



Lesson 18: Technology and North Atlantic right whales.

Objectives: Students will learn about the ways that technology is being used to study North Atlantic right whales.

You will need:

- Copies of “*Kleenex the North Atlantic Right Whale*” (page 18-2 to 18-3) for each student
- Student worksheets (page 18-4; one per student)
- Pencils/pens

Standards: CCSS.ELA-Literacy.RI.4.1; CCSS.ELA-Literacy.RI.4.10; CCSS.ELA-Literacy.L.4.6

Sunshine State Standards: SC.4.E.6.5

Strategy:

1. Give students copies of “*Kleenex the North Atlantic Right Whale*” and the corresponding student worksheet.
2. Ask students to read the story and answer the questions on the worksheet.



“Kleenex” the North Atlantic Right Whale

The North Atlantic right whale called “Kleenex” was first seen in 1997. Scientists know that she has had at least six babies, or calves. When a calf is swimming with an adult whale, we know that adult is the calf’s mother. Scientists try to take photographs of the calf and the mother. They can use the right whale photo catalog to identify the mother. It is harder to figure out who the father of the calf is. The father whales do not swim with the mother and calf.

Since 1988, scientists have used arrows with hollow tips to collect small samples of skin and blubber from right whales. Scientists study the whale’s blubber to find out what types of pollutants it has been exposed to. They can collect DNA from the skin. DNA is in all living cells. It is like a map of all of the characteristics of the plant or animal. Scientists have DNA from more than $\frac{3}{4}$ of all North Atlantic Right Whales. They only take a small piece of skin—about the size of the end of a pencil. This tiny piece of skin gives a large amount of information!

Every plant and animal’s DNA is unique (one of a kind.) The DNA of a calf is similar to the DNA of both of its parents. DNA can be used to tell which whales are the parents of a particular calf. If scientists have a skin sample from the calf and its mother, they will try to use the DNA to find the calf’s father. This is how we know which whales are the fathers of two of Kleenex’s calves.

In 2001, Kleenex took part in two studies. First, a small time and depth recorder was stuck onto her back using a suction cup. The scientists used a crossbow to “shoot” the suction cup onto Kleenex’s back where it stuck. After about an hour and a half, the suction cup came loose and floated to the surface. Scientists were able to collect it and download data from the recorder. This helped them learn about right whale diving and feeding behavior.

In the second study, scientists used a machine called an ultrasound machine. They wanted to find out how thick right whales’ blubber was. Kleenex was one of the whales they studied. The ultrasound machine produces a sound wave, then “listens” to the sound waves that bounce back. Waves that bounce off



different surfaces make different patterns. In a whale, the sound waves go through the blubber and bounce back off the muscle. Scientists measure how long it takes for the sound waves to bounce back. They can then estimate how thick the blubber layer is. The thinner the blubber, the faster the waves will bounce back. The blubber thickness tells scientists if the whales are healthy or not. A whale with a thin blubber layer may be sick.

North Atlantic right whales can be very large. They can measure up to 55 feet in length and can weigh more than 60 tons! It is hard to measure a whale from a boat or from land. Scientists used a special camera to measure Kleenex's length. They attached the camera under an airplane. They also measured her girth (the distance around her belly).

Kleenex has helped with one other research project. Scientists are collecting samples of whale poop! They use dogs that have been trained to sniff out floating whale poop. The scientists scoop the sample from the water. They analyze the poop for parasites and hormones. This tells them if the whales are healthy or stressed. They can also get DNA from the sample.



Name: _____

Student worksheet—Kleenex the North Atlantic Right Whale

Read the story about Kleenex the whale. Kleenex has been studied by many scientists! Use information from the story to answer the questions.

1. Circle all of the different ways that scientists use to identify right whales.

Photographs

DNA

Skin samples

Blubber

2. Scientists use special equipment to measure how thick a whale's blubber is. That equipment is called a _____ machine.
3. If a right whale has a thick layer of blubber, is it sick or healthy?

4. Circle the correct answer. Scientists study _____ using time and depth recorders.
 - a. DNA
 - b. Diving and feeding behavior
 - c. The length of whales
 - d. Blubber thickness
5. Circle all of the correct answers. Scientists can tell if a whale is healthy by studying its _____.

Blubber thickness

DNA

Blubber

Poop

6. Fill in the blank. Kleenex has at least _____ calves.



ANSWER KEY—Kleenex the North Atlantic Right Whale

Read the story about Kleenex the whale. Kleenex has been studied by many scientists! Use information from the story to answer the questions.

1. Circle all of the different ways that scientists use to identify right whales.

Photographs

DNA

Skin samples

Blubber

2. Scientists use special equipment to measure how thick a whale's blubber is. That equipment is called a ULTRASOUND machine.
3. If a right whale has a thick layer of blubber, is it sick or healthy?

HEALTHY

4. Circle the correct answer. Scientists study _____ using time and depth recorders.
 - a. DNA
 - b. Diving and feeding behavior**
 - c. The length of whales
 - d. Blubber thickness
5. Circle all of the correct answers. Scientists can tell if a whale is healthy by studying its _____.

Blubber thickness

DNA

Blubber

Poop

6. Fill in the blank. Kleenex has at least SIX calves.