1st Grade Whale Watching Adventure Packet

Grade that is addressed: 1st

NGSS performance expectation:

Students who demonstrate understanding can:
1-PS4-1 Plan and conduct investigations to provide evidence that vibrating materials can make sound and that sound can make materials vibrate. [Clarification Statement: Examples of vibrating materials that make sound could include tuning forks and plucking a stretched string. Examples of how sound can make matter vibrate could include holding a piece of paper near a speaker making sound and holding an object near a vibrating tuning fork.]

Purpose of this pre trip packet: This packet is designed for first grade students based on the content standards adopted by the California State Board of Education. Students will be able to plan and carry out an investigation that vibrations from toothed whales can travel through water and be received by themselves/other toothed whales to navigate through the ocean and communicate with each other.

Activities overview: Students will participate in short activities and discussions to familiarize themselves with toothed whale communication and the anatomical structures that make echolocation possible.

Time: 30 minutes

Procedures:

Engage in discussion 1:

Hearing is the most important sense for whales and dolphins and helps them locate food in some cases and communicate with others. Sound travels much farther

and faster in water than it does on land, however it does not necessarily mean it can be heard easier. Whales and dolphins have very specialized ears which are very small holes on the side of their head that help them to hear in the ocean. Some whales like blue whales make sounds that are very low and travel all the way across oceans to communicate with others. Other whales like Humpback will sing songs to each other to communicate. Ask students if they have ever heard of the term “echolocation” and if so, ask if they can describe the process in their own words. If echolocation is a new concept, share with them that echolocation means “Sound Location.” Animals that use echolocation can seek out their food and explore their surroundings by generating sounds and using the echo they receive back to understand their environment. Toothed whales (which include dolphins) have adapted the ability to echolocate. At times it can be difficult to see in deep waters where the sunlight can’t reach and at night.

Activity 1: Cetacean echolocation workstation

Description of activity: Students will perform an experiment to test how sound waves travel through a medium, in this case air, is received by a listener then respond to the sound by determining the location of where it originated from.

1. Select a student or 2 to stand in the middle of the room while the rest stand around them in a circle. The students will need either a blind fold or can close their eyes to mimic the dark ocean when visibility is very low.
2. Have the non-blindfolded students one at a time snap or clap their fingers while the other student guesses the location from where the snap came. They may do this by pointing or facing to where the sound originated.
3. The teacher or chaperone will write down how many times the blindfolded students guess correctly so there is data to refer to later during discussion.

4. After a minute or so, have students switch places and repeat the procedures so that everyone may have a turn.
5. Talk as a class about the results! Were some locations harder to guess than others? Did wearing a blindfold make hearing and locating the sound more challenging? Or did it enhance the sense of hearing since there were less distractions to see?

Engage in discussion 2:

Ask students what parts of their body allow them to speak? What parts allow us to hear? Share with students that a dolphin's body is a little different than ours but can still perform these actions. Dolphins direct the noises (vibrations) straight out of the front of the forehead through an organ called the Melon (fatty forehead), which focuses the sound into a narrow beam. When these sounds strike an object, some of the energy from that sound wave travels back towards the dolphin. The vibrations are not "heard" as they come back, but instead the dolphin "feels" the vibrations as they come in contact with the lower jaw. The lower jaw then carries the vibrations straight to the animal's inner ear, where finally the vibrations are received as a sound. This shows that vibrations make sounds, and sound can create vibrations in other materials.

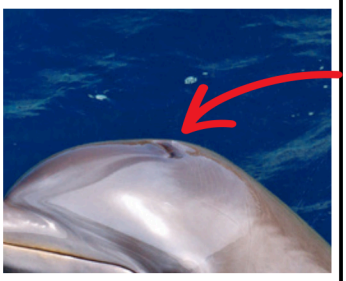
Activity 2: Anatomy Match

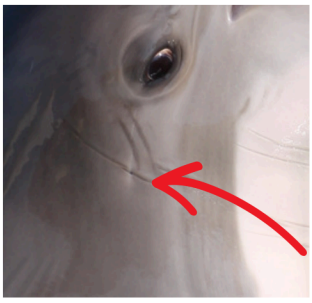
Description of activity: Students will match a vocabulary word to the correct body part to label the different structures on a toothed whale. This allows students to practice identifying the anatomy of toothed whales before they join their whale watching trip.

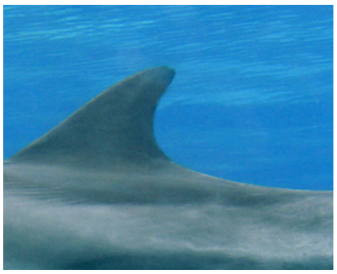
Dolphin anatomy

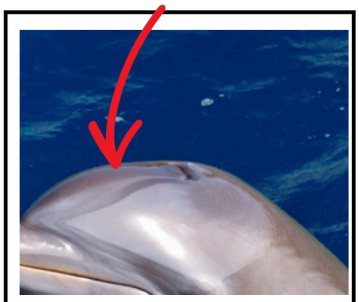
Cut and paste the word to match the correct body part.

Blowhole	Dorsal Fin	Ear
Melon	Teeth	Fluke









Orca anatomy

Cut and paste the word to match the correct body part.

Dorsal fin	Melon	Blowhole
Pectoral fin	Eye	Eye patch