Using the reading strategies you have learned, read this passage and answer the questions that follow it. Solutions are on page 85

BUILT FOR THE WATER

Why are Whales so Big?

At four tons, the elephant is the biggest land animal we know of today. At seventy-five tons, the Brachiosaurus was one of the largest dinosaurs. But of all the animals that have ever lived on earth, none has rivalled the blue whale in either size or weight. The environment in which it lives has allowed it to reach gigantic proportions: the blue whale weighs approximately 100 tons! 1

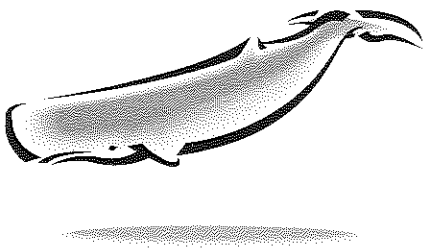
Water supports weight much more easily than air. As a result, whales have expanded in size because they are not limited by gravity. They have a layer of blubber ten to twenty centimetres thick that makes them buoyant and allows them to live in weightlessness like astronauts. 2

Whale or Boat?

What do a boat and a whale have in common? The first boat builders must have been inspired by the shape of cetaceans. Whales are streamlined at both ends, which let them glide through the water easily, with no resistance. 3

The pectoral fins (or flippers) on either side of the body help to stabilize them, like the keel of a boat, and the horizontal tailfin (or flukes) propels them forward. Cetaceans are hydrodynamic, just like boats, which allows them to cut through waves. 4

Diving to the Depths



northern bottlenose whale
Hyperoodon ampullatus

Length: 8 metres
Weight: 3 tons

Northern bottlenose whales are wonderful divers, as are sperm whales. They can stay submerged for up to seventy minutes at a time and can dive as deep as 800 metres! Cetaceans are mammals, so they have lungs. Proportionally, their lungs are smaller than those of humans. So, how do they manage to beat all the diving records? 5

When a northern bottlenose whale comes to the surface to breathe, it exhales and then inhales ninety percent of all the air its lungs can contain, as opposed to seventy-five percent for humans. It has more available oxygen than we do because it is better at emptying and refilling its lungs, not because its lungs contain more air. 6

The oxygen captured during inhalation is then stored in its blood in a protein called hemoglobin. Cetaceans have a higher volume of blood than humans, so they have more hemoglobin in their blood vessels and muscles. This means they can accumulate more oxygen reserves and stay under water longer! 7

—EVELYNE DAIGLE

1. Order the following animals by weight, from heaviest to lightest.
   - **A.** elephant, bottlenose whale, brachiosaurus, blue whale
   - **B.** brachiosaurus, blue whale, bottlenose whale, elephant
   - **C.** blue whale, brachiosaurus, elephant, bottlenose whale
   - **D.** bottlenose whale, elephant, blue whale, brachiosaurus

2. A whale floats because of its
   - **A.** blubber.
   - **B.** fins and flukes.
   - **C.** ability to swim.
   - **D.** air in their lungs.

3. How long can sperm whales stay underwater?
   - **A.** fifty minutes
   - **B.** sixty minutes
   - **C.** seventy minutes
   - **D.** eighty minutes

4. In the phrase, "the pectoral fins…help to stabilize them," the word "stabilize" means to
   - **A.** protect.
   - **B.** steady.
   - **C.** move.
   - **D.** float.

5. Whales have expanded in size because they
   - **A.** have ample living space.
   - **B.** are not limited by gravity.
   - **C.** have a steady food supply.
   - **D.** are not limited by lung capacity

6. Whales belong to which group of animals?
   - **A.** fish
   - **B.** reptiles
   - **C.** mammals
   - **D.** crustaceans

7. According to the passage, which of the following dinosaurs was among the largest?
   - **A.** diplodocus
   - **B.** brontosaurus
   - **C.** brachiosaurus
   - **D.** tyrannosaurus

8. When a bottlenose whale breathes, what percentage of its lung capacity does it use?
   - **A.** Seventy percent
   - **B.** Eighty percent
   - **C.** Ninety percent
   - **D.** One hundred percent