(616) 364-5991 **SCUBA DRILLS** *WWW.MOBYSDIVE.COM*

Snorkeling Gear Prep, Entry, Snorkel clear, Kicks

Gear prep: Mask (ant fogged) –fins, gloves, boots, ready by entry point access.

(it is crucial that the mask-fins-boots are properly designed and fitted before the aquatic session to prevent delays in training due to gear malfunction)

Equipment nicely assembled by entry point for easy donning and water access

ENABLED ***EQUIPMENT NICELY ASSEMBLED – BUDDY CHECK – LOGBOOK CHECK – ENTRY – DRILL REVIEW***

Equipment Nicely Assembled:

(Each Diver needs to develop the practice of properly assembling their scuba gear by themselves)

Full tank secured until ready for gear assembly. Tank upright, BCD tank band straps are loosened as to allow easy placement of strap around the tank. **NOTE: Hard pack BCD's usually have ONE tank band, Soft pack BCD's usually have TWO tank bands. Most bands have a buckle / cam strap and need to be weaved a particular way to stay secured.**

Ensure the BCD's placement on the tank so the tank valve is level with where the diver's neck will be and that the front part of the valve (where the air is released) is facing the back of the diver.

Secure the strap or straps so they are tight enough to pick up the BCD and tank and not slip while shaking.

Regulator placement: The First stage (dust cap removed) is placed over the tank valve so the intake of the 1st stage covers the o-ring on the tank valve, (o-ring should be in place – if not, lack of seal will cause air leak).

Place the 1st stage on the tank valve so the "low pressure" 2nd stage hoses are higher (up) rather than lower.

The 1st stage screw knob is then tightened (but not over tight), ensure the 1st stage straight up rather than crooked.

BCD connections: connect the lp BCD hose to the inflator/deflator. The hose has a slip collar that is pulled up while placing the hose over the inf/def intake nipple. It is secure when it is soundly attached and cannot be pulled off unless the slip collar is pulled up again.

Utilize the BCD hose management to hold the hose in place preventing dangling equipment.

The primary 2nd stage should be up off the ground and placed in a protected accessible area. The Safe 2nd should be secured in the safe 2nd holder located on the right side of the BCD where the right arm can easily grab the hose (like a holster for a pistol). The gauge console is also secured in a place that is easy to reach and look at while diving.

The placement of the gauge is sometimes optimal when attached to a retractor of some sort, to be pulled out to look at or perform compass navigation easily – then retracted back in a secure spot when not used.

The retractor placement is sometimes attached on the right side of the BCD, while the gauge comes around the LEFT side attaching and securing the gauge is done after the bcd is donned.

Dry breath check on 2nd stages. Suck in on the 2nd stages before turning the air on to check for air leaks.

The 2nd stages should NOT allow any air in. If it does, this usually indicates a tear or hole in the mouthpiece diaphragm or purge in the 2nd stage. Alert the Dive Leader .

Tank Air: TURN THE AIR ON Open by twisting valve open (lefty loosy – open /righty tighty closed).

Twist open the tank valve as far as allows then back one turn.

You will hear the air fill the lines and should not hear any air leaks at all.

If you do hear air hissing or leaking, alert the Dive Leader to assist.

Check the 2nd stages listen for leaks, **NOTE: sometimes a very slight hiss indicates the adjustment knob is opened all (or most) of the way and just needs to be turned in (again righty tighty – turn knob right / clockwise will tighten).**

Check both the Primary 2nd stage and Safe 2nd, depress purge quickly to see if it is functioning smoothly.

Check Inflator / Deflator with a quick blast of air on the inflation button, and the dump button for smooth performance.

The purpose of this check is to ensure the valves are not sticking and the air is flowing smoothly.

NOTE: do not depress valves as to waste excess air, a quick short blast will do.

Last stand back and look at the "BCD / Tank / Regulator" set up, a last visual to see if everything looks good and in place before depending on it as an underwater "life support" system.

Buddy Check: switch to your buddies gear and inspect as if it is your own, question buddy on anything,
quick short air blasts, both divers are confident of proper gear function.

Log-Book check: This checklist is to prepare for the dive beforehand in areas: Buddy protocol, Equipment Check,
and Pre-Dive Plan. *After the dive log Post-Dive analysis, and any specialty dives recorded.*

NOTE: Every Diver needs a Log-Book. The Log book serves a variety of purposes for the diver.
The Log book is a checklist to review Buddy protocol, Equipment review, Environment assessment, Pre-dive planning, Post dive analysis, Notes pertaining to the dive such as highlights, lowlights, lessons learned about the dive, etc., Also the log-book is a record of the "type" of dives you have done "specialty dives" that can count toward a "specialty" rating such as navigation, night / limited visibility, wreck, deep diving and many others that can lead to an Advanced Diver level and even Master Diver level.

Entries:

Objective: a smooth transition from land into water with your scuba gear (5 types described here)

1. Giant Stride: (most common from boat, dock or platform by water's edge)

Get the "OK" from Dive Leader to proceed before entry with surface support in place to assist in need.
Gear completely donned, stand at platform by water's edge with "feet" half way over the edge
BCD to be inflated at least 50 – 75% for buoyancy after entry.
Right hand fingers holds and secures mask as if it will be knocked off,
palm to surround second stage regulator (in mouth) as to provide a shelter from the impact of water upon entry
Left "arm" is to reach around front of body to hold back and secure any loose peripherals attached to the BCD such as corrugated hose (inflate deflator), gauge, and or light, slate, camera or any such attached equipment to diver (NOTE: larger – bulkier equipment to be used by diver should be handed to the diver via surface support after the diver make their entry, such as camera system).
Bite down snuggly on mouthpiece preparing for it to be knocked out of mouth
Diver stands upright facing and looking forward then steps (with prominent leg) toward the water,
As diver steps forward to enter water keep other leg on the platform edge until it follows bent at knee
as to allow top side of fin to contact parallel with water.
The leg (and fin) that first make contact with the water should be parallel with the water
as to act as a buffer into the water dampening the contact.

(Note this entry is NOT a giant "hop" with both legs together - this can be dangerous as the divers tank can slam against the boat or dock edge)

The purpose of the giant stride is to step out and "away" from the edge for good clearance.
Diver will enter water, usually submerging momentarily until the buoyant BCD pulls the diver up to surface.
At surface signal the "big OK" signal to surface support (if OK). ***If the diver is NOT OK – they usually don't signal.***

OK SIGNALS Three "OK" signals

"Little OK" is thumb and index finger creating circle prominently displayed for close diving communication.
"Big OK" is one arm reaching out to side, up and finger tips touching top of the head with the fingers
creating a prominent circle generally for communication to surface support or 20 to 75 feet away.
"Really Big OK" both hands above head, finger tips touching creating a big circle.
This is a long distant (surface) communication from over 100 feet away.

2. Front roll: (not that common usually done in awkward boat or dock entrance points)

Stand at edge of water ***as earlier described***. Knees bent and body Bent over (forward)
Simply tip forward –falling toward the water. Half way point (45 degree angle)
KICK off the edge with both legs (as they are pre-bent) , pull head and shoulders down to perform a somersault
into the water landing on your cylinder on your back to dampen the blow.
Ok sign to surface support

3. Back roll: (not common, typically done in a row boat type of boat, where the boat is small and can be "rocked" more easily.)
NOTE: Back roll allows the diver a lower center of gravity more stability for the diver and boat.)
Gear assembly done on shore before placing in small craft. Equipment probably should already be donned while entering the boat. When the diver is ready to enter water, they will sit on the edge (side) of the boat. A counter balance is necessary on the other side, either a diver or boat tender. Both divers could back roll at same time as to balance out boat on both sides during entry, this will minimalize the boat from rocking.

Diver sits on edge of boat facing inside the boat, securing mask with right hand and securing remaining gear with left hand, crouching and bending inside the boat. Air in BCD for buoyancy. When ready, lean back and let tank hit the water, be very careful as to keep legs BENT and stiff at a 45 degree angle when falling into the water, allowing the legs to clear the edge of the boat.

If this is not done the legs will scrape the edge and hurt. After regaining surface buoyancy and composure, OK signal to buddy or boat tender.

4. Side Entry: ***(Not common, usually done if the physical capabilities of the diver do not allow the diver to perform other entries.)***

Air in BCD for buoyancy; Diver sits on a stable edge by the water facing out, placing both the right and left hand together (on right or left side). Diver postures their back to angle closer toward the water entry point. When ready, diver nudges their behind off the edge and pushes with both hands together with enough momentum as to clear the tank from the edge.

Before entering the water the diver will quickly place right hand on mask and left hand over remaining hoses and gear to secure before entering water. Buoyancy up and OK to shore support or buddy.

5. Shore Entry: 2 Methods: ***I.) Gear donned on shore***. Walk in water carrying fins in hand. When waist deep, lean on buddies shoulder to don fins. OK to dive.

II.) Assemble gear on shore, carry BCD pack and fins into water. When 2-3 feet deep, place fully inflated BCD / tank in water (securing the adjustment straps inside to secure hoses / gear), secure fins inside BCD too if a long trek out to deeper water. Tow BCD to waist deep water. Don fins first, leaning of floating BCD. When ready detach loosen BCD straps and cummerbund and open out. Flip BCD around so the top of the floating BCD is pointing at diver. Place arms into loosened BCD shoulder straps, grab tank securely. Take breath and crouch under the water – pulling and flipping BCD onto back.

As diver stands up the BCD will naturally land on the back of diver. Secure straps – cummerbund. OK to dive.

Surface Descending Procedure 2-25:

Buddy check before descent: ensure that both divers are ready physically, mentally and equip-mentally.

Descent: using rope as a stabilizing to stop and take time to equalize from the squeeze (ear clearing and BCD deflation)

When reaching established depth take a moment to re-adjust and secure equipment.

Regulator Clearing 2-23:

Regulator Clearing objective is to expel water from second stage cavity that can enter when removed from mouth.

Drill: remove 2nd stage regulator from mouth and point the mouthpiece DOWNWARD to prevent FREE-FLOW, which can (and will occur) if the mouth piece is pointing UP. **NOTE: This is caused from the increased pressure underwater that will force the exposed open cavity of the 2nd stage to suck the air out. This is how regulators are designed to allow the increased pressure (or sucking / breathing) for "easy breathing". "EVERY" regulator designed is susceptible to this.**

The concern is two-fold, One is precious loss of air, the other concern is when a second stage is allowed "free-flow" it WILL begin to freeze (or stick open) unable to stop the free-flow (unless the air cylinder is shut off).

During the time the 2nd stage is out of the mouth the diver is to gently blow air out of the mouth to show that they are "breathing" (divers are always breathing – never holding their breath)

When replacing the 2nd stage back in the mouth, the diver can do one of two things to eliminate the water from the 2nd stage cavity. ***1) Blow*** : is to simply exhale with effort through the mouth, forcing excesswater out the bottom purge port on the 2nd stage. ***2) PURGE*** : press the front purge plate on the 2nd stage that depresses the lever allowing air from the regulator to force water out of the 2nd stage.

3) A COMBINATION: of the two techniques together at the same time is highly efficient is quickly forcing water out. One quick blast of air out of the mouth can ALSO prevents accidental choking if the diver hasn't prepared for purging.

Regulator Retrieving 2nd stage 2-23: Objective of this drill is to familiarize the diver with location and retrieval of the 2nd stage regulator if accidentally misplaced, or knocked out of the mouth

TWO METHODS: 1) **SWEEP:** First Take regulator out of mouth after a breath, point mouthpiece DOWN then place 2nd stage to the side - Exhale lightly blowing bubbles. Right hand touch bottom of tank, LEAN at 45 degree angle to the right, sweep right arm straight up, Look at right bicep to locate 2nd stage hose grab 2nd stage and place in mouth to purge / blow clear

REACH BACK : LEFT hand grab bottom of tank and "pull" tank up (making it easier to reach the 1st stage), RIGHT hand reach for 1st stage, feel for the hoses attached on right side, grab front hose and slide it through the hand until 2nd stage visible, place in mouth – purge / blow clear.

Mask Clearing 2-2: Objective is to be so comfortable clearing the water out of the mask that at any point for any reason the diver has the confidence to remove and replace the mask from their face and completely expel the water.

IMPORTANT - BREATHING Technique breath in (mouth) exhale through NOSE full inhale – full exhale - slow and steady.

TWO METHODS : 1) **Partial** fill and clear: Allow water to seep in the TOP of the mask trickling in to fill mask halfway full, stop and place gentle pressure at the top of the mask, with nose pointing up (looking up) - exhale through the nose forcing water out the bottom of mask like a purge, repeat until mask cleared.

2) **FULL** mask clear: remove mask completely from face, take three full breaths without the mask on (breathing in the mouth –OUT THE NOSE), while tracking the exhalation through the nose – place the mask strap behind head and mask above the face, use the mask to catch the air expelled through the nose, bring down over the face to seal mask (all the while expelling air through the nose) REMEMBER slow steady breathing – a nice slow exhalation will be plenty of time to fully clear the mask while placing it over the face. The mask should be fully cleared.

NOTE: this technique is preferred in training newer students, as this method does not unintentionally push or force water up the nose of a diver during this drill.

Buoyancy Control 2-26: (Buoyancy Control Device): Diver shown the various ways of "dumping" eliminating air from the BCD 2 ways. 1) Inflator / Deflator: the "Inflator/Deflator" is located mid chest - left side attached to the corrugated hose. The corrugated hose allows the diver to hold UP the Inf./Def. while depressing the "DUMP" button (generally located on the end / lower part of the inf/def mechanism) this allows air to be naturally vented up and out of the BCD. 2) PULL DUMPS : most modern BCD jackets have a cable inside the corrugated hose connected to a dump mechanism on the shoulder, allowing the diver to "pull" down on the infl/defl (or corrugated hose), to release (dump) air without holding up the hose.

Other Pull dumps are generally connected to a string / pull knob attached to different locations such as the right shoulder, right rear bottom BCD bladder, or sometimes the left rear bottom bladder.

BCD Buoyancy Control inflation is established by depressing the "inflation button" (generally located on the top / upper part of the inf./ def. mechanism) various pressure application of this button should control the "amount" (volume) of air allowed in the BCD at a given time to fine tune perfect buoyancy for any given depth.

NEUTRAL BUOYANCY Drill: Objective is to learn to "maintain" neutral buoyancy with the BCD

(Drill to be performed on pool floor, platform, or sandy / clean lake bottom). Diver to eliminate air from BCD, laying on stomach flat on bottom holding inf/def forward with thumb on inflator button –pressing to allow quick short air blast into the BCD, the diver has to be patient between inflations to allow time for the buoyancy created to "take effect", The buoyancy should be perfect, in that, it will allow the diver to slowly raise up from the bottom, but not too much as to continue rising to the surface. Perfect buoyancy is reached when the diver will raise and lower slightly in conjunction with their breathing ***(going up slightly when inhaling then down slightly when exhaling).***

Ascending 2-27: Objective is to get to the surface in the safest and most controlled manner allowing body and equipment to acclimate to the decreased pressure upon ascent.

Acknowledge to your buddy that it's time to go up to your based on a pre-determined circumstance ***(air pressure or dive time).***

Always use descent / ascent line if available (for control), swim toward line First diver place, RIGHT arm around line and grab gauge (to monitor ascent rate / safety stop time), left hand grab inflator / deflator and hold up, thumb is on the DUMP button ready to depress (BUT NOT DEPRESSING until needed), kick up to ascend slow (very slow) looking up as well as monitoring gauges, buddy follows below. Rate of ascent is "very slow" ***(30 feet per minute or no faster than the tiniest bubble expelled),*** dive buddies stay close to each other to assist each other if need.

Safety stops at 60 (if below), for a minute, then again at 30 feet for a minute, then again at 16 feet for 3-5 minutes, allowing the excess nitrogen to be eliminated via- respiration. The final stage of ascent the diver will become quite buoyant, so it is necessary to be prepared to dump excess air to maintain neutrality, also continue looking up and hold up right hand to block for obstacles (or other divers) and to be sure there are no boats with their props running ***(you should clearly hear this which will provide a warning to stay clear).***

NOTE: The "diver down" flag is a requirement while diving as a warning for water craft to stay 200 feet away from divers. On a dive off of a boat, the flag is mounted clearly on the vessel. If shore diving the diver will pull a surface dive flag.

Surfacing 3-31:

As divers clear the surface, inflate the BCD for ample surface buoyancy and signal the "big OK" or "Really big OK" signal to the Dive Leader or captain on the boat. Or shore support whatever the case may be.

Exits 2-28 / 29:

Exit plan to be set before entering water, (consider tides, currents, and other potentially challenging environmental hazards).

EXIT on to BOAT : become buoyant, First piece of equipment OFF is weight system, Second is fins while holding the boat ladder, then climb up into boat with gear on. In some cases the boat Captain may have a system of hauling up your BCD / tank and in that case – the diver would take BCD off in water while holding the boat securely.

Alternate Air Sharing 3-32:

Out of Air Scenario Objective : is to get air to the diver with the equipment malfunction, then get to the surface safely.

2 remedies: 1) **With dive buddy present**, 2) **Alone**

NOTE: It is a good exercise for the student to experience the sensation of a regulator ceasing to deliver air (under controlled supervision), for the sake of understanding what that sensation is like.

Out of Air with buddy: RECEIVER (is the diver with the regulator malfunction), Donor is the diver delivering air to the Receiver. The Receiver swims toward the donor getting their attention and signaling "out of air" in a very exaggerated way. (see hand signals examples). The donor reaches for their primary second stage (in their mouth) grabbing the hose at the base of the second stage (taking a full breath before taking it out of the mouth) then pulling it out and forward toward the Receiver, making sure the mouthpiece is in the upright position for easy placement in mouth. The donor also places their LEFT arm forward with hand in "blocking" position to protect themselves yet readying to grab hold of the Receivers BCD shoulder strap to secure them.

After the Receiver places regulator in mouth and purges it, the Donor grabs his Safe 2nd (either the alternate inflator/deflator - Safe 2nd OR the safe 2nd "secured" at the lower right side) to use for their air supply. After both of the divers are breathing well, either the Doner or Receiver signals "OK" to proceed. Next step is for the buddy team to get to the ascent line for a controlled ascent. When at the line, IF NECESSARY, the receiver blows two times into the manual inflation of the BCD (for neutral buoyancy ***and*** for practice, familiarizing themselves with manual inflation during equipment malfunction).

Both divers ascend slow following the proper ascending procedures if air supply allows.

Emergency Ascents 3-33

Emergency Swimming Ascents 3-34

Out of Air ***(Alone)*** Emergency Swimming ascent: Objective is to get to the surface safely and effectively without air delivered from the regulator, and no other divers are available to help.

Prevention: stay in close proximity to dive buddy. Keep equipment serviced and well maintained, carry a redundant (back-up) system while diving

Proceedure: Lookaround for help, place hands on WEIGHT DUMP release READYING to dump weight if need, but DO NOT DUMP unless you cannot kick up. NOTE: if a diver is properly weighted and has proper buoyancy, it would take very little effort to kick up to "go-up" thus ditching weight is not necessary.

However if in doubt and if any restriction from a clean shot to the surface, ***ditch the weight***.

SUB NOTE: The concern of ditching weight is that is can allow the diver to surface TOO rapidly potentially causing over-expansion injuries, however proper exhalation while ascending can prevent injury as explained further.

While ascending, keep air passageway open- just exhale. While ascending and exhaling the increased volume of air from the lungs will escape out your mouth / nose, this is necessary to prevent the lungs from over expanding and ripping creating an over-expansion injury (see diving injuries cause prevention treatment).

While ascending (and continuing to exhale), the diver will need to flare out (like an inverted sky diver free-falling) at approximately 15 feet under to create "drag" preventing the diver from slamming into an object at the surface of the water. (15 feet under can be determined by seeing the surface in good visibility, or by the sudden increase of light approaching the surface. ***(In night diving circumstances the diver should flare out immediately until at surface).***

Diver to get surface support help and to do a self assessment of injury If any. ***Properly done, no injury should occur.***

Buoyant Ascent 3-34:

Out of Air Emergency Buoyant Ascent: Same as Buoyant Swimming Ascent with the only difference of "DITCHING the WEIGHT SYSTEM" OFF to the side. Ensure that when the weight system is pulled OFF – that it is cleared from the diver as not to entangle. Premise being that weight removal is necessary due to ineffective surface kicking, (diver is probably over-weighted).

Only difference is the diver actually ditches weight by pulling the weight belt / pockets OUT and AWAY from themselves and dropping the belt or weight pockets, following the same procedure as "swimming" ascent but flaring out more quickly as the diver will be ascending more rapidly and be considerably more buoyant.

BCD removal and replacement: ***Objective is for diver to become comfortable taking off the BCD underwater (in case of entanglement and to build confidence functioning underwater not wearing the equipment) and to easily /smoothly don the gear underwater***

NOTE: Divers with Weight integrated BCDs will need to wear weight "belts" during this drill, splitting the weights between BCD and belt. RSTC training standards still require training Open Water students with "weight belts"

Remove shoulder strap from the LEFT shoulder strap by loosening the strap and detaching it's clip, detach the cummerbund strap clip, then un-peeling the Velcro cummerbund, allowing the BCD to easily come off the right shoulder. Bite down securely on mouthpiece and bring BCD around to the front. The top of the tank should be pointing at the diver. Re-clip the right shoulder clip, place arms inside the shoulder straps (making sure the "second stage" HOSE is between the ARMS) and grab the tank. Pull the tank up and over the head with enough momentum to allow gravity to let it drop over your head with your arms through the straps. Re-secure the straps, cummerbund and adjust to comfort.

NOTEWORTHY:

ISSUE	***CAUSE***	***PREVENTION***	***TREATMENT***
Ear Squeeze	***Increased pressure***	***before dive-practice valsalva, take Sudafed***	***Go up and keep trying to clear***
Leg Cramps	***Lack of potassium***	***orange juice / banana's before diving***	***grab fin blade above knee – pull***
Post dive Lethargic	***excess nitrogen***	***slower ascents, shallower dive, use nitrox gas***	***rest, eat-carbs, hydrate***
Nitrogen Narcosis	***extra nitrogen***	***don't dive too deep***	***go up slowly 5 – 10 feet***

Other Considerations: Proper weighting, Air Consumption, Mask placement, And many more techniques trained in our SPECIALTY Classes.