

Name _____

Exploring Marine Science at the Seymour Center

“Why is Science Important?” (Green Pod)



Read all the questions below, then choose at least three to answer from this area.

- 1) Why is scientific research important and what does it help us do?
- 2) What did Russ Flegal's lead testing of water samples in southern California reveal? How did he explain his results?
- 3) Describe some objects humans use and how they put trace metals into the environment.
- 4) What type of pollution is Ron Schusterman and his research group concerned about?
- 5) Using the display or telephones, describe three things Ron Schusterman's group has learned about seals or sea lions.
- 6) How does Peggy Delaney obtain her mud samples for testing? What can scientists learn from studying mud cores?
- 7) Listen to the video to find out what Peggy Delaney likes about working on the Ocean Drilling Project.
- 8) What is one of Terrie Williams' theories about how dolphins conserve energy while swimming?

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“Why is Science Important?” (Green Pod): ANSWER KEY



Read all the questions below, then choose at least three to answer from this area.

1) Why is scientific research important and what does it help us do?

Scientific research is vital to the understanding and conservation of the world’s oceans. Science helps us develop technology and medicine, address societal issues, make informed decisions, build knowledge, satisfy curiosity, and solve everyday problems.

2) What did Russ Flegal’s lead testing of water samples in southern California reveal? How did he explain his results? Flegal found a 30% reduction in lead in southern California waters between the years 1973 and 1988. He attributed his findings to a result of the declining use of leaded gas in the U.S.

3) Describe some objects humans use and how they put trace metals into the environment.

1. Copper based pesticides and fungicides – copper is carried into rivers and bays.
2. Lead based paint – peeling, flaking and sanding cause lead residue to contaminate soil, water and air.
3. Silver used to make and process film – silver may be released from factories into nearby waters.
4. Mercury used to separate gold from quartz – leftover mercury flows into rivers and bays.
5. Copper used in lining brake pads – as it wears off, copper can be carried by wind or water into rivers, lakes, and bays.
6. Lead used to make fishing sinkers or shotgun pellets – lead remains in the environment and can be eaten accidentally by animals.
7. Copper tubing used in plumbing systems – although not highly toxic to people, excess copper can be deadly to plants and invertebrates.
8. Galena crystals and cinnabar – soils, rocks, and ores naturally contain toxic elements such as lead and mercury. These elements can be freed into the environment when mined or disturbed by human activity.

4) What type of pollution is Ron Schusterman and his research group concerned about?

Ron Schusterman and his research group are concerned with noise pollution in the ocean and how it affects elephant seals, sea lions, and harbor seals.

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5) Using the display or telephones, describe three things Ron Schusterman’s group has learned about seals or sea lions.

Possible responses:

1. Elephant seals see better in the dark than sea lions or harbor seals.
2. Elephant seals spend most of their time under water.
3. Elephant seals’ eyes adapt to the dark faster than any other known mammal.
4. Elephant seals’ eyes are fully dilated in six minutes compared to 22 minutes for people.
5. Elephant seals hear much better in water than in air.
6. California sea lions hear better in air than in water. (They socialize a lot while on land.)
7. Harbor seals hear about equally well in air and water. (They divide their time between land and water fairly equally.)
8. All three species demonstrate a wide range of problem solving skills.
9. Elephant seals make different sounds for different reasons: bulls identifying themselves to other elephant seals, mothers calling to their babies, babies calling to their mothers.
10. Harbor seals make different sounds for different reasons: males make a variety of underwater sounds (the purpose of each sound is not fully known), babies call to their mothers, and the call can be heard in air or in water, females are not known to vocalize.

6) How does Peggy Delaney obtain her mud samples for testing? What can scientists learn from studying mud cores? Peggy Delaney practices scientific ocean drilling. A special ship rigged for drilling extends a pipe down to the sea floor, drills a core sample below the sea floor and returns the sample to the ship. She uses the samples to study the history of the ocean, the composition of past oceans, and historical climate changes.

7) Listen to the video to find out what Peggy Delaney likes about working on the Ocean Drilling Project. Peggy Delaney enjoys her opportunity to study the composition of oceans in the past, thinking about questions that no one knows the answers to, focusing on one project and one set of objectives during the entire sea voyage, and seeing samples of the ocean floor that no one has seen ever before.

8) What is one of Terrie Williams’ theories about how dolphins conserve energy while swimming? Dolphins may have “springs” in their tail flukes. This means they get a quick boost from elastic energy stored in stretched muscles, ligaments, and tendons.