

Maryland School Assessment

Science

2008 Public Release

Grade 8

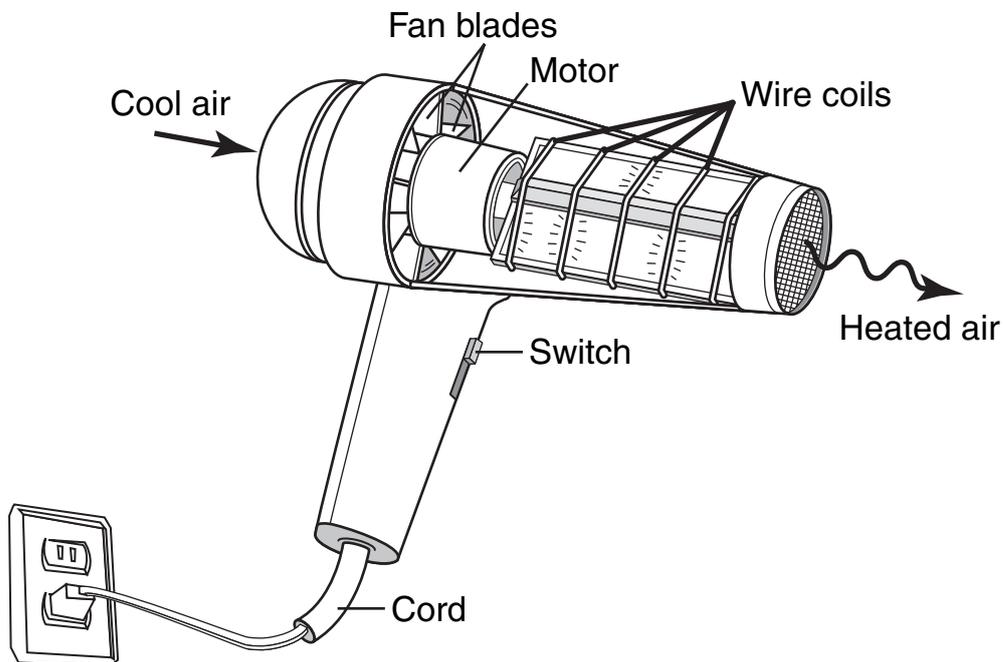
Part 4



Directions

Use the information below to answer Numbers 36 and 37.

The hair dryer in the cross section diagram below transforms one type of energy into other types of energy.



36 Wire coils in the hair dryer become hot when in use.

What energy transformation occurs in the wire coils?

- A** electrical to heat
- B** heat to mechanical
- C** chemical to mechanical
- D** mechanical to electrical

37 What part of the hair dryer changes electrical energy into mechanical energy?

- A** motor
- B** switch
- C** wire coils
- D** fan blades



38 Earthquakes and volcanic eruptions occur both on land and in water.

Earthquakes and volcanic eruptions most often occur

- A** near plate boundaries
- B** on large pieces of land
- C** in large bodies of water
- D** in regions near the equator

39 Students are investigating the physical properties of three solid mixtures by placing each solid mixture in liquid water.

What physical property are the students testing?

- A** solubility
- B** conductivity
- C** boiling point
- D** melting point

Directions

Use the technical passage below to answer Numbers 40 through 42.

The Good, the Bad, and the Algae

While the name “algae bloom” might sound like something pretty and delicate, algae blooms are not sweet-smelling flowers that blossom in the Chesapeake Bay. In fact, they have much to do with the nature of algae and the way people use the land around them.

What Are Algae Blooms?

When nutrients are present in excessive amounts, algae grow rapidly. Their numbers can double in a day. Population explosions of algae are known as blooms.

Because different species thrive as waters vary from warm to cold and fresh to salty, algae blooms occur throughout the Bay and throughout the year. However most blooms appear in summer, when sunlight and nutrients are plentiful.

Depending on the species, blooms can form scum, clumps or mats that float near the surface or grow on the bottom. Blooms in the Chesapeake are most often greenish, red, or brown.

How Are Blooms Harmful?

While higher organisms—such as zooplankton, clams, oysters, minnows and menhaden—eat algae, blooms provide a large surplus of food. Some species low in nutritional value can weaken the organisms that eat them. When algae die, they sink to the bottom. Their decomposition uses more oxygen than they produced when living. The grim result is that blooms rob water of the dissolved oxygen that fish, shellfish, and other aquatic creatures need to survive. Blooms block the sunlight needed by bay grasses, which produce oxygen and provide habitats for fish and shellfish. Some blooms produce poisonous substances called toxins. Toxins can weaken or kill fish, harm land animals that drink contaminated water, and cause skin irritations and stomach problems in humans.

How Can We Control Blooms?

Restoring forests and wetlands is a way to reduce the flow of nutrients into waterways. The trees and vegetation soak up nutrients much like a sponge, acting as nutrient-storage devices. Planting forested or vegetative buffers along waterways also helps slow runoff, allowing more nutrient-laden water to filter through the ground. Restoring populations of algae-eating organisms, particularly oysters and menhaden, is yet another important way to counteract algae blooms in the Chesapeake.

40 Why might the animals in a bay be affected by large numbers of dead algae?

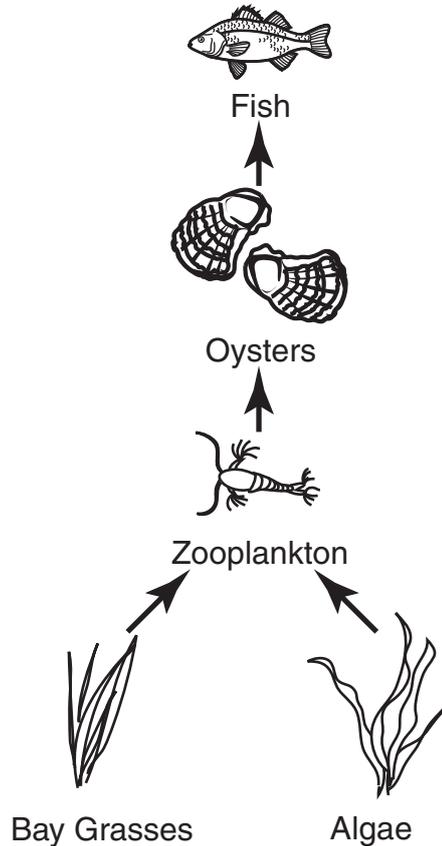
- A The animals have less oxygen.
- B The animals have less nutrients.
- C The animals are at risk of algal infections.
- D The animals are at risk of freezing in the winter.

41 Which human activity would most likely reduce the number of algae blooms in a bay?

- A converting marshland to cropland
- B adding trees along stream banks
- C building shopping centers on paved areas
- D increasing the amount of fertilizers used for growing crops



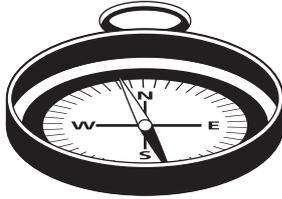
- 42 During one year the algae population decreases in the Chesapeake Bay. Below is a partial Chesapeake Bay food chain.



Explain how a large decrease in the algae population will most likely impact the bay ecosystem. In your explanation, be sure to include

- the roles of the organisms in the partial Chesapeake Bay food chain
- the possible effects of a decrease in the algae population on the plant and animal populations

- 43 Hikers often use a compass and a map to determine their location. The needle on a compass moves and aligns with the magnetic field of Earth because the needle is magnetized.



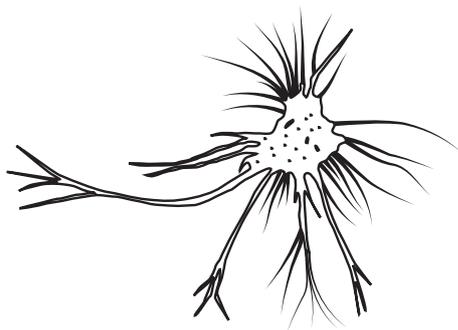
Which action most likely affects the accuracy of a compass?

- A changing hiking speed
- B moving to a high altitude
- C changing hiking speed and direction
- D moving close to overhead power lines

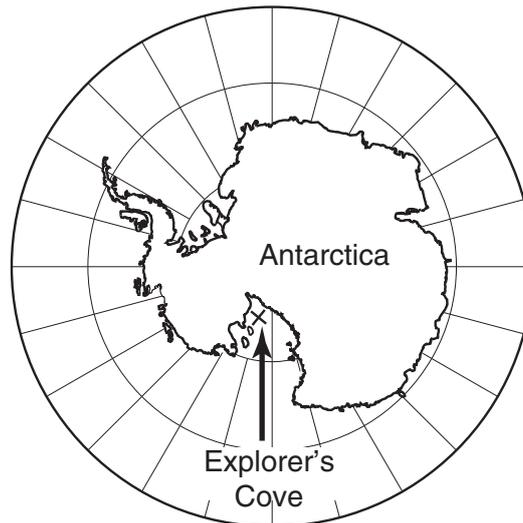
Directions

Use the information and diagrams below to answer Numbers 44 through 46.

Astrammia rara is a unicellular organism that is several millimeters long. This organism lives on the ocean floor of Antarctica in an area called Explorer's Cove. *Astrammia rara* builds a shell by cementing grains of sand from the ocean floor together. The organism either absorbs nutrients from the water or eats other organisms on the ocean floor. The offspring of *Astrammia rara* have genes identical to the parent. Below is a diagram of an *Astrammia rara* and a map showing where the organism lives.



Astrammia rara



(not drawn to scale)

44 Asexual reproduction by *Astrammina rara*

- A** involves an egg and a sperm
- B** requires a male and a female
- C** reduces the variation in the offspring
- D** increases the variation in the offspring

45 Which statement best describes how genetic information is passed to the offspring of *Astrammina rara*?

- A** The genetic information comes from the egg.
- B** The genetic information comes from the sperm.
- C** All of the genetic information comes from one parent.
- D** Half of the genetic information comes from one parent.

46 Which of the following reasons best explains why *Astrammina rara* builds a shell?

- A** to grind food
- B** to attract a mate
- C** to absorb sunlight
- D** to blend with the ocean floor



Acknowledgements

Fill 'Er Up....With Soybeans and Corn Please." Courtesy: United States Department of Agriculture.

"The Good, the Bad and the Algae." Courtesy of the Maryland Department of Natural Resources - www.maryland.gov