OIMB GK12 CURRICULUM

5th Grade **60 minutes**

WHALE COMMUNICATION HIDE AND SEEK

Oregon Science Content Standards:
5.2L.1 Explain the interdependence of plants, animals, and environment, and how adaptation influences survival.

Ocean Literacy Principle:
5. The ocean supports a great diversity of life and ecosystems

Goals:
- To describe how whales use vocalizations as part of their common behaviors
- To distinguish between echolocation and communication

Concepts:
- Whales use sounds to communicate, possibly to pass on information and socialize.
- Different species of whales have different vocalizations.
- Echolocation is the process by which animals emit sounds and are able to detect objects, including food and each other, when the sound waves return to them.

Materials:
- Communication Codes: 6 copies of 6 different codes are included at the end of this lesson. Photocopy the codes and cut out into individual strips—one strip per student). Determine the number of pods you will have (e.g. 6 pods with 5 students in each pod). You will need a different code for each pod and enough strips with the same code for each member of a pod. For those codes where reading the code upside down will result in the wrong code, arrows indicate the direction the code needs to be read, *from left to right*.
- One balloon for each student

Lesson Plan:

Discussion
1. Show students the website "Voices in the Sea" either on an overhead projection unit, or at their own computers: www.cetus.ucsd.edu/voicesinthesea_org/Flash/
2. Spend some time exploring the website, listening to the "voices" of different species of whales (and pinnipeds).
3. Ask the students the following question: Why do they think the whales are making these sounds? List their ideas on the board. What are ways, other than sound, that other mammals-- humans, dogs, etc. communicate? *(Sign language, facial expressions, body language, etc.)* Can whales communicate in this way? *(perhaps some body language)*

4. Ask the students why they think different species of whales might have different vocalizations or calls? *(To tell each other apart, different hunting and feeding strategies, different social patterns, etc.)*
5. Distinguish between vocalizations and echolocation. *Echolocation is the process by which animals emit sounds and are able to detect objects, including food, when the sound waves return to them (like a submarine's sonar). Vocalization is using sounds to communicate.*
6. Back to the Voices in the Sea main page, click on Dolphin → Orca → the video (bottom right corner) entitled "Acoustic Culture of Orca".
7. Ask the students why different populations within one whale species, such as the orcas, might have different dialects, or types, of calls? *(E.g. feed on different prey, to tell one pod from another.)*

Activity

8. Explain to the students that each of them is an orca, and they will be searching for their "pods". As orcas use squeaks to communicate and keep track of each other, the students will do the same, with balloons.
9. Explain the Morse code briefly to the students. Dashes are LONG, and Dots are SHORT. Draw several examples of brief Morse codes on the board, and have the students recite the code out loud. For example, draw .._. on the board, and all together, have the students recite "short short looooooong short". Continue practicing until the students understand how to read a code.
10. Give each student a Communication Code. At this point, the students should **NOT** know who else is in their pod. Advise the students that their code needs to be kept secret, so that their neighbors don't know what their code is.
11. Have the students look again at their Communication Code, and have them figure out (silently) what their code is. Make sure they are reading the code in the direction of the arrow. They need to commit their code to memory for the activity. Give them enough time to do so.
12. Hand a balloon to each student. Have the students blow up their balloons, and then stretch the mouth of the balloon to produce a squeaking sound, and have them squeak out a sample Morse code. Have the students practice several times before beginning the communication activity.
13. The search for the pods begins! Have the students squeak out their communication code to each other and group up as a pod as they find other members. Recognize the first pod to find all 6 (or 5, or 4, depending on how many codes were passed out) of its members.
14. Discuss with the students the difficulties of finding all their pod members, and discuss the difficulties that orcas might have when confronted with different pods coming together.
15. Review the difference between echolocation and communication. *Echolocation is the process by which animals emit sounds and are able to detect objects, including food, when the sound waves return to them (like a submarine's sonar). What the students experienced today was very different: they used sounds to vocalize to communicate.*

Assessment: Have the students write or discuss in pairs the reasons why whales use echolocation vs. using vocalizations for communication. The students may also write a reflection on the experience of finding other members of their pods using only squeaks.

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Reference:
www.cetus.ucsd.edu/voicesinthesea_org/Flash/