

Marine Biology, Oceanography and Underwater Robots Teleclass Webinar!

You can fill out this worksheet as we go along to get the most out of time together, or you can use it as a review exercise at the end of the class to see where your strengths are.

What we're going to cover today:

- Mapping the ocean floor
 - Ocean Zones
 - Temperature, pressure
 - Acids and Bases, pH
 - Waves, currents, tides
 - Salinity
 - Atmosphere
 - Photosynthesis and chemosynthesis
 - Food chain/webs
 - Phytoplankton
 - Bioluminescence
 - Properties of light
 - Marine plants and animals
 - Marine environments
 - Exploration techniques
 - Observing techniques
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Write down two things you really want to know about marine biology or oceanography:

1. _____

2. _____

Do this NOW: Write down WHY you want to learn about the things you mentioned above. What will it give you, or provide you with, or make possible for you if you now understand these things that you wanted to learn?

IMPORTANT: During class, you can either fill out the worksheet, OR if that's too stressful or a hassle, just set it aside and fill it out after class is over so you can enjoy watching the class.

Answer key is on the last page, so put it in a place where you won't be tempted to peek at the answers until after you've given it your best shot.

Material List:

- Cup of water
- Salt
- Hard boiled egg
- Paperclip
- Rubber band
- 2 glow sticks (same color)
- Ice water
- Warm-hot water (not too hot)
- Sample of pond water (make your own by filling a cup of water with grass clippings, then let it sit on the windowsill for a few days)
- Gummy bear (one red and one green)
- Red laser pointer (inexpensive “Dollar Store” keychain type are perfect)
- Needle-nose pliers (or something you can bend a paperclip with)

During the Lesson:

You can look over the worksheet so you know what to listen for as you go through the class with me, or you can go through it along with me during class. OR... flip it over and forget about it and just enjoy the class. When class is over, flip it back over and fill it out and be amazed at how much you've picked up and learned!

1. Marine Biology studies life in _____

environments.
2. Oceanographers study _____, currents, waves, seafloor

_____, _____ composition,

sea _____ and animals.
3. Remotely Operated Vehicles are _____,

unoccupied underwater robots that _____.
4. SONAR: _____und _____vigation and _____anging is used to identify objects in water

and determine water _____.
5. Bathymetry is the study of the _____.
6. The ocean floor has _____ and _____

just like on land.
7. There are main three _____ of the ocean:

8. For every _____ meters you descend, _____ atmosphere of pressure is added.
9. The _____ at the bottom of every ocean is _____.
10. (Circle) True or False? Water spins down a drain one way in the Northern hemisphere, and the other way in the Southern hemisphere.
11. Tides are caused by _____ and _____.
12. Hydrothermal _____ are surrounded by thriving communities of organisms that _____ from the vents for chemosynthesis.
13. _____ in the ocean comes from _____ on land.
14. _____ are organisms create _____ for the food chain.
15. _____ is a tiny organisms that lives in _____ . Cyanobacteria generate over _____ of the oxygen we breathe.
16. _____ use chemosynthesis to make organic matter in total _____.

17. Bioluminescence is the _____ by
a living organism.

18. Light allows organisms _____ and it also provides
_____.

19. Red light has the _____ wavelength and the
_____ amount of energy in the visible light spectrum.

20. Cephalopods _____ their environment by matching color,
texture, brightness, and pattern.

21. A _____ supports more species than any other marine
environment.

22. What I didn't know about marine biology and oceanography until class today was:

Vocabulary Words:

Aphotic Zone: the depths beyond which less than 1% of sunlight penetrates.

Aquatic: operating or living or growing in water

Bathysphere: spherical deep diving apparatus for underwater exploration

Bioluminescence: The ability to glow in the dark; production of visible light by living organisms

Camouflage: an outward semblance misrepresenting the nature of something

Cephalopod: marine mollusk characterized by well-developed head and eyes and sucker-bearing tentacles

Coriolis Effect: The idea that surface water moved by wind does not flow parallel but rather deflects to the right in the Northern Hemisphere and to the left in the Southern Hemisphere.

Crustacean: mainly aquatic arthropod usually having a segmented body

Disphotic Zone: known as the twilight layer, this zone has only a small amount of light.

Echolocation: determining the location of objects by reflected sound

Invertebrate: any animal lacking a backbone or notochord

Krill: shrimp-like planktonic crustaceans

Marine Biology: Marine biology is the study of marine organisms, their behaviors and interactions with the environment. Marine biologists study biological oceanography and the associated fields of chemical, physical, and geological oceanography to understand marine organisms.

Medusa: one of two forms that coelenterates take: it is the free-swimming sexual phase in the life cycle of a coelenterate; in this phase it has a gelatinous umbrella-shaped body and tentacles

Mollusk: invertebrate with a soft unsegmented body usually in a shell

Nautilus: cephalopod of the Indian and Pacific oceans having a spiral shell with pale pearly partitions

Oceanography: the branch of science that deals with the physical and biological properties and phenomena of the sea.

Ph : shows how acidic the water level is using the ionization of water for a scale

Photic Zone: is the depth of the water nearest to the surface where enough light penetrates to allow photosynthesis.

Photosynthesis: synthesis of compounds in plants aided by radiant energy

Phytoplankton: Single celled microscopic organisms that are found scattered throughout the photic zone

Pressure: the continuous physical force exerted on or against an object by something in contact with it.

Radar: a system for detecting the presence, direction, distance, and speed of aircraft, ships, and other objects, by sending out pulses of high-frequency electromagnetic waves that are reflected off the object back to the source.

Salinity: The total amount of dissolved salts in seawater. Measured in parts per thousand

Sonar: a system for the detection of objects under water and for measuring the water's depth by emitting sound pulses and detecting or measuring their return after being reflected.

Symbiosis: the relation between two interdependent species of organisms

Temperature: the degree or intensity of heat present in a substance or object, especially as expressed according to a comparative scale and shown by a thermometer or perceived by touch.

Answer Key:

1. Marine Biology studies life in salt water environments.
2. Oceanographers study tides, currents, waves, seafloor geology, chemical composition, sea plants and animals.
3. Remotely Operated Vehicles are tethered, unoccupied underwater robots that explore oceans.
4. SONAR: SOund NAavigation and Ranging is used to identify objects in water and determine water depth.
5. Bathymetry is the study of the seafloor.
6. The ocean floor has canyons and seamounts just like on land.
7. There are main three zones of the ocean:
8. For every 10 m you descend, 1 atmosphere of pressure is added.
9. The temperature at the bottom of every ocean is 4 °C.
10. Water spins down a drain one way in the Northern hemisphere, and the other way in the Southern hemisphere. False!
11. Tides are caused by gravity and inertia.
12. Hydrothermal vents are surrounded by thriving communities of organisms that use energy from the vents for chemosynthesis.
13. Salt in the ocean comes from rocks on land.
14. Primary producers are organisms create new organic material for the food chain.
15. Phytoplankton is a tiny organism that lives in water. Cyanobacteria generate over 50% of the oxygen we breathe.
16. Bacteria use chemosynthesis to make organic matter in total darkness.
17. Bioluminescence is the production and emission of light by a living organism.
18. Light allows organisms to see and it also provides energy.
19. Red light has the longest wavelength and the least amount of energy in the visible light spectrum.
20. Cephalopods mimic their environment by matching color, texture, brightness, and pattern.
21. A coral reef supports more species than any other marine environment.