

Orca Vocalizations Worksheet

Name _____

How do we know what we know about orcas?

Understanding Orca Society Using Data and Observations

Studying marine mammals can be challenging. Observing wild animals living in the open ocean limits researchers to the information they can gather from **hydrophones** (underwater microphones for recording sounds) and chance sightings. Even in the face of these difficulties, scientists have been able to recognize patterns and identify details useful in constructing an understanding of how orcas live and survive.

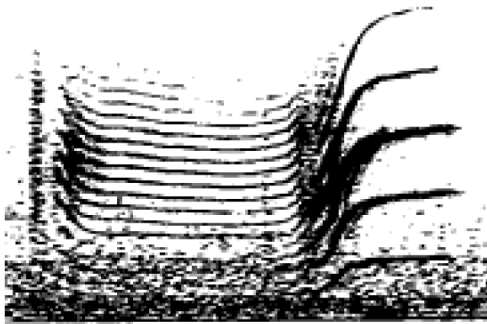
Understanding Vocalization

Researchers have recorded orcas making three types of sounds, **clicks**, **calls** and **whistles**. Through observing anatomy and analyzing **acoustic data** (sounds), scientists now understand how orcas use sound to explore their world. The clicks are vibrations that are focused as they pass through an organ called the **melon**, located in the whale's head. These "beams" of fast-paced vibrations bounce back and create echoes after hitting underwater objects. The returning sounds are detected in the animal's jaw and sent to the brain, thereby providing a sensory picture of the orca's environment. The process is appropriately called **echolocation**, as it helps the orcas locate food and navigate their environment.

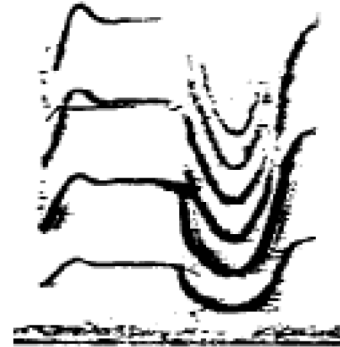
Marine biologists combined data on orca behavior and their vocalizations to reveal that orcas use calls and whistles to communicate. Researchers use **spectrograms**, graphic pictures of each individual sound, to record and describe the different calls. Spectrograms show us how the frequency (y axis) of the sound changes over time (x axis).

Look at the spectrograms below.
How would you describe these sounds?
(Do they go up and then down, end low,
keep a steady tone, etc.?) Which call lasted longer?

Spectrogram A



Spectrogram B



After listening to and comparing the qualities of the sounds produced, researchers were able to recognize patterns and develop criteria used to distinguish one group of orcas from another.

This is what they learned ...

- Members of the same **pod**, a tightly knit group lead by the **matriarch** (oldest or lead female), make the same calls.
- Related pods are considered **clans**. Clans make *some* of the same calls and some distinctly different calls. When two groups make some of the same calls with only small variations, they are said to speak the same **dialect**.
- Unrelated groups are considered distinctly different communities. These groups make completely different calls.
- Orcas are not believed to mate with a member of the same pod, but do mate within their clan or with a member of another clan in their community. Different communities (e.g., northern residents and southern residents) do not intermingle, even when they are living in the same place, like the waters of the Pacific Northwest.