

Name: _____

ATLANTIC'S MOST WANTED

In "Lionfish Invasion!" (p. 20), you read about how scientists are enlisting the help of divers to protect habitats in the Atlantic Ocean from lionfish. Use information from the article to create a "wanted" poster informing divers about the species. Your poster should include a description of the offender, an explanation of its "crimes," and advice on how to control it. Use this skills sheet to gather evidence from the article. Then create your poster on a separate piece of paper.

DESCRIPTION: How would someone recognize a lionfish?

KNOWN HANGOUTS: Where might a diver encounter a lionfish?

CRIMES: Choose at least three facts from the article that explain why the lionfish is harmful to Atlantic habitats.

CAUTION: Does a lionfish have any defense mechanisms that could pose a danger to divers? Explain.

DEAD OR ALIVE: Search the article for ways to capture a lionfish. What could a diver do with one that has been apprehended?

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STOP THE INVASION!

In "Lionfish Invasion!" (p. 20), you learned about a dangerous invasive species in the Atlantic Ocean. Read the following passage to learn about another threatening marine invader and the chemical approach being used to fight it. Then use complete sentences to answer the questions that follow.

WEIGHING THE RISKS

Zebra mussels are one of the most harmful invasive species in the United States. Chemicals can be used to control these invertebrates, but the chemicals pose dangers of their own.

Zebra mussels are native to fresh waters in Russia. One way the shellfish spreads is by attaching to boat hulls. When owners sail to other waters, they unknowingly carry the mussels to rivers and lakes. The mussels reproduce rapidly and kill off native species by disrupting the natural food chain.

One way to prevent the spread of zebra mussels is to paint boats with a coating of anti-fouling paint. Chemicals in the paint, such as copper, slow the mussels' growth and prevent them from attaching to the boat's hull. However, the metals are toxic not just to the mussels but also to native species and can affect their reproduction.

Scientists are researching new ways to prevent the spread of zebra mussels. One possibility being tested is a paint containing an ingredient similar to Teflon, the non-stick coating used for some frying pans. Animals can't attach well to the slippery surface and get swept off when a boat reaches high speeds.

QUESTIONS

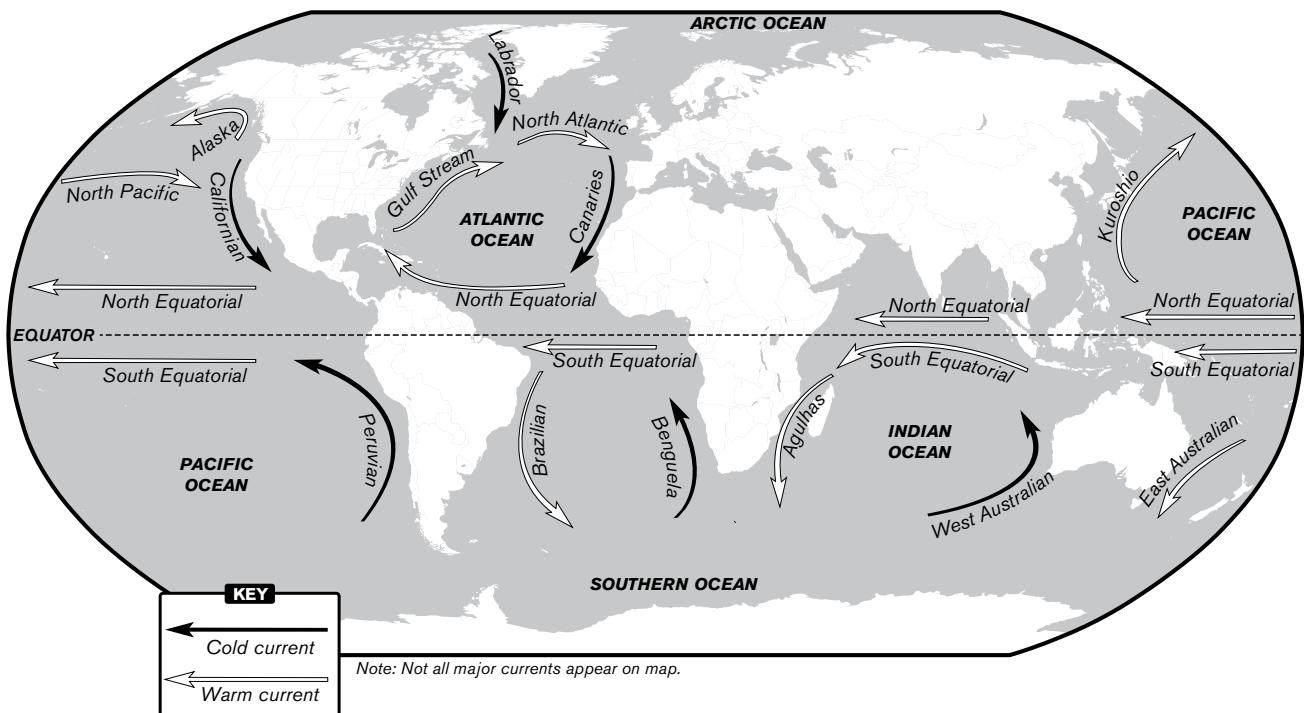
1. What is the central idea of this passage?
2. What are two facts from the passage that support the central idea?
3. Where is the native habitat of zebra mussels?
4. How does anti-fouling paint affect mussels?
5. Describe the new paint being tested. How might it prevent mussels from spreading?

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OCEAN CURRENTS

In "Lionfish Invasion!" (p. 20), you learned about the damage caused by invasive lionfish populations along the Atlantic Coast of North and South America. Scientists believe the Gulf Stream has helped the fish spread up the east coast of the United States. This large, fast-moving mass of water is one of the world's major ocean currents. The strong current likely transports lionfish eggs and larvae northward from Florida. Young lionfish have been found as far north as the waters off the coast of New York, but scientists don't expect the warm-water fish to be able to survive the cold winters there. The map below shows the Gulf Stream and other major ocean currents. Study the map and then answer the questions that follow.

Major Ocean Currents



QUESTIONS

1. Is the water in the Gulf Stream warm or cool?
2. In which direction does the South Equatorial current flow?
3. The major ocean currents flow in circular loops called gyres. In what direction do gyres rotate in the Southern Hemisphere: clockwise or counter-clockwise?
4. Which currents are part of the gyre in the Indian Ocean?
5. In general, how are the currents that flow away from the equator different from the currents the flow toward the equator?

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UNDER PRESSURE

In "Lionfish Invasion!" (p. 20), you learned that one reason lionfish populations are hard to control is that they can live deeper than people can dive to catch them. Read the following passage to learn how water pressure limits the depths that scuba divers can reach. Then answer the questions that follow.

DIVING DEEP

How deep is too deep? Most scuba diving organizations limit recreational divers to 40 meters (130 feet). They established this limit based on *water pressure*.

At sea level, air presses on your body with a pressure of 1 atmosphere (14.7 pounds per square inch). Water exerts greater pressure than air. So when a diver gets into the water, the pressure on the body increases. As a diver goes deeper, pressure rises because of the additional water pushing down from above.

Pressure affects the gases inside the body. Nitrogen gas from the air that divers breathe begins to dissolve into their blood. The deeper they go, the more nitrogen gas dissolves. Too much of this gas in the blood can cause *narcosis*—a state in which the diver feels confused and has difficulty moving.

Water pressure also affects how long a diver can breathe underwater. That's because the pressure affects the volume of oxygen gas as it flows out of the diver's tank and into tubes that carry it to his or her mouth. At the recreational diving limit, divers experience a pressure of roughly 5 atmospheres. That means the oxygen flowing from the tank is compressed to one fifth of the volume it would occupy above sea level; therefore, it will last just one fifth as long.

QUESTIONS

1. What is the approximate pressure at a water depth of 40 meters?

- (A) 0.4 atmospheres
- (B) 1 atmosphere
- (C) 5 atmospheres
- (D) 40 atmospheres

2. Use context clues to determine the BEST definition for *exerts*.

- (A) contains
- (B) applies
- (C) reduces
- (D) absorbs

3. How does water pressure cause narcosis?

- (A) The pressure causes too much nitrogen to dissolve in the blood.
- (B) It increases the amount of oxygen in the blood.
- (C) It takes too much nitrogen out of the blood.
- (D) It removes oxygen from the blood.

4. Suppose the air in a diver's oxygen tank would last one hour at a pressure of 1 atmosphere. Based on what you learned in the passage, about how long would the air last at a pressure of 4 atmospheres?

- (A) 5 minutes
- (B) 15 minutes
- (C) 45 minutes
- (D) 60 minutes

5. What is the purpose of this passage?

- (A) to warn people of the dangers of scuba diving
- (B) to describe the role of nitrogen in the body
- (C) to explain how scuba diving works
- (D) to explain how pressure affects scuba divers