

TEST YOUR KNOWLEDGE ANSWERS

1. What is an estuary?
 - a. A coastal habitat that is only found in Long Island Sound.
 - b. A partially enclosed body of water where salt water and fresh water meet.**
 - c. All the oceans of the world.
 - d. A type of plant found in brackish water.
2. Which of these statements is TRUE about coastal grasslands?
 - a. Their root systems hold the ground material in place so it will not blow away or shift with the wind.
 - b. It provides habitat for migratory birds and other nesting bird species.
 - c. The plants are very effective at utilizing and absorbing water.
 - d. All of the above.**
3. What purpose does peat serve for the salt marsh?
 - a. It filters out the salt from the water so that the plants in the salt marsh only drink fresh water.
 - b. It absorbs the sunlight and photosynthesizes, creating extra food for the salt marsh grass during the winter months when there is less sunlight.
 - c. It is a rich organic layer that absorbs water and filters pollutants.**
 - d. Trees can only grow in this special layer of substrate near the edge of the water.
4. In the rocky intertidal zone....
 - a. There is very little water because the tide never reaches this area.
 - b. Rocks hold the sediment in place, preventing erosion.**
 - c. Migrating birds come here to nest.
 - d. The silty sediment filters the water, making it cleaner for Long Island Sound.
5. Which of these statements is FALSE about the wrack line?
 - a. The wrack line is always in the same place on the beach.**
 - b. The wrack line provides food and nutrients.
 - c. The wrack line occurs because of the tide.
 - d. The wrack line can contain seaweed and dead animals.

6. Which of these is the correct pairing of a type of adaptation with an example of that adaptation?
- a. **The body of a plant can bend towards the light using chemical reactions inside the body, which is a physiological adaptation to ensure they can make their own food.**
 - b. Snakes create their own venom, which is a structural adaptation that they use to get their prey.
 - c. Diamondback terrapins have a beak to crush their food, which is an example of a behavioral adaptation.
 - d. Blue crabs have a back leg like a paddle to help them swim through the water, which is an example of a physiological adaptation.
7. _____ occurs when animals are better at surviving and are able to pass on genes to their offspring.
- a. Adaptation
 - b. **Natural selection**
 - c. Morphology
 - d. Genetic diversity
8. Which of these statements is TRUE about having variation within the same population of animals?
- a. There should be no variation, all animals should be exactly the same because they are best fit for that environment forever.
 - b. There should be no variation because if the environment changes, the animal should not be allowed to continue to exist.
 - c. **There should be variation within a population because the conditions could suddenly change and then at least some of the animals would survive.**
 - d. There should be variation so that each animal can choose the mate they like the best.
9. How is the horseshoe crab's telson an example of an adaptation?
- a. It uses the telson to sting predators that come near it.
 - b. It uses the telson like a rudder to steer through the water.
 - c. It uses the telson to taste the water and make sure the chemistry is right.
 - d. **It uses the telson to flip over when it is upside down on the beach.**
10. A(n) _____ is the combination of all living and non-living things in an area.
- a. Biotic factor
 - b. Abiotic factor
 - c. **Ecosystem**
 - d. Estuary

11. Which of these is NOT an example of a biotic factor in Long Island Sound?
- a. **The sunlight that is used by producers to make food.**
 - b. A producer that makes food from the sun.
 - c. A consumer that eats producers.
 - d. A decomposer that breaks down dead consumers.
12. Which of these statements is FALSE about the salinity in Long Island Sound?
- a. The salinity fluctuates throughout the year.
 - b. The salinity is the lowest in the spring due to all the extra fresh water.
 - c. **The salinity is the highest in the winter due to all the direct sunlight on the water.**
 - d. Animals that can't adapt to fluctuating salinities move out to the ocean where it is more consistent.
13. What is the crucial job of a mud snail in a mud flat substrate?
- a. Maintaining the salinity of the water so all the animals can live there.
 - b. Giving energy to producers like seaweed so they can photosynthesize.
 - c. Stirring up the mud to bring in oxygen to the lower levels.
 - d. **Breaking down dead materials and releasing nutrients back into the environment.**
14. Which of these is an example of how an abiotic factor has affected the lobster population in Long Island Sound?
- a. **Rising water temperatures have caused the lobster to molt earlier than they are supposed to so they end up getting a shell disease more often.**
 - b. Rising water temperatures have caused the lobster to migrate to shallow water later than they are supposed to and as a result the lobsters do not have enough food for the winter.
 - c. Rising water temperatures make the lobster less likely to get diseases, so the populations of lobsters are rising as the water temperature rises.
 - d. All of the above.
15. Why are tillering roots important to the salt marsh grass?
- a. Tillering roots remove the salt from the water before it gets into the leaves of the grass.
 - b. **Tillering roots have rhizomes that help to create new root systems and create colonies of plants in an area.**
 - c. Tillering roots have a single taproot and some lateral roots because there are so many nutrients in one area of the salt marsh.
 - d. Tillering roots help hold the salt marshes grasses to the rocks so they can move around under the water freely.

16. What purpose does the salt gland serve for *Spartina alterniflora*?
- a. It converts salt to nutrients for the plant.
 - b. It stores salt for animals that live on the plant.
 - c. It makes the plant immune to the salt in the water.
 - d. **It removes salt and expels it on the leaf surface.**
17. Compared to coastal plants, marine plants....
- a. Do not have to worry about sunlight because they are always floating at the top of the water.
 - b. Get their nutrients with a specialized structure called an air bladder.
 - c. **Do not have root systems, instead they have a holdfast to attach to rocks or substrate.**
 - d. Are not used by marine animals for habitat and food.
18. The tides are controlled by....
- a. The sun
 - b. **The moon**
 - c. The stars
 - d. Mars
19. What makes a semi-diurnal tide different than a mixed tide?
- a. A semi diurnal tide only has one high tide and one low tide each day and a mixed tide has two high tides and two low tides each day.
 - b. **In in a mixed tide, each of the two high tide is a different height and in a semi-diurnal tide, each of the two high tides is the same height.**
 - c. A semi-diurnal tide only happens on a full moon and a mixed tide only happens on a new moon.
 - d. A semi-diurnal tide is only half the height of a regular tide height and mixed tide is double the size of a regular tide height.
20. Which tide has the lowest height difference (lower tidal range) between high and low tides?
- a. Spring tide
 - b. King tide
 - c. **Neap tide**
 - d. Fall tide
21. Why are tides important to areas like Long Island Sound?
- a. The tides bring in nutrients from other areas of Long Island Sound and the Atlantic Ocean.
 - b. The tides move animals around so predators can hunt smaller animals.
 - c. The tides help prey animals hide from large predators.
 - d. **All of the above.**

22. How do boaters know if an area is safe to drive in during high and low tide?
- a. They should only drive in areas they are used to because there is no way to know how deep the water will be at high or low tide.
 - b. Boaters can use a bathymetric chart or an app on their smartphone, which tells them the height of the water at high and low tide.**
 - c. Boaters must have a depth sounder instrument on their boat so they know if the area is safe to drive in.
 - d. Boaters must use a special kind of anchor to measure the depth of the water as they are driving in a body of water.
23. Why are freshwater rivers important?
- a. They provide nutrients to bodies of water like Long Island Sound.
 - b. They provide drinking water to people living around them.
 - c. They provide habitat to plenty of invertebrates and other animals.
 - d. All of the above.**
24. Which of these statements is TRUE about benthic macroinvertebrates?
- a. You must use a microscope to see them because they cannot be seen easily with your eyes.
 - b. They can be found at the bottom of the river, down in the sediment.**
 - c. These animals have been introduced by humans to provide food for larger animals in the river.
 - d. They include animals such as small fish and turtles.
25. If scientists only find invertebrates with a tolerance value of 4 or higher during a survey of the river, it suggests that....
- a. They should do another survey because the results are inconclusive.
 - b. They should not be concerned because that means there is no pollution risk in the area.
 - c. They should be concerned because that means there could be a source of pollution in the area.**
 - d. They should grow the invertebrates in the lab to make sure they identified them properly.
26. Which of these statements is true about monitoring the health of a river?
- a. Scientists should never monitor the health of rivers.
 - b. Scientists should only measure the benthic macroinvertebrates once because the health of the river will not change.
 - c. Scientists should monitor the river regularly because pollution can get into the river in a lot of different ways.**
 - d. Scientists should only measure the benthic macroinvertebrates when adding new buildings directly along the river.