Lesson 3: Manatee Adaptations!

Objective: Students will learn about what an adaptation means and how manatees are adapted to their aquatic environment.

Vocabulary: adaptation, habitat, carnivore, herbivore, omnivore

You will need:
- The ability to show a powerpoint presentation (LCD projector or smartboard)
- Manatee Adaptations (Lesson 3) powerpoint presentation. [Make sure to also download the lesson 3 video file and save it in the same folder as the powerpoint file.]

Strategy:
1. Divide students into groups of 3-4 students.
2. Use the Manatee Adaptations PowerPoint to get students thinking about adaptations. Each slide on the PowerPoint has a question. Have the groups discuss each question for 1-2 minutes, then use the teacher guide below to guide the class discussion and provide answers to the questions.

Manatee Adaptation Lesson - Teacher Guide to PowerPoint Slides:

Slide 2 – What is adaptation?
Students:
- Have the students explain what they think an adaptation means.
Teacher:
- The true definition is that it is a trait or characteristic that improves an organism’s ability to survive and reproduce in its environment.
- An example – Animals’ teeth are different depending on their diet. Lions and sharks, which are carnivores, have razor sharp teeth good for tearing meat while cows, which are herbivores, have teeth that are good for grinding plant material. Humans are omnivores so they eat both plants and animals, thus they possess both razor sharp teeth and grinding molars.

Slide 3 – Do manatees breathe under water?
Students:
- Have the students discuss whether or not manatees breathe underwater like a fish or if they hold their breath.
- When they have determined that manatees hold their breath, have them guess how long they can hold their breath for.
Teacher:
- Manatees breathe air just like humans, so they hold their breath. Their special adaptation is that they can close their nostrils so that water does not get into their
lungs; just like we hold our nose when we dive underwater. In the two pictures on the slide, one shows the nostrils open, and the other shows them closed. When manatees surface to breathe, only their nose has to come out of the water so that they can open their nostrils and gulp in a breath of air.

- Manatees can hold their breath for up to 20 minutes, while the average person can only hold their breath for 30-45 seconds.

Slide 4 – What are manatee whiskers for?

Students:
- Have the students explain what five senses a person possesses.
- Have the students discuss what they think manatee whiskers are used for.

Teacher:
- Manatees use their whiskers as a sensory organ, much like a cat does. They can feel things (sense of touch) with their whiskers. The whiskers are actually more sensitive than the tips of our fingers.

Slide 5 – How do manatees swim?

Students:
- Have the students explain what body part of the manatee is shown in the slide.
- Have the students discuss how they think the manatee swims through the water.

Teacher:
- The manatee moves through the water by moving its tail up and down.
- On average, manatees swim at about 3 to 5 mph. This is about the same speed that people can walk. However, they have been known to swim at almost 20 mph in short bursts.

Slide 6 – A manatee in motion.

Teacher:
- Play the movie showing how a manatee swims through the water. Explain to the students that this manatee is swimming quite fast! Encourage them to watch the tail pumping up and down. Point out that because the tail is wide, it generates a lot of power. Compare the speed of a person swimming with bare feet to that of a person swimming with swim fins or flippers. Who can swim faster?

Slide 7 – What is my flipper for?

Students:
- Have the students explain what manatees use their front flippers for.

Teacher:
- Manatee front flippers help manatees steer and change direction when they are swimming. Point out that students probably noticed this in the movie clip.
- Point out to the students their toenails, which are similar to those on an elephant’s feet.

This activity is available online at http://stjohns.ifas.ufl.edu/sea/manatees.html
- Manatees can use their flippers (and toenails) to help them collect the plants that they like to eat, and to get the plants into their mouths.

**Slide 8 – What does a manatee use his lips for?**

**Students:**
- Have the students discuss why they think a manatee’s snout looks like an elephant trunk.

**Teacher:**
- A manatee’s snout allows them to collect food easily. They can eat plants that are underwater or floating on the surface. Their lips are muscular and can actually be used to grab plants and move the plants into the manatee’s mouth.

**Slide 9 – Do baby manatees use their lips to get food?**

**Students:**
- Have the students discuss what a mother manatee provides for her calf.

**Teacher:**
- A manatee calf nurses from under their mother’s flipper, so even baby manatees use their lips to help them get food—in this case, to get milk from the mother manatee!

**Slide 10—What kind of teeth do manatees have?**

**Students:**
- Have the students discuss which of their teeth most resemble a manatee’s teeth.

**Teacher:**
- Humans have different types of teeth because we eat many different types of food (we are omnivores—we eat both meat and plants.) Our incisors are used to cut food. Our canine teeth (cuspids) are used for tearing food. The bicuspids behind the canines are used for crushing food. Our molars are used for grinding food.
- Since manatees are herbivores (they only eat plants), they only have molars, which they use to grind up the plants before they swallow them.
- Unlike us, manatees grow new teeth in the back of their mouths all the time. As their older teeth get worn down, from chewing those tough and sometimes sandy plants, they fall out. The rest of the teeth actually move forward in the jaw and new teeth start to form in the back. We say that manatees have “marching molars.” Manatees never have to worry about running out of teeth!

**Slide 11– How many manatee adaptations can you list?**
- See how many groups of students can list all 5 adaptations mentioned in the presentation. How do manatees use their nose, whiskers, lips, flippers and tail?

Standard addressed: **SC.3.N.1.1**