

DOLPHIN RESEARCH CENTER

Dolphin Bodies

Grade Level: 6th-8th

Objectives: Students will be able to identify and explain the characteristics that make dolphins so well adapted to their aquatic environment.

Florida Sunshine State Standards:

Science

SC.F.2.3.3 The student knows that generally organisms in a population live long enough to reproduce because they have certain survival characteristics.

National Science Education Standards:

Content Standard C (5-8) - Diversity and Adaptations of Organisms: Biological evolution accounts for the diversity of species developed through gradual processes over many generations. Species acquire many of their unique characteristics through biological adaptation, which involves the selection of naturally occurring variations in populations. Biological adaptations include changes in structures, behaviors, or physiology that enhance survival and reproductive success in a particular environment.

Background: Dolphins are classified as marine mammals. In order for an animal to be classified as a mammal, it must: breathe air, give birth to live young, nurse the young, possess hair at some point in the life cycle, and be endothermic (regulate body temperature internally). Marine mammals possess all of these characteristics. In addition, they make the sea their homes for all or part of their lives.

Scientists believe that dolphins and whales evolved from a terrestrial animal. While there is currently debate as to which group of animals ancient cetaceans evolved from, there is no doubt that significant adaptations were made to allow these animals to occupy a niche in the world's oceans. Read more about the evolution of dolphins and the adaptations of modern day dolphins in the **Physiology** information file. Also refer to the **Anatomy** diagrams.

Materials:

For the class:

- Dolphin anatomy photographs (from curriculum CD)

Key Terms

Adaptation: A change in structure, behavior, or physiology that enhances survival and reproductive success in a particular environment.

Anatomy: The bodily structure of a plant or animal or any of its parts.

Physiology: The biological study of the functions of living organisms and their parts.



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For each group:

- Stopwatch
- One die
- Game pieces (colored paper clips, coins, or pieces from another game)
- PlayDough™
- Blank paper and pencil
- **Dolphin Cranium** game board
- **Dolphin Cranium** instructions
- **Dolphin Cranium** question cards

For each student:

- **Dolphin Anatomy** handout
- **Physiology** information file (You may want to modify the information file to the reading level of your students. There are many books that present this information in a kid-friendly manner with lots of pictures. You could use information from these books instead.)
- **Acoustics** diagram
- **Anatomy** diagram

Teacher Prep Notes: Make copies of the **Dolphin Anatomy** handout, **Physiology** information file, and **Acoustics** and **Anatomy** diagrams for each student. Ensure that students are able to view the dolphin anatomy photographs on the curriculum CD.

Students will need to be divided up into groups in order to play the **Dolphin Cranium** game. Two groups of students per game board is ideal. A suitable group size would be two to four students. Prepare the proper number of game boards for your class size. Print out the game board and use a copy machine to enlarge the board (200% works well). You can use 11”x17” paper, or you may need to piece the larger board together using a couple sheets of paper. Print out the question cards on paper or cardstock. Use a different color for each type of card (Fun Facts, Dolphin Dictionary, Anatomical Art) so that students can differentiate between the cards.

Procedures:

1. Ask students to imagine themselves spending their entire life in the ocean. Have students begin thinking about ways in which it might be difficult for the human body to survive in this saltwater environment. Things students may consider: Our eyes don't see well in water; Our ears don't allow us to hear well underwater; Our bodies aren't streamlined and our limbs don't allow for effortless movement through the water; We don't have defenses to ward off predators; We wouldn't be effective at hunting for prey; We would need a source of fresh water, We would be unable to dive far or for extended periods of time; We might inhale water into our lungs.
2. Explain to students that dolphins are mammals, as are humans. (If students are not familiar with the five characteristics of mammals, discuss those at this point.)



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3. Dolphins have a number of amazing adaptations that allow them to make the ocean their home. Discuss the term ‘adaptation’. Explain to students that they will be learning more about the amazing adaptations of dolphins, and that their new knowledge will be put to the test with a game of **Dolphin Cranium**.
4. Introduce students to the term “anatomy”. Distribute the **Dolphin Anatomy** handout. Have students fill in the blanks. As a class, discuss each of the anatomical features and use the anatomy photographs to assist with the explanations. You may also distribute the **Anatomy** diagram to discuss additional external and internal anatomical features.
5. Introduce students to the term “physiology”. Depending on the level of your students, you may choose to present the information on dolphin physiology in one of the following ways:
 - As a class, read the **Physiology** information file aloud and stop to discuss material along the way.
 - Have students read the material independently. Students should take notes while reading and then discuss the information as a class.
 - Divide students into groups and have them participate in a jigsaw activity using the information files, diagrams, and/or other resources you have available. (See <http://www.jigsaw.org/overview.htm> to learn more about this type of activity.)
 - Present the information in a lecture-style format as students take notes.
6. In a subsequent class period (once the students have familiarized themselves with the anatomy and physiology of the dolphin), allow students to test their knowledge of dolphin anatomy and physiology by playing **Dolphin Cranium**. Divide students into teams and provide the instructions and materials. Model the way the game is played so students have an adequate understanding of the rules and procedures.
7. Allow students to play the game. You can even offer prizes for the winning teams!

Wrap Up: Ask each student to verbally describe one dolphin adaptation that makes these mammals so well suited for their marine environment.

Taking it Further:

- Research adaptations of other marine mammals. Interesting options include manatees, river dolphins, and sea lions.
- Create other games based on the anatomy and physiology of dolphins or other animals.

Resources:

- Carwardine, Mark. **The Book of Dolphins**. Collins and Brown, 1999.

