

Test of Unit 4

Cause : We had a tremendous snowstorm during the night. Winds gusted to 45 mph.
The roads are blocked, even at the bus stop.

1. Which is the best *effect* for the given *cause*?

- A) We decided to make a snowman.
- B) We went to the store to get some snacks.
- C) We stayed inside and made hot chocolate.
- D) We were not able to go to school.

Cause : She was in a hurry riding her bike, so she carried her viola across the handlebars. She failed to see the rock on the street in front of her.

2. Which is the best *effect* for the given *cause*?

- A) The rock did not get in the girl's way.
- B) The girl got off her bike to take a break.
- C) The viola did not fall off the bike.
- D) The girl fell off of her bike.

How Things Float

When a boat floats in the water, there is a very important principle involved. It is called the Archimedes principle. It is named after a famous mathematician who lived over 2,000 years ago. This principle states that when an object is placed into water (or any other liquid), there is an automatic change. The object put into the water must remove an amount of liquid equal to the object's weight. When a 1,000 kilogram boat is put into the water, it will move more than 1,000 kilograms of water around *it*. The boat floats because it displaces more water than the actual boat weighs. But how do we know if an object will float or sink?

The density of an object is a major factor that decides if an object floats (like a basketball) or sinks (like a stone). All items that have an average density less than water will float. Since the stone is thicker and denser than the air-filled basketball, the stone will sink. The basketball being less dense means that it will float. Boats, whether they are a tiny sailboat or even a very large oil tanker, all have hollow hulls. A hull is the bottom section of the boat or ship's frame. The hollow hulls are filled with air. This makes them less dense than water. Hence, the effect of having an air-filled bottom section to a ship means that it will float.

One example of the buoyancy concept is the cola can experiment. If you take an aluminum can of cola and place it in a bucket of water, it will sink. However, if you pour out all the cola from the aluminum can and then place it in a bucket of water, it will float. The combined effect of a filled cola can brings the density to a higher level, hence it sinks. Another experiment can be tried at home. Get some ice from the freezer and see if *it* floats. Normally, you would think that a block of ice would not float. After all, it is made from water. Will water float on water? But a block of ice will float since the density of frozen water is actually lower than when it's in liquid form.

3. When a 1,000 kilogram boat is put into the water, it will move more than 1,000 kilograms of water around *it*.(line 5)

It refers to

A.) water

B.) boat

C.) kilogram

D.) putting

4. Get some ice from the freezer and see if **it** floats (line 16). Normally, you would think that a block of ice would not float. **It** refers to

A.) ice

B.) freezer

C.) floating

D.) a block

5. Sailboat floats on the water because

A.) all steel and wooden boats tend to float

B.) the weight of the boat is lighter than the water

C.) its density is less than the ocean water

D.) it shares similar characteristics to the water

6. Frozen ice floats because

A.) it is less dense than when it's in liquid form

B.) it is denser if placed in tap water

C.) it causes warmer water to be displaced

D.) it removes less water than it weighs

7. Which correctly states Archimedes theory?

A.) An object prevents water from being displaced.

B.) An object will remove an equal amount of water to the object's weight.

C.) Objects placed in water always sink.

D.) Objects placed in water always float.

8. What happens to a ball that is less dense than water?

A.) The ball will move around a lot.

B.) The ball will float on water.

C.) Certainly the ball will sink quickly.

D.) It confuses people because it is lightweight.

9. Which of the following is **NOT** true?

A.) Some heavy objects can float, but a small rock will sink.

B.) The buoyancy concept is based on the Archimedes' principle.

C.) The density of a filled cola can is higher than that of an empty cola can.

D.) An object put into the water removes less amount of water than the object's weight.

10. What is the purpose of the paragraph on cola?

A.) To compare the density of water and cola

B.) To show how water fills up hollow cans

C.) To give people a chance to experiment with a can

D.) To illustrate a simple experiment about density

Voyage of the Kon-Tiki

In 1947, a young ambitious Norwegian explorer set out to sail across the Pacific Ocean. His name was Thor Heyerdahl. He sailed in a primitive wooden raft called the Kon-Tiki. He was trying to test two theories. The first theory was that a wooden raft could actually float and could be sailed a significant distance. Many scholars laughed at the idea of a wooden boat crossing the perilous Pacific Ocean. They thought bamboo (the primary wood used on the Kon-Tiki) would become water-logged and soon sink. The second theory was about where the native tribes from the South Sea Islands came from. Hundreds of years ago, other explorers found that people lived on these islands. There were even stone statues similar to those found in Peru, South America. Heyerdahl thought they may have come from South America.

The Journey

He wanted to sail from Peru in South America to the South Sea Islands in the Pacific Ocean using just the material and resources available centuries ago. The Kon-Tiki raft was made mainly from bamboo and balsa wood trees. Inside the 13-meter long raft was 250 liters of water for drinking. The Kon-Tiki had a crude rudder attached to the rear of the boat. But it didn't steer that well. The raft's journey was more than 6,980 kilometers long and lasted 101 days. For a lot of the time, the raft just drifted with the ocean currents. In order to help **them** navigate, Heyerdahl and his crew of five brought a radio, a sextant, knives, charts and watches. None of these inventions existed centuries ago, but they were not relevant to testing his theories. Heyerdahl wanted to see if a wooden raft could actually survive the journey across the ocean. In this respect, he succeeded. Even though the Kon-Tiki crashed on the South Sea Island of Raroia, the theory that a wooden boat could sail across the Pacific Ocean using ancient technology was proven.

Origins of South Island Peoples

The second theory about the origins of the South Sea Islands was disproved. Although the native Indians of Peru could have sailed to those faraway islands on a bamboo raft, they did not migrate to the South Pacific Islands. In the 1990s, DNA testing showed that the people from the South Pacific came from Southeast Asia, not from South America.

11. In order to help **them** navigate (line 14), Heyerdahl and his crew of five brought a radio, a sextant, knives, charts and watches. **Them** refers to
- A.) a radio, a sextant, knives, charts and watches
B.) Heyerdahl and his crew
C.) knives
D.) native tribe
12. What is the Kon-Tiki?
- A.) It's a primitive wooden raft.
B.) It's a primitive wooden boat.
C.) It's a primitive wooden hut.
D.) It's a primitive metal raft.
13. **Voyage of the Kon-Tiki** What does **voyage** mean?
- A.) raft
B.) journey
C.) explorer
D.) boat
14. What was the purpose of voyage?
- A.) To visit his relative
B.) To explore the new islands
C.) To test the theories
D.) To find out the native Indians of Peru

15. Which is **NOT** true?
- A.) Thor Heyerdahl is a Norwegian.
 - B.) Thor Heyerdahl is an explorer.
 - C.) Thor Heyerdahl sailed in a wooden raft.
 - D.) Thor Heyerdahl set sail across the Pacific Ocean to test 3 theories.
16. What was the result of testing the islanders' DNA in the 1990s?
- A.) It disproved Heyerdahl's theory about their origins.
 - B.) It showed the islanders didn't eat red meat.
 - C.) Many native Indian migrated to the South Pacific Islands.
 - D.) It indicated that 101 days is a long time to travel 6,980 kilometers.
17. Why did scholars laugh at Thor Heyerdahl's voyage?
- A.) They thought Thor Heyerdahl was just showing off.
 - B.) They thought a balsa wood boat couldn't sail on the sea.
 - C.) They thought the boat would become water-logged and sink.
 - D.) They thought the currents would take the raft off course.
18. What did Heyerdahl infer from the statues on the South Sea Islands?
- A.) The native tribes might have come from Peru.
 - B.) The natives discovered North America.
 - C.) The South Sea Island tribes carved many rudders.
 - D.) The native tribes must have used modern tools.
19. What **WAS NOT** used to help the Kon-Tiki crew navigate?
- A.) knives
 - B.) watches
 - C.) a map
 - D.) a radio
20. What is the author's purpose in telling about the Kon-Tiki voyage?
- A.) To prove that DNA testing cannot solve all theories
 - B.) To examine how good Norwegian sailors are
 - C.) To show how difficult it is to sail across the Pacific Ocean
 - D.) To describe an amazing voyage using old technology