

DOLPHIN RESEARCH CENTER

Photo Identification

Grade Level: 6th-8th

Objectives: Students will be able to identify individual dolphins by observing unique characteristics in a series of dorsal fin photographs. Students will also be able to explain ways in which wild dolphin identification projects can help with research and conservation projects.

Florida Sunshine State Standards:

Science

SC.G.1.3.2 The student knows that biological adaptations include changes in structures, behaviors, or physiology that enhance reproductive success in a particular environment.

National Science Education Standards:

Content Standard A (5-8) - Understandings about Scientific Inquiry: Different kinds of questions involve observing and describing objects, organisms, or events; some involve collecting specimens; some involve experiments; some involve seeking more information; some involve discovery of new objects and phenomena; and some involve making models.

Content Standard C (5-8) - Reproduction and Heredity Reproduction is a characteristic of all living systems; because no individual organism lives forever, reproduction is essential to the continuation of every species.

Content Standard C (5-8) - Populations and Ecosystems A population consists of all individuals of a species that occur together at a given place and time. All populations living together and the physical factors with which they interact compose an ecosystem.

Background: Researchers are conducting numerous observational studies on wild dolphin populations. From these studies, we can learn a lot about dolphin population dynamics and social structure. In order to collect accurate data and obtain valuable results, researchers must be able to identify individual dolphins within populations. This can often be difficult, as researchers are often quite far away from the subject dolphins and they do not often get a good view of the entire body. Fortunately, a dolphin's dorsal fin is a good way of identifying a dolphin. No two dorsal fins are exactly alike! Unique notches, markings, and curvature allow researchers to distinguish individual dolphins.

Researchers create photo catalogs by taking photographs of dorsal fins and assigning an identification number or name to each individual. Within these catalogs, photographs are organized in groups according to fin shape. These groups are then further broken down according to the region on the fin where notches or markings are found. Future photographs can then be compared to the photographs in the catalog to identify individuals.

It is important to realize that this can be a challenging process. It can be very difficult and time consuming to manually match photographs. Some researchers use software to help with the identification processes. Certain programs are able to compare new digital images



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to those already in a database. Another variable that researchers must take into account is the fact that dorsal fins may change over time, as dolphins may acquire new notches or markings throughout their lifetime.

Materials:

For each group:

- One photo of a wild dolphin pod (dorsal fins visible above the water)
- One set of photo ID cards

For each student:

- **Photo Identification** handout

Teacher Prep Notes: Copy the **Photo Identification** handout for each student. Each group will need one set of photo ID cards. The cards are easily made by printing up the provided dorsal fin photographs. (A color printer or black-and-white laser printer will work best). Cut the photographs out along the lines. Lamination is optional, but it will enable the cards to be used year after year.

Each group will also need a printed photo of a wild dolphin pod (with dorsal fins visible from above the water) for the introductory activity. One good place to obtain a photo is at the NOAA Photo Library (<http://www.photolib.noaa.gov/>). You will find a collection titled **NOAA's Ark (Animals)**, and within this collection there is a group of photos titled **Killer Whales and Dolphins**. In this grouping, there are images of wild dolphin pods (mostly pods of killer whales) with the dorsal fins visible from above the water. Try and select a photograph that shows a little variation in dorsal fins (size, curvature, etc.).

Procedures:

1. Ask the students why it is important for researchers to be able to identify individual dolphins in the wild. Possible reasons include: estimating population size, assessing immigration and emigration, determining average life span, and understanding social groupings.
2. Distribute the photograph of the wild dolphin pod to each group. Explain that this is often how researchers will see dolphins in their natural habitat.
3. Ask the students to suggest some ways researchers might be able to differentiate individuals. Students should identify the dorsal fin as a key feature in identifying individuals.
4. Explain the process of photo identification. Explain that researchers will take photographs and create a catalog of known individuals. The catalogs are organized into categories according to fin shape and the location of various markings or notches. Researchers can then match new photographs with existing photographs of known dolphins. Some researchers will match photographs manually, while others will use computer programs to match photographs.
5. Distribute the **Photo Identification** handout to each student.



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6. As a class or in groups, have the students read through the introduction to the handout. Discuss the importance of being able to identify and describe the unique characteristics of individual dorsal fins. This enables researchers to communicate with one another while attempting to identify individuals.
7. Have students complete #1-4 independently. Once the students have completed these descriptions, ask them to share their answers with their group members. All group members should concur on each of the four descriptions before progressing to the next part of the activity.
8. Distribute one set of photo ID cards to each group. Each group is responsible for identifying each of the unknown dolphins by matching their dorsal fins to a group of previously identified dolphins. The students should record their data in the table provided on the handout.
9. Once the group has finished matching dorsal fins, have them complete the application questions. (These could be assigned for homework instead.) The answers to the matching activity are shown below.

Photo Number	Dolphin's Name
1	Molly
2	Aleta
3	Tursi
4	Rainbow
5	Merina
6	Talon
7	Pandora
8	Kibby
9	Sandy
10	Delphi
11	A.J.
12	Tanner
13	Pax
14	Theresa
15	Santini
16	Calusa

Wrap Up: As a class, discuss the students' responses to the application questions. Explain that female dolphins seem to *learn* more effective mothering skills by observing others and through their own experience. For example, calves learn foraging techniques from watching their mothers, and more experienced mothers may be more successful at teaching their calves how to find food. As a result, the calves of more experienced dolphins have a higher survival rate.

This knowledge is something that could be used by scientists looking to reintroduce individuals into an area with a depleted population. Based on this information, scientists involved in reintroduction projects might be more likely to introduce experienced mothers



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into an area to help the population rebound. Curators at marine mammal facilities might be more likely to place young females in social groups where they will have an opportunity to observe experienced mothers in action.

Taking it Further:

- Assign each student or group a cetacean population or species to research. Have students examine what we have learned about these populations or species as a result of photo identification studies in the wild.

Resources:

- Find more information on Randall Wells study described in the handout at www.sarasotadolphin.org

