

A Guide to Scuba Diving

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The Ocean – Our Most Unexplored Frontier

Many people think that space is our final frontier – and that is not entirely true. While it is more difficult to get to outer space, we probably know more about the various planets and environments in space than we do about what lies beneath the surface of our oceans.

Just as in outer space, there is a whole environment, or ecosystem, under the waters that cover 75% of our planet, with 70% of our planet being ocean waters. Beneath those waters there really is an entirely new world -a world full of beauty and mystery that few humans have the opportunity to experience.

But the lucky few who do have the opportunity to experience this vast under water world are able to do so because they are scuba divers. Obviously, human beings cannot breathe underwater, so instead, they rely on a portable respiratory system that is self contained.

In fact, that is what the word Scuba means: Self Contained Underwater Breathing Apparatus. This apparatus allows human beings to dive to depths that were once unthinkable, and to stay under the water for long periods of time, depending on how full the air tank is. Different mixtures of gasses are used in the air tank, depending on the length and depth of the planned dive.

Forages into this underwater world have become increasingly popular, especially since Scuba diving equipment makes it so easy. Now, if there is an ocean nearby, you can bet there are scuba divers, scuba lessons, and scuba diving clubs in the vicinity as well. There are even scuba diving clubs that are not located near oceans. These clubs plan trips around the world to go scuba diving in different oceans!

When you see the beauty that lives so peacefully under the water, it isn't any wonder why scuba diving is so popular. In fact, it is a world that is so amazing and breath taking that you will want to make an under water camera part of your essential dive equipment.

While no sport suits everyone, most people who try scuba diving are hooked after their very first dive. Most people are looking forward to their next dive before they ever return home from the last dive.

In our fast paced world, scuba diving offers the ultimate in relaxation and stress relief. Imagine a world where there are no phones, no palm pilots – and no rush. You leave a world that is noisy, and enter a world where the only real noises you

will hear are the bubbles from your scuba gear. In this world, you are only limited by the amount of air in your tank.

The History of Scuba Diving

As far back as recorded history goes, people have been drawn to and mystified by the ocean. Before the industrial age, however, if one wanted to explore what was beneath the surface of the ocean, one had to hold his or her breathe, and obviously, could only explore for as long as they could hold their breathe.

The ocean has always provided human beings with a source of food, and since man discovered this, he has been working on ways to better explore that underwater world. Initially, humans held their breath to either explore or gather food, but eventually, hollow reeds were used.

These reeds allowed swimmers to keep their heads under the surface, where they could view the underwater life to an extent, for an indefinite period of time. However, using hollow reeds would not allow the swimmer to submerge more than a couple of feet.

Next, divers tried to use air bags. Unfortunately, this could not work because the air that was being breathed in from the bag was being exhaled back into the bag, and then inhaled again, causing the diver to breathe in carbon dioxide. Air bags were followed by diving bells in the 16th century. The bottom portion of the bell contained water, but the upper portion contained air. The diver could hold his breathe to dive, then return to the bell to rest and get air.

It wasn't until 1825 when William H. James made a huge advancement in the diving world. He designed a diving suit that was self contained and had compressed air, which was in an iron container that was to be strapped around one's waist.

In 1829, Charles and John Deane improved on this design, presenting the first air-pumped diving helmet to the world. As time marched on, divers kept improving on the older systems, and by 1865, the first diving regulator had been invented by Benoit Rouquayrol and Auguste Denayrouze.

Unfortunately, the equipment was all still so heavy that the diver did not actually dive into the ocean – he walked. By 1879 the first known rebreather was being used, and by 1905 the first rebreather that had metering valves that allowed for control of the oxygen supply was invented.

By 1926, divers were actually swimming, instead of walking on the seabed floor, and in the 1930's Guy Gilpatrick of France was swim diving with waterproof goggles. Swim fins also arrived on the scene, again in France. However in San

Diego, California, the very first sport diving club, known as the Bottom Scratchers, was opened.

Research and improvements continued, and finally, around 1953, thanks to an article that appeared in the National Geographic Magazine about Jacques Cousteau, the general public in the United States became interested in scuba diving.

At this time, the breathing apparatus for scuba diving was called Aqualungs, and this gear was very expensive. Because diving suits were so rare during the war years, people often dived in their regular swimming attire and so scuba diving as we know it today was referred to as skin diving. The first wetsuit wasn't actually introduced until 1956.

Throughout the history of scuba diving in the United States and Canada, television shows and movies, such as Titanic, have made scuba diving even more popular. It seems that every time such a movie is released, there is a surge in the sale of scuba gear and lessons, as newer generations join the ranks of those who have a love for the world that hides beneath the surface of the water.

Whether you are young or old, or you want to dive for pleasure or turn scuba diving into a full time career, every time you dive, you are continuing a quest that began when man first laid eyes on the ocean. You are part of a quest to discover what secrets that beautiful and mysterious underwater world holds.

Will you discover a new breed of sea life? Will you discover a sunken pirate's ship or an old cargo ship? What type of sea life will you find? One of the best things about scuba diving is that you can never be fully sure what is waiting to be discovered beneath the surface until you actually discover it.

Even if you dive in the same area time and time again, you will see something new or different on each dive. The life within the ocean is only contained by the land that surrounds it – or that it surrounds. Other than that, there are no borders. Again, you will only be limited by the amount of air in your tank!

Diver Education

You have probably seen shows that depict scuba divers. You may have seen pictures that are taken under the water of scuba divers as well. It all looks very easy – and in a sense, it is. But there is a great deal that you must know before you can participate in your first dive.

Do not assume that the guy at the sports store or the dive shop can tell you everything you need to know when you purchase your diving equipment. You need to take scuba diving lessons and become a certified diver. This is necessary for your own safety, as well as for the safety of those who are diving with you. A lot can go wrong on a dive.

You also cannot learn everything you need to know on one Saturday afternoon. To complete the first certification course that is offered by scuba diving schools, it takes approximately 32 hours of instruction. You will definitely need open water certification if you hope to go scuba diving in the ocean.

Today, you can take a portion of your scuba diving lessons online, and then complete your training at a local dive school, where you will practice in a swimming pool. You could also complete your certification in the ocean, again through a diving school, where you will get greater hands on experience.

Do not be surprised that most of your scuba diving training will take place in a classroom setting, as opposed to doing any actual diving. The diving comes later in the course, after you know the basics.

There are many things that you must consider when selecting a dive school or certification program. All dive schools are not created equally – and the quality of the education you receive may mean the difference between life and death when you are doing open water dives.

Start by getting references for dive schools from divers that you know or meet. If you don't know any divers in person, you can easily find divers in your geographic region through the numerous online scuba diving communities, and get recommendations that way. Also, when you talk to the dive school operators, ask for references, and check those references out!

Talk to the instructors. Find out how long they have been diving, how long they have been certified, what level of certification they have, how long they have been teaching, and how many courses they have taught.

Ask about the equipment that will be used during the training. Will you be taught how to properly use the equipment that you personally own or plan to buy as well? There are several different types of equipment, all with different procedures for operation. Make sure that you will learn what you need to know.

Do not skimp on yourself. You will find that the cost of training and certification varies from one school to the next. Schools that are longer generally cost more than the schools that have shorter training periods. There is a reason for this, and for your safety and well-being, you should go with a school that has a longer training period, even though it will cost more.

Diving school is affordable, but not cheap. If the school is cheap, it's a sure bet that the equipment is probably worn or outdated, or that the instructors are not that great. Don't make the mistake of just checking out one dive school – check all of the schools in your area.

Also watch out for hidden charges. When you are first quoted a price for training, it may sound like a good deal – but after you've signed up, you may find that there are more fees that you have to pay. You may be required to purchase additional equipment or books – which they will happily sell you.

Ask about discounts as well. Many dive schools also offer certification courses. If you take your initial training through them, they may offer you a nice discount on the cost of the certification.

The important thing is to do your research. Be picky and ask questions. If the dive school or schools in question become irritated with your questions, these are not the people you want to teach you how to scuba dive anyway – because there will be questions then as well.

Just remember that this training literally means the difference between life and death on the open water. You would never put your life in the hands of a second rate doctor – don't put your life in the hands of a second rate scuba instructor either.

If you live near a YMCA, this may be the ideal place to take your scuba lessons. The YMCA usually offers the best training at the most affordable price. Don't think that you can bypass training. You will need a certification card that shows that you have diver training before you can rent scuba equipment, join commercially sponsored dives, or even take advanced training courses.

Different Types of Diving

There is more to scuba diving than meets the eye. There are different types of scuba diving. First, there are two major classifications – recreational diving and professional diving. Each classification has other classifications within it as well.

Recreational diving, for instance, may include cave diving, free diving, drift diving, altitude dives, deep diving, ice diving, night diving, underwater photography or videography, or even simple snorkeling.

Different types of dives require different types of training as well. Just because you have been trained and certified in regular scuba diving does not mean that you are qualified for ice diving or other types of diving.

Some people start diving for recreational purposes and discover such a love for the sport that they begin doing it professionally. They may become instructors, or enter into one of the many professional or commercial diving fields.

Professional diving includes marine biology diving, maritime archaeology, underwater search and recovery, underwater ship repair, and wreck diving. Professional divers are often called tech divers, and they may also participate in deep diving, ice diving, night diving, and cave diving during the course of their professional diving activities.

Military diving includes combat divers as well as work divers for the armed forces. The Navy has an elite team of divers known as Frogmen. Public Safety Diving refers to police and rescue personnel who dive for the purpose of rescuing other human beings. They may also dive to recover human bodies, or to recover evidence.

Commercial diving encompasses professional divers, but also includes other breeds of divers as well. Offshore divers are used in the oil and gas industries, and they dive for the purpose of constructing, repairing, or maintaining offshore rigs and pipelines. Inland or Inshore divers often work in ship harbors to repair ports underwater, or to make repairs to ships underwater.

Some professional diving is quite dangerous. There are nuclear industry divers who literally dive in waters that are in radioactive conditions, or HAZMAT divers who dive when hazardous materials are present, such as when oil spills occur.

The equipment used for different types of divers varies as well. Typically, professional divers use full face diving masks and the diving mask and the diving regulator are combined in one unit. These masks often include communication

devices that make it possible for the divers to communicate with each other, or with people on the surface.

Depending on the length and depth of a dive, professional divers may have a long hose that supplies air from the surface, as opposed to a personal air tank. This hose is called an umbilical. The umbilical may also supply air for pneumatic tools. Some umbilicals provide electrical power for communication equipment or lighting equipment.

Again, the equipment that the diver uses depends a great deal on the type of diving they are doing. For instance, underwater photographers obviously need underwater cameras. Construction divers need tools that can be operated underwater. Usually these power tools are actually powered by high pressured air that is supplied by a hose from the surface.

Professional dive equipment is often very expensive, and not something that the average recreational diver would want or need to invest in. At the same time, the equipment used by a recreational diver isn't suitable for those who are working underwater either. However, professional divers usually have a self contained air tank with them as an emergency back up – in case their air supply from the surface gets cut off for any reason.

Remember that most professional divers started diving for recreational purposes. There is a possibility that you like scuba diving so much that you seek further information about possible diving careers.

Different classifications of professional diving often require knowledge in other fields. For instance, if you want to be an underwater photography, you obviously need some photography skill. If you want to do construction underwater, you may need welding skills or other construction skills. If you want to do rescue diving, you may need first aid skills or even medical or police training.

Just think, before you know it, you may find yourself underwater working to make a movie, or shooting pictures of sea life for a magazine! If that is too tame for you, what about working underwater to raise sunken ships or to make repairs to ships? Maybe you won't turn into a professional diver at all. You might prefer to use your diving skills for pleasure, instead of for money – but the option is always there. Diving, after all, is a skill that not everyone has!

Different Scuba Diving Skill Levels

While each dive school will offer courses that are called different things, The National Association of Underwater Instructors (NAUI) recommends that dive schools should offer dive courses, in order, as follows:

- Skin diver courses
- Scuba diver courses
- Advanced Scuba diver courses
- Specialty courses
- Master Scuba diver courses
- Technical diver courses
- Leadership courses
- Instructor courses

Skin diver courses should come first, and they should start with snorkeling lessons. While this may not be what you thought you signed up for, it is a necessary part of your training. Skin diver courses should also include breath-hold diving as well. A good skin diving course will include at least one, and preferably two open water dives.

Skin diver courses are followed by scuba diving courses. This should be a beginner's course, with certification at the end of the course. You should learn the fundamental basics of scuba diving, including skills and safety measures for open water dives. You should also know how to choose, use, and maintain your dive equipment, how to dive, and dive safety guidelines. You should have at least three open water dives as part of your training, and preferably more.

Advanced scuba diving courses are highly recommended – especially if you want to dive often. Your dive school may recommend an experienced scuba course before the advanced course. If so, it is a good idea to take the experienced scuba course, which should be a series of instructor led open water dives.

When you are ready for the advanced scuba diving course, you will most likely be required to show proof of a certain number of open water dives before you will be admitted to the advanced program. For instance, the NAUI requires proof of twenty-five open water dives before a diver will be allowed to enroll in the advanced course.

The advanced diving course should allow you to explore various types of specialty diving. The advanced course should not provide in-depth instruction in these specialties, but there should be enough to allow you to know whether you want to explore a specialty further in the future.

You should learn more about navigation during the advanced course as well, which will allow you to explore more waters later on. Night diving and low visibility diving are usually covered in advanced courses, as well as deep diving.

Depending on the dive school, your advanced instruction may allow you to participate in various types of dives including hunting and collecting, surf diving, altitude diving, photography diving, using dive computers, diving in different waters, such as salt water or fresh water, underwater mapping, and even search and recovery simulations, as well as wreckage simulations.

Master scuba courses are also recommended after you have completed advanced training. A master course should include dives in areas that will test your skills and abilities. The course should also give you even more skills and abilities. Deep diving as well as simulated decompression diving should be covered, as well as night diving and limited visibility diving, underwater navigation, emergency procedures, rescue diving, and search and recovery diving. Elective dives in various specialties should also be offered.

Specialty courses may include underwater photography, underwater hunting and collecting, wreck diving, deep diving, dry suit diving, rescue diving, search and recovery, training assistant diving, underwater archaeologist, underwater environment diving, underwater ecologist, and enriched air nitrox diving.

Technical diving courses should include introduction to tech diving courses, as well as cave diving, cavern diving, mixed gas diving, decompression diving, ice diving, closed circuit rebreather diving and semi-closed rebreather diving, wreck penetration diving, Heli-air diving, Helitrox diving, nitrox diving, tri-mix diving, and technical support leader courses.

Leadership and instructor courses should include assistant instructor courses, skin diving instructor courses, dive master courses, and instructor courses. Each type of instructor or leadership courses will have strict prerequisites before a diver will be allowed to enroll.

How much training you receive is really up to you, as long as you have basic scuba diving training that provides you with a certification card. However, the more training you receive, the better equipped you will be when you are doing open water dives in terms of both enjoyment and safety.

Are You Healthy Enough to Dive?

Before you start scuba diving, you need to make sure that you are actually healthy enough to dive. There are several medical conditions for which diving will have a negative impact. This includes long term illnesses and short term illnesses.

Short term illnesses and conditions that will temporarily keep you from diving include pregnancy, colds, and the flu, as well as some injuries. There has not been enough research done in how diving affects a fetus, but experts recommend that pregnant women avoid diving due to the water pressure and the mixture of gases that enter the system.

When you have a cold or flu, the pressure within your sinus system is already affected, and the water pressure will only add to those problems, and may complicate a simple cold or flu.

While the injury that you have may not physically prevent you from diving, it may increase your chances of experiencing decompression illness. All injuries to joints and muscles should be completely healed before you resume your diving activities.

If you are on medications of any kind, you need to ask your doctor about the safety of scuba diving while taking such medication. If you are still in training, you also need to inform your scuba instructor. This is also true for over the counter medications. If the medication you are taking causes drowsiness, do not dive. If medication affects your heart rate, again, do not dive.

Asthma is one condition that can prevent you from scuba diving. This is determined on a case by case basis by your health care provider. When you scuba dive, the air and/or gases that you are breathing are cool and dry, which makes conditions right for an asthma attack. Divers also exert a lot of physical energy which can cause breathlessness.

Diabetics who are insulin dependant were once advised against diving. However, more and more insulin dependant diabetics are now diving, but their health must be closely monitored. After checking with your doctor, a diabetic may dive if their blood glucose levels are under control and they do not have any conditions that are a direct complication of diabetes, such as eye diseases, kidney problems, or blood vessel problems. It is also very important that the diabetic has a complete understanding of how exercise can affect their diabetes.

A diabetic should not dive if they have had a hypoglycemic episode within the past year, if they have a secondary illness or condition that is caused or related to diabetes, or if they do not have control of their blood glucose levels.

Many heart problems will prevent you from diving. These include a recent heart attack, angina, Intracardiac Shunts, any type of heart failure, recent heart surgeries or bypass surgeries, controlled atrial fibrillation, and hypertension.

Diseases that affect the lungs may also prevent a person from diving as lung problems can increase the chance of lung barotrauma and cause the lung or lungs to collapse. Lung issues that affect diving include lung fibrosis, TB, any type of lung surgery, and collapsed lungs.

You should never dive if you have an active infection – whether it is internal or external. You should not dive if you have ear problems either, as this can lead to ruptured ear drums and/or deafness. If you have lost hearing in one or both ears, you should check with your doctor before scuba diving.

Gastrointestinal problems may interfere with your diving as well. These problems include any condition that causes vomiting, bowel diseases, bowel obstructions, and hernias.

Other areas of concern include vision problems, dental problems, and even skin problems. Inability to see well while diving can be a problem in that the diver may not be able to see dangers or exit points. Teeth may rupture on ascent if they are not in good shape to begin with. There are also many varieties of dermatitis that may become worse after prolonged contact with water, or contact with materials used in scuba equipment.

People who have been diagnosed or suspected to have bipolar disorder, depression, or psychosis should not dive. This is due to the potential lack of judgment that may be required to save one's life or to avoid danger. Furthermore, people who are on medication for mental conditions may also be at risk when scuba diving.

Anyone who has a neurological problem or disorder that may affect judgment, loss of sensation, or restrict movement should not dive. Those who suffer from epilepsy or convulsions will not be given certification to dive in open waters, and should be excluded from all types of scuba diving.

If you have had a head injury or lost consciousness within the past few years, you should seek medical advice before scuba diving. Also note that scuba diving may trigger migraine headaches.

Obviously, anyone who is under the influence of drugs or alcohol should not dive. Anyone who has complications or illnesses that are a result of alcoholism or drug use should seek medical advice before scuba diving.

Anyone who plans to scuba dive should have a pre-dive physical exam. Many dive instructors and dive schools require this. Many doctors specialize in exams for dive safety, and they can be located through various dive organizations. You can also get a referral to such a doctor from local dive schools.

Usually, during a scuba fitness exam, the doctor will have the patient perform a physical fitness or exercise tolerance test, where conditions that exertion affects can be ruled out.

Finally, if you do not feel well or 'normal' before a dive, don't dive. It is always best to forgo the dive than to risk serious injury or complications – no matter how far you may have traveled for a dive.

Travelers should also note that there is a safe wait time between scuba diving and flying. This is due to potential dangers associated with left over nitrogen in the human system and the decompression issues that your body will face when the plane ascends. If you fly too soon after scuba diving, you may develop painful gas bubbles in your joints or in your flesh. You could also develop such gas bubbles in your blood system, which often leads to death.

While you should not fly less than twelve hours after a dive, it will be safer to wait a full 24 hours after diving before flying. Many dive computers have an indicator on them that will tell you a safe time to fly based on your personal information and the nitrogen levels.

Remember that this is your life – and you only have one of those. Don't risk diving when you have a condition or illness that may be affected negatively from the dive. It simply is not worth it to risk your health, or your life, in such a way. Take the time to visit your doctor and make sure that your health is in top dive condition.

If you have to forgo a dive due to a temporary health problem, just do your best to follow your doctor's orders so that you can get back in the water as soon as possible.

Basic Diving Equipment

Initially, it is not a good idea to buy scuba diving equipment. Many people take lessons and participate in the open water dives only to discover that scuba diving is not for them. If you've bought your equipment, you will be stuck with a lot of expensive scuba equipment that you will never use again.

Instead, rent your equipment in the beginning. However, make sure that the equipment that you rent is in great shape. Don't trust your life to substandard equipment. Also, try renting different types of equipment for each of your first dives so that you have the opportunity to learn first hand which equipment you prefer.

Eventually, you will be ready to purchase your own equipment. Here is a list of basics that you need, as well as a description of each item:

- **Scuba Mask** – The scuba mask may cover only the eyes or the entire face. The purpose of the mask is to help the diver see more clearly underwater.
- **Swim Fins** – Swim fins for the feet help the diver by creating more efficient propulsion.
- **Scuba Booties** – Scuba booties are worn on the feet to help keep them warm in colder water. They also protect the feet when walking in or out of the water, and are typically made from the same material that dive suits are made of.
- **Scuba Weights and Belts** – Because dive suits and tanks often make the diver more buoyant, scuba weights may be used to counteract this. There are many different types of weight systems available, and most are typically part of a scuba weight belt. It is important that the weights can be easily dropped in the event of an emergency. These weight systems may also be called BCD's (Buoyancy Control Devices).
- **Proper Clothing** – There are three types of dive clothing, which include dive suits, wet suits, and dry suits. Its purpose is to protect the diver while underwater. Dry suits and wet suits are the two types of clothing that are worn by divers today. Traditional dive suits were once used to allow the diver to maintain atmospheric pressure while under the water. A dry suit keeps the divers skin completely dry, even while under water, to help

maintain thermal body temperature. Wet suits only provide minimal thermal protection and are designed more to protect the divers skin from other dangers.

- **Depth Gauge** – A depth gauge is used in conjunction with a watch and the decompression table to allow the diver to ascend in a safe manner.
- **Scuba Regulators** – The scuba regulator is part of the required scuba gear that allows the diver to breathe the gas or air from the dive tank or cylinder. It may also be called a regulator or a demand valve. Used in open circuit breathing systems.
- **Rebreather** – This is a type of breathing system that allows the diver to breathe a gas that contains oxygen. The system recycles the gas as it is exhaled. This recycling process allows the diver to continue to breathe safe air, while also allowing the diver to remain underwater for longer periods of time. This system is called a closed circuit system.
- **Scuba Tanks** - Part of the open circuit breathing system, the scuba tank may also be referred to as a diving cylinder. The cylinder stores high pressure breathing gas that contains oxygen. The gas is supplied through the diving regulator. Diving cylinders can hold anywhere from 850 to 4200 liters of gas.
- **Dive tables** – Dive tables, which may also be called decompression tables or tables, are typically printed on cards or in booklets. These tables enable divers to determine decompression stops that they must make during ascension, based on the breathing gas, depth, and length of the dive, to avoid decompression sickness. Commonly used decompression tables include the US Navy Tables, BSAC 88 Tables, PADI Tables, and Buehlmann Tables. Divers may also use Deco On The Fly (DOTF) which is a method for determining the necessary decompression stops without the use of tables or a dive computer.
- **Certification Card** – The diver's certification card that is obtained after successful completion of a divers training course.
- **Log Book** – For certification reasons, divers should log their dives. There are many log books available that are specifically for divers.
- **Watch** – Used in conjunction with the depth gauge and the decompression tables.

Additional equipment you may want to purchase includes:

- **A dive knife and sheath** – a knife is necessary to cut lines or nets, and may also be used to dig. In a worst case scenario, the diver may need the knife for protection against predators.
- **A dive light** – an ordinary flashlight will not do. You need a light that is specific for underwater usage.
- **An underwater camera or video camera** – You will definitely want to take pictures! Make sure that you get a good underwater camera that will be useable in the depths you intend to dive.
- **A dive computer** – Used in place of decompression tables, gauges, and watches, a dive computer figures a safe ascent to avoid decompression sickness.
- **A collection bag** – These are usually bags that drain water. However, large bags may be needed for heavier objects. These are called lifting bags, and are activated by adding air. A dry box may also be necessary to hold items that must remain dry.
- **A dive float** – Also called a diving shot, this is a buoy with a line and a weight. It is used to mark the location of a dive and allows divers to navigate to the surface more easily. The dive float usually marks decompression stops as well.
- **Snorkel** – While you will have a breathing system for deeper water, a snorkel may come in handy at some point.
- **Gloves** – made of wetsuit material, and used to protect the diver's hands, or to retain body heat.
- **A Back Plate** – A back plate may be used to hold the cylinder in place.
- **Compass** – Used for navigational purposes.
- **Diver Propulsion Vehicle** – This is a small vehicle that the diver holds with their hands. Its purpose is to enable the diver to get around easier underwater, and to dive deeper.

- **Communication System** – Diver communication systems are usually installed in full face masks, allowing the diver to maintain communications with each other, or with those on the surface.
- **Distance Line** – This is a line that is used to navigate back to the starting dive point in conditions of poor visibility.
- **Underwater Writing Apparatus** – This usually consists of a slate and pencil that are useable underwater. This writing apparatus makes communication with other divers easy, and also allows divers to take research notes while underwater.
- **Whistle** – When divers surface a distance from the boat, they can blow the whistle to get the attention of those on the boat for pick up. Whistles typically cannot be heard over engine noise. You may also consider a high pressure whistle.

Equipment that should be on the boat used for diving purposes includes:

- **First aid kits** – The first aid kit is usually kept on the boat. A small cheap first aid kit should not be used. Instead, use one of the larger, more expensive first aid kits. When diving, you will typically be a long way from medical help.
- **Dive flags** – There are two types of flags that are universally known and understood in ocean waters. A red flag with a white strip, as seen below, indicates that informal recreational diving is in the area.



A blue and white signal flag, as seen below, indicates that divers are down in the water, and other boats or water crafts should keep clear.



- **Other Signal Devices** - Other signal devices such as a strobe light, orange water dye that is viewable by helicopters, a mirror, flares, and an emergency position indicating rescue beacon.
- **Echo Sound** – Echo sound is a sonar depth measuring device used to profile a dive site.
- **Marine VHF Radio** – Allows those on a boat to communicate with other boats and rescue services in the event of an emergency.
- **Air compressor** – An air compressor that is specifically used refill diving cylinders.
- **GPS Receiver** – To locate and navigate to specific locations. Great for locating dive sites over and over again.
- **Inflatable boat or life raft** – May be needed if the boat sinks.

No matter what your dive requirements are, there is equipment to make things easier or safer for you. However, you should note that it is not necessary to buy a lot of equipment that is offered.

Start with the absolute basics, and then purchase additional equipment as you determine that you need it, based on your diving preferences. Equipment can be quite costly. Again, rent before you buy to help determine exactly what you want and/or need.

The Divers Respiratory System

There are three different respiratory systems available for scuba divers. These three systems are open circuit scuba sets, closed circuit scuba sets, and surface air supply systems. The type of system that you use will depend on the type of diving that you do.

The respiratory system that you choose is essentially your underwater life support system. Typical recreational divers will use either open circuit sets or closed circuit sets, as opposed to a surface supplied air system.

In both open circuit and closed circuit sets, breathing gases are contained in a cylinder or air tank. Many people mistakenly believe that these cylinders are filled with oxygen. This isn't true. When such respiratory systems first came into play, the cylinders were simply filled with compressed air.

Today, however, mixtures of gases are used to help prevent decompression sickness. Because pure oxygen can become toxic when the pressure exceeds 1.6 atmospheres, it is only used during decompression stops in some instances.

The gas mixture is determined by the type, length, and depth of diving that is to be done. Enriched Air Nitrox is often used by divers who wish to stay under for longer periods of time. Gas mixtures and the different types of mixtures should be covered thoroughly in any beginners training course that you take.

The air or gas from the cylinder is either controlled, or uncontrolled. If it is uncontrolled, it is called constant flow, and does not require the use of a regulator. Constant flow is only used for short dives, because the air in the cylinder is used up faster.

Sometimes referred to as an aqualung, a regulator is used to control the flow of air or gas from the cylinder. The regulator automatically adjusts the amounts of gasses that are supplied to the diver based on the depth and pressure of the water. The regulator may be connected to one or two cylinders.

There are three types of open circuit systems: Twin Hose open circuit scuba, single hose open air scuba, and Cryogenic open air scuba. Twin hose systems are rarely used today. Essentially twin hose systems allow the diver to receive air from one hose and to exhale through another.

Today, single hose open circuit scuba systems are widely used. All inhalation and exhalation is done through one hose, which has a diving regulator that contains a first stage pressure valve attached over the cylinder's output valve.

A configuration of hoses called an 'octopus' may also be used. These hoses are attached to a spare demand valve, and this is usually used as a backup or emergency respiratory device, with a second mouthpiece attached. Cryogenic open air circuit systems use liquid air tanks instead of cylinders. These are new in design, and not widely used.

Closed circuit scuba sets use rebreathers. When a diver exhales, the gas is stored, and the air circulates back through the system, passing through a scrubber, which removes the carbon dioxide. A scrubber is essentially a canister that is filled with soda lime.

Because air is reused, the length of the dive can be longer. However, because the scrubber is adversely affected by depth, the depth of the dive is lessened. Rebreathers can also be used as part of a semi-closed circuit system.

Scuba divers must use mathematical formulas to determine how much air is needed for a dive based on how long the dive will last, or how long a dive can last based on how much air or gas is in the cylinder. The length of a dive depends on how much air is in the cylinder, how deep the dive is, and how fast or slow the diver breathes – i.e. breathing rate.

There are different formulas used for open circuit, closed circuit, and semi circuit systems. These formulas should be taught as part of your scuba training. It is very important that you understand and know how to use these formulas properly. Surface supplied air systems are generally used for technical diving.

There are some alternatives to scuba for underwater exploration. Snorkeling is popular, but does not allow for depth more than two feet, as the end of the snorkel must remain above water for air. Free diving is essentially when one swims underwater while holding one's breathe.

Snuba is a technique that is now offered by many resorts. Typically for beginners who have not had training, the same equipment that is used for scuba diving is used, but the diver does not carry the cylinder. Instead, he or she breathes through a mouthpiece attached to a hose, which is attached to the air tanks on the surface. Usually, the diver can only descend about twenty feet.

Finding Your Way Under Water

Underwater navigation is not like anything you have ever done. There are no street signs, and landmarks may move or shift. There are, however, many ways to accurately navigate in the murky depths of the sea.

How can one get lost underwater? It is hard to judge distances underwater – especially the distance that you have traveled. While you can easily distinguish up from down, when you are moving through the water, turning around several times to look at the underwater life, stopping and starting again, it is easy to lose track of where you are, which direction you are going, or how far you have already gone. There are no lines to follow – unless you bring one with you.

While underwater, you will have a lot of things to concentrate on, as well as sea life that may distract you or pull your attention. The water will be murky, which makes visibility harder, and there are no maps to follow.

First, you need a good compass – one that you can see and read underwater. Once you are in the water, look at the compass and note where you are, using the points of the compass. Don't skimp. Get a good compass.

Before you ever go on your first dive, make sure that you know how to use the compass properly. Compasses that are used by divers differ from compasses that are used on land. Make sure you know how to read the right compass before the dive.

Distance traveled underwater is often measured using a method known as 'dead reckoning.' However, dead reckoning is not very reliable. Even so, you need to know how long it takes you to swim a specified distance. You can then estimate how far you have traveled by how long you have been swimming. This may be done in a swimming pool before your first open water dive.

It is important when using this method to make sure that you always swim the same speed. It is also important to realize that swim speeds will be affected by currents.

Another method of navigation is to count, however, you must not allow yourself to become distracted and lose that count. This also works with fin strokes or cycles – you count your fin cycles to determine how many fin cycles will be needed to return to the boat. However, you must use this in conjunction with your compass, and again, you must not lose count.

Of course, the most accurate and safest way to navigate underwater is with the use of a line. This line is either held or attached to the diver at one end, and attached to the boat at the other end. To return to the boat, the diver simply

follows the line back, or uses a reel to reel themselves into the boat. While this is the safest form of navigation, it is also the most limiting method. The diver can only go as far as the line allows, and there must not be anything that will tangle or ensnare the line. Also, make sure that the diver has the ability to detach the line in the event of an emergency.

Next, make sure you have a depth gauge, unless you have a dive computer. While this won't really tell you where you are in terms of where the boat is, it will tell you how deep you are, and help you avoid decompression sickness when you ascend.

It is important to have a plan before you get in the water. While it is difficult to note any landmarks in the middle of the ocean – where no land is visible, there are no buoys, and other boats in the area are likely to move, you must rely on other means of noting your position.

Note the position of the sun when you get in the water. On days when visibility is good, you will be able to see the sun under water. Navigation should be taught as part of your scuba training, however more advanced navigational techniques are not taught in beginner classes.

It is very important that you listen to your dive instructor or the dive host if you are on a group dive. They will tell you how long the dive will be for. On dive tours, the operators usually have a list where everyone puts their name. The operator places marks by each name to ensure that each person returns to the boat before heading back to shore. Make sure you are accurately counted!

Take advanced underwater navigational courses as soon as possible. Knowing how to find your way underwater may mean the difference between life and death – especially in the ocean. Remember that the ocean is extremely vast. If you lose your way, you will be hard to find by rescuers.

Scuba Diving Safety Guidelines

Scuba diving is not only fun, but it is interesting and educational. It is not considered an extreme sport by anyone's standards; however, if you fail to follow proper safety guidelines, scuba diving can be deadly. Here are some general safety guidelines that you should follow:

- If you are ill or don't feel well, don't dive. Live to dive another day. Illnesses and medical conditions that are ignored can cause even more serious medical problems, including death, for scuba divers.
- Pay close attention to your dive tables and gauges, or to your dive computer. Don't ignore the data. Adhere to it to ensure a safe dive.
- Never dive without a buddy. Furthermore, make sure that you trust your buddy and ensure that they will monitor you, as you will monitor them. Never stray out of your buddy's eyesight while underwater. If one of you returns to the surface, you both return to the surface.
- Learn about your dive area ahead of time. Find out what sea life you can expect to encounter, and what the terrain or environment will be like if possible. Know what to expect, but prepare for the unexpected.
- Make a note of tides and currents for your dive area. This information is essential in navigation.
- Never, ever dive while under the influence of drugs or alcohol. Not only does this impair your perception and your judgment, but there are medical risks to be considered as well when it comes to the effect of water pressure on the body in conjunction with the effect of the drugs or alcohol.
- If you take medication, make sure you clear your dive with your doctor ahead of time, even if you are only taking over the counter medication. Your life may depend on it.
- After your dive, if you do not feel well or 'normal' in any way, go to the nearest emergency room and make sure that the physician is aware that you have been diving. Be prepared to give details about the dive, including location, depth, the gas mixture in the cylinder, and any other information that may be pertinent to diagnosing and treating your condition.
- Follow your gut instincts. If you feel the least bit apprehensive about a dive, don't dive. If you start feeling apprehensive while underwater, return

to the surface – but do so in a controlled manner, making your decompression stops along the way as necessary.

- Always have a dive plan, and stick to the plan. Even if you see something you want to explore that is outside of your dive plan, note the location and go back later – stick to your plan.
- While you are underwater to explore, there are some things that are best left unexplored for the time being. For instance, if you come upon a sunken boat or ship that you didn't expect to find or see, do not enter the vessel. Again, note the location and plan another dive later to explore. The same is true with underwater caves. Only those who have been trained for cave diving should enter underwater caves.
- Do not hold your breathe during ascension. Continue to breathe normally and ascend slowly.
- Make sure that you equipment is in top condition and working properly before you dive. Replace worn equipment as necessary.
- Avoid flying for no less than twelve hours after a dive. Preferably, you should wait for approximately 24 hours before flying.
- No matter what, do not panic while underwater. If something frightens you, stop and get your bearings and keep your thinking as clear as possible.

You should learn even more safety procedures and guidelines during your scuba diving training courses as well. Make note of these guidelines and commit them to memory! There may be additional guidelines that apply to the area you are diving in – for instance, “Don't Feed The Sharks!”

About Under Water Pressure and Decompression

Scuba diving can become extremely painful if you do not understand water pressure and take measures to protect yourself from the adverse effects that water pressure has on the human body.

Water is approximately 800 times denser than air, and even though air has weight, water is a great deal heavier. When you are underwater, the weight of the water is actually pressing down on and around your body. The deeper you dive, the more weight you have pressing down and around you.

Ear problems and pain are the most common adverse effects that a diver may experience due to water pressure. The pressure must be equalized, which occurs when the ears 'pop.'

The water pressure also affects breathing. The pressure on the lungs actually compresses them, making it harder to breathe. As we go deeper, we take in more air, naturally breathing in and absorbing more nitrogen. Due to increased absorption of nitrogen, the diver may be at risk for narcosis, and this in turn may cause the diver to become confused.

Problems may also occur when a diver tries to return to the surface, without properly decompressing along the way. The nitrogen gas causes bubbles in your body, and you essentially become 'carbonated.' If you ascend too quickly, those bubbles become larger, causing severe pain – usually within your joints. These bubbles can occur in the blood system as well, which can become deadly.

Divers use tables along with a watch and a depth gauge, or a dive computer, to avoid problems and decompress properly. These tables will also tell the diver how long they can safely remain at specific depths.

Typically, you should rest for 3 minutes every fifteen feet when ascending. You should also take a break between dives to allow the nitrogen to leave your body. Failing to decompress properly can not only be painful, but it can also be fatal, or at the very least, have long term ill effects.

Gravity Underwater

When you are underwater, you may have a sense that there is no gravity. This isn't true. Imagine if you will a concrete brick thrown into the ocean – it sinks straight to the bottom. This is because there is in fact gravity, even underwater. However, if you dropped that same concrete block in space, it would float – because there is no gravity.

That sense that there is not any gravity underwater is actually caused by buoyancy. The force of gravity is literally counteracted by the buoyancy of the water.

So why don't the fish sink? Their bladders are filled with gases, which causes buoyancy, just as air does. This is done by the space filled with the gas or air pushing against the pressure of the water, causing the object or being to float. As the air within the object or being increase, the object or being floats higher, towards the surface of the water.

Essentially, the force of the buoyancy must be greater than the force of the gravity for a being or object to float, and the opposite must be true for an object to sink. If the force of buoyancy and gravity are the same, the object or being will neither float towards the surface nor sink.

In the case of human beings, the force of buoyancy and gravity are almost the same. When a swimmer wears a life jacket, the buoyancy is increased, but without the life jacket, the buoyancy is not enough to keep the person above water level.

To counteract the effects of buoyancy, divers use weights, which can be enough to slowly sink them to the bottom of the ocean, or just enough to keep them from floating up towards the surface. These weights are usually contained within a weight belt that is worn around the waist of the diver.

Underwater Dangers

Again, scuba diving is not an extreme sport, but it can be dangerous. Most people believe that the greatest danger underwater is from predators, but this is not necessarily true, depending on the location of your dive.

In fact, the greatest dangers that divers face are medical in nature. Common medical conditions that are caused by scuba diving include Arterial Gas Embolism, Pulmonary Barotrauma, Inner Ear Barotrauma, and decompression sickness.

Inner Ear Barotrauma is the most common medical condition associated with scuba diving. Also known as squeezes which can affect the teeth as well, this is a condition that happens when you are not properly equalized during a dive. This condition can result in dizziness and potential hearing loss. Middle ear squeezes are the most common and usually only cause severe ear pain.

Arterial Gas Embolism, or AGE, may be the most serious medical condition that can arise from scuba diving. This is a condition where bubbles enter the circulatory system and travel to the brain. This is fatal in many cases. The symptoms include tingling skin, numbness, paralysis, or weakness, and the diver may lose consciousness.

Pulmonary Barotrauma is a condition that occurs during ascension, when the person is not breathing properly. It is common for people who dive with respiratory infections, illnesses, or problems. The symptoms of Pulmonary Barotrauma include breathlessness or shortness of breathe, hoarseness, and possibly chest pain.

Decompression sickness is also known as the bends. This condition also occurs during ascension, and may continue once the diver has surfaced. As with Arterial Gas Embolism, bubbles are formed, but they occur in the body's joints instead of the bloodstream. Not only do these bubbles cause intense pain, but they can also damage body tissues and block blood vessels. Decompression sickness is evident when the brain, lungs, and spinal cord are not functioning properly.

Aside from these illnesses, there are other dangers that must be acknowledged. The underwater environment will be different from one dive to the next, and divers often get cuts or scrapes on exposed skin from objects and underwater life. This can be prevented by exposing as little skin as possible with a wet suit.

Divers may receive injuries from marine life as well, such as jelly fish, sharks, and sharp corals. Divers need to be fully aware of their surroundings while underwater and give way to predatory underwater creatures that may cause injuries or death.

Becoming trapped under water is also a possibility. Never enter caves or wrecks unless you have been trained to do so, and avoid fishing lines and nets. Carry a dive knife in a sheath that is accessible on each and every dive so that you can cut away anything that may trap you while underwater.

While accidents and injuries can happen to any diver, beginners are the most susceptible, simply because they lack the experience necessary to avoid all or most of the dangers. This experience is preferably gained through training, but it is often gained through first hand experience – i.e. becoming injured.

Since becoming injured is a possibility, you need to know how to treat potential injuries before they occur. All divers should strongly consider courses in basic first aid, CPR, and marine safety, as well as beginner, advanced and master diver training courses. Courses concerning various sea life may also be beneficial.

Furthermore, a diver should be equipped to handle emergencies. A good first aid kit on board the boat is essential, as well as a good first aid manual. The ability to communicate with rescue personnel is also important, and you need to know how and when to contact such personnel as well.

Always make sure that your equipment is in top condition, and that you are in top physical condition as well before a dive. Make sure that your buddy is also in good physical condition.

By understanding the potential danger, you will be better equipped to avoid such danger, or at the very least to be able to treat the effects of the danger if the need arises. Again, follow your gut instincts. If you sense danger, danger most likely exists.

Scuba Diving Organizations and Communities

There are a great many scuba diving organizations and communities. Most of these organizations and communities can be located through local dive shops. You can also find communities of scuba divers online. Furthermore, different countries have different national organizations for scuba divers. Here is a listing of some of the more well known organizations:

- **Diver's Alert Network (DAN)** – <http://www.diversalertnetwork.org> – Established in 1980, DAN is a non-profit medical and research organization that is dedicated to the health and safety of recreational scuba divers. The organization is associated with Duke University Medical Center, and is supported by the largest association of recreational divers in the world.
- **Handicapped Scuba Association International (HAS)** – <http://www.hsascuba.com/> - Founded in 1981 by Jim Gatacre, the HAS is the world's leading authority on recreational diving for people with disabilities. The HAS is a non-profit organization located in California, and has educational programs worldwide.
- **National Association for Cave Diving (NACD)** – <http://www.afn.org/~nacd> –
- **National Association of Black Scuba Divers (NABS)** – <http://www.nabsdivers.org> –
- **International Association of Nitrox & Technical Divers (IANTD)** – <http://www.iantd.com>
- **National Association of Underwater Instructors (NAUI)** – <http://www.naui.org> –
- **YMCA – Y-SCUBA** – <http://www.ymcascuba.org> – In existence for the past forty years, the YMCA scuba division offers some of the best scuba training available in the world. Serving both young and old divers, the YMCA offers courses that range from beginners to masters.
- **Professional Association of Diving Instructors (PADI)** – <http://www.padi.com> – PADI is one of the top diving schools and organizations in the world, offering courses that range from beginners to master.

- **Professional Diving Instructors Corporation (PDIC)** – <http://www.pdic-intl.com> – The PDIC was established in the 1960's, due to a need to properly train scuba instructors. The organization started offering training for open water diving in the 1970's. Today, PDIC is a founding member of the Recreational Scuba Training Council.
- **Scuba Schools International (SSI)** – <http://www.ssiusa.com> – Founded in 1970, SSI is made up of scuba dealers and instructors. The organization contributes to the art and science of diving and has developed a method of teaching that produces confident divers.
- **British Sub Aqua Club (BSAC)** – <http://www.bsac.com> – A UK organization, the BSAC was founded in 1953 by a small group of people who enjoyed underwater activities for the purpose of promoting underwater exploration. Over the years, the BSAC has greatly expanded and today serves more than 45,000 members, making it the largest diving club in the world.

Again, there may be diving associations that are more specific to your geographic location, or to the type of diving that you do. Be sure to check with your local dive schools to find more information about those organizations.

Some online scuba diving communities include:

- **Scuba Duba** - <http://www.scubaduba.com/>
- **Scuba Board** - <http://www.scubaboard.com/>
- **Diving In Depth** - <http://www.divingindepth.com/>
- **About.Com Scuba Community** - <http://scuba.about.com/od/community/>
- **Diving Obsession** - <http://www.divingobsession.com/>

There are also many geographic specific online communities as well. You can use any search engine, and simply type in your state, country, or region, and the words 'scuba diving community.'

Where To Dive

Your first open water diving experience should be arranged through your dive school, as part of your training. It is not advisable for inexperienced divers to dive in waters that they are not familiar with.

Beginners should start in waters that are not overly deep, or overly dangerous, where help can quickly be obtained if it is needed. Ideal locations are just off the shore of beaches, especially if there are no expert divers in the vicinity or in the dive party.

When diving in open waters, after training has ended, the beginner may want to stick to dive tours. These are commercial tours, where certified divers are taken out to dive locations. The divers are monitored, and as with most things, there is safety in numbers.

You can find dive tours and expeditions in most coastal areas. Dive schools are also a good source for finding tours and expeditions, and may even host such events as well.

You will make friends through your dive school as well. The other students in your dive class may be willing to get together to dive. Again, there is safety in numbers.

You can find a wide variety of detailed dive locations and tours on the Internet as well, with detailed information. This will enable you to arrange tours or private dives in areas where you can expect what you hope to see when you are underwater.

Again, it is not a good idea for inexperienced divers to dive in unexplored waters. It is also a bad idea to go off on private dives until you have gained more experience. Furthermore, you should never dive alone. Always make sure that you have a dive buddy with you.

Beginners should also consider bringing along a third person that will stay in the boat while the dive is in progress. This person can make sure that both of the divers return to the boat in a specified period of time, and help warn other boats of divers in the area.

Dive Vacations

One of the things that you may most enjoy about scuba diving – aside from the beauty of the underwater world – is dive vacations. These are essentially planned vacations, where scuba diving will be the main entertainment, and is the main purpose of the trip.

Planning a dive vacation is unlike planning any other type of vacation. Start by choosing your destination. Make sure you do this before you talk to the travel agent. The more research you do concerning your dive vacation, the more enjoyable the vacation is likely to be.

When choosing your destination, it is important to choose a location that is suitable for your skill level, the amount of time you have, what you hope to see, and your budget. Begin your search online, and then consult with a dive travel specialist.

A dive travel specialist is a travel agent, but they obviously specialize in dive vacations, and understand the needs of divers better than ordinary travel agents. The dive travel agent will make your travel and hotel arrangements, but will also book dive tours and/or expeditions for you as well, based on your wishes. Whether you make the reservations yourself, or use a travel agent or dive travel specialist, make sure that you confirm all of your reservations yourself.

For dive vacations, it is a good idea to have flexibility concerning your travel dates. Some dive tours won't start until specific dates. Likewise, you should not fly within 24 hours of your last dive. If you will be traveling out of the country, allow time to get passports, visas, or any other documentation that may be required. Make copies of these documents, and leave them at home with a close relative.

Since you will not be diving the entire time, you should also plan other activities that are specific to the area that you will be visiting. Learn as much as you can about the area you will be visiting, before you leave. If possible, learn the language. Also find out about the currency exchange, cultural information, health hazards, and any requirements for foreign visitors.

Well before your travel dates, find out what airlines policies are concerning diving equipment. With heightened security at airports, you may not be able to travel with all of your required equipment. This means that you may have to ship your equipment in advance, or purchase or rent new equipment when you arrive. Get the details ahead of time!

Try to travel with a group. Groups get discounts that individuals are not eligible for, and can reduce the cost of your dive vacation considerably. This will also

give you instant friends to travel with and hang out with when you arrive. Being in a foreign country alone can be very scary. Dive schools and dive travel specialists are good sources of information for finding groups or for putting groups together for dive vacations.

Find out about diving conditions well in advance. Know what type of underwater life you may encounter and what the water conditions will be like – including water temperatures. Do research and find out what you can expect in terms of weather conditions. Nothing would be worse than a dive vacation that is ruined by bad weather.

Get a pre-dive physical from your doctor before you leave. Let him or her know where you are going, and inquire about any vaccinations you may need for that location. Also find out what the effects of any medications or vaccinations on your diving are.

Again, learn the language if possible. If this isn't possible, find out if anyone will be available on the dive tour that speaks and understands your language. The language barrier can literally get you killed or seriously injured if you do not understand what is being said to you, or others don't understand what you are saying.

As you would with any other vacation, do not bring unnecessary valuables with you. Also make each piece of your scuba equipment easily identifiable. You should also consider travel insurance, as well as dive insurance, if it is available to you.

Diver's Glossary

Here are some terms that you should learn if you want to be a scuba diver. Knowing these terms is very important. Most terms will be defined and explained by your dive instructor, but if you know them before your training starts, you will be well ahead of the game.

- **Aqua Lung** – Breathing equipment that is used underwater. The equipment consists of a diving cylinder and regulator.
- **Gas Blending** – The act of filling dive cylinders with various mixes of gasses.
- **Gas Embolism** – A condition that is caused when a diver emerges too quickly. Gas bubbles essentially enter the blood stream and travel to the brain. This can cause death.
- **Barotrauma** – a condition that is caused by water pressure or air pressure.
- **Recreational Diving** – Diving that is done for the purpose of enjoyment, relaxation, or leisure, as opposed to technical diving, or other types of diving.
- **Dive Master** – A diver who has master diver status. This individual usually leads inexperienced divers in open water dives.
- **Buddy Breathing** – An event that usually occurs during an emergency situation, this is where two divers breath from either the same mouth piece, passing it back and forth, or from the same tank, using separate hoses and mouth pieces.
- **Dive Profile** – Much like a personal profile, the dive profile gives information about a particular dive, listing various facts about a dive that the divers need in order to maintain safety. The dive profile usually includes the depth and time required or allowed for the dive, and is important to the diver's decompression time.
- **Frogman** – An elite team of military divers.
- **Anoxia** – a condition that occurs when breathing a gas that contains no oxygen. The affected person may not be able to inhale any breathing gas at all.

- **Carbon Dioxide Poisoning** – A condition that occurs when a person is not able to completely exhale or eliminate all of the carbon dioxide within their system.
- **Carbon Monoxide Poisoning** – A condition that occurs from inhaling gases that are not properly mixed.
- **HPNS** – High Pressure Nervous Syndrome. Also known as Helium Tremors, this condition is caused by using a mixture of gases that contain helium in deep waters.
- **Nitrogen Narcosis** – A medical condition that is caused by breathing high pressured nitrogen in deep waters.
- **Drowning** – Inhalation of water, resulting in death.
- **Secondary Drowning** – Death that occurs several hours after a near drowning experience.
- **Hypoxia** – A condition that means that there is not enough oxygen in the body. This is caused by inhaling breathing gases that do not contain enough oxygen.
- **Dysbarism** – A medical condition that is caused by changes in pressure.
- **Pneumothorax** – the medical term for a collapsed lung.
- **Interstitial Emphysema** – A condition that occurs after one experiences lung barotrauma, where gas is trapped in the chest cavity.
- **Salt Water Aspiration Syndrome** – A condition that occurs when one accidentally inhales sea water – even in small amounts - which causes a reaction in the lungs.
- **Hypercapnia** – A condition that is essentially the same as carbon dioxide poisoning. This condition occurs when one is rebreathing their own exhaled carbon dioxide.
- **Hypothermia** – A medical condition that occurs when the body becomes too cool.
- **Subcutaneous Emphysema** – Gas that appears under the skin tissue.
- **Oxygen Toxicity** – A medical condition that is caused when a person inhales too much oxygen.

- **Hyperventilation** – A condition that is often caused by inhaling too much air too fast. In terms of diving, this is often a condition that is caused deliberately to extend the length of a free dive.
- **Decompression Sickness** – A very dangerous, yet common medical condition that is caused by ascending to the surface too quickly after a deep dive – without decompressing. Potentially lethal, this condition causes inert gases to become trapped in tissues, organs, and blood vessels.
- **Bounce Diving** – Diving that involves descending to a maximum depth, and then ascending back to the surface quickly.
- **Hard Hat Diving** – Also known as surface supplied air diving, this type of diving is usually done by professional or technical divers who wear a diving helmet with an air hose attached for the air supply from the surface.
- **Professional Diving** – Diving that is done for monetary compensation.
- **Shore Diving** – Diving that is done just off shore, without requiring a boat.
- **Drift Diving** – Diving into a current.
- **Technical Diving** – Diving that is often done by professional divers for reasons other than recreation, such as research or exploration.
- **Saturation Diving** – Used by commercial divers, this is a decompression routine that allows divers to dive for weeks at a time, with their tissues becoming saturated with high pressure gases.
- **Night Diving** – Diving that is done at night.
- **Wreck Diving** – Diving done for the purpose of exploring or recovering wrecked ships, boats, airplanes, or other vessels.
- **Solo Diving** – The act of diving alone, without a buddy. This is not recommended.
- **Wall Diving** – Diving that is done beside a vertical wall. This is actually a dangerous type of diving.
- **Buddy System** – Two or more divers who dive together, and stay together underwater, watching out for and monitoring each other during the entire dive. Highly recommended for all divers.

- **Log Book** – A book that is kept by a diver, listing all dive, including times and locations. The log book is used as proof of experience.
- **Dive Club** – A group of people that come together at regular intervals to dive, or to discuss diving. These clubs often form dive groups for dive vacations and explorations.
- **Time To Fly** – The safest time to fly after a dive. The ideal time is 24 hours, however the time between diving and flying should never be less than 12 hours.
- **Dive Marshall** – Also referred to as a beach master, this is an individual who records times that divers enter and exit the water. This person is always present during training dives, and keeps track of students and provides assistance as needed. May also be called a dive master.
- **C-Card** – Also called a certification card. This is the card that one is issued after completing diving training, and is used as proof that one has actually completed the training.
- **Navy Seal** – A member of the elite Navy team known as the Navy Seals.
- **Wet Suit** – A suit worn by divers that hugs the skin. Wet suits are made of a material known as Neoprene. Wet suits offer minimal insulation to keep the body warm and they limit the amount of water that gets inside of the suit.
- **Semi-Dry Suit** – A semi-dry suit is a combination of a wet suit and a dry suit. The wrists and ankles are sealed to reduce the amount of water that enters the suit.
- **Skin Suit** – A skin suit is made of lycra, and is worn in lieu of a wet or dry suit in warmer waters, or under a wet suit in cooler waters for added insulation.
- **Standard Diving Dress** – Standard Diving Dress is no longer used today. The term is used to describe diving apparel that was worn when scuba diving first started.
- **Dry Suit** – Dry suits are much like wet suits, except that they provide more thermal insulation, and keep the skin dry to protect the diver from exposure to cold water.
- **Trimix** – A mixture of gases that include oxygen, nitrogen, and helium.
- **Nitrox** – A mixture of gas that includes nitrogen and oxygen.

- **Partial Pressure of A Gas** – Refers to the concentration of each gas in a mixture of gases.
- **Compressor** – A machine that is used to fill diving cylinders or air tanks, using high pressure.
- **Electro Galvanic Fuel Cell** – A device that is used to measure the amount of oxygen a diving cylinder.
- **Recompression Chamber** – A chamber that is designed to treat and prevent decompression sickness. Typically used on ships and in facilities that professional divers work from.
- **Rebreather** – A respiratory support system used by divers that recycles the air that is exhaled by the diver, making it possible for the diver to stay underwater longer.
- **Decompression Stop** – A point where a diver must stop for a period of time during ascension for the release of inert gases in order to prevent decompression sickness.
- **Equivalent Air Depth** – The narcotic effect of gases that are inhaled when those gases include nitrogen.
- **Maximum Operating Depth** – The maximum depth where the partial pressure of the oxygen that is contained in a gas mixture becomes unsafe.
- **Decompression Tables** – Tables that are printed out and carried by divers to determine how long they can stay at certain depths, and where they must make decompression stops on ascension in order to prevent decompression sickness.
- **Decompression Buoy** – A buoy on a line that divers use underwater to help them locate the boat, and to mark decompression stops accurately.
- **Surface Marker Buoy** – Also called an SMB, this is a small buoy that divers take underwater with them in order to locate the boat.
- **Dive Flag** – A flag that is used to indicate that there are divers under the water. The flag may be either red, with a white diagonal strip, or blue and white. These flags warn other boaters that there are divers in the vicinity.
- **Buoyancy Compensator** – Also called a BCD, this is equipment that is worn by divers to keep them from floating on the surface, and to make

immersion easier. The BCD can also allow the diver to reach the surface fast by releasing the BCD.

- **Dive Shop** – Shops that sell diving equipment. Many dive shops also offer dive training and organize dive tours and expeditions.
- **Dive School** – A school that has instructors certified to teach diving skills to others and to help those students get certification to dive in open waters.
- **Dive Tables** – Dive tables are the same thing as decompression tables. These tables are used in conjunction with a watch and a depth gauge to determine decompression needs to prevent decompression sickness.
- **Surface Detection Aids** – Surface detection aids may include dive flags, flares, whistles, or other devices that help divers find the boat, or to warn others that divers are in the area. These devices may also include location devices in the event of an emergency.
- **Controlled Buoyant Lift** – A technique used by rescue divers, where the buoyancy of the rescue diver and the person being rescued are controlled.
- **Surface Interval** – The time spent on the surface between dives. This time is necessary to allow the body to rid itself of gases, and to plan decompression stops for their next dive session.