air. Every dive has a time limit, which changes with depth, so you need to know how long you've been underwater.

You can time your dive with either a water resistant watch, or with a bottom timer. Underwater watches include analog

MAIN Objectives

Underline/highlight the answers to these questions as you read:

36. What five types of reference information can you get from dive instruments?

37. What are two types of underwater timepieces used for diving?

38. Why do you need a depth gauge?

39. What is the purpose of a dive computer?

40. What are three reasons that you need an underwater compass?

Where'd the time go?
Underwater watches include analog (time displayed by hands) and digital (time displayed numerically) models. Using an analog watch, you measure elapsed time against a rotating scale (bezel) you set at the beginning of the dive; with a digital watch, you normally use the stopwatch function.

(time displayed by hands) and digital (time displayed numerically) models. Using an analog watch, you measure elapsed time against a rotating scale (bezel) you set at the beginning of the dive; with a digital watch you normally use the stopwatch function. Both types must be checked at the start and end of the dive. In choosing a watch for diving, be sure to choose one that's rated for depth, not just water resistance. Most watches intended for scuba diving have a depth rating of 200 metres or more, and will last for years as they're designed to withstand far greater pressures than recreational divers will ever experience.

Bottom timers are pressure-activated stopwatches that automatically start when you begin your descent, and stop when you return to the surface. Today, most modern bottom timers are digital and track your time between dives (you need to know that, too). The majority combine with digital depth gauges or dive computers into a single instrument.

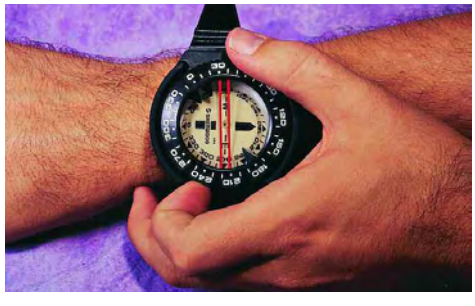
Handle underwater timepieces with care, and rinse them after each dive. Most modern timepieces are fairly maintenance-free beyond that; consult the manufacturer instructions.

Depth gauge. As mentioned, you have time limits based on depth, so you need to know how deep you are. For that, you need a depth gauge, which you can find in a wide variety of types, styles and price ranges. Like underwater timepieces, there are both analog and digital models, with the electronic digital types the most popular today. Depth gauges are considered mandatory dive equipment.

Treat your depth gauge like any other precision instrument. Protect it from rough handling and rinse it after each dive, following the manufacturer's instructions. Some analog depth gauges can be damaged by exposure to the reduced pressures at altitude. Keep your depth gauge out of prolonged direct sunlight.

Dive computers — Dive computers are by far the most common dive instruments and have become standard equipment. Your computer is usually one of your first equipment investments. Your computer combines your

Three gauges in one.
Dive computers combine your depth gauge, timer and sometimes your SPG into a single instrument that reads the data and computes the remaining allowable dive time you have at any point. You can choose from a wide variety.



Find your way.
A dive compass will be liquid-filled to make it pressure resistant, and to help stabilize the compass needle. The preferred type of compass has a reference mark called the lubber line and index markers that you align over the compass needle to maintain a directional heading.

Just how warm is this water?
You can get a thermometer as a separate instrument, but today they're more commonly part of your SPG.

depth gauge, timer and sometimes your SPG into a single instrument, but this is far more than to make a convenient package. Your dive computer applies depth and time information to a decompression model to keep track of nitrogen that dissolves into your body during a dive, and in so doing constantly tells you the time you have remaining. This can be done with tables (you'll learn how), but your dive computer does it more efficiently so you have more dive time, as well as more conveniently. Dive computers give you more freedom in the way you dive, making them one of the most significant advances in dive equipment. You'll learn more about using dive computers in Sections Four and Five. Your PADI Professional can help you choose one suited to you and where you'll be diving.

Compass. A compass helps you know where you are and where you're going, which is useful because being underwater can throw off your sense of direction. Having and using a compass lets you follow a designated course, find your way to the exit, and know where you are at all times. Sometimes it comes in handy at the surface, such as in low-visibility conditions like fog.

A dive compass will be liquid-filled to make it pressure resistant, and to help stabilize the compass needle. The preferred type of compass has a reference mark called the *lubber line* and index markers that you align over the compass needle to maintain a directional heading. You'll learn a bit about compass navigation later on in the course.

As with other dive instruments, rinse your compass after each dive, avoid dropping it and keep it out of direct sunlight.

Thermometer. Although not an essential dive instrument, a thermometer makes diving more comfortable by giving you a temperature reference. With experience, you learn how much exposure protection you need for a given temperature, making it easier to plan a comfortable dive. You can get thermometers as separate instruments, but today they're more commonly part of one of your other gauges, such as your SPG.

Altogether.
Consoles put instruments in one place, which reduces your gearing up time, since you don't need to strap anything on. On the other hand, some divers find wearing gauges on the wrist more effective for streamlining because a console is relatively large compared to an SPG alone, making consoles more likely to protrude.

Submersible Pressure Gauge (SPG). You learned about the SPG in Section One, but it's repeated here because it's a mandatory instrument for diving, so it would be odd not to at least mention it while discussing dive instruments.

Instrument consoles. You can wear dive instruments individually on your wrist, or you can combine them into a single console attached to your SPG. Consoles put everything in one place so you get all your information at a glance. They also reduce your gearing up time, since you don't need to strap anything on.

On the other hand, some divers find wearing gauges on the wrist more effective for streamlining. A console is relatively large compared to an SPG alone, making consoles more likely to protrude or dangle. Gauges on your wrist can't dangle.

Quick Quiz

Self Assessment 15

1. The reference information you get from dive instruments includes (check all that apply):
   - ☐ a. time
   - ☐ b. temperature
   - ☐ c. direction

2. Underwater timepieces can be (check all that apply):
   - ☐ a. dive watches
   - ☐ b. bottom timers
   - ☐ c. lap timers

3. You need a depth gauge because
   - ☐ a. local dive regulations require one.
   - ☐ b. underwater time limits relate to depth.

4. A dive computer provides an underwater library reference, such as a giving you facts about aquatic life.
   - ☐ True ☐ False

5. Reasons for having an underwater compass include (check all that apply):
   - ☐ a. monitoring your air supply.
   - ☐ b. determining where to find your exit point.
   - ☐ c. following a course.

How'd you do?
1. a, b, c. 2. a, b. 3. b. 4. False. A dive computer determines your dive time remaining based on your depth and the elapsed dive time. 5. b, c.

MAIN Objectives

Underline/highlight the answers to these questions as you read:

41. What are two ways of gaining the attention of another diver underwater?

42. What are two ways of communicating with another diver underwater?

43. What are the 25 standard hand signals (visually) and what does each mean?

44. What should you do if you get an underwater recall?

Buddy System: Communication and Procedures

Section One introduced you to the buddy system, and how it's important for safety and fun. Let's look at some of the ways you communicate with your buddy underwater, and some of the procedures for an effective buddy system.

Communication

Sound travels well in water, but voice communication isn't an option without electronic communication systems. As a result, you do most of your talking with your hands — by signaling or writing on a slate.

Gaining attention. For hand signals to do any good, your buddy has to look at you. This means you tap your buddy's shoulder or rap on your tank to get attention. Don't startle your buddy when you do this.

Speak in gesture.
You do most of your talking underwater with your hands — by signaling.

Signals. After gaining your buddy's attention, you can communicate by writing on a slate or by using hand signals. The primary drawback to using a slate is that writing takes a lot of

Summary Points

In this subsection on Dive Equipment, you learned:

- Wet suits and dry suits insulate you, but differ in that you get wet in a wet suit and stay dry in a dry suit.
- You should avoid wearing an excessively tight hood.
- You want to wear gloves while diving for thermal protection and to avoid cuts, scrapes and stings.
- Although you're protected (to a large extent) from the environment, remember that the environment isn't protected from you — use care to avoid damaging aquatic life.
- Be cautious to avoid overheating in your exposure suit.
- The most important feature in a weight system is the quick release.
- Locate your alternate air source in the triangle formed by your chin and the corners of your rib cage.
- Look for a dive knife with both smooth and serrated edges and a sheath.
- You need dive instruments to tell you depth, direction, temperature, time and air supply.

Common hand signals.

Signals may vary somewhat, so review them when planning a dive with a new buddy.

1. Stop, hold it, stay there

2. Something is wrong

OK? OK.

4. OK? OK. (glove on)

5. Distress, help

6. OK? OK. (on surface at distance)

7. OK? OK. (one hand occupied)

8. Danger

9. Go up, going up

10. Go down, going down

11. Low on air

12. Out of air

13. Buddy breathe or share air

14. Come here

15. Me, or watch me

16. Under, over, or around

17. Level off, this depth

18. Go that way

19. Which direction?

20. Ears not clearing

21. I am cold

22. Take it easy, slow down

23. Hold hands

24. Get with your buddy

25. You lead, I'll follow

time, so you'll use hand signals when you can. The illustrations show standard underwater hand signals (take a few minutes to learn them — they're pretty intuitive), plus you and your dive buddy can invent and improvise some as needed. Because signals vary somewhat, review them when you dive with a new buddy for the first time or two.

Quick Quiz

Self Assessment 16

1. To get your buddy's attention underwater you can touch your buddy or:
☐ a. rap on your cylinder.
☐ b. blow your whistle.

2. The two methods of communicating underwater are using a slate and:
☐ a. hand signals.
☐ b. Morse code.

3. Identify the following:

a. _____ b. _____ c. _____

4. If you receive an underwater recall, you should:
☐ a. swim to the boat immediately.
☐ b. cautiously surface and look to the boat for instructions, or as directed in the briefing.

How'd you do?
1. a. 2. a. 3. a. okay, b. let's go up, c. out of air. 4 b.

Communication at the surface. Sometimes you need to communicate with someone on shore or a boat while you're at the surface. You can use hand or audible signals. The illustrations show some of the common hand signals, and as you can see, waving means "HELP!" So don't wave as a greeting. To get attention, you'll want to carry a whistle as standard equipment. A whistle carries a long way and gets attention without expending much energy (as opposed to yelling). Attach it to your BCD hose where it's out of the way, but easy to get to and use. You can also get a whistle/horn powered by your low pressure hose; they're quite loud, but it's a good idea to carry a regular whistle, too, in case you need to signal but have no air left in your tank.

When at the surface, be cautious regarding boats and boat traffic. Many divers carry inflatable signal tubes that alert boats to their presence at the surface. They're also useful when trying to get the attention of someone on a boat or shore at a distance.

Underwater recall. Most dive charter boats have a recall procedure to get your attention while underwater, which can include electronic underwater sirens, banging on something metal, starting and revving the boat engine and other methods. The crew will explain the recall during the briefing. If you get the recall, cautiously surface and look to the boat for instructions. Don't swim toward the boat until the captain signals that it's okay to

MAIN Objectives

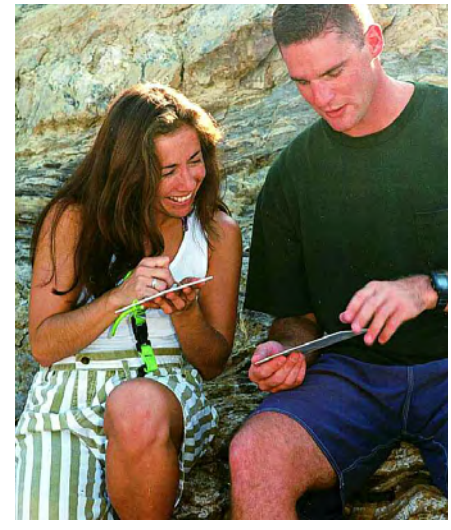
Underline/highlight the answers to these questions as you read:

45. What nine considerations should you discuss with your buddy when planning a dive?

46. What are the steps of the Predive Safety Check?

47. If you lose contact with your buddy underwater, what should you do?

do so. Depending on the circumstances, the boat crew may brief you on slightly different procedures for a recall.

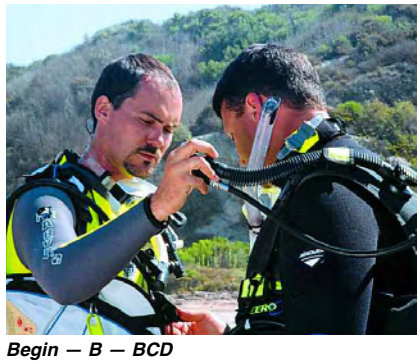


Have a plan.
You and your buddy should plan your dive together and dive your plan together.

Buddy System Procedures

In Section One, you learned your responsibility as a buddy includes helping your buddy avoid problems and assisting when needed. You provide "extra" eyes and hands for your buddy, and vice versa. There are nine specific points to agree upon with your buddy to coordinate your efforts and optimize both your safety and enjoyment.

1. Agree on appropriate entry and exit points and techniques.
2. Choose a course to follow.
3. Agree upon time and depth limits.
4. Establish and review communications.
5. Establish a returning air pressure.
6. Discuss the technique you'll use to stay together.
7. Agree on what to do if separated.
8. Discuss emergency procedures.
9. Agree on your dive objective. "Let's just look around," is as much of an objective as you need, but check that your buddy has the same objective.



Begin — B — BCD

With — W — Weights

Plan your dive together and dive your plan together. Before each dive, run through each other's equipment using the predive safety check. Use the phrase **Begin With Review And Friend** to help you remember the checks:

Begin — **B** — **B**CD — Check adjustment, operation, low pressure inflator connection, and that tank is firm in the band. If appropriate for the entry technique, make sure it's partially inflated.

With — **W** — **W**eights — Check for proper weighting, and that the quick release system is clear for ditching. Weight belts should have a right hand release.

Review — **R** — **R**eleases — Make sure you're familiar with your buddy's releases and how they work. Check each other to make sure they're secure.

And — **A** — **A**ir — Confirm that you both have ample air for the dive, that your valves are open, that regulators and alternate air sources work, and that you know where to find and how to use each other's alternate air sources.

Friend — **F** — **F**inal Okay — Give each other a final inspection looking for out of place equipment, dangling gauges, missing gear, etc.

Review — R — Releases

And — A — Air

Friend — F — Final Okay

Make a habit of performing this check — with experience you'll do it quickly and almost intuitively. If it helps you remember, make up your own recall statement for BWRAF.

During the dive, you and your buddy need to stay together so you can lend assistance to each other if necessary, not to mention because it's more fun. Ideally, stay within a couple metres/a few feet of each other. Staying together is easier if you agree on who will lead, your relative positions, and the general course to follow until you both acknowledge a change. If separated, the general guideline is to search for each other for not more than one minute, then surface and get back together. In some instances it may be better to avoid surfacing to reunite. If this applies on a particular dive, it's important to agree on another course of action that reunites you within a few minutes.

The buddy system only works when divers stay together. **Remember: It's *your* responsibility to stay with your buddy and follow the rules, guidelines and recommendations for each other's dive safety.** No one can do it for you.

Confined Water Dive Preview

Predive Safety Check

As you just read, you perform the predive safety check with your buddy before each dive. Starting in this confined water dive, you and your buddy will practice the check before each entry. By the time you finish the course, you should have run through it many times. Remember **BWRAF** — **B**CD, **W**eights, **R**ereleases, **A**ir and **F**inal okay.

Entering the Water

Different types of dive sites have different types

Self Assessment 17

1. Dive plan considerations to discuss with your buddy include (check all that apply):
   - ☐ a. the dive objective.
   - ☐ b. what to do if separated.
   - ☐ c. time and depth limits.
   - ☐ d. the course to follow.

2. The BWRAF of the predive safety check stands for:
   - ☐ a. BCD, Weights, Regulators, Air, Finish
   - ☐ b. BCD, Weights, Regulators, Alternate air source, Fins
   - ☐ c. BCD, Weights, Releases, Air, Final okay
   - ☐ d. BCD, Wolverine, Releases, Air, Final okay

3. If you lose contact with your buddy, the general procedure is:
   - ☐ a. to wait where you are until your buddy relocates you.
   - ☐ b. search no more than a minute, then reunite on the surface.

How'd you do?
1. a, b, c, d. 2. c. 3. b.

of entries — and different divers may even use different entries at the same site. In general, the best entry is usually the easiest. If you can wade or lower yourself in, that's usually better than a long drop. The idea is to enter without becoming disoriented or knocking any equipment loose. Some general rules for entries include:

1. Be sure the entry area is clear so you don't hit anything or anyone getting in.

Confined Water Dive Two

Skill Requirements

Here's what you'll be able to do when you successfully complete Confined Water Dive Two:

1. Perform the predive safety check.
2. Demonstrate appropriate deep-water entry(s).
3. Clear a snorkel of water by using the blast method and resume breathing through it without lifting the face from the water.
4. Exchange snorkel for regulator and regulator for snorkel repeatedly while at the surface without lifting the face from the water.
5. Swim a distance of at least 50 metres/yards at the surface, while wearing scuba and breathing through the snorkel.
6. Demonstrate a descent using the appropriate five step method.
7. Completely remove, replace and clear the mask of water while underwater.
8. Breathe underwater for not less than one minute while not wearing a mask.
9. Demonstrate the response to a leaking low pressure inflator by disconnecting the low pressure hose from the inflator mechanism.
10. At the surface in water too deep to stand in, orally inflate a BCD to at least 1/2 full and then fully deflate it.
11. Adjust for proper weighting, which is defined as floating at eye level at the surface with an empty BCD and holding a normal breath.
12. React to air depletion by giving the out-of-air signal in water too deep to stand up in.
13. Demonstrate an ascent using the appropriate five step method.
14. Remove weights at the surface with minimal assistance using the weight system's quick release mechanism.
15. In water too deep to stand up in, remove the weights, scuba unit and fins (if necessary), then exit using the most appropriate means. (Buddy assistance may be provided.)

2. If entering water too deep to stand in, have your BCD about half-inflated so you'll be buoyant.

3. Be sure your buddy is prepared to enter, too.

4. Hold your mask so the water doesn't knock it off. This isn't an issue with some types of entries.

5. After entering, signal that you're okay and clear the entry area to wait for your buddy.

Safety starts with a check.
Beginning in this confined water dive, you and your buddy will practice the predive safety check before each entry. By the time you finish the course, you should have run through it many times. Remember BWRAF — BCD, Weights, Releases, Air and Final okay.

You can use *the controlled seated entry* to enter from a platform just above the water — like a dock, boat swim step or pool side. Sit on the platform with your feet dangling in the water. Turn slightly and reach across yourself with one arm so you place both hands on the platform on the same side. Then, using your arms for support, gently pivot so you turn and face the platform as you lower yourself into the water. Once in and comfortable, let go of the platform and clear the entry area. Because you use your arms for this entry, it may be a useful entry technique if you have a physical challenge that limits leg use.

In easy.
You can use the controlled seated entry to enter from a platform just above the water — like a dock, boat swim step or pool side.

When you must enter the water from a raised platform such as a boat, wall or pier, you may use a *giant stride entry*. To do this, secure your equipment, check that your BCD is about half-inflated, place your regulator in your mouth and hold your mask tightly in place. When your buddy's ready, check the area below, then simply step out with one foot.

Keep your legs spread until they hit the water, then pull them together in an upward kick to minimize how far you sink. Once in the water, give the okay signal and clear the entry area for your buddy.

You'll practice the controlled seated entry, the giant stride and/or other appropriate methods for entering water deeper than you can stand in.

Snorkel Breathing and Blast Clearing

During this confined water dive, you'll start making a habit of using your snorkel to save energy and rest at the surface without wasting tank air. If you're not used to using a snorkel, there's not much to it: breathe slowly and deeply. Bite gently on the mouthpiece, letting your lips seal around it and hold it in place. When you put the snorkel in your mouth exhale before inhaling, and inhale cautiously, just in case there's some water in it.

Blast!
To clear water from your snorkel, simply exhale forcefully and sharply into it.

To clear water from your snorkel, such as you'll typically do when you surface and switch to it from your regulator, simply exhale forcefully and sharply into it. This "blasts" the water out of the barrel through the top and through the self drain valve. The "blast method" of clearing will remove nearly all the water from the snorkel. Use airway control to carefully breathe past any small amount left, and then clear it with a second blast.

Remember: When using the blast method to clear a snorkel, the exhalation must be quick and forceful, as though you are shooting a giant pea-shooter. Use this method to clear any water sloshing into the snorkel while swimming at the surface.

Snorkel clearing becomes automatic and easier with experience. Keep in mind that if there's some water left in the snorkel, by inhaling slowly and using airway control, you can "bubble" the air through the water until you have enough air for another blast.

Snorkel/Regulator Exchanges

Quite often you'll snorkel on the surface to the place where you want to dive so you don't waste air on the way. When you get there, you exchange your snorkel for your regulator. Since you can have waves or chop in the ocean or a lake, you may effectively have to do this with your face in the water. So during this confined water dive, you'll simulate this by keeping your face in the water as you switch back between your snorkel and regulator.

Find your regulator and hold it in your right hand. Take and a breath and then with your left hand, remove your snorkel from your mouth, put in your regulator (right hand), clear it and begin breathing. Face in the water — no cheating. When you surface after your dive, you exchange your regulator for your snorkel. To practice this, do the opposite. Take a breath, remove your regulator with your right hand and replace it with your snorkel in the left. See why you wear your snorkel on the *left* side? Blast the water from your snorkel and inhale cautiously as you resume breathing. Blow small bubbles during the exchange so you reinforce the habit of never holding your breath with scuba.

You'll practice exchanging your regulator and snorkel until you can do so with minimal effort, which is to say, until it's boring. But that means you know it.

Right, left. Left, right.

Practice exchanging your regulator and snorkel with your face in the water. This prepares you for doing so in open water, where the surface may not be as calm.

Surface Snorkeling

During this confined water dive, your instructor will have you practice swimming on the surface while snorkeling with scuba equipment. Watch your body position. Keep your arms at your side and the top of the snorkel out of the water. Swim slowly and relaxed with your fins below the surface for maximum efficiency. This may be easier if you look ahead, not down. You may find it easier to swim on your side or backward (you may need to readjust the snorkel tip to keep it out of the water).

Descending

Descending has five steps that you'll start practicing during this confined water dive:

1. You and your buddy signal that you're both ready to descend.

2. Orient yourself to something at the surface that will help you find out where you are when you resurface.

3. Switch from your snorkel to your regulator. Do this with your face in the water.

4. Check the time/ set your watch bezel or start your stopwatch. If you

don't have an underwater watch, for practice look at your wrist where you would wear your watch to simulate noting the time.

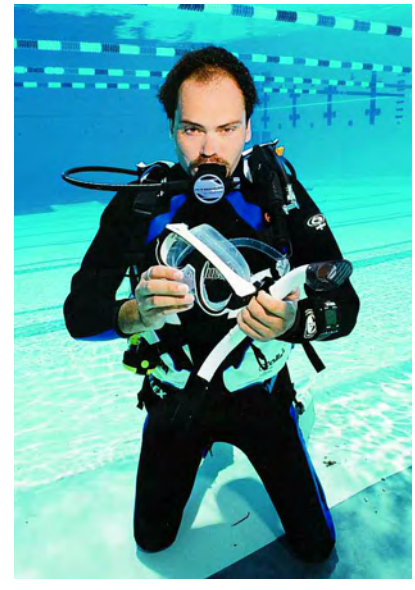
5. Slowly deflate your BCD and exhale to initiate a head up descent. Equalize your ears immediately upon submerging and do so frequently during descent. You don't need to be straight up and down like you're saluting a general or something, but staying in a generally head up position helps you stay oriented and makes it easier to equalize.

Watch your buoyancy.
Control your descent so you can stop or ascend at any time. Pay attention to your lung volume and add air to your BCD to offset buoyancy lost to wet suit compression. Descend slowly, keeping your fins beneath you so you can kick upward if you need to.

Always control your descent so you can stop or ascend at any time. Pay attention to your lung volume and add air to your BCD to offset buoyancy lost to wet suit compression. Descend slowly, keeping your fins beneath you so you can kick upward if you need to.

No-mask Breathing

It doesn't happen often, but it's possible for you to lose your mask, so you need to be able to breathe and swim with your nose exposed to the water. This may sound more difficult than it is. With practice, you'll easily be able to breathe through your mouth with no mask on while keeping water out of your nose.



No sweat.
With a little practice, you'll discover that breathing without a mask is as easy as breathing with one. Your instructor will have you do this for one minute, which would be long enough to reach the surface on a typical dive.

At first, you may find it easier to inhale through your mouth and exhale through your nose. After you're comfortable with that, practice inhaling and exhaling through your mouth only. If it feels like water's entering your nose, just exhale slightly through it to push the water out. Water won't go in your nose by itself unless you turn upside down or tilt your head back. If you need to look up without your mask on, exhale through your nose while you do it.

With a little practice, you'll discover that breathing without a mask is as easy as breathing with one. Your instructor will have you do this for

one minute, which would be long enough to reach the surface on a typical dive. That way you can be confident you can surface under control if you lose your mask and can't relocate it.

Mask Replacement

If you lose your mask underwater, chances are you'll find it or your buddy will hand it to you, and you'll put it right back on. First, put the mask on your face, making sure there's no hair or the edge of your hood trapped under the skirt. Otherwise, it will leak.

Make sure the strap is out of the way by looping it forward over the back of the hand holding the mask. Once you have the mask properly positioned and the skirt unobstructed, either immediately clear the mask like you did in the first confined-water dive, or replace the strap and then clear it. Some people find that replacing the strap first makes mask clearing a little easier; others find that clearing the mask before replacing the strap helps them be sure they've properly seated the mask. Use whichever works best for you.

Strap on.
After replacing your mask, you may find that replacing the strap first makes clearing a little easier, or you may find that clearing the mask first, then replacing the strap is easier.

Disconnecting the Low Pressure Inflator Hose

If your BCD (or dry suit) inflator mechanism were to stick or leak, it could begin inflating your BCD (or dry suit) by itself. To stop this, you disconnect the low pressure hose and then end the dive. To simulate a sticking inflator, your instructor may have you hold down the inflation button with one hand, while you disconnect the low pressure hose with the other. Remember to reconnect the hose after the exercise.

Inflating Your BCD Orally

In Confined Water Dive One, you learned to inflate your BCD using the low pressure inflator. During this session, you'll learn to do so orally. You might orally inflate it if you had no air in your cylinder, or if you had a problem with the low pressure inflator and disconnected it. To orally inflate the BCD:

1. Take a breath.

2. Place the mouthpiece on the BCD hose in your mouth.

3. Open the valve by pressing the same button you use to release air.

Another way.
You might orally inflate your BCD if you had no air in your cylinder, or if you had a problem with your low pressure inflator.

4. Blow about two thirds of the air in your lungs into the BCD hose.

5. Release the valve button.

Your mouth doesn't have to be above water while you blow. In fact, you save energy if it's not — simply lift your chin to take a breath, then relax with your face back in the water as you blow into the BCD mouthpiece. Lift your face to take the next breath, and repeat until you have sufficient buoyancy to stay up without kicking. Release the valve button between breaths; otherwise the water pushes the air back out and you'll never get it inflated.

Proper Weighting

Your instructor will have you adjust your weight using the method you learned earlier in this section:

1. Enter the water with all your equipment on and your estimated weight requirement.

2. Keep your regulator in your mouth, and staying at the surface, deflate your BCD and hold a normal breath. Be ready to kick or hold onto something in case you've got too much weight.

3. You should float at eye level. If not, add or subtract weight until you do. You can just hold weights while you figure out how much you need.

4. As a final check, exhale. You'll begin to slowly descend if you're properly weighted.

5. If you're using a full cylinder, now add enough weight to offset the weight of the air you use during the dive (usually about 2 kg/5 lbs with a single cylinder).

Your instructor will help you get your weight set.

Air-Depletion Exercise

Watch your SPG regularly and you should never find yourself running out of air. Nonetheless, you should know what it feels like when you're running out of air so you have as

The eyes have it.
When you're properly weighted, you should float at eye level with an empty BCD and while holding a normal breath.

Gasp?
To simulate low air, your instructor will close your tank valve as you continue to breathe. When you have difficulty getting a breath, signal out-of-air, and your instructor will immediately reopen the valve. Resume normal breathing.

much advance warning as possible.

To simulate low air, your instructor will sit in front of you and close your tank valve as you continue to breathe from your regulator. You'll feel the breathing effort gradually increase until you have difficulty getting a breath. At that point, signal out-of-air, and your instructor will immediately reopen the valve. Resume normal breathing.

Naturally, you want to avoid an out-of-air situation by always keeping an ample reserve supply. You may need this air to retrieve something you drop after surfacing, and to make sure you don't completely drain your tank. As a rule of thumb, plan to surface with *at least* 20-30 bar/300 psi in your tank. Many divers reserve about 35 bar/500 psi; the smaller the cylinder and the more complex the dive, the more reserve you want to keep. With proper planning, you should be able to make a slow, comfortable ascent, a three-minute safety stop at 5 metres/15 feet, and reach the surface without using your reserve. This is one of the marks of a good diver.

Ascents

Building on what you practiced in Confined Water Dive One, a proper ascent has five steps that you learn and practice starting in this confined water dive:

1. You and your buddy signal each other and agree to ascend.

2. Note the time of your ascent. (If you don't have a watch for this dive, simulate checking the time by looking at your wrist.)

3. Hold your right hand over your head (so you don't run into anything) and hold up the BCD hose with exhaust control with your left. As you'll see, air expanding in your BCD during ascent increases your buoyancy. You need to release air as you rise to keep your ascent under control.

4. Look up and around, slowly rotating to make sure the area above you is clear.

Out easy.
To exit the water onto a low platform or small boat without a ladder, you may remove your weights and scuba gear at the surface, then lift yourself out.

5. Swim up slowly, at a rate no faster than 18 metres/60 feet per minute (slower is fine), while breathing normally.

As soon as you and your buddy reach the surface, inflate your BCDs so you can float comfortably and effortlessly. Make a habit of keeping your regulator in your mouth until you've inflated your BCD.

Weight Removal at the Surface

In an emergency at the surface, your first reaction should be to be sure you can float. You'd usually do this with your BCD and low pressure inflator, but if that doesn't work (such as if you had an empty tank), your next option would be to ditch your weights. So that you're familiar with this, your instructor will have you practice using your weight system quick release.

With a weight belt, reach down with your right hand, flip the release, grasp the free (no buckle) end and pull the belt clear of your body. That way you know it won't hang up when you drop it. During this practice session, your instructor may ask you *not* to actually drop your weight (such as if it would damage the pool), or your instructor may have you drop it. Either way, before removing your belt be sure there are no divers beneath you who could be hurt by falling weights.

If you're using a weight integrated system, you'll use the system's quick release. However, depending on the system configuration, to prevent pool damage, your instructor may remove all but one or two weights and have someone catch them as they release, or have you practice this in shallow water.

Deep Water Exit

At times you might need to remove your weights, scuba unit and (perhaps) fins to exit the water — like when diving from a small boat. Since you already took your weights off in the last skill practice, your instructor will probably have you learn to do this next.

First, remove your weight system (if you haven't already; if you have a weight integrated BCD, the weights can usually stay in for exiting) and hand it to your buddy, or place it up on the pool deck. Next, slide out of the scuba unit — it is usually easiest to slide it off one shoulder first. Make sure you put enough air in it so that it doesn't sink, then hold it for your buddy to pull up on the deck.

Remove your fins last, if necessary. On a low platform, you may find it easier to leave them on because you can kick as you lift yourself out. If you must remove your fins, to climb a ladder for example, make sure you have solid contact with something so you won't drift away from the exit. In open water, try to exit when the waves will help lift you onto the platform, boat or rocks.