Cloverbud Investigators: Career Detectives

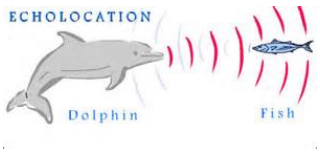
April

Speaking Dolphin

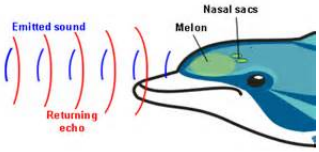
Background:

Dolphins can't talk underwater…or can they? Dolphins are mammals that spend their whole life in water and while they have excellent eyesight both above and below water, they generally rely on a different skill to find food. This skill is a type of communication which involves making sounds (talking) and listening. Since sound travels about five times faster through water than it does through the air, dolphins use a complex collection of sounds to talk to each other. Biologists even believe that every single bottlenose dolphin develops its own distinct high-pitched whistle, called a signature whistle. This signature whistle appears to serve as a means of individual identification; much like a name does for humans. Additional sounds and whistles serve to establish or maintain vocal or physical contact between dolphins. Biologists have witnessed dolphins responding to each other by using different sounds. The sounds that dolphins make underwater serves to help them navigate through the water, locate food, gather information about their environment, and communicate with other dolphins.

Bottlenose dolphins have also been observed whistling while hunting prey. Biologists believe that when a dolphin finds a school of fish, it will vocalize more frequently. This increase in vocalizations attracts more dolphins to the area to assist with rounding up the fish, and allowing all the individual dolphins to get a larger meal.



How do dolphins make sense of all the sounds they hear? They use something called echolocation. We see this in other mammals like bats and also in whales. Echolocation is the use of sonar to locate objects by reflecting soundwaves back to the animal. The animal sends out sounds and then listens for the echo, this tells them exactly what is around them and where their prey is located.



Dolphins have a waxy, lens-shaped structure in their forehead called the melon that focuses the clicks into a tight beam forward. When dolphins are examining an object or scanning their environment, their heads move rapidly from side to side as they direct the echolocation beam back and forth across the object or through the environment. Dolphins may be able to accurately echolocate on objects as far away as 100 yards.

Dolphins use lots of sounds to communicate: for courtship behavior they make pulsed yelps, if under duress they make pulsed squeaks, if aggressive or confrontational they make buzzing click-trains. This highly developed spoken language closely resembles human communication.

Career Connections: Wildlife Biologists, Zoologist, Veterinarian, Veterinary Technician, Park Naturalist, Animal Trainer, Oceanographer, Ecologist, Environmental Biologist, Marine Biologist, Zoologist, or even Audiologist, and Speech Pathologist.

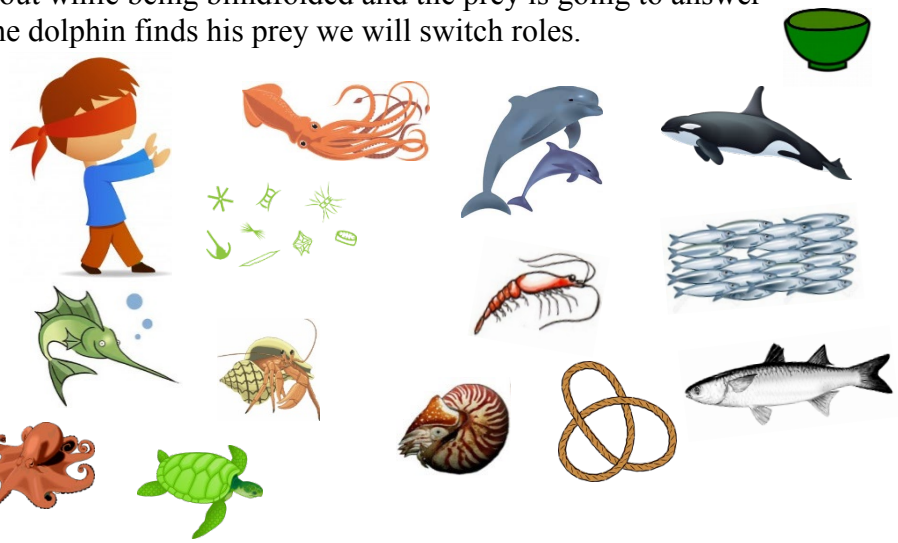
April's Mystery: How can sound help feed the hungry dolphin?

Activity

Now that we know that dolphins communicate with sounds to catch their prey, we are going to play a game to try out our echolocation. We are going to take turns pretending to be a hungry dolphin hunting for its next meal. The rest of the group is going to pretend to be the prey or other sea life. The dolphin is going to call out while being blindfolded and the prey is going to answer back, similar to Marco-Polo. Once the dolphin finds his prey we will switch roles.

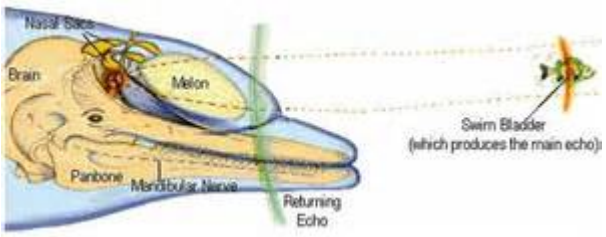
***Supplies*:**

- Blind folds
- Pictures of Ocean Fish and other creatures or figures with a sound (See Ocean Creature's Worksheet)
- Bowl or hat
- A rope or tape



Science Behind:

Echolocation in dolphins - The clicks emitted by a dolphin strike objects in its underwater world and bounce back as echoes to be picked up through the dolphin's lower jaw. From the returning echoes, a dolphin can tell the size, shape, distance, speed, direction of travel, and density of the object. Detecting density is important to a dolphin because most fish have a swim bladder filled with air which helps the fish maintain its equilibrium. Detecting the fish's swim bladder helps the dolphin locate and identify their prey (fish) during echolocation and avoid predators such as sharks, who do not have a swim bladder. Even in a large group of dolphins all using echolocation at once, each dolphin seems to be able to pick out its own echolocation echoes and not collide with another.



***What to Do*:** **We are going to help feed the dolphin by communicating with sounds, not words.**

Step 1: Cut apart and fold the ocean creatures and sound list worksheet. Mix all of them together in a bowl or hat.

Step 2: Have each person pick an ocean creature and then go stand in a circle. One or two (depending on group size) will be the dolphin, while the others will be the fish or "Prey".

Step 3: Each folded piece of paper will have an animal and sound on it. Explain that they are pretending to be this animal and have them practice making the sound. Clicking sounds with their tongues, snapping sounds with their fingers, or make whistling sounds. They will be listening for sounds from the "dolphin" and will be need to call back with their sound if it is the same.

Step 4: The person that picked the dolphin will then be blindfolded. Tell the "dolphin" they can make one of these three sounds at a time. Clicking sounds with their tongues, snapping sounds with their fingers, or whistling sounds.

Step 5: Make a rope boundary for the playing area. This will be the ocean. Just as fish can't live out of water, the players must stay in the boundary. Once the prey practices their sounds, they can begin "swimming" around in the circle.

Step 6: Lead the blindfolded person (the dolphin) into the circle. The "dolphin" may start by making one of the sounds. The "prey" assigned to that sound will return the sound each time they hear it. Kind of like saying "polo" when you hear "Marko".

Step 8: The blindfolded player or "dolphin" has to try and figure out which direction the sounds came from and catch its "prey". Be sure to take turns so that everyone has a chance to be the dolphin.

***Optional activity*: Making a musical instrument**

INSTRUCTIONS FOR KAZOO

Materials: per child: 6inch cardboard tube (toilet tissue or paper towel), wax paper (enough to cover the end of the tube), a rubber band, and crayons or markers for decorating.

- Step 1. Place the piece of wax paper over one end of the opening of the tube and secure with the rubber band.
- Step 2. The volunteer will need to add a hole about half way down the tube.
- Step 3. Allow the members to decorate their kazoo.

Additional Activities: This activity stresses the importance of body language and voice tone in communication. Add the question, do you think animals use body language to communicate with each other? Do they communicate using body language with humans?

Emoji Feelings (Suggested Opening): Seeing facial expressions can tell us how someone is feeling. What happens when we can't see someone's face, like when we communicate with text messages? Can it be difficult to understand the persons tone or emotional feelings? This is where emoji faces come in handy with text messages or social media. They help the communication by relaying the person's emotion or meaning. (See attached Emoji sheet)

- Happy
- Sad
- Funny
- Angry
- Sleepy
- Love
- Unsure
- Embarrassed
- Sick
- Shocked/ Wowed

1. Prepare some statements to read out loud, while having the investigators match the correct feeling emoji to your tone and body language while reading the statement.
2. Try reading the statement in different tones or using different body language to get the point across about facial expressions and tones.
3. Do they all pick the same emoji? Probably not, since they may interpret the statements and tones differently.
4. Discuss how important it is to human communication for us to understand tone and emotions.
5. Discuss a time when someone didn't understand that you were joking and had their feelings hurt by something you said.
6. Ask them how they think animals like dolphins communicate emotions or feelings. You can relate this to a more common animal like a dog or cat. Ask them if they can tell when their pet is afraid, or happy.

The Art of Listening: Tell the investigators you are going to give them a coloring sheet, but you want them to listen to all of the instructions before they start to color. Also tell them they need to color their own paper, without looking at what others are doing. They may come up and ask you questions if they want, after the instructions are completed.

1. Give them the coloring sheet.
2. Read a list of coloring directions, on what color you want each object colored.
3. Once everyone is done coloring, have them tape up their coloring page on a wall, so everyone can see them. (Notice the differences between the works of Art.)
4. Talk about how important listening is to communication. Did anyone ask question about the instructions? Did they have a better understanding of what to do?
5. Ask "What would happen to a dolphin if it didn't listen for the sounds to come back?"
   "Would it find food?"
   "Would it crash into something?"
   "Would it get attacked by a predator like a shark?"

Sound Matching Game: Make sound containers

- Collect solid colored (non-see clear) containers with lids.
- Fill them with items like rice, sand, paper clips, bells, coins or even water.
- Have the group try to guess the items in the containers without looking. (Some of the items may sound similar.)
- Open the containers to see if they guessed correctly.
- Explain that just like dolphins, we can learn a lot about the world around us by listening to sounds. Sounds can be a warning to us, like smoke alarms or something that tells us something like how the bell at school tells us it's time to go home or recess is over. Stress the importance to listen as part of communication.

Go Over Findings:

What is echolocation?
How do the dolphins use it?
Do other animals use echolocation?
How do we communicate?
How important is emotions or body language in understanding what someone is saying?
How important is it to listen so that you understand what someone is telling you?
What kind of career could you have if you like working with Animals? What about if you like working to help someone hear better or communicate better?

Investigate, Create, & Take: Investigators can take with them:

From The Ohio Cloverbud Kit-The Science of Sound: Good Vibrations, we are going to make Kazoos for the kids to take home.

Sources:

Dolphin Research Center, Marine Mammal Info, https://dolphins.org
The Ohio Cloverbud Kit-The Science of Sound

Additional Links:

- How do dolphins communicate? PBS
  https://www.youtube.com/watch?v=gbYjM1KlFrE
- Here's What We Know About Dolphin Intelligence, National Geographic; https://www.youtube.com/watch?v=_bnur3gHJ0s
- Could we speak the language of dolphins?, Denise Herzing, https://www.youtube.com/watch?v=CQ5dRyyHwfM

Developed by: Tiffany Sanders Riehm, Gallia County 4-H Program Assistant, Ohio State University Extension, riehm.11@osu.edu and Tracy Winters, Gallia County 4-H Extension Educator, Ohio State University Extension, winters.5@osu.edu. Edited by Michelle Stumbo, Meigs County 4-H Extension Educator, Ohio State University.

Dolphin

Click-Bell
Snap-Spoon
Whilst-Kazoo

Whale

Click-Bell
Snap-Spoon
Whilst-Kazoo

Baby Sea Turtle

Click-Bell

Needlefish

Click-Bell

Needlefish

Click-Bell

Mullet

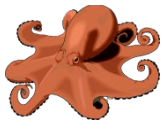
Click-Bell

Mullet

Click-Bell

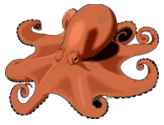
Octopus

Snap-Spoon



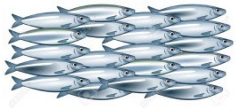
Octopus

Snap-Spoon



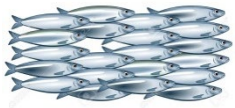
School of Sardine

Whistle-
Kazoo



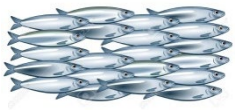
School of Sardine

Whistle-
Kazoo



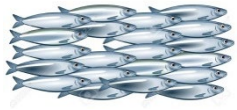
School of Sardine

Whistle-
Kazoo



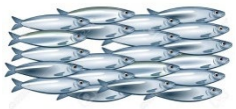
School of Sardine

Whistle-
Kazoo



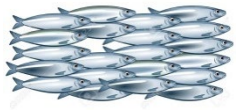
School of Sardine

Whistle-
Kazoo



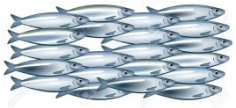
School of Sardine

Whistle-
Kazoo



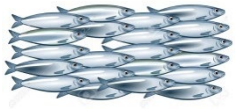
School of Sardine

Whistle-
Kazoo



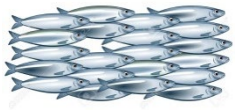
Plankton

Whistle-
Kazoo



Plankton

Whistle-
Kazoo



Plankton

Whistle-
Kazoo

Plankton

Whistle-
Kazoo

Plankton

Whistle-
Kazoo

Krill

Whistle-Kazoo

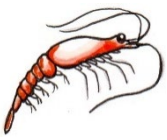
Krill

Whistle-
Kazoo

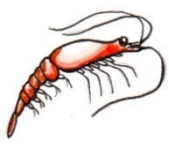
Crustacean

Whistle-
Kazoo

Snap-Spoon



Snap-Spoon



Snap-Spoon

THE OHIO STATE UNIVERSITY
COLLEGE OF FOOD, AGRICULTURAL,
AND ENVIRONMENTAL SCIENCES

Last updated: T. Winters, 1/2019

gallia.osu.edu

Cephalopod

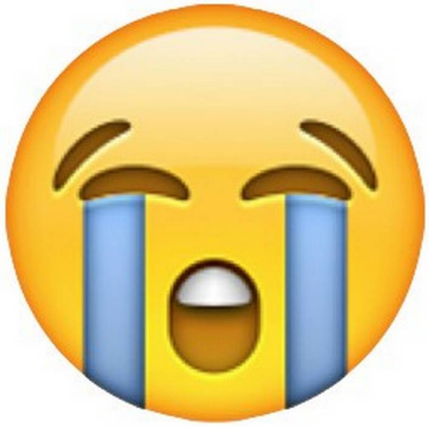
Snap-Spoon

Squid

Snap-Spoon

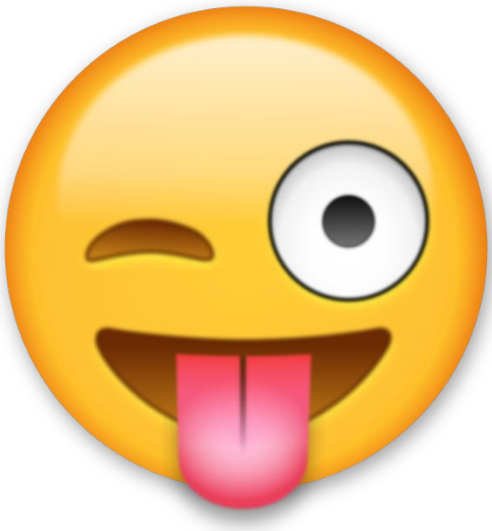
Squid

Snap-Spoon



THE OHIO STATE UNIVERSITY
COLLEGE OF FOOD, AGRICULTURAL, AND ENVIRONMENTAL SCIENCES

Last updated: T. Winters, 1/2019



*Images are Clip art

Cloverbud Investigators: Career Detectives

Speaking Dolphin

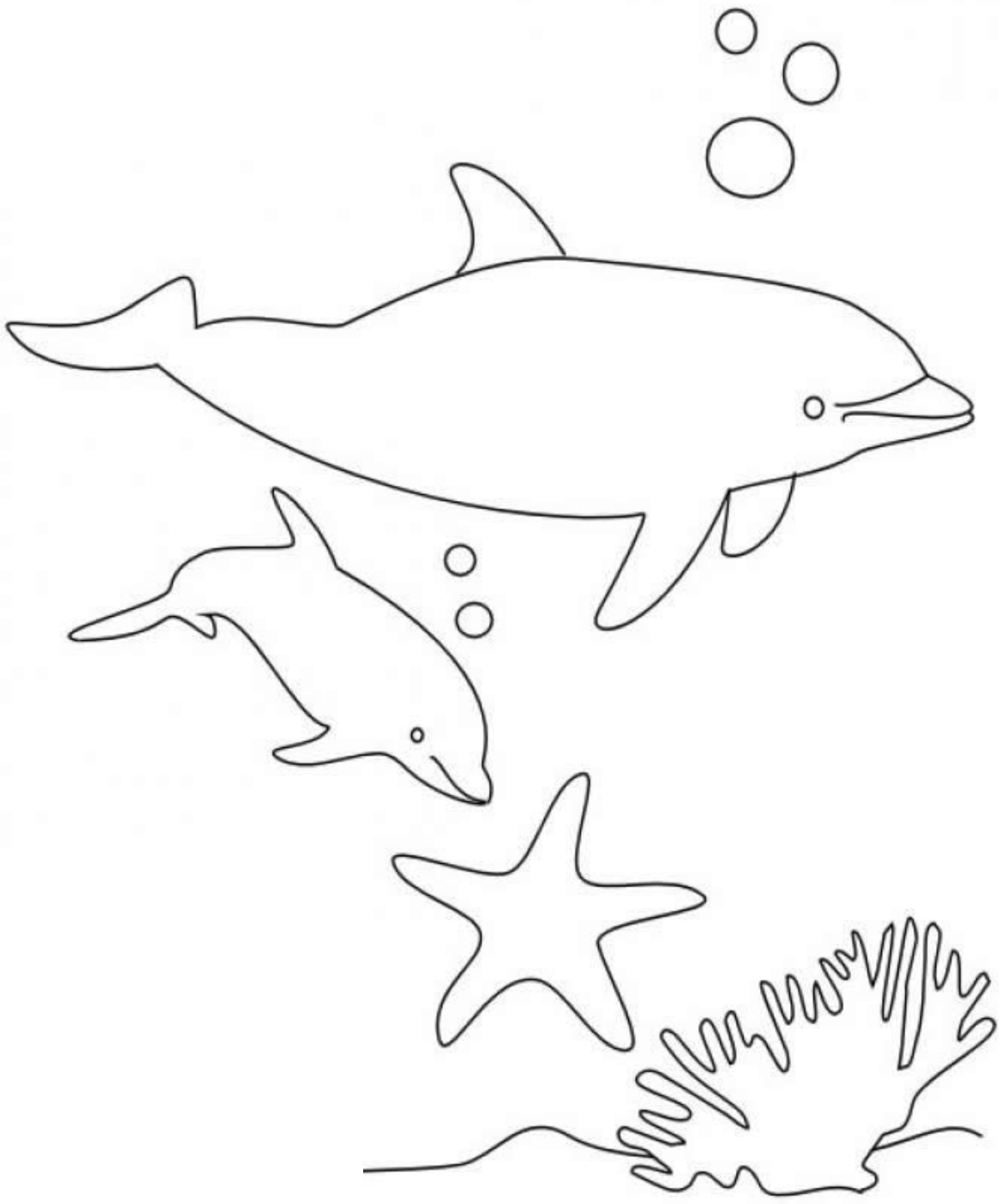
The Art of Listening: Under the Sea coloring page.

1. Write your name and age in black on the line.
2. Color the big dolphin grey and small dolphin light blue.
3. Color the star fish orange with red dots. (You decide how many dots.)
4. Draw 10 wavy lines through the ocean around the dolphins.
5. Color the reef purple, yellow, or brown.
6. Draw and color a fish in the space above your name. The color must start with the letter "P".
7. Color the clover green.
8. Draw the sun and its rays shining at the top of the page.
9. Color the sand dollar your favorite color.
10. Draw a crab to the left of the clover.

- When everyone is finished, tape the pages together on a wall.
- Ask "Did anyone follow all of the instructions perfectly? Probably not exactly, but close. Explain that sometimes we think we are listening, but we may not be listening as well as we think.

Make the connection:

Dolphins do not echolocate constantly, especially if they are in a familiar area or if the visibility is quite good. When dolphins are not using echolocation, they rely on their **extremely sensitive hearing** for information about their environment, including sounds made by other dolphins. Often dolphins catch prey by listening for it rather than with echolocation. The sound emitted by a dolphin when using echolocation may give away their presence.



Name: _____
Age: _____

Adapted from: https://www.coloring-pages-kids.com/coloring-pages/animal-coloring-pages/dolphins-coloring-pages/dolphins-coloring-pages-images/dolphin-coloring-page-13.gif

THE OHIO STATE UNIVERSITY
COLLEGE OF FOOD, AGRICULTURAL, AND ENVIRONMENTAL SCIENCES

CFAES provides research and related educational programs to clientele on a nondiscriminatory basis. For more information: go.osu.edu/cfaesdiversity.

Last updated: T. Winters, 1/2019

gallia.osu.edu