NIGHT DIVER

INSTRUCTOR GUIDE

Product No. 70226 (Rev. 06/22) Version 3.0

PADI

PADI Night Diver
Specialty Course Instructor Guide

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INTRODUCTION

This section includes suggestions on how to use this guide, an overview of course philosophy and goals, a flow chart to show you how course components and materials work together for success, and ways you can organize and integrate student diver learning.

How to Use this Guide

This guide speaks to you, the PADI Night Diver Instructor. The guide contains three sections: the first contains standards specific to this course; the second contains knowledge development presentations; and the third covers optional confined water and/or surface training and details the open water dives. All required standards, learning objectives, activities, and performance requirements specific to the PADI Night Diver course appear in **boldface. The boldface assists you in easily identifying those requirements that you must adhere to when you conduct the course.** Items not in boldface print are recommendations for your information and consideration. General course standards applicable to *all* PADI courses are located in the General Standards and Procedures section of your PADI *Instructor Manual.*

Course Philosophy and Goals

Is it natural curiosity? Is it getting a new look at the familiar? Could it be the vibrant changing colors of aquatic life? Or, is it just because you can, that night diving is so popular? Whatever the motivation to dive at night – you'll find that the environment is quite different.

Imagine hovering over a large pumpkin-size brain coral, and watching a group of parrotfish that are easily 1-1.5 metres/3-4 feet long, weighing in at 22-27 kilograms/50-60 pounds each trying to sleep. The creatures, paying no attention to you, on some secret signal from one of their group, lower their heads under the reef ledge and secrete a mucous sack that envelopes their bodies rather like a bubble. Typically, these interesting creatures wouldn't spend the time of day with a diver; however, the cover of night changes their behavior.

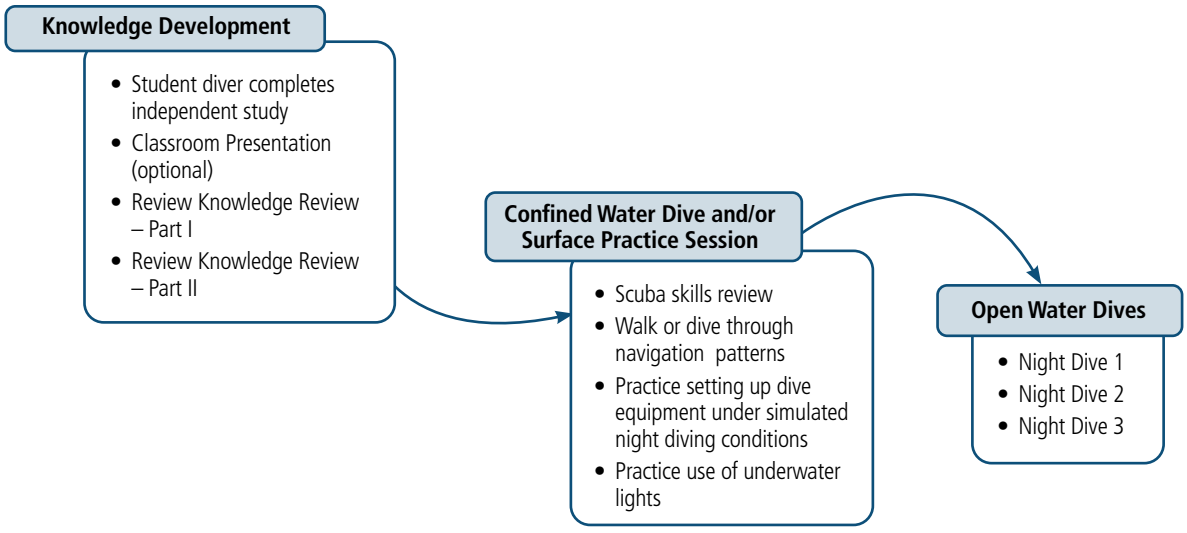
Picture your dive light penetrating the cold dark emerald sea. You see a wreck lying there on her side. You feel what the hapless crew must have felt on that cold stormy day – you begin to have that uncomfortable sensation as you descend through the night above her main deck. Suddenly, a slithery wolf eel darts out of the darkness in front of you and you realize the sea has begun to give her new life. What had once been a wheelhouse of a container ship is now a home for marine life. Thousands of cold-water friends scurry out of their hiding places by the unintentional blinding of your light. You move cautiously and slowly to allow the timid nightlife to settle.

Keep that thought, the philosophy of this course is to focus on seeing in the dark things you miss seeing, or that appear differently during daylight dives. Thus, the goal of this course is to teach student divers a systematic, methodical approach to enjoying diving at night. Student divers will develop the techniques involved in night diving within recreational limits, while avoiding disturbing delicate marine life.

The best way to learn night diving procedures and how to apply them is by doing it. This course philosophy therefore, expands student diver knowledge about night diving equipment, evaluating dive conditions at night, using and maintaining dive lights, night navigation techniques, and how to interact responsibly with the aquatic life they'll see while night diving. Student divers will apply the knowledge they gain by interacting with PADI *Night Diver eLearning* or by reading the PADI *Night Diver Manual* and watching the companion video on at least three open water dives practicing and demonstrating the practical aspects of diving at night.

Course Flow Options

Course Flow Options provides a look at how knowledge development and confined water and/or surface practice sessions support open water dives. When possible, it's preferable to have student divers complete the PADI *Night Diver eLearning* or the PADI *Night Diver Manual,* including the Knowledge Review – Part I, before participating in the open water dives. Knowledge Review – Part I is the same Knowledge Review that appears in the Night Diver section of PADI *Advanced Open Water Diver Manual.* If you have the first part of the Knowledge Review on file, you may at your discretion, have student divers complete only Knowledge Review – Part II.



Confined water and/or surface practice sessions are not required for the PADI Night Diver course; however, you may choose to have practical sessions that allow student divers to practice skills such as navigating patterns, setting up their equipment under simulated night diving conditions, and practicing diving with an underwater light.

There are three dives to complete. **You may rearrange skill sequences within each dive; however, the sequence of dives must stay intact.** You may add more dives as necessary to meet student divers' needs. Organize your course to incorporate environment friendly techniques throughout each dive, student diver learning style, logistical needs, and your sequencing preferences

SECTION ONE

Course Standards

This section includes the course standards, recommendations and suggestions for conducting the PADI Night Diver course.

Standards at a Glance

Topic	Course Standard	
Minimum Instructor Rating	**PADI Night Diver Specialty Instructor**	
Prerequisites **Minimum Age**	**PADI (Junior) Open Water Diver** **12 years**	
Ratios	**Open Water: 8:1**	
Site, Depths and Hours	Depth: 6-12 metres/20-40 feet recommended Hours Recommended: 12 **Minimum Open Water Dives: 3**	
Materials and Equipment	**Instructor:** • **PADI Night Diver Specialty Course Instructor Guide** • **PADI *Night Diver eLearning* or *Manual*** • **Lights/strobes/marker lights and marker for entry/exit, ascent/descent line light**	**Student Diver:** • **PADI *Night Diver eLearning* or *Manual*** • **Dive light, back up light and marker light** • **Compass** • PADI *Night Diving* video

Instructor Prerequisites

To qualify to teach the PADI Night Diver course, an individual must be a Teaching status PADI Open Water Scuba Instructor or higher. PADI Instructors may apply for the PADI Night Diver Instructor Specialty rating after completing a Specialty Instructor Training course with a PADI Course Director, or by providing proof of experience and applying directly. For further detail, reference the Professional Membership section of your PADI *Instructor Manual.*

Student Diver Prerequisites

To qualify for the PADI Night Diver course, an individual must:

1. **Be certified as a PADI (Junior) Open Water Diver or have a qualifying certification from another training organization**
2. **Be at least 12 years old**

Supervision and Ratios

Open Water Dive

A Teaching status PADI Night Diver Specialty Instructor must be present and in control of all activities. If Dive One is the student diver's first night dive, the instructor or certified assistant must accompany the student diver. Otherwise, the Specialty Instructor may indirectly supervise all dives. During night dives, it's recommended, but not required, that a certified assistant accompany each buddy team. **The Specialty Instructor must ensure that all performance requirements are met.**

The ratio for open water dives is 8 student divers per instructor (8:1), with 4 additional student divers allowed per certified assistant (4:1).

Sequencing

1. Ideally, student divers should complete Knowledge Review Part I before Night Dive One.
2. Student divers should complete Knowledge Review Part II before Night Dive Two.
3. **Training dives must be conducted in order.** You may rearrange skill sequences within a dive.

Site, Depths, and Hours

Site

Choose sites with conditions and environments suitable for completing requirements. Shallow dives will provide divers with more time to complete tasks. Use different open water dive sites, if possible, to give student divers experience in dealing with a variety of environmental conditions (incorporate environment friendly techniques throughout each dive) and logistical challenges. Ideally, select sites familiar to student divers – places they have gone diving during daylight hours. Practice skills in a confined water session first to better prepare divers to apply skills in open water later.

Depths

6-12 metres/20-40 feet recommended

30 metres/100 feet limit for Dive 1 (Night Adventure Dive)

Hours

The PADI Night Diver course includes three open water dives. Conduct dives at night, between sunset and sunrise. The minimum number of recommended hours is 12.

Materials and Equipment

Instructor

- **PADI Night Diver Course Instructor Guide**
- **PADI *Night Diver eLearning* or *Manual***
- PADI *Night Diving* video (included in eLearning)
- **Specialty equipment needed for student divers to complete night dives:**
  - **Surface lighting system – lights, strobes or beacons to mark entry/exit location**
  - **Strobe or marker light to mark ascent/descent line location**
  - **Dive light, and backup light**
- As needed: extra backup lights, compasses, and slates for divers. Marker lights to mark individual student divers.

Student Diver

- **PADI *Night Diver eLearning* or *Manual***
- **Dive light, and backup light**
- **Compass**
- **Marker light for identification**.
- PADI *Night Diving* video (eLearning contains the video.)
- Access to support equipment as necessary, including but not limited to: surface light, strobe, and slate.

Assessment Standards

For eLearners, check the diver's eRecord to verify successful completion of *Night Diver eLearning,* including Knowledge Review.

To assess knowledge of divers using the manual, have divers complete the Night Diver Knowledge Reviews (located in the Appendix of this guide and in the *Night Diver Manual)* and review missed questions until they demonstrate adequate knowledge.

During open water dives, divers must perform all skills – procedures and motor skills – in a reasonably comfortable, fluid, repeatable manner as would be expected of a diver at this certification level.

Certification Requirements and Procedures

To qualify for certification, student divers must complete all performance requirements for Night Dives One, Two and Three. The instructor certifying the student diver must ensure that all certification requirements have been met.

Linking to Other Courses

Divers who successfully complete Night Dive One may receive credit for an Adventure Dive toward the PADI Advanced Open Water Diver or Adventure Diver certifications. The Night Adventure Dive conducted during the PADI Advanced Open Water Diver course may count as the first dive toward this specialty at your discretion.

Divers may credit the specialty certification toward the PADI Master Scuba Diver rating.

SECTION TWO

Knowledge Development

Conduct

Student divers complete independent study by interacting with PADI *Night Diver eLearning,* or by reading the PADI *Night Diver Manual* and watching the PADI *Night Diving* video. Use these knowledge development presentations to prescriptively address student diver misconceptions, or to provide clarification on certain points of interest.

If there is a need for instructor-led presentations, such as when the *Night Diver eLearning* or *Manual* does not exist in a language student divers understand, use the following teaching outline to cover the knowledge development learning objectives and course content. The Night Diver Knowledge Reviews (located in this guide's Appendix) must be completed and reviewed before the diver is certified.

I. Introduction

Note to Instructor

Have staff introduce themselves and provide a bit of background. Have student divers introduce themselves and explain why they are interested in night diving.

A. Course Goals

The goals of this program are to enable you to:

1. Develop your practical knowledge of night diving.
2. Increase your diving skills.
3. Plan, organize, and make dives at night.
4. Improve your diving ability and provide you with additional supervised experience.
5. Encourage you to participate in other specialty training.

B. Course Overview and Schedule

Note to Instructor

Discuss the course sequence, assignments, meeting times, places and other information about all class practical application sessions and training dives. Build excitement about the course, particularly the training sessions and dives.

C. Costs, Equipment Requirements and Paperwork

Note to Instructor

Explain all costs, equipment requirements and logistical details as necessary. Reconfirm prerequisites if appropriate, and ensure all paperwork is completed – see Section One, and Paperwork and Administrative Procedures, General Standards, PADI *Instructor Manual*. Collect outstanding fees.

D. Performance Requirements and Certification

1. To qualify for any PADI certification, you must meet specific performance requirements.
   a. You pay for the course, but must earn the certification.
   b. Performance-based learning is objective – a student either meets a requirement or not; your instructor is not arbitrary in assessing performance.
2. Although you must meet all performance requirements, having difficulty does not mean you will be unsuccessful.
   a. You take a course to learn – making mistakes and needing time to master knowledge and skills is part of learning.
   b. You may pick up some things quickly and others slowly; what matters is that you demonstrate mastery – not how long it takes.
   c. You move on at the pace you learn – you may need extra dives or other practice.
3. Upon successfully completing this course, you'll receive the PADI Night Diver specialty certification.
4. Certification means that you've completed all performance requirements and are trained to:
   a. Plan, organize, make, and log open water dives at night in conditions generally comparable to or better than, those in which you are trained.
   b. Apply for the PADI Master Scuba Diver rating if you are a PADI Advanced Open Water Diver (or have a qualifying certification from another organization), and a PADI Rescue Diver (or have a qualifying certification from another organization) with certification in four other PADI Specialty ratings and 50 logged dives.

II. Why Dive at Night?

Learning Objectives

By the end of this section, you should be able to answer the following questions:

1. **What are five reasons for night diving?**
2. **What four diving specialty activities benefit from night diving?**

1. What are five reasons for night diving?

A. The appeal of night diving

1. Natural curiosity – a safe and controlled glimpse of the nighttime aquatic environment.
2. A chance to observe nocturnal aquatic animals seldom seen during the day.
3. A new look at old dive sites. Night diving creates a different perspective and offers new adventure at dive sites that have lost their daytime fascination.
4. A chance to view the "true" colors of an environment. At night you will be using your dive light at close range. This will let you see the true colors of the area and its organisms – even more than during the day when sunlight's colors have been selectively filtered out at depth.
5. Extends diving opportunities. The after-work dive is possible when you know how to night dive.

Note to Instructor

When discussing nocturnal aquatic organisms give examples such as crayfish, lobsters, some species of crabs, catfish, basket stars, many species of shelled animals, coral polyps, etc. Use parrotfish, squid, octopuses, etc., as examples of organisms that allow you to approach at night.

2. What four diving specialty activities benefit from night diving?

B. Special night diving activities

1. Underwater Naturalist. Sightseeing and casual observation; there are lots of new animals to see and behaviors to observe while night diving – this will be discussed in detail later. In the nighttime marine environment you may see the phenomenon of bioluminescence – flashes of chemical light emitted by tiny microorganisms (mostly dinoflagellates) when disturbed by a diver, fish, boat or breaking wave.
2. Digital Underwater Photographer and Underwater Videographer. For the seasoned night diver and underwater photographer or videographer, night diving creates a dramatic backdrop. Night diving allows the underwater photographer and videographer to get pictures and capture video of organisms rarely seen or difficult to approach during the day.

3. Wreck Diver. For the seasoned wreck diver, wreck diving at night offers a new look at a familiar site.

Note to Instructor

Remind student divers interested in fish identification, photography, videography, and wreck diving to take the associated specialty. Also, emphasize that wreck diving at night never involves penetration into the wreck, even if familiar with the wreck during day dives.

III. Nocturnal Aquatic Life

Learning Objectives

By the end of this section, you should be able to answer the following questions:

1. **What are three types of nocturnal aquatic life you normally find in salt water? In fresh water?**
2. **What are four behaviors that aquatic life displays at night?**
3. **How should you interact responsibly with nocturnal aquatic life?**

1. What are three types of nocturnal aquatic life you normally find in salt water? In fresh water?

Note to Instructor

Customize this topic based on the aquatic environment used for the night dives in the course. This presentation may be in the form of a slide show, video presentation, movie, or verbal overview. Provide student divers with an orientation to several species of nocturnal life (fish; sponges; corals, anemones, sea fans, and jellyfish; crustaceans; mollusks; echinoderms; sharks and rays; and marine reptiles and mammals) typically seen locally. When practical, identify for student divers species of active daytime fish often seen resting at night. Be sure to highlight the *Encyclopedia of Recreational Diving*, Chapter 2, The Ocean Planet, as a point of reference for student divers.

A. Local saltwater aquatic life found at night

1. Fish (i.e., moray and wolf eel, flounder, parrotfish, and red sea squirrel):

2. Sponges (i.e., azure and yellow tube):

3. Corals, anemones, sea fans, and jellyfish (i.e., soft coral, fire coral, sea anemone, stalked anemone, Portuguese man-of-war, and box jellyfish):

4. Crustaceans (i.e., shrimp, lobster, and crab):

5. Mollusks (i.e., cuttlefish, squid, and octopus):

6. Echinoderms (i.e., sea star, reef crinoids, feather star, brittle star, sunflower star, sea urchins, sand dollar, and sea cucumber:

7. Sharks and rays (i.e., manta and spotted eagle ray):

8. Marine reptiles (i.e., turtles, sea snakes, and iguanas):

9. Marine mammals (i.e., seals, sea lions, dugongs, and manatees):

10. Other types of aquatic organisms typically found at night in the local saltwater environment:

B. Local freshwater aquatic life found at night
   1. Crustaceans (i.e., crayfish, crawdad):

   2. Fish (i.e., catfish, freshwater eel):

   3. Other types of aquatic organisms typically found at night in the local freshwater environment:

2. What are four behaviors that aquatic life displays at night?

C. Nocturnal behavior

1. In addition to seeing animals at night that you don't during the day, you'll also see different behavior from creatures you encounter routinely during the day.
2. During the day, coral appears hard and stone-like, but after dark, the coral polyps open and extend to feed on plankton.
3. Common freshwater and saltwater fish "sleep" at night. They either rest on the bottom or glide as if in a trance, and some species change color or become pale.
4. Some species of fish (parrotfish) take unusual steps to ensure an undisturbed sleep by secreting a mucus sack that envelopes it, rather like a bubble.
5. Your dive light may attract some organisms, including plankton, small crustaceans, worms, and jellyfish to crowd around your light.

Note to Instructor

Inform student divers that although sleeping fish usually react little to lights, some react strongly to the lightest touch. Often they bolt away in any direction, running into divers or the reef, oblivious to injuries they inflict on themselves. With this in mind, remind divers to be cautious to avoid touching them.

3. How should you interact responsibly with nocturnal aquatic life?

D. Interacting with aquatic life

1. Take steps to avoid inadvertent injury or damage to the organisms you come across.
2. With visibility limited by darkness, you may have to be more cautious about bumping into things. At the same time, many organisms are more exposed due to nocturnal behavior and therefore more prone to injury.
3. Be aware that your light can cause harm, too, if you use it to push or prod.
4. Interact by moving cautiously and slowly. Maintain neutral buoyancy. Give animals the option to approach, remain where they are or retreat.
5. The best bet is to avoid touching aquatic animals at all; this prevents injury to either you or the animal.

IV. Night Diving Equipment

Learning Objectives

By the end of this section, you should be able to answer the following questions:

1. **What personal dive equipment considerations does a night dive require?**
2. **What is the recommendation regarding the use of new or unfamiliar equipment at night?**

1. What personal dive equipment considerations does a night dive require?

A. Personal equipment needed for night diving

1. Mask, snorkel and fins
2. Regulator with submersible pressure gauge
3. Alternate air source
   a. Must have for night diving
   b. Second stage must be visually identifiable and attached within triangle area between the mouth and lower corners of the rib cage.
4. Cylinder
5. BCD
   a. A BCD used for night diving should have a low-pressure inflator. This allows for one-handed inflation of the BCD. This is necessary since the other hand is holding the underwater light.
6. Exposure suits and accessories
   a. Exposure suits – should be used while night diving, regardless of the water temperature. Underwater they protect against scrapes and stings (greater chance of this at night); topside they prevent pre- and post-dive cooling due to generally cooler ambient air temperatures. Knees and elbows should especially be covered while night diving.
   b. For physical protection of the hands and ankles, gloves and boots are a must for night diving.
7. Weight system
8. Gauges
   a. Use the full complement of gauges – dive computer (or depth gauge and timer) and compass.
   b. Place gauges in a console for night diving for convenience and quick reference.
   c. Choose gauges with backlighting or luminous (glowing) markings for easy reference. You may also secure a marker light to your console for convenient gauge reference.
9. Slate and pencil – used for difficult nighttime communications with your buddy, plus noting bottom time and compass headings.

10. Whistle – attach signaling device to the BCD and used for long-distance surface communication.
    a. Air horn
    b. EPIRB (Emergency Position Indicating Radio Beacon)
11. Primary and backup dive lights (discussed later).
12. Marker light or other battery-operated light device (discussed later).

Note to Instructor

At this point, take a few minutes to examine the personal equipment student divers will be using on their night dives. Specifically note whether the exposure suit and weight system complement each other.

Bring to the attention of student divers the various audible devices and the importance of having a redundant signaling system.

Don't spend too much time on dive lights and backup lights as they will be covered in more depth in the next section. Have student divers identify and locate their buddy's alternate air source.

2. What is the recommendation regarding the use of new or unfamiliar equipment at night?

B. General recommendation for night diving equipment
    1. Use equipment with which you're familiar and comfortable. If you're using unfamiliar equipment that requires a substantial change in how you use it or where you wear it, get used to it during the day first.
        a. For instance, you don't have to think about where to find or how to use a new snorkel, but you may not use a new BCD with a different inflation system automatically until you've made a couple of dives with it.
        b. Get used to new gear like this and make any adjustments during the day so you can night dive more relaxed and efficiently.

V. Underwater Light Systems

Learning Objectives

By the end of this section, you should be able to answer the following questions:

1. **Why is it important to carry at least two lights on a night dive?**
2. **What six features should you look for in a dive light?**
3. **What are the advantages and disadvantages of rechargeable and nonrechargeable batteries for dive lights?**
4. **Why should some dive lights be switched on only underwater?**

1. Why is it important to carry at least two lights on a night dive?

A. Light systems used for seeing underwater

1. Primary dive light – You need to carry at least two dive lights. Although dive light technology has become increasingly reliable, bulbs still burn out, batteries go dead, and improperly maintained lights flood. The primary light is usually the brighter of the two lights. Use your primary light for navigating underwater and for surfacing and exiting the water.
2. Backup light – Usually a small light of lower power than primary light, used in case the primary fails. Connect this light to a clip on your weight belt or BCD, or place in a BCD pocket.
3. A third light – to be extra sure you won't have to finish the dive without one. The three light minimum comes from cave diving and other forms of technical penetration diving.

Note to Instructor

Explain to student divers that each diver must have their own lights; divers may not share a primary light source on open water night dives. Have available different lights (primary and backup) to show student divers. Take the time to have student divers display their lights, confirm that the lights work, and that divers have become familiar with where they and their buddies will be carrying their lights. Identify those student divers who need to acquire additional lights to participate in the open water night dives. Once you have reviewed the six features they should look for in a dive light, assist the divers in their light selection.

2. What six features should you look for in a dive light?

B. Dive light features

1. You may be surprised at the variety of dive lights to choose from. They range from relatively large, high power to smaller, very compact models. No matter what the purpose, look for these six features when you buy dive light:
   a. Rugged case. Dive lights are made primarily from aluminum or, most commonly, plastic. Common materials include ABS plastic (acrylonitrile butadiene styrene), polycarbonate (also called Lexan®), Delrin® (a lightweight, but durable low wear, engineered plastic) and PVC (polyvinylchloride). They need to be strong enough to withstand pressure, and tough enough to endure rough handling and the occasional bump or drop.
   b. Dependable switches. Three types: indirect switches (magnetic, screw-down front lenses), o-ring gland switches and rubber boot-covered switches. A locking switch feature is nice.
   c. Few o-ring seals. A dive light must have at least one watertight o-ring sealed opening that gives you access to the batteries and the bulb – the fewer the openings the better.

d. Comfortable handle/mount. You can divide dive light handles into pistol grip, lantern grip, torch styles and canister (tec diving) models. Choose one that you can hold comfortably for an extended period.
e. Lanyard or clip. When you buy a dive light, if it doesn't come with a lanyard, get one for it. A lanyard helps you avoid accidental loss, and allows you to release the light when you need both hands for a moment. You may also want a clip on your backup light to make sure it stays secure until you need it.
f. Fresh batteries. A dive light's no better than its batteries, which can be either disposable or rechargeable. You need to be sure you either have fresh disposables or fully charged rechargeables before you go night diving.

C. Choosing a dive light
1. The dive light you choose depends on where you plan to use it, the activities you plan to engage in and how often you think you'll need it. For example, in limited visibility many divers prefer a powerful, narrow beam to reduce the fog of suspended particles. In clear water, wide beams are preferred to light as large an area as possible.
2. Narrow beams also work well for looking into cracks and small areas. Generally a narrow beam is brighter than a wide beam. Many divers prefer to use a narrow beam light as their backup as these lights provide adequate illumination to surface and exit the water. Also, keep in mind that backup lights work well for looking into holes and under ledges during the day.
3. Many lights have a medium wide beam with a bright center – excellent for general application.

D. Light and power
1. When you want to compare dive light specifications, it helps to understand manufacturers' terms.
2. Candlepower/watts – A light's power/intensity is usually measured in watts, or less commonly, candlepower. A small backup light will be rated two to eight watts, a large primary 12 to 30 watts and a video light between 50 and 100 watts. If you're comparing two lights with the same bulb and reflector types, then watts are helpful. Candlepower is a measure of actual light intensity.

Note to Instructor

Explain to student divers that the watt rating only tells part of the story because it only tells you how much power the light uses. A light's reflector and bulb type affect how this translates into light output. A wide beam light and a narrow beam light with the same watts will have different brightness; the wide beam will cover a large area more dimly and the narrow a smaller area more brightly. Different types of bulbs generate light more efficiently than others. A 10-watt HID bulb, for example, generates about the same light as a 50-watt halogen bulb.

Again, this is only part of the picture. A very narrow, low power light can have a higher candlepower than a high power, wide beam light. HID bulbs put out essentially the same amount of light until the batteries get too low, then blink off entirely. LED bulbs hold their brightness a long time, then dim significantly and burn for quite a while longer.

3. Lamps/bulbs amps – Light bulbs or lamps are rated by volts or amperes. Volts rate the intensity of electrical power and amperes rate the quantity of power. The higher either rating is for a bulb, the greater a power source it needs, and this however, doesn't mean it's brighter.

Note to Instructor

Explain to student divers that a bulb for a powerful rechargeable light may draw 1.2 amperes, while one for a disposable battery light draws .5. If the bulbs were switched, the rechargeable batteries might quickly burn out the .5 bulb and the disposable batteries would lack sufficient power to light the 1.2 bulb.

4. Burn time/battery life – This describes the average time fresh batteries will last. Large bright lights used to have relatively short burn times, but this has changed with advances in bulb efficiency and battery capacity. Burn time is an estimate, and varies depending on variations in bulb current requirement, and how you use the light – continuously or turned off and on. Use burn time to gauge approximate duration only.

Note to Instructor

Explain to student divers that most primary dive lights now have burn times of four to six hours, though you can still find lower cost models with one- to three-hour burn times. Small lights (backup size) may have five- or six-hour burn times.

5. Bulb life – The bulb life rating is based on how long 50 percent of test bulbs last. Use bulb life ratings to compare how often you'll need to replace bulbs in various dive lights, but not to determine how long a particular bulb will last.

Note to Instructor

Explain to student divers that if a bulb has a 30-hour rating, which means that after 30 hours of use, 50 percent of the bulbs, were still burning. In short, assuming no other damage, this means you have about a 50 percent chance of a bulb making it through its estimated life. LEDs have the longest life estimates in the 5000-hour range.

6. Bulb types – Bulbs are classified based on the material that generates light within them. Dive lights generally employ the whitest lights possible for the truest colors possible. Most modern dive lights are equipped with LED bulbs, but HID, halogen and xenon used to be the most common and are still around.

Note to Instructor

Explain to student divers the different bulb types. LEDs have become by far the most popular because they offer comparable brightness to other lights, but use far less power and therefore give you substantially longer burn times for a given battery supply. They are also the hardiest bulbs with the longest expected life. Halogen used to be a primary choice for high-powered dive and video lights, though HID lights largely replaced them, and now LEDs have largely replaced HIDs. If using an HID light, the primary drawback is that you cannot turn HIDs off and on repeatedly without excessive battery drain and wear on the bulb. Generally, you turn an HID on immediately before entering the water and leave it on until you're out of the water again. Xenon bulbs have been used in less expensive lights, and are brighter than krypton and argon bulbs, offering a good trade between brightness, cost and burn time.

7. Reflectors – Besides the bulb, reflector shape greatly affects a light's characteristics. The reflector concentrates or spreads the beam, for greater coverage with less over all brightness, or greater brightness but less over all coverage.

Note to Instructor

Explain to student divers that a few models have adjustable bulbs and reflectors so you can vary the beam angle. Reflectors are fragile and easily scratched or marred when handled, so use caution when disassembling your light. Now that you have reviewed the six features divers should look for in a dive light and have explained the light and power of dive lights, assist those student divers without lights in their light selection.

3. What are the advantages and disadvantages of rechargeable and nonrechargeable batteries for dive lights?

E. Batteries

1. When choosing a dive light, a major decision is whether to choose one that uses rechargeable or disposable batteries. Each has advantages and disadvantages, applications and maintenance considerations.

Note to Instructor

Remind student divers that batteries are not friendly to the environment. One of the primary concerns is that they can leak heavy metals into the environment (especially a concern regarding groundwater). Rechargeable batteries are generally worse in this regard than disposables. However, over its life one rechargeable battery replaces more than 100 disposable batteries. In that light, the disposable batteries are a bigger concern. If you're going to be night diving a lot, rechargeables may be better not just for your wallet, but for the planet you live on. When your batteries reach the end of their useful life, dispose of them properly. It's a simple step that goes a long way toward protecting the environment.

2. Disposable type – Disposable batteries primarily used in dive lights are alkaline and lithium ion batteries. Alkaline batteries are the most common and are available in all the usual sizes for dive lights – C, D, AA, AAA, N or nine volt.
   a. Advantages: Alkaline batteries have the advantage of a long burn time. As the batteries weaken, the light dims slowly, giving you adequate warning that you're getting low on power. Lithium ion batteries have similar performance but have up to six times the burn duration in exchange for costing about twice as much.
   b. Disadvantages: If you're not going to use the light for an extended period, remove the batteries. Although both alkaline and lithium ion batteries have long shelf lives, they can leak and damage your light, even though the risk is minimal over a period of months.

Note to Instructor

Caution student divers about battery replacement. When the batteries get weak, replace all the batteries with new, fresh batteries. Never mix weak and fresh batteries because doing so simply drains the new ones, and releases excess hydrogen. Never mix batteries of different types. That is, never use alkaline batteries and lithium ion batteries together, even if they're brand new, nor mix disposable and rechargeable batteries. Although a light may accept all these types, different battery types have differing discharge characteristics and mixing them will at best damage and drain the batteries, and at worst create a fire hazard.

3. Rechargeable type – lithium, nickel-cadmium (NiCad), nickel metalhydride (NiMH) and gel-cell, but lithium is by far the most common in modern lights.
   a. Not long ago, most rechargeable dive lights used NiMH, and before that, NiCads. Compared to alkaline disposables, these powered higher wattage bulbs and maintained their power until nearly exhausted.
   b. Lead-acid gel-cell batteries were common for some uses because you could recharge them partially discharged without hurting their capacity, though they are heavy and bulky.
   c. All rechargeable batteries have specific maintenance requirements that you need to follow, not only to get full performance and life expectancy from them, but for safety.
      i. For one, handle them carefully because dropping them can damage them so they no longer hold a charge.
      ii. Most batteries heat up while charging and you should allow them to cool before sealing them in your light and using them.
   d. Most lithium batteries, for example, last longer if they're stored partially but not fully discharged. Most types suffer if discharged deeply.
4. When the batteries are low, turn the light off and recharge the batteries.
   a. With some types of lights, you will see the bulb dim, but some types don't.

   b. Some of the more sophisticated systems will automatically shift to a noticeably dimmer low power mode to extend useful light.
5. Follow all manufacturer use, charging and safety guidelines. Don't assume that what's true for one type of battery applies to others.
6. With all rechargeable batteries, if you travel internationally, be careful to recharge using the proper current; the wrong current can ruin your batteries instantly.
   a. When traveling by air, be aware that some types have to be in your carry-on baggage.
   b. With all dive lights, remove, reverse or unplug the batteries when packing them because if the light accidentally came on during travel, it could start a fire.
7. Use only the specific charger intended for your batteries – the wrong voltage or using a charger intended for a different battery type may not only damage the batteries, but can result in a fire.

Note to Instructor

Review that today, lithium rechargeable systems coupled with LED technology dominate lighting. Lithium cells have no memory issues, are more environmentally friendly at the end of their useful life and have long burn times. Although lithium is most common in rechargeable systems, NiMH are available in AAA, AA, C, D and nine volt.

Batteries are rated by milliamp hours (mAH). The higher the rating, the more power the batteries hold and the longer the burn time. The higher mAH batteries cost more, and they accept fewer charge cycles, so they have a shorter useful life.

4. Why should some dive lights be switched on only underwater?

F. Tec diving and underwater videography call for special lights.
   1. Keep in mind that many should only be turned on (other than momentarily) in water to keep the heat from damaging the light or worse, causing a fire.
   2. Even normally cool lights, like LEDs, are sealed tightly and take advantage of water's cooling properties. This is not an issue with all dive lights, but often is with the more powerful ones, so see the manufacturer guidelines before using a dive light out of water.

VI. Dive Light Maintenance

Learning Objectives

By the end of this section, you should be able to answer the following questions:

1. **How do you maintain a dive light?**
2. **How do you care for a flooded light?**

1. How do you maintain a dive light?

A. Routine preventative maintenance

1. Wash light thoroughly with fresh water. Better still, allow light to soak in warm water for a few hours – this will dissolve the remaining salt crystals.
2. Dry and open light. Remove batteries in case of leakage. Store disposable batteries in a refrigerator for longer life. If rechargeable type, charge them before storage.
3. Clean o-rings. Remove sand, lint or any foreign material, and check for cuts and nicks. Lightly lubricate with silicone grease. Clean area where o-ring seats, also lightly lubricate.
4. Inspect battery and bulb contacts. Clean with extra-fine sandpaper or a pencil eraser
5. Store away from heat or sun.

2. How do you care for a flooded light?

B. Caring for a flooded dive light

1. Act fast, turn off light immediately
2. Open and drain water from interior. Rinse interior including bulb and rechargeable batteries with fresh water (throw disposable batteries away). Drain fresh water. Wipe off/dry bulb and reflector and set aside.
3. Using a very mild heat or blowing source (blow-dryer) to dry the light quickly.
4. Return light to professional dive store or manufacturer for servicing.

Note to Instructor

Explain to student divers that wet batteries emit gas that can build up pressure inside the light so that it may pop apart. As a precaution, remind divers to wear their mask or other eye protection when opening a flooded light. Advise student divers that after caring for their flooded light, it needs to be serviced by a PADI Dive Center or Resort or the manufacturer. Explain to divers that one reason many lights need manufacturer service is that they have a platinum catalyst that absorbs hydrogen gas released by the batteries. This catalyst is damaged by water and must be replaced to avoid dangerous gas buildups in the light.

VII. Lights for Navigation and Orientation

Learning Objectives

By the end of this section, you should be able to answer the following questions:

1. **What are three uses for marker lights and where should you attach marker lights?**
2. **How can underwater strobes be used?**
3. **What are two uses for surface support lights?**

1. What are three uses for marker lights and where should you attach marker lights?

A. Marker lights

1. Marker lights are typically inexpensive, disposable battery models, so it's not much of a problem for you and your buddy to have one or more each to use as needed. You can attach marker lights with rubber bands, tape, string or cable ties, and several come with their own attachment devices.
2. You can apply marker lights in three basic ways to help you and your buddy remain oriented.
   a. Use to mark each diver. Attach the marker light to your snorkel or cylinder valve, so you can be seen more easily from the rear.
   b. Secure marker lights to the dive boat or your surface float so you can spot it easier when you surface. It also alerts boaters to your presence. Attach the light about one metre/three feet up on the flagstaff.
   c. Mark your ascent/descent line or anchor line with them so you can locate it easily. Attach several along the line's length, with a different color at 5 metres/15 feet to mark the safety stop depth.

Note to Instructor

Remind divers to attach marker lights securely so they don't come loose and litter the reef or beach.

2. How can underwater strobes be used?

B. Strobe lights

1. Strobe lights produce high intensity flashes at short intervals, making them visible much farther away than marker lights.
2. Typically placed a few metres/feet underwater below floats and boats to mark their location. You can put strobes on the boat or float for easy identification at the surface.

Note to Instructor

Suggest to divers they should be careful placing any bright light, underwater or just above the surface, next to the descent/ascent or entry/exit area. Some species of small stinging marine organisms are attracted to the bright light causing problems for divers. The problem may be seasonal or local. When in doubt, check with local divers for more information before using bright surface or underwater lights. Point out that there is also a concern with shore lights where sea turtles nest. Suggest that divers check with their local PADI Dive Center or Resort about local policies and recommendations that apply during nesting season in areas where turtles lay eggs.

3. What are two uses for surface support lights?

C. Surface support lights

1. Along with your dive lights, you'll want several surface lights when you night dive. You'll use surface lights as you gear up, and as you slide out of your kit after the dive. They help orient your entries and exits, and they spare your dive light's batteries for the actual dive.
2. Types: 1) gas lanterns, 2) boat or car lights, 3) street lights, 4) roadside barricade flashers and 5) strobe beacons.
3. Label surface lights as needed to prevent their removal from shore (e.g., "Do not remove – divers in the water"). Leave a nondiver on the beach to tend the lights.

Note to Instructor

Suggest to divers they should check with the local Coast Guard or Harbor Patrol concerning proper use of shore/boat lights. Make sure divers do not use red, white or green flashing lights. These lights could be mistaken by vessels as navigation beacons or harbor entrances.

VIII. Planning Night Dives

Learning Objectives

By the end of this section, you should be able to answer the following questions:

1. **What should you consider when evaluating and choosing a night dive site?**
2. **What six environmental conditions should you try to avoid when planning a night dive?**
3. **What are the four general night dive planning recommendations?**

1. What should you consider when evaluating and choosing a night dive site?

A. Choosing a dive site

1. Review general dive planning considerations.

a. Advance planning
b. Preparation
c. Last-minute preparation
d. Predive planning

2. Choose an underwater area you are familiar with. If possible, dive or snorkel the proposed location during the actual day of the night dive.
3. Evaluate water conditions: visibility, surge, currents, water temperature and surf. Check tide tables – it's best to dive at high, slack tide in most areas.
4. Reference your compass often and write down important details to help you find a specific reef, wreck, etc., during the night dive.
5. If shore diving, note specific locations of entries and exits.
6. If it is not possible to dive a location during the actual day of the night dive, choose a location you have dived in the past. Reference your logbook for important dive data on the location.
7. Always evaluate the environmental conditions at the dive site prior to the dive – just before sunset if possible.

Note to Instructor

Inform student divers that as a general recommendation, it's preferable to avoid diving in an unfamiliar site at night. Under a few circumstances, it may be acceptable to night dive at an unfamiliar site. Under ideal conditions in a type of environment you're familiar with, it may be reasonable to night dive on a site you've never visited before. For example, if you've been diving all week on coral reefs around an island in clear, calm water, a night dive on a part of the reef you haven't seen would probably be acceptable. You may never have seen that exact part of the reef, but provided you evaluate the site, locate your planned entrance and exit points and so on, you'd be adequately familiar with the environment to have a fun, safe night dive. Similarly, it may be reasonable to visit a site for the first time with a professional dive guide or instructor who is familiar with the site. Recommend that divers check with the local PADI Dive Center or Resort about their Discover Local Diving night experiences.

2. What six environmental conditions should you try to avoid when planning a night dive?

B. Evaluating conditions for a night dive.
1. Evaluating conditions doesn't differ from any other dive. What does differ, however, is where you draw the line between "acceptable" and "unacceptable" conditions. Try to plan night dives when a full moon is present (unless your planned activity requires complete darkness). A full moon provides ambient light for suiting up, swimming to and from the dive site and finding your way underwater if both lights burn out (this will only be possible if the visibility is good and/or you are in shallow water).

2. When planning a night dive, choose the location and time that provides the best environmental conditions. You want conditions for a night dive to be a bit better than the worst conditions you would consider acceptable for a day dive. The better the environmental conditions, the more enjoyable the night dive.
3. Avoid these conditions at anytime, but especially at night:
    a. Moderate to high surf – it's difficult at best to judge changes in the surf at night as you can't see the waves coming.
    b. Moderate to strong currents – if you're thrown off course and end up down current, you may not be able to see your exit point, and when boat diving, you may be hard to spot for pick up.
    c. Bad visibility – visibility that complicates navigation or reduces the possibility of seeing anything interesting is not worth diving in.
    d. Thick kelp, fishing nets or anything you could become tangled up in – in restricted visibility it is harder to avoid potential entanglement so steer clear of these areas.
    e. Heavy surge – night surge can swing you into something before you see it, making disorientation and vertigo likely.
    f. Overhead environments – even if you're equipped and trained for overhead environments, stay outside them at night.

3. What are the four general night dive planning recommendations?

C. General night dive planning recommendations

1. Prepare your equipment in the daylight. Pay particular attention to your dive lights. Change or recharge batteries as necessary. Secure your marker lights, but don't activate them until you're about to get into the water.
2. Eat a few hours before the dive. Eat a good meal at least three hours before the dive and avoid eating greasy foods. A proper, balanced meal assists in having the energy you need to stay warm. Also, drink plenty of noncaffeinated, nonalcoholic beverages to stay hydrated.
3. Dive with familiar buddies. Plan to make night dives only with buddies you have dived with during the day. A professional divemaster who's familiar with the environment is an exception.
4. Bring a friend. When planning a night dive, invite a nondiving friend along to wait on the shore or boat. This individual can tend the relocation lights, hand or take accessories from you, and provide assistance in case of an emergency. Charter boats usually have someone to do this, which is one reason many divers prefer night diving from charter boats.

IX. Special Night Diving Situations

Learning Objectives

By the end of this section, you should be able to answer the following questions:

1. **How can you minimize and cope with stress during a night dive?**
2. **What should you do if your light fails during a night dive?**
3. **What should you do if you become separated from your buddy during a night dive?**
4. **What should you do if you become disoriented or lost during a night dive?**

1. How can you minimize and cope with stress during a night dive?

A. Night diving stress

1. Some stress makes night diving exciting, but too much takes the fun out of it. The causes of stress while night diving include:
   a. Darkness – the lack of ambient light (lack of light in general, light failure and using a light without adequate output) can cause stress. For some, darkness conjures "imaginary" thinking (that something is following you, watching you or ready to grab you) and this can cause stress.
   b. Adverse environmental conditions combined with darkness (such as strong currents, rough waves and limited visibility) may cause undue stress while night diving. As stated previously, the better the environmental conditions are at the dive site, the more enjoyable your night dive will be. Avoid night diving when conditions are poor.
   c. Using unfamiliar equipment.
   d. Task loading – trying to accomplish too many objectives.

B. How to cope with night diving stress

1. Complete this class. Night diving for the first time can cause stress, so it is nice to know you will be making your first few night dives under the supervision of a professional PADI Instructor. Completing all three dives in this course will help you eliminate much of the stress you may have otherwise experienced if you had tried night diving on your own. This class will give you confidence, and that alone is an excellent stress reducer.
2. Make sure you are physically and psychologically prepared to night dive – maintain physical fitness, over-learn basic skills through practice and repetition (until they're automatic), know your physical limits and always stay with your buddy.
3. In the unlikely event a problem occurs while you are night diving – Stop, Breathe, Think and then Act. Do not react to the problem. Breathe continuously and deeply; doing so will help reduce stress while night diving. Dive in areas that are familiar to you (those locations you've dived by day).

2. What should you do if your light fails during a night dive?

C. Failure of underwater lights

1. If your light fails, simply stop, switch to your backup light and signal your buddy. At this point, head for the boat or shore – don't continue a night dive on your backup, because if it fails, you won't have a light.
2. Borrow your buddy's backup light if both of your lights fail. In the very unlikely circumstance that it doesn't work either, leaving the two of you with only one light, conditions allowing, ascend together immediately.
3. Make an ascent without a light. If both you and your buddy had a quadruple light failure/light loss (very unlikely), or you separated from your buddy and had a double light failure/light loss (also unlikely) discontinue the dive and make a direct ascent. Begin by taking a moment to let your eyes adjust. If you're near a reference line, use it to guide and control your ascent. Listen for your dive computer's audible ascent rate warning, if it has one, to help you ascend at 18 metres/60 feet per minute or slower, or as specified by your dive computer.

Note to Instructor

Reinforce to student divers that a backup light should only be used for the purpose of safely ascending and exiting the water – not for continuing a dive. When you have to resort to a backup light, end the dive.

3. What should you do if you become separated from your buddy during a night dive?

D. Buddy separation

1. First, look for a glow from your buddies' lights. If you can't see other lights, hold your light up against your exposure suit or put your palm over the lens to dim the light. If you still don't see one, shine your light straight out from you and rotate, so that perhaps they will find you.
2. If after a one-minute search you can't find your buddy, surface cautiously, inflate your BCD and wait for your buddies to do the same. You and your dive team should agree to this plan before the dive. Once you and your buddy have surfaced, regroup and descend together – time and air supply permitting.

Note to Instructor

Remind divers that devices used to gain attention at the surface should be a standard piece of equipment for every diver, regardless of certification level. Audible devices like whistles or air horns (devices that attach to the low-pressure inflator of the BCD) can be easily heard at night or in limited visibility conditions. For daytime use, include a visual signaling device like a signal mirror or surface marker buoy (safety sausage) in your equipment. Familiarize student divers with the latest devices on the market. The best way to do this is to have samples of these devices for divers to handle.

4. What should you do if you become disoriented or lost during a night dive?

E. Disorientation and loss of direction
   1. During descents and ascents:
      a. Whenever possible, use a reference line for orientation and control. Also, make all descents in a head-up, feet-down position. Remember the five-point ascent/descent from the Open Water Diver course.
      b. If disorientation occurs in mid-water (you can't see the surface or bottom) without a reference line – watch bubbles to determine up and down, and grasp your buddy or hug yourself until the disorientation passes. If the disorientation doesn't pass, discontinue the dive and follow your bubbles upward at a rate of 18 metres/60 feet per minute or slower.
   2. On the bottom:
      a. Check your compass and depth gauge frequently. Dive your plan.
      b. Return to the surface with your buddy for orientation to the boat or shore. With time and air allowing, agree on a new direction of travel, descend and continue the dive on your new heading.

X. Night Diving Techniques

Learning Objectives

By the end of this section, you should be able to answer the following questions:

1. **What are the procedures for entering and exiting the water from a boat and from shore while night diving?**
2. **What techniques should you use during night ascents and descents to avoid disorientation and stress?**
3. **How should you signal on a night dive?**

1. What are the procedures for entering and exiting the water from a boat and from shore while night diving?

A. Night diving entries
   1. Boat entry
      a. Turn on your primary light and secure its lanyard (in case you lose it as you enter the water).
      b. Check the area below with your light.
      c. Make your entry as you normally would with your regulator in your mouth.
      d. Signal "okay" once in the water, clear the entry area, and wait for your buddy. Don't shine your light up to the boat, which can blind those aboard.

2. Shore entry
    a. Turn on your primary light and secure its lanyard (in case you lose it as you enter the water).
    b. Check the entry area with your light for rocks or obstructions.
    c. If you're entering through light surf, time your entry for a lull in the waves. Watch for waves frequently with your light as you enter.
    d. Make your entry as you normally would.
    e. Stay close to your buddies, and be careful not to shine your light in their eyes.
3. When exiting, use similar techniques. Turn your light on so you can see, and in case you drop it, but be careful not to shine it up into the boat or shore tender's eyes. When exiting through surf, time your exit for a lull and keep an eye out for waves as you go.

2. What techniques should you use during night ascents and descents to avoid disorientation and stress?

B. Descents
1. If you're diving from shore, you can often use the bottom as your reference. If you're diving from a boat, or with a float, a reference/anchor line provides a good reference.
2. To descend, turn your light on just before you begin to make your descent. Check the time, take a compass reading on the shore or boat lights, signal your buddy and slowly vent the air from your BCD.
3. When possible, use a reference line. This can be a buoy or boat-anchor line.
4. Hold on to the line with your free hand. Your other hand, the hand holding your light, may be used to vent air from your BCD, adjust loose equipment, etc., (the light may be released, since a lanyard connects it to your wrist).
5. Descend slowly in a head-up, feet-down position. Adjust for neutral buoyancy often and stay close to your buddy.
6. Point your light downward as you descend. Watch for the bottom. Continuously reference your gauges during the descent.

C. Ascents
1. Try to find your buoy or boat-anchor line before you ascend. Signal your buddy, and note the time of your direct departure to the surface. Remember to breathe continuously.
2. Use the reference line for a slow, controlled ascent. Stay close to your buddy and maintain neutral buoyancy while looking up and around with your light.
3. Hold on to the line with the hand that grasps your light. The other hand should always be above your head, alternating between venting air from your BCD and holding your gauges in front of your light to reference your ascent rate.

4. Ascend no faster than 18 metres/60 feet per minute. Be a S.A.F.E. diver – Slowly Ascend From Every dive.
5. While ascending, shine your light upward to watch for obstructions and reference your ascent rate.
6. Once at the surface, inflate your BCD and signal "okay" to the boat or shore tender. If necessary, take a moment to rest before heading to the exit.

3. How should you signal on a night dive?

D. Communication

1. You use the same hand signals at night as you do during the day, but you need to be sure your buddy can see your signal. You also need to be sure you don't accidentally blind your buddy with your light in the process of signaling.
2. Gaining your buddy's attention underwater
   a. Rap on your tank
   b. Rapid waving of your light (up-and-down, side-to-side or any other rapid movement) is an attention-getting signal that alerts another diver to something of interest, when something is wrong and in an emergency.
   c. Gently touch your buddy. Be careful doing this at night, your buddy may be startled by your touch!
3. Gaining your buddy's attention at the surface
   a. Wave your light back and forth to get attention and to signal for help.
   b. Use a whistle attached to your BCD for long-distance communication.
4. Using hand/light signals
   a. Use the standard hand signals and any others agreed upon before the dive.
   b. Shine your light on the hand signal – it's best to signal at waist level.
   c. Large circular motions with your light indicate everything is okay.
   d. Since night dives take place when other people may be going to bed, give some thought to common courtesy. Speak softly and keep your light off windows, cars, boats, tents and out of people's eyes.
   e. In the water, be courteous of your buddies and other divers who may be there. Don't shine your light in their eyes; point at leg level when you're trying to identify or locate a diver. When passing another group of divers, point your light to the side away from them.

Note to Instructor

Remind student divers to avoid shining their light directly into their buddy's eyes because this will temporarily blind their buddy by destroying their night vision. Suggest locating their buddies by shining their light on their fins. Also, because quick, jerky light motions are attention-getting signals, try to keep normal light movements slow and steady. If they see a rapidly waving or jerky dive light beam, don't ignore it. Determine the source and cause because someone may need help.

XI. Night Diving Navigation

Learning Objectives

By the end of this section, you should be able to answer the following questions:

1. **What are the procedures for locating an offshore dive site at night?**
2. **What natural navigation techniques do you use to avoid disorientation at night?**
3. **What compass navigation techniques do you use to avoid disorientation at night?**

1. What are the procedures for locating an offshore dive site at night?

A. Locating an offshore dive site
   1. When night diving from shore, you may want to visit a specific spot away from shore. A few techniques make finding the spot easier.
   2. Follow a previously determined compass course to the dive site. The course heading and approximate distance information could be obtained from another diver, a previous day dive of the area (consult your logbook) or a dive made during the day of the night dive. To determine the distance to the dive site, try using kick cycles.
   3. If the water's clear enough, use your light to look for familiar features on the bottom. Otherwise, check above-water landmarks.

2. What natural navigation techniques do you use to avoid disorientation at night?

B. Natural navigation
   1. Natural navigation relies on maintaining a mental picture of where you are based on features and navigation clues that surround you. For more precision, you can map your course on a slate to find your way back. Look for obvious landmarks and other distinct features that keep you oriented.
   2. Pay particular attention to these:
      a. Water movement – can help you detect near-shore areas or offshore rocks by the back-and-forth movement of surge. The direction of a current may also be used to detect your location, but remember currents can change direction unexpectedly.
      b. Sand or mud ripples – run roughly parallel to shore and are excellent natural navigational aids.
      c. Rock or reef formation – coral or rock reefs often form long natural lines. One of the easiest ways to navigate is to follow a reef edge out and back.
      d. Depth – note your depth relative to the bottom contour and your exit point. As you return, depth helps you judge how close you are to your exit.

3. Light – especially in clear water, light – from the boat or shore, a strobe or along your reference line – helps you keep your bearings.

Note to Instructor

Natural navigation techniques may be a new topic for student divers only certified to the Open Water Diver level. Expand on this topic as necessary. Remind divers that natural navigation on a night dive is most effective when you're familiar with the dive site, having visited the area during the day. Choose a dive site familiar to you, reference your logbook for information about the dive site or dive the same location during the day.

3. What compass navigation techniques do you use to avoid disorientation at night?

C. Compass navigation techniques

1. Use compass navigation techniques to avoid disorientation at night. Consider the following techniques:
   a. Always have a compass while night diving.
   b. Before descending, take a compass reading on the boat or exit area on the shore. Write this heading down on a slate for reference underwater. Now you can navigate away from, parallel to or toward the boat or shore.
   c. If the area is somewhat new to you, choose a single compass heading away from the reference line and try to swim in a straight line. It is okay to stop and look at things, but try to stay on the chosen heading. Once you or your buddy have reached a predetermined air supply limit, swim the reciprocal course back to the reference line. If you still have enough air to continue the dive after relocating the reference line, tour the area close to the line and try to keep it in sight until you are ready to ascend.
   d. In lower visibility, follow several short courses to and from the exit area. Starting, for instance, at the anchor line, follow a compass heading out and back a short distance. After you relocate the anchor line, choose another heading and repeat the process. You'll see a good deal, while remaining oriented and close to the boat.
2. Navigating to the exit – plan night dives so that you return to your exit, or as close as possible, underwater.
   a. Before you descend. Look back toward the boat or shore while you're still oriented and note what your exit looks like from the water.
   b. At the end of your dive, if you must return to your exit on the surface, cover your dive light and let your eyes adjust. Look for your boat or shore lights; use your compass to show you which way to look.
   c. Swim slowly, take your time and watch for obstructions. Use your light to check the area as you exit.

SECTION THREE

Open Water Dives

Conduct

The PADI Night Diver Specialty course has three required open water training dives. You also have the option of adding a confined water dive to practice skills such as using dive lights, signalling and night navigation techniques along with a general scuba skills review

You may add training dives for additional experience as needed for student divers to demonstrate mastery. However, **student divers must demonstrate mastery of all performance objectives for each dive prior to progressing to the next training dive.**

On the first dive, student divers mainly work on adjusting to the night environment, using their diving equipment, communicating underwater, maintaining neutral buoyancy, and using their navigation skills. On the second dive, student divers continue to practice their navigation skills and take note of the nocturnal aquatic life while on the tour part of their dive. On the third dive, student divers plan their own night dive and experience a portion of the dive with lights out.

Prior to certification, student divers must demonstrate mastery of all performance objectives.

Dives, Times, Depths and Gases

1. **The minimum number of dives for certification as a PADI Night Diver is three open water dives.**
2. **All dives must be planned as no stop (no decompression) dives.**
3. The recommended depth is 6-12 metres/20-40 feet. **The maximum depth for Dive 1 is 30 metres/100 feet.**

General Considerations

1. Involve student divers in dive-planning activities.
2. Have students prepare training buoys, reference lines, shore surface lights and underwater orientation lights (strobe, marker lights and/or beacons).

3. Since this activity takes place in a unique and potentially stressful environment, give special attention to student diver anxiety and stress levels, in addition to student diver equipment preparedness.

4. Conduct a thorough briefing. The better the briefing, the more smoothly the night dive will proceed.

5. You can determine student diver performance on dives from the surface by observing the beams of each team's underwater dive lights.

6. Divers who finish exercises with sufficient air remaining may continue to dive for pleasure and experience, at your discretion.

Sequence Options and Dives

1. Ideally, student divers should complete Knowledge Review – Part I before Night Dive 1.

2. Student divers should complete Knowledge Review – Part II before Night Dive 2.

3. **Training dives must be conducted in order.** You may rearrange skill sequences within a dive.

Night Dive 1

Performance Requirements

By the end of the dive, student divers should be able to:

1. **Execute a descent using a line or sloping bottom as a reference.**
2. **Demonstrate how to communicate with hand signals and dive lights while night diving.**
3. **Demonstrate the proper use of a personal dive light, submersible pressure gauge, compass, timing device and depth gauge at night.**
4. **Navigate to a predetermined location using a compass/natural features and return to within 8 metres/25 feet of the starting point, surfacing for orientation only if necessary.**
5. **Demonstrate proper buddy procedures by maintaining buddy contact throughout the night dive.**
6. **Perform an ascent using a line or sloping bottom as a reference.**

I. Night Dive 1

A. Environment: Open Water

B. Maximum Depth: 30 metres/100 feet, 6-12 metres/20-40 feet recommended

II. Suggested Sequence

A. Briefing

1. Evaluate dive site conditions.
2. Identify facilities at the dive site.
3. Explain interesting and helpful facts about the dive site, including bottom topography, bottom composition, depth range and points of interest (use a dive site map if appropriate).
4. Describe entry and exit techniques for the dive site.
5. Have buddy teams plan their turn pressure, ascent pressure and reserve pressure for the dive based on gas supply limits.
6. Review the dive sequence and performance objectives.
7. Review communication and other emergency protocols as required by local regulations.

B. Predive Procedures

1. Have divers help assemble/position surface lighting systems.
2. Have divers prepare dive lights, marker lights and all standard equipment.
3. Put on all equipment.
4. Review check-out/in procedure with surface support staff (as required).

C. Night Dive 1

1. Predive safety check – includes checking light function.
    a. Buddies conduct a predive safety check.
    b. Watch for and correct errors as appropriate.
2. Entry
3. Buoyancy check and proper weighting
4. Before descent, take compass bearing on shore/boat.
5. Descent
6. Navigation exercise – designate a starting point and have divers navigate out then return to within 8 metres/25 feet of the starting point.
7. Dive within planned depth and times, and well within dive computer limits at all times.
8. Ascent
    a. Divers ascend at a maximum rate not exceeding 18 metres/60 feet per minute or according to a dive computer.
    b. Divers complete a safety stop for a minimum of three minutes at 5 metres/15 feet.
9. Exit

a. Divers establish positive buoyancy at the surface.
b. Divers exit the water appropriately for the environment, with assistance as necessary.

D. Post-dive Procedures

1. Check in with surface support staff (as required).
2. Divers stow equipment and exchange cylinders as appropriate.

E. Debriefing

1. Provide positive reinforcement and assess performance.
2. Have student divers critique themselves on their performance. Add your observations as appropriate.
3. Log the dive (instructor signs log book/approves digital log).

Night Dive 2

Performance Requirements

By the end of the dive, student divers should be able to:

1. **Execute a descent using a line or sloping bottom as a reference.**
2. **Demonstrate how to communicate with hand signals and dive lights while night diving.**
3. **Demonstrate the proper use of a dive light, submersible pressure gauge, compass, timing device and depth gauge at night.**
4. **Using a compass for navigation, return to the shore or boat underwater with at least 50 bar/500 psi remaining in your scuba cylinder.**
5. **Identify nocturnal aquatic life discussed during the course.**
6. **Demonstrate proper buddy procedures by maintaining buddy contact throughout the night dive.**

I. Night Dive 2

A. Environment: Open Water

B. Maximum Depth: 6-12 metres/20-40 feet recommended

II. Suggested Sequence

A. Briefing

1. Evaluate dive site conditions.
2. Identify facilities at the dive site.
3. Explain interesting and helpful facts about the dive site, including bottom topography, bottom composition, depth range and points of interest (use a dive site map if appropriate).

4. Describe entry and exit techniques for the dive site.
5. Have buddy teams plan their turn pressure, ascent pressure and reserve pressure for the dive based on gas supply limits.
6. Review the dive sequence and performance objectives.
7. Review communication and other emergency protocols as required by local regulations.

B. Predive Procedures

1. Have divers help assemble or position surface lighting systems.
2. Have divers prepare lights and all standard equipment.
3. Put on all equipment.
4. Review check-out/in procedure with surface support staff (as required).

C. Night Dive 2

1. Predive safety check – includes checking light function.
   a. Buddies conduct a predive safety check.
   b. Watch for and correct errors as appropriate.
2. Entry
3. Buoyancy check and proper weighting
4. Before descent, take a compass bearing on the shore or boat.
5. Descent
6. Nocturnal aquatic life identification
7. Dive within planned depth and times, and well within dive computer limits at all times.
8. Navigation to exit point using a compass
9. Ascent
   a. Divers ascend at a maximum rate not exceeding 18 metres/60 feet per minute or according to a dive computer.
   b. Divers complete a safety stop for a minimum of three minutes at 5 metres/15 feet.
10. Exit
    a. Divers establish positive buoyancy at the surface.
    b. Divers exit the water appropriately for the environment, with assistance as necessary.

D. Post-dive Procedures

1. Check in with surface support staff (as required).
2. Divers stow equipment.

E. Debriefing

1. Provide positive reinforcement and assess performance.

2. Have student divers critique themselves on their performance. Add your observations as appropriate.
3. Log the dive (instructor signs log book/approves digital log).

Night Dive 3

Performance Requirements

By the end of the dive, student divers should be able to:

1. **Execute a "free descent" using the line or sloping bottom as a visual guide only**
2. **Demonstrate how to communicate with hand signals and dive lights while night diving**
3. **Demonstrate the proper use of a personal dive light, submersible pressure gauge, compass, timing device and depth gauge at night.**
4. **Remain in a stationary position for three minutes, on the bottom, with no dive lights on.**
5. **Demonstrate proper buddy procedures by maintaining buddy contact throughout the night dive.**

I. Night Dive 3

A. Environment: Open Water

B. Maximum Depth: 6-12 metres/20-40 feet recommended

II. Suggested Sequence

A. Briefing

1. Evaluate dive site conditions.
2. Identify facilities at the dive site.
3. Explain interesting and helpful facts about the dive site, including bottom topography, bottom composition, depth range and points of interest (use a dive site map if appropriate).
4. Describe entry and exit techniques for the dive site.
5. Have buddy teams plan their turn pressure, ascent pressure and reserve pressure for the dive based on gas supply limits.
6. Review the dive sequence and performance objectives.
7. Review communication and other emergency protocols as required by local regulations.

B. Predive Procedures

1. Have divers help assemble or position surface lighting systems.
2. Have divers prepare lights and all standard equipment.
3. Put on all equipment.

4. Review check-out/in procedure with surface support staff (as required).

C. Night Dive 3

1. Predive safety check – includes checking light function.
   a. Buddies conduct a predive safety check.
   b. Watch for and correct errors as appropriate.
2. Entry
3. Buoyancy check and proper weighting
4. Before descent, take a compass bearing on the shore or boat.
5. Descent only using a line or sloping bottom for visual reference
6. Lights out exercise – divers position themselves in an area on or near the bottom where they won't disturb any aquatic life and remain stationary for three minutes with lights out.
7. Dive within planned depth and times, and well within dive computer limits at all times.
8. Navigate to exit point
9. Ascent
   a. Divers ascend at a maximum rate not exceeding 18 metres/60 feet per minute or according to a dive computer.
   b. Divers complete a safety stop for a minimum of three minutes at 5 metres/15 feet.
10. Exit
    a. Divers establish positive buoyancy at the surface.
    b. Divers exit the water appropriately for the environment, with assistance as necessary.

D. Post-dive Procedures

1. Check in with surface support staff (as required).
2. Divers stow equipment.

E. Debriefing

1. Provide positive reinforcement and assess performance.
2. Have student divers critique themselves on their performance. Add your observations as appropriate.
3. Log the dive (instructor signs log book/approves digital log).

APPENDIX

Night Diver

Knowledge Review – Part I

Complete this knowledge review to hand in to your instructor for review. If there's something you don't understand, review the related material. If you still don't understand, have your instructor explain it to you.

1. State the recommendation regarding the use of new or unfamiliar equipment on a night dive.

2. List three uses for marker lights and where they are attached for those uses.
    1.
    2.
    3.

3. Describe what you will want to consider and evaluate in choosing a potential dive site for night diving.

4. What are the six environmental conditions you should avoid when night diving?
    1.
    2.
    3.
    4.
    5.
    6.

5. What are four general night diving planning considerations?
    1.
    2.
    3.
    4.

6. Briefly describe what you should do if you experience stress, light failure, buddy separation or disorientation while night diving.

7. Briefly describe the procedures for entering the water at night from a boat and from shore.

8. Describe the proper techniques for descending and ascending at night so as to avoid disorientation and undue stress.

9. List the methods of communication while night diving.

10. Briefly describe the navigational techniques used to avoid disorientation and loss of direction while night diving.

Student Diver Statement:

I've reviewed the questions and answers, and any I answered incorrectly or incompletely I have had explained to me and/or reviewed the material, so that I now understand what I missed.

Student Name _____

Signature _____ Date _____

Night Diver

Knowledge Review – Part II

Complete this knowledge review to hand in to your instructor for review. If there's something you don't understand, review the related material. If you still don't understand, have your instructor explain it to you.

11. State the rule regarding overhead environments and night dives.

12. List night diving considerations that apply to your personal dive equipment.

13. Explain why it's important to carry at least two dive lights on a night dive.

14. Describe the advantages and disadvantages of rechargeable and non-rechargeable batteries in dive lights.

15. Describe how to maintain a dive light.

16. Describe what to do if your dive light floods.

17. List three uses for marker lights.
    1.
    2.
    3.

18. Explain how underwater strobes can be used.

19. List two uses for surface support lights.
    1.
    2.

20. Describe how to be courteous while night diving

Student Diver Statement:

I've reviewed the questions and answers, and any I answered incorrectly or incompletely I have had explained to me and/or reviewed the material, so that I now understand what I missed.

Student Name _____

Signature _____ Date _____

Night Diver

Knowledge Review – Part I Answer Key

Note to Instructor

To assess knowledge, review the Knowledge Review student divers completed in their PADI *Night Diver Manual*. Prescriptively review answers to questions student divers may have missed, or have answered incorrectly or incompletely. Ensure student divers understand what they have missed.

1. State the recommendation regarding the use of new or unfamiliar equipment on a night dive.

   When possible, avoid using unfamiliar equipment on night dives.

2. List three uses for marker lights and where they are attached for those uses.

   1. **To mark each diver – attach the marker light to your snorkel or cylinder valve.**
   2. **To mark dive boat or surface float – attach the marker light about one metre/three feet up on the flagstaff.**
   3. **To mark ascent/descent line or anchor line – attach several marker lights along the length of the line, with a different color at 5 metres/15 feet to mark the safety stop depth.**

3. Describe what you will want to consider and evaluate in choosing a potential dive site for night diving.

   Dive familiar sites; try to dive the site the day before the night dive.

   Night dive when conditions are good in a type of environment you're familiar with.

4. What are the six environmental conditions you should avoid when night diving?

   1. **Moderate to high surf**
   2. **Moderate to strong currents**
   3. **Poor visibility**
   4. **Thick kelp – or other entanglements**
   5. **Heavy surge**
   6. **Overhead environments**

5. What are four general night diving planning considerations?

   1. **Prepare your equipment ahead of time in daylight.**
   2. **Eat a proper meal a few hours before the dive.**
   3. **Dive with familiar buddies.**
   4. **Bring a nondiver friend.**

6. Briefly describe what you should do if you experience stress, light failure, buddy separation or disorientation while night diving.

   Stress: Stop, breathe, think and then act; breathe slow, deep and regular.

   Light failure: Switch to backup light and signal your buddy.

   Buddy separation: Look for glow of buddy's light; search for one minute, then surface.

   Disorientation: Without a reference line, hold on to your buddy, hug yourself, watch your bubbles or look for the bottom if the visibility allows.

7. Briefly describe the procedures for entering the water at night from a boat and from shore.

   Predive safety check: check lights and backups. From boat: check entry area, turn on light, enter water, signal "okay," clear entry area. From shore: check entry area with light, stay close to buddy, move quickly through surf, be cautious where you step. Swim when water is deep enough.

8. Describe the proper techniques for descending and ascending at night so as to avoid disorientation and undue stress.

   Use a reference line for both descent and ascent. Descend feet-first, pointing light downward to watch for bottom. During ascent, point light upward, watching above, swim slowly (18 metres/60 feet per minute or slower).

9. List the methods of communication while night diving.

   Rapping on your tank, waving your light or moving your light in a predetermined pattern, gently touch your buddy, shining your light on hand signals at waist level, using a slate, and by using a whistle on the surface.

10. Briefly describe the navigational techniques used to avoid disorientation and loss of direction while night diving.

    Dive site during the day. Before descent, take a compass heading to shore or back to boat. Keep navigation patterns simple. Don't stray far from entry/exit and reference line.

Night Diver

Knowledge Review – Part II Answer Key

Note to Instructor

To assess knowledge, review the Knowledge Review student divers completed in their PADI *Night Diver Manual*. Prescriptively review answers to questions student divers may have missed, or have answered incorrectly or incompletely. Ensure student divers understand what they have missed.

11. State the rule regarding overhead environments and night dives.

    It's inappropriate to make overhead environment dives at night because locating an exit would be extremely difficult in case of light failure, disorientation, and contact loss with a guideline.

12. List night diving considerations that apply to your personal dive equipment.

    Be able to locate equipment by touch and operate with one hand. Alternate air source should be easily accessible and identifiable. BCD low-pressure inflator should be easy to find. Wear exposure protection. Instrument consoles are convenient to use at night. Carry a slate, audible and visual signaling device for communication. Use equipment with which you're familiar.

13. Explain why it's important to carry at least two dive lights on a night dive.

    In case of light failure, you'll have a backup light.

14. Describe the advantages and disadvantages of rechargeable and non-rechargeable batteries in dive lights.

    Non-rechargeable

    Advantages: **long burn time, light dims slowly as batteries weaken.**

    Disadvantages: **not reusable, can't power high wattage bulbs.**

    Rechargeable

    Advantages: **may use over again by recharging. Less expensive than non-rechargeables in the long run, power high-wattage bulbs.**

    Disadvantages: **need careful handling and maintenance, light drops off quickly as battery weakens.**

15. Describe how to maintain a dive light.

    Rinse in fresh water. Remove batteries. Inspect and clean battery contacts and o-rings. Lubricate and replace o-rings. Store in a cool, dry place.

16. Describe what to do if your dive light floods.

    Turn light off and exit water. Open carefully, pour water out, dispose of batteries, and rinse light thoroughly with fresh water. Have light serviced.

17. List three uses for marker lights.

    1. **To mark each diver – attach the marker light to your snorkel or cylinder valve.**
    2. **To mark dive boat or surface float – attach the marker light about one metre/three feet up on the flagstaff.**
    3. **To mark ascent/descent line or anchor line – attach several marker lights along the length of the line, with a different color at 5 metres/15 feet to mark the safety stop depth.**

18. Explain how underwater strobes can be used:

    Strobe lights can mark floats, reference lines or a boat, or may be used as an emergency signaling device.

19. List two uses for surface support lights:

    1. **Provide light for assembling equipment and gearing up as well as removing equipment and storing it away.**
    2. **Mark entry and exit point.**

20. Describe how to be courteous while night diving.

    Keep noise down. Keep your light off windows, cars, boats, tents and out of people's eyes.

PADI Specialty Training Record

Night Diver

Instructor Statement

I verify that this student has satisfactorily completed all knowledge development training sessions and/or any confined water training sessions as outlined in the PADI Night Diver Specialty Course Instructor Guide. I am a renewed, Teaching status PADI Instructor in this specialty.

Instructor Name _____ PADI # _____

Instructor Signature _____ Completion Date _____

Dive 1

I verify that this student has satisfactorily completed Dive 1 as outlined in the PADI Night Diver Specialty Course Instructor Guide including:

- Gearing up
- Assemble/position surface lighting systems
- Take compass bearing on shore/boat
- Acclimatization on the bottom
- Using a compass, navigate to a predetermined location and return to within 8 metres/25 feet of starting point
- Tour immediate underwater area

I am a renewed, Teaching status PADI Instructor in this specialty.

Instructor Name _____ PADI # _____

Instructor Signature _____ Completion Date _____

Dive 2

I verify that this student has satisfactorily completed Dive 2 as outlined in the PADI Night Diver Specialty Course Instructor Guide including:

- Gearing up
- Assemble/position surface lighting systems

- Take compass bearing on shore/boat
- Acclimatization on the bottom
- Tour underwater area and note nocturnal aquatic life
- Using a compass, return to shore/boat with at least 50 bar/500 psi remaining

I am a renewed, Teaching status PADI Instructor in this specialty.

Instructor Name _____ PADI # _____

Instructor Signature _____ Completion Date _____

Dive 3

I verify that this student has satisfactorily completed Dive 3 as outlined in the PADI Night Diver Specialty Course Instructor Guide including:

- Gearing up
- Assemble/position surface lighting systems
- Take compass bearing on shore/boat
- Acclimatization on the bottom
- Lights out for three minutes in a stationary area on or near bottom
- Tour underwater area

I am a renewed, Teaching status PADI Instructor in this specialty.

Instructor Name _____ PADI # _____

Instructor Signature _____ Completion Date _____

Student Diver Statement

I verify that I have completed all performance requirements for this PADI Night Diver specialty course. I am adequately prepared to dive in areas and under conditions similar to those in which I was trained. I agree to abide by PADI Standard Safe Diving Practices.

Student Name _____

Student Signature _____ Completion Date _____

PADI Adventure Dive Training Record

Adventure Dive: Night

Skills Overview

- Knowledge Review
- Briefing
- Gearing Up
- Predive Safety Check (BWRAF)
- Entry
- Acclimatization on the Bottom
- Navigation Exercise
- Night Dive for Fun and Pleasure
- Ascent – Safety Stop
- Exit
- Debrief
- Log Dive – Complete Training Record

Instructor Statement

I verify that this student has satisfactorily completed the Knowledge Review and Performance Requirements (as described in PADI's Advanced Open Water Diver Instructor Guide) for this PADI Adventure Dive. I am a renewed, Teaching status PADI Instructor for the current year.

Instructor Name _____ PADI # _____

Instructor Signature _____ Completion Date _____

Instructor Contact Information (Please Print)

Instructor Mailing Address _____

City _____ State/Province _____

Country _____ Zip/Postal Code _____

Phone _____ Email _____

Student Diver Statement

I verify that I have completed all of the Performance Requirements for this Adventure Dive. I realize that there is more to learn about night diving and that completion of a PADI Night Diver course is highly recommended. I also agree to abide by PADI Standard Safe Diving Practices.

Student Name _____

Student Signature _____ Completion Date _____