



Clever Cetaceans

Description: Students will explore through games and hands-on activities a few common dolphin adaptations used in various hunting and feeding strategies. Can be done all in one lesson, or broken up over multiple days.

Audience: Grades 4th – 7th

TEKS: Science 4.9A, 4.10A&B; 5.9A&B, 5.10A&B; 6.3B&C; 7.11B

Learning Objectives:

- Students will be able to name at least two different feeding strategies cetaceans use in hunting for food (i.e. bubble nets, echolocation, beaching onto mud flats, etc.)
- Students will be able to explain the importance of cetaceans utilizing feeding strategies in their own words (i.e. ensuring all members of pod eat, are healthy, are taken care of, etc.).
- Students will be able to define echolocation as a physiological process for locating distant or invisible objects (such as prey) by emitting high pitched sound waves that are then reflected back to the emitter (such as a dolphin) from the objects they hit (such as fish).
- Students will be able to use math skills to calculate both the range and average number of fish caught by their pod.

Materials: Towels, Large shallow bins of water (in the middle of each bin, create a circle out of tape about 8 inches in diameter), Plastic beads, Sieves, Straws, Stopwatch, Calculators, Blindfold, student data collection sheet.

Definitions:

Echolocation: a physiological process for locating distant or invisible objects (such as prey) by emitting high pitched sound waves that are then reflected back to the emitter (such as a dolphin) from the objects they hit (such as fish).

Procedures:

Bubble Net Simulation

- Divide students into table teams of 4 or 5. Place a towel at each table and a large shallow bin with a circle marked with tape in the middle. Fill bins with an inch of water and about 50 beads.
- Explain that dolphins are very social animals, which means they can be very cooperative in their hunting methods.
- By working as a team dolphins can ensure that all members of the pod are able to get food. One way that dolphins have been observed doing this is by creating large bubble nets with their breath to encircle schools of fish.
- By trapping them in a ring of bubbles, the dolphins can then take turns diving into the concentrated area to scoop them up into their mouths. This makes for an easy meal.

For more information or to book a program, visit the Texas State Aquarium website:

www.texasstateaquarium.org

- In this activity each student will be a dolphin. The first step is to work together to move all of the beads or "fish" into the ring in the center of your bin. They will do this by blowing bubbles with a straw, similar to the dolphins exhaling through their blow hole.
- Students should feel free to stand and move about their bin while communicating with the other dolphins in their pod.
- Hand each student a straw and allow them a few minutes to experiment. Walk around and ask teams what strategies are working best for them.
- ****Emphasize only exhaling into the straw. Students must remember to take breaks from blowing to inhale so they do not get light headed.**
- Once they have spent a few minutes experimenting with their technique, it's time to see how well they work together to circle and catch their 'prey.' Each pod will be competing to see who can get the most fish.
- Designate one dolphin on each team to be the feeder. That dolphin can use a sieve to scoop fish. Make sure they are only scooping fish from the center circle. The other dolphins will be working to guide the fish into the center to make it easier for the feeder. Give the teams 1 minute to gather as much fish as they can from the middle circle.
- After the minute is up, have teams count their fish. Ask teams that did well to share their strategies.
- Once they have shared their ideas, it's time to feed their whole pod! In real life, more than one dolphin will have to eat! Dolphins are very social creatures that have relationships with the others in their pod. They look out for each other and make sure the pod as a whole is healthy.
- In this next challenge, all of the dolphins on each team will take one quick turn feeding while everyone else helps herd the fish. They will have 1 minute. Make sure they keep the fish that they caught individually in front of themselves.
- After one minute, have everyone count their fish and record the number. How many did they get? How many did the team get total? Did every dolphin get something to eat? List the numbers caught by each dolphin. What was the maximum? What about minimum? Use the maximum and minimum to calculate a range.

Range = Maximum – Minimum

Did everyone get their fair share? Why or why not?

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What was the average catch per dolphin? Show on the white board how to calculate an average.

$$\text{Average} = \frac{\text{Total fish caught by the team}}{\text{Number of dolphins on the team}}$$

What other clever strategies have dolphins developed in order to catch their prey?

Show video clips. (Dolphins creating a ring of mud to trap fish and dolphins beaching fish onto muddy banks)

Mud ring: <https://www.youtube.com/watch?v=bzfqPQm-ThU>

Breaching: https://www.youtube.com/watch?v=EVJ_sbmw07M

Echolocation Station

- Dolphins have special adaptations that help them to hunt and catch prey. One very special adaptation is echolocation. Ask if any students can explain in their own words before giving them the definition. See *definition for Echolocation*.
- Basically, echolocation is the use of sound waves to determine an animal's surroundings. By sending out sound waves and detecting their return, dolphins can tell how far away their prey is and in what location.
- The students are going to play a game to simulate what it's like for a dolphin to find its prey using primarily sound waves. This activity must be done in a large open space.
- Select one student to be the dolphin and one to be the fish. Have all other students stand in a circle surrounding them.
- Blindfold the dolphin. Dolphins are not actually blind, quite the contrary, they have good vision. However, their hearing is far more acute and relied on first when hunting.
- Dolphins send out sound waves by making clicking noises. In this game we will simply clap. The dolphin will simulate this by clapping once.
- That sound wave will 'bounce off the prey.' Our fish will simulate this by responding with a double clap.
- It will be up to the dolphin to locate the fish simply by using this technique. They are to carefully move about the circle, holding their hands out to try and gently tap the fish with their fingers.

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- Allow the students about a minute. If the dolphin catches the fish before the minute is up, they win the round. Declare the fish a winner if they can make it to the end of the minute without being caught by the dolphin. Repeat with other volunteers if time remains.