

BASICS OF BETTER UNDERWATER PHOTOGRAPHY

MACRO PHOTOGRAPHY



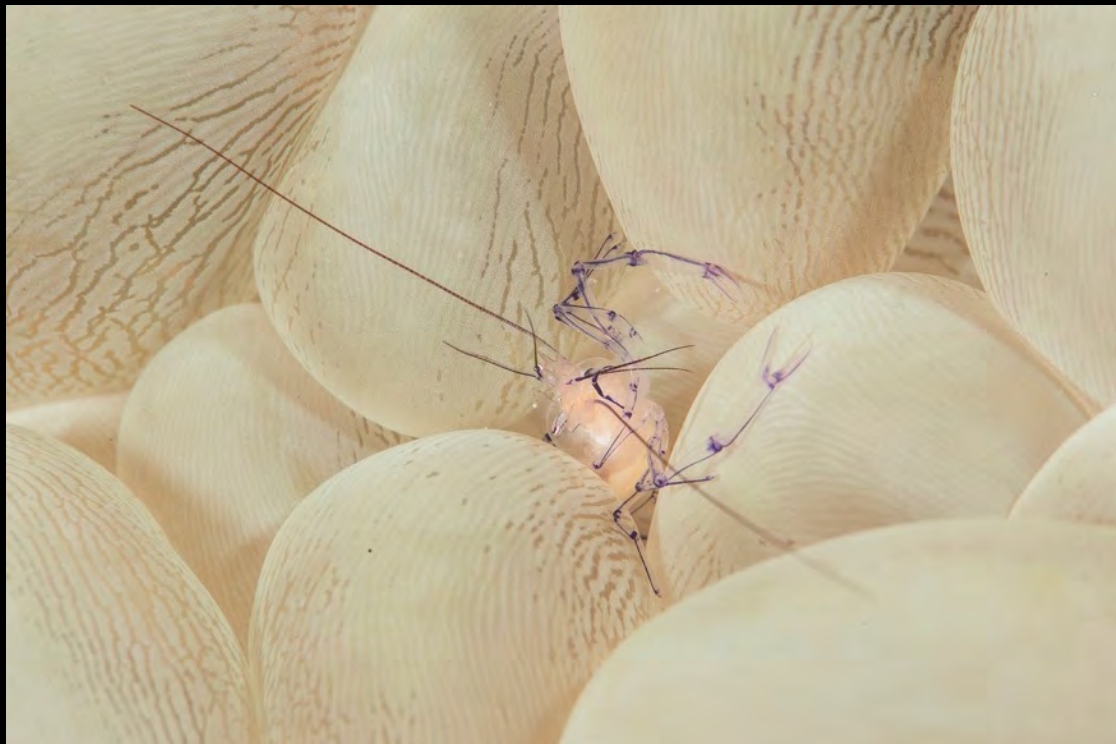
OPTICAL OCEAN SALES
UNDERWATER PHOTOGRAPHY EQUIPMENT

MACRO

GO SMALL AND GET CLOSE

Underwater, the closer we look, the more we see. Slow down, go small and look into the plants and growth. You'll find surprisingly beautiful and fascinating subjects.

Macro photography allows photographers to get in close, reducing the amount of water between the camera and subject; bringing out color, sharpness and details in photos.



A super macro photograph showing a yellow flower bud with long, thin stamens emerging from a purple, textured, honeycomb-like surface. The image is highly detailed, showing the fine structure of the flower and the surrounding material.

WHAT SIZE IS MACRO?

REPRODUCING LIFE

Macro photos require a magnifying macro lens or other optics that can focus closely to achieve a high **reproduction ratio**.

This is the ratio of the subject size on the sensor plane to the actual subject size. Classically, a lens capable of reproduction ratios greater than 1:1, or “lifesize” is required for it to be a true macro lens.

Images shot at less than 1:1 are actually considered “**close-up**”, with photos shot greater than 1:1 referred to as “**super macro**”.

However, commonly, any lens capable of high magnification can be considered and used as a macro lens.

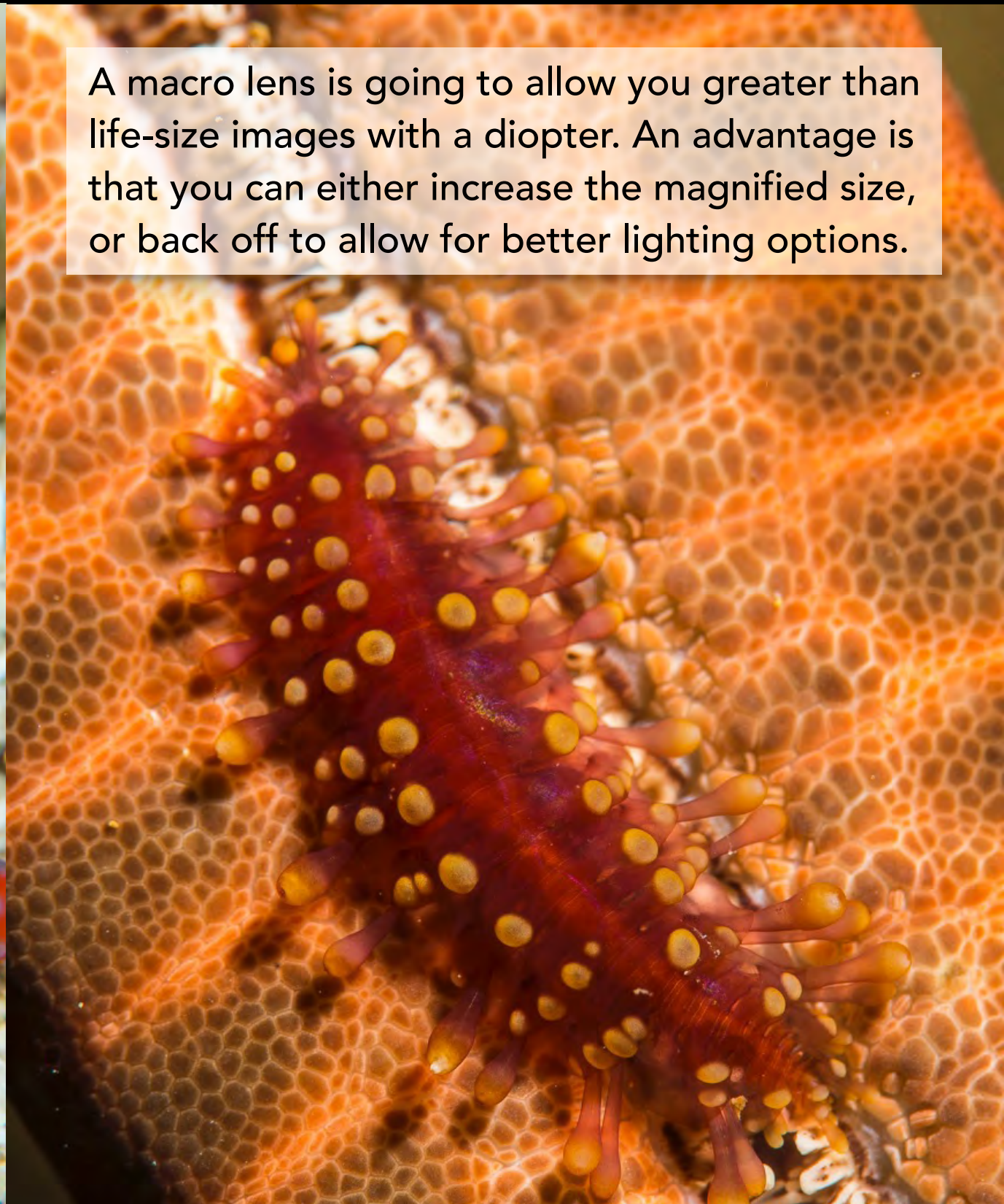
Super macro

CLOSE VS CLOSER

STANDARD LENS VS MACRO LENS - BOTH WITH A DIOPTER



A macro lens is going to allow you greater than life-size images with a diopter. An advantage is that you can either increase the magnified size, or back off to allow for better lighting options.



UNDERWATER MACRO

CONSIDERATIONS

- ▶ **Refraction helps:** Objects underwater are magnified by 1/3rd, so your subjects are already larger!
- ▶ **Use a flat port:** Dome ports are for wide angle to undo the effect of refraction. Using them for macro will reduce magnification. Make sure your lens fits closely to the front of the flat port for best magnification.
- ▶ **A diopter doesn't magnify:** Don't confuse closer focusing with magnification. A diopter allows you to focus closer and thus get a larger image.
- ▶ **Keep your rig compact:** Smaller is better, and allows you to get into tighter spaces.



Good buoyancy control is very important when shooting macro photos.

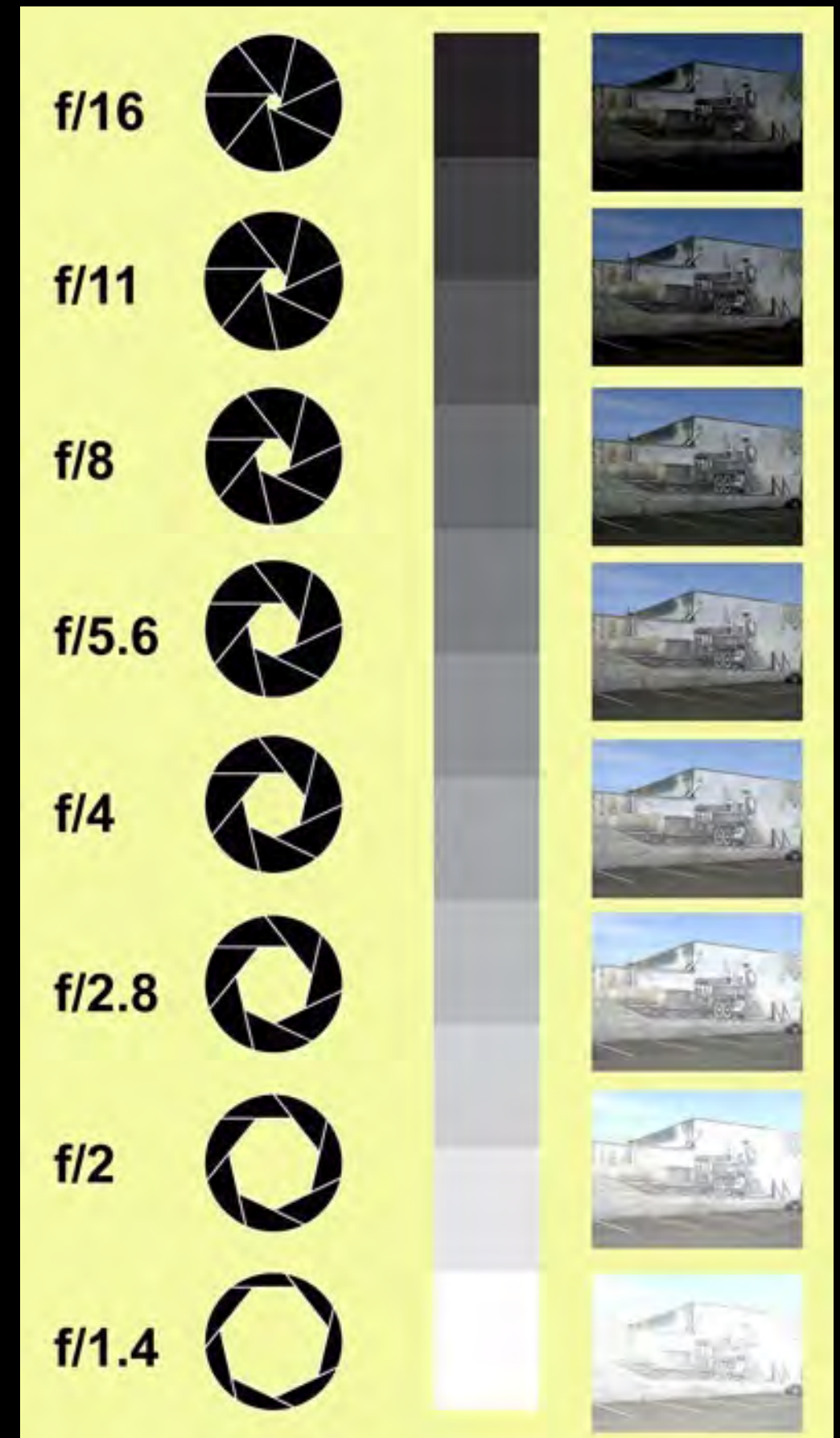
SEE OUR GUIDE ARTICLE:
["RECOMMENDED LENSES FOR UNDERWATER PHOTOGRAPHY"](#) TO LEARN MORE.

BALANCE THE EXPOSURE

CONTROL LIGHTING AND DEPTH OF FIELD

A few things to remember:

- ▶ **Start with shutter or aperture priority:** Don't use all-auto. Learn the relationship between having more light and less depth of field.
- ▶ **Learn to shoot manual:** You'll have much more control if your camera allows it.
- ▶ **Use low ISO:** You'll get better detail, sharpness and color saturation.
- ▶ **Control your background with shutter speed:** Faster shutter speeds will give darker backgrounds and have less camera shake for better sharpness as well.
- ▶ **Use smaller apertures:** You will need to have greater depth of field. Mid or higher apertures allow more of your subject to be in focus.



STARTING SETTINGS

FOR COMPACT AND SLR/DSLR CAMERAS

Compact Cameras:

Macro setting

+5 air diopter, or Compact Macro Converter

Mode: Manual or auto aperture

Focus: Single point auto focus

Zoom: Set to telephoto for max enlargement

Shutter: 1/250+ for dark backgrounds

Aperture: Auto or set to a mid-point like f/5.6

ISO: 100

SLR/DSLR Cameras:

60mm or 105mm macro lens

+5 ,+10 air diopter, or Super Macro Converter

Mode: Manual or auto aperture

Focus: Single point auto focus

Shutter: 1/180 or higher for dark backgrounds, but not higher than strobe can sync.

Aperture: Auto or set to a mid-point like f/16

On full frame cameras use around f/18+

ISO: 100-200



APERTURE

DEPTH OF FIELD VS. SHARPNESS

The higher the magnification, the less depth of field you'll have. But stopping down further than half to 3/4s on most lenses leads to less sharp images. This is due to "diffraction" - the light being bent by the small openings. Try different shots to see what the "sweet spot" is.



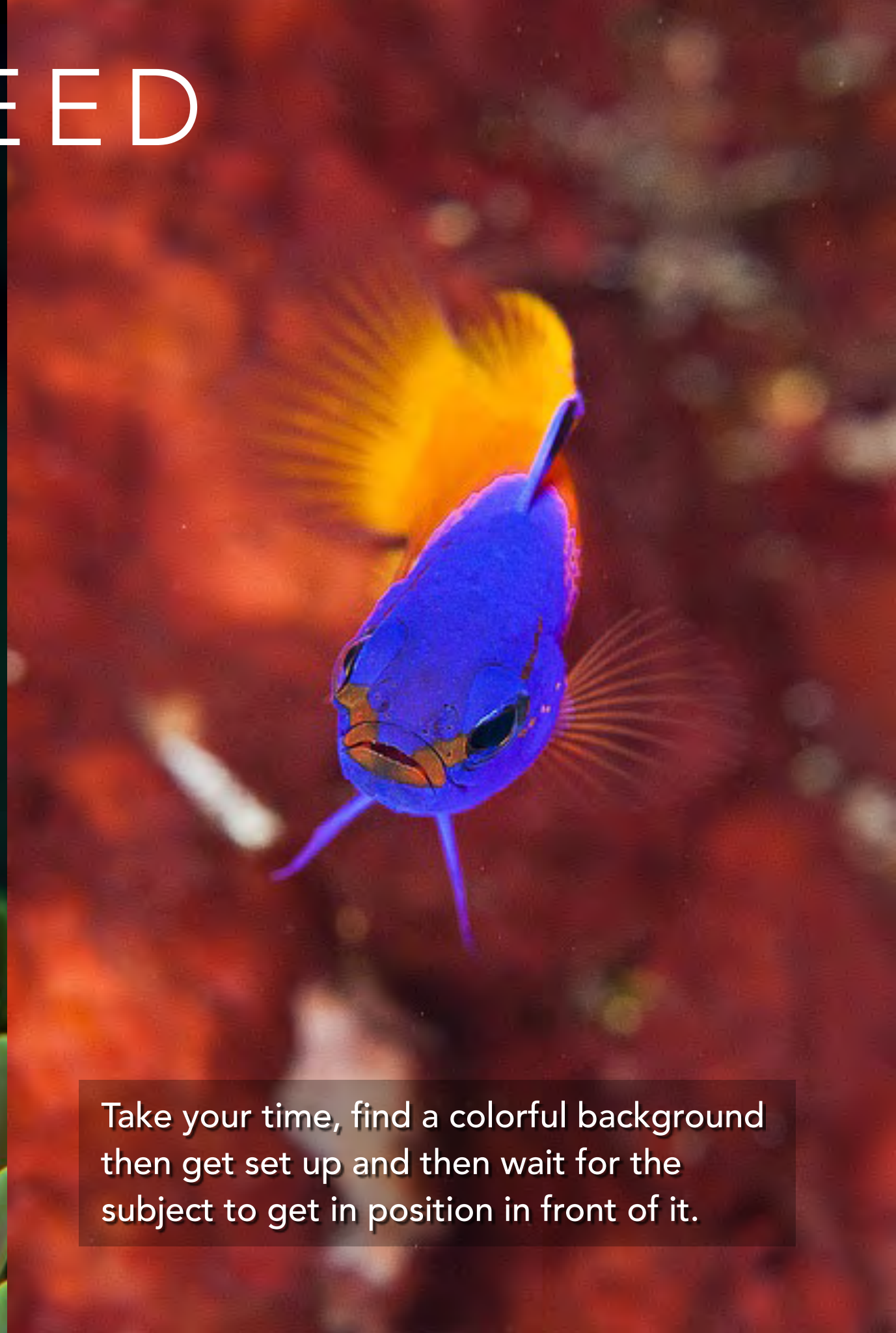
SHUTTER SPEED

DARK VS. LIGHT BACKGROUNDS

Many photographers use dark backgrounds for macro shots by shooting with high shutter speeds. This is one area that compact cameras have an advantage with electronic shutters that can sync with strobes at any speed.



SEE OUR HANDBOOK:
["PHOTOGRAPHING UNDERWATER
ANIMALS"](#) TO LEARN MORE.



Take your time, find a colorful background then get set up and then wait for the subject to get in position in front of it.

TECHNIQUES

FOCUSING

A few things to try:

- ▶ **Use half press on the shutter to lock focus.**
Make sure you are in single point AF, position the dot where you want it, lock focus (usually on the animal's eye) by pressing halfway down, then recompose and take the picture.
- ▶ **Try "Back Button" or the "AF Lock" button:** This is sometimes easier to catch focus with and you can scroll the AF dot where you want it first.
- ▶ **Rock Focus:** After locking focus, move the camera slightly in and out to move the focus area. Remember that depth of field will help. Try taking several shots to bracket the area in focus, using different aperture settings.
- ▶ **Manual Focus:** For those cameras that have it, or by adding manual gearing, you can have more control over focusing.



SHOOT LOTS AND LOTS OF PHOTOS!

Shooting underwater is much more challenging than shooting on land, especially at first. Be sure not to over tax the animal, and let others access to also take photos.

Taking a large volume of images also allows you to experiment with your lighting, composition and camera settings.



KNOW THE RULE OF THIRDS

COMPOSITION COUNTS

Imaginary lines are drawn dividing the image into thirds both horizontally and vertically. You place important elements of your composition where these lines intersect.



SEE OUR HANDBOOK:
["UNDERWATER PHOTOGRAPHY
COMPOSITION"](#) TO LEARN MORE.

MACRO:

USING ONE STROBE

One strobe macro set-up with focus light. TTL or manual control.

Single Strobe Macro:

- ▶ The closer the subject is to the lens – the closer the strobe should be positioned to the housing port.
- ▶ A good starting point is with the strobe centered directly over the port as in image #1. (This is just a starting point. It will work okay in clear water, but will cause backscatter in murky conditions.)



Strobe directly above (IN):

- ▶ Subject is very close
- ▶ Lots of light is needed
- ▶ The water is very clear



Strobe directly above (OUT):

- ▶ Subject is very close
- ▶ Aim strobe away from subject for indirect light and less chance of backscatter



Strobe extended out:

- ▶ Subject is farther away
- ▶ Less light is needed
- ▶ Aim strobe away from subject for indirect light and less chance of backscatter

MACRO PHOTO

USING ONE STROBE

A good starting point:

- ▶ The strobe centered directly over the port
- ▶ The closer the subject is to the lens, the closer the strobe is positioned to the housing & port.
- ▶ TTL or manual strobe control will work fine.



- ▶ Only aim the strobe directly at the subject in very clear water - when the subject is very close.



MACRO PHOTOGRAPHY

STROBE POSITION OPTIONS

Pivoting strobes for different lighting effects on close subjects:

- ▶ Strobes can be pivoted in (towards the port) to increase light on subject, being careful of creating backscatter.
- ▶ Strobes can be pivoted out (away from the port) to decrease light on subject.
- ▶ Shadows can give more dramatic effects. Strobes can be moved vertically and horizontally to create shadows.



Image 1: "In" position

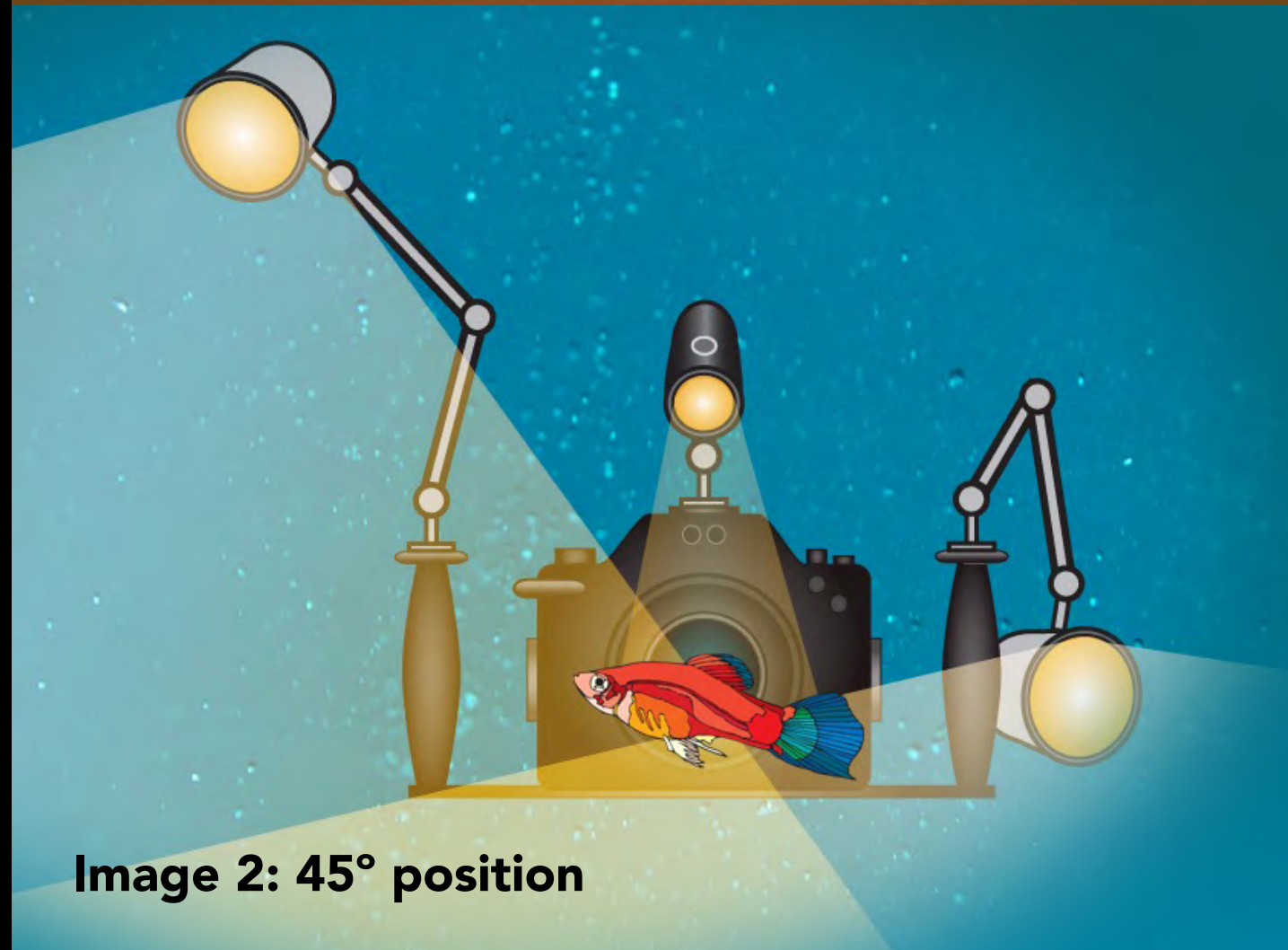


Image 2: 45° position

MACRO PHOTO

STROBES IN CLOSE



Focus Light



Aiming your strobes:

- ▶ Bring strobes in (towards the port) when the subject is closer.
- ▶ Pivot strobe face out (away from the port) to avoid backscatter.

MACRO EQUIPMENT

CAMERAS, HOUSINGS & LENSES

Macro photography is a great place for a beginner to start as basic equipment is minimal.

- ▶ **Compact Cameras:** When shopping for a compact camera, make sure it can focus closely, and has a macro mode.
- ▶ **Mirrorless & DSLR Cameras:** Make sure that macro lenses are available. For cropped sensor cameras starting with a 60mm lens is easier. For full-frame the 100/105mm lenses are the lens of choice. A bright and large viewfinder helps.
- ▶ **Housings:** Make sure the port can take an external macro lens (usually threaded to 67mm) and that it can mount a focus light.

SEE OUR HANDBOOK:
"[CHOOSING A CAMERA & HOUSING](#)"
TO LEARN MORE.



DIOPTER AND CONVERTER LENSES

Diopter lenses are added to your existing lens to allow for closer focusing.

- ▶ **External or Internal:** Diopters can be added internally to the front of the lens inside the port. But most are mounted externally to the front of ports as “wet mount” lenses. They can be added and subtracted underwater for greater flexibility.
- ▶ **Wet or Dry Optics:** More powerful macro diopters are sealed inside of glass with an airspace, using refraction to their advantage.
- ▶ **Macro Converters:** Take the idea of air sealed lenses further by also adding in an extension and more sophisticated optics. May only work with
- ▶ **Chroma Aberration:** Many lenses in combination with sensors create a purple or green fringe of a pixel or two that can affect sharpness. This is easily removed in editing.
- ▶ **Achromatic Lenses:** Is a lens that is designed to limit the effects of color separation and reduce chromatic and spherical aberration.



Super Macro Converter



Air-sealed +10 Diopter



+5 “Wet” Diopter

LIGHTING & STROBES

Lighting is always important underwater. With the reduced working distances and small subject matter a strobes and focusing lights are important.

- ▶ **Focusing Lights:** Cameras need contrast and detail to catch autofocus, a continuous light greatly helps to speed up the image capture. It also helps you to see to frame the shot.

A focus light has a broad beam and works differently than a narrow-beamed dive light by giving even lighting without hotspots. Red lighting options can work to be less obtrusive to some animals.

By shooting faster than 1/100th of a sec or so, you'll never see the focus light.

- ▶ **Strobes:** By using an external strobe you can reduce backscatter and give more natural lighting. The extremely fast, high-intensity light that a strobe delivers freezes motion, gives sharp details and intense color saturation.



OTHER USEFUL ACCESSORIES

- ▶ **Dioptr holders:** A lens holder or flip diopter adapter makes life easier by allowing you to quickly add and subtract additional lenses.
- ▶ **Viewfinders:** Being able to see to critically focus greatly reduced depth of field shots can be hard. A bright, magnifying viewfinder makes it much easier. Models with a 45° bend allow you to stay off the bottom.



- ▶ **Light Directing Accessories:** Snoots narrow the light and direct it. Ring lights transfer the strobe light directly and evenly to the the subject to give lighting with intense color saturation.
- ▶ **Muck Stick:** Inexpensive and very useful, a metal stick that allows you to hold position without hurting the reef. It can also be used as a monopole to steady your housing.



Flip diopter holder



Ring flash



Muck Sticks



Part of the “Basics of UW Photography” Series

OPTICAL OCEAN SALES

UNDERWATER PHOTOGRAPHY EQUIPMENT

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1800 Westlake Ave. N, Seattle, WA 98109
800-359-1295 / 206-284-1142

orders@OpticalOceanSales.com

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