



GUIDE FOR EDUCATORS

National Marine Mammal Foundation
Education & Outreach

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Dolphin Doctor Workshop Overview

The National Marine Mammal Foundation (NMMF), headquartered in San Diego, CA, is a world leader in marine mammal research and conservation. This project recognizes the lifetime work of Dr. Sam Ridgway, the original Dolphin Doctor and current President of the National Marine Mammal Foundation. Dr. Ridgway pioneered dolphin anesthesia, medical technology, and methods for studying trained dolphins swimming freely in the open sea. His discoveries have been published in more than 300 research papers in leading scientific journals such as Science, Nature, and the Journal of the Acoustical Society of America.

Our team of researchers and veterinarians uses the latest advances in veterinary medicine to care for U.S. Navy Marine Mammals with the best available science in locations around the world. Our team is in a unique position to share cutting-edge marine mammal science, as well as teach STEM concepts with real world applications. An important asset of our program is that our outreach staff are all primarily scientific researchers and marine mammal veterinarians who have a passion for sharing our work with the community.



About the National Marine Mammal Foundation

The National Marine Mammal Foundation (NMMF) has a mission to improve and protect life for marine mammals, humans, and our shared oceans through science, service, and education. We achieve our mission through the following actions:

- *Collaborate with the nation's top scientists and institutions to translate our research into applicable medicine and species conservation*
- *Develop education programs to share NMMF research discoveries and expertise*
- *Foster an environment that creatively, effectively, and positively shapes marine mammal medicine, research, training, and education*
- *Conduct research that benefits the conservation and care of marine mammals and the health of humans*

Our vision for the future is to revolutionize the way we think about marine mammals. By embracing the partnership created between human and marine mammal, we can create a sea change in our global approach to scientific exploration, ocean conservation, and public education. The National Marine Mammal Foundation has offices in San Diego, CA and Charleston, SC.

Resources and Materials Summary

We've developed a variety of educational tools to accommodate various age groups and instructional styles, which have been made available on the National Marine Mammal Foundation website www.nmmf.org.

These materials are designed to be presented together as a two-hour educational workshop; however they can also be used independently.

Slideshow

A [PowerPoint slideshow](#) has been developed to introduce students to dolphin anatomy, adaptations, echolocation, health assessments, and what it takes to become a marine mammal veterinarian. The slideshow includes detailed speaker notes associated with each slide.

Activity – Mock Dolphin Health Assessment

Description: In this mock dolphin health assessment activity, you will rescue a pretend dolphin and then proceed through a complete medical checkup! This includes an ultrasound, body measurements, x-rays, and satellite tagging. You can use any kind of pretend dolphin and real or pretend veterinary supplies for this activity. Follow along on the worksheet and the slideshow to learn the steps of a dolphin health assessment!

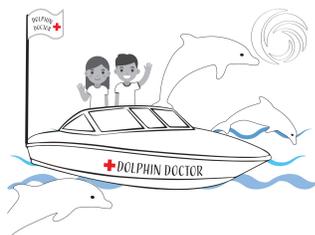
[HERE](#) is a clip from Dispatches from the Gulf of veterinarians studying the dolphins in the Gulf after the 2010 Deepwater Horizon Oil Spill. Follow along with the video using your health assessment checklist! Feel free to show the entire video or, order your own FREE version of the entire Dispatches from the Gulf film [HERE](https://dispatchesfromthegulf.com/dvd/). <https://dispatchesfromthegulf.com/dvd/>



Suggested Mock Health Assessment Supply Checklist:

- Dolphin Medical Check-up & Critical Thinking worksheet and pens/pencils
- [Dolphin Health Assessment Slideshow](#)
- Towels to keep dolphin wet and cool
- Kids medical kits (Doctor of veterinarian toy kit with pretend syringes, stethoscopes, lab coats, measuring tape etc.)
- Inflatable or stuffed dolphin
- Dolphin anatomy models ([anatomical models available online](#))
- GPS tags (chip clips work great)

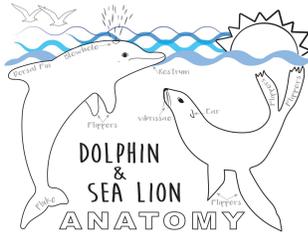
Worksheets (available at www.nmmf.org)



Dolphin Doctor Coloring Sheet

Dolphin Doctor Coloring Sheet

Grades: Pre-K- 5



Dolphin & Sea Lion Anatomy

Grades: Pre-K- 4th

NGSS: 2-LS4-1.

Make observations of plants and animals to compare the diversity of life in different habitats.

DOLPHIN MEDICAL CHECK-UP!

- Collect blood for analysis
- Listen to the heart and lungs
- Is this dolphin a male or female?
 - MALE or ♂
 - FEMALE ♀
- If female, is she pregnant?
 - YES NO

Dolphin Medical Check-up Worksheet

Grades: 3-8

NGSS: 3-LS4-2. Use evidence to construct an explanation for how the variations in characteristics among individuals of the same species may provide advantages in surviving, finding mates, and reproducing.

DOLPHIN SOUND PRODUCTION

Sound travels in WAVES. The frequency of a sound wave is the number of wavelengths that travel past the ear in one second (measured in Hertz). The intensity, or amplitude, of a sound wave is the loudness of a sound (measured in decibels). In other words, a change in pitch is a change in FREQUENCY while a change in volume is a change in AMPLITUDE.

In humans, very loud sounds above 90 dB are damaging to the inner ear and can even do irreversible damage above 120 dB. Humans can hear frequencies of about 20 hertz to 20,000 hertz (number of vibrations per second). Sound waves of more than 20,000 hertz are known as ULTRASONIC and cannot usually be heard by humans. However, we can use ultrasound in medicine, in ship navigation, and in industry.

Sound is also used by various animals, including dolphins, bats, and some birds to perceive objects in their environment, which we call ECHOLLOCATION. Sound moves 4X faster in water than in air, and most marine mammals rely on sound for communication, foraging, navigation and predator avoidance. Dolphins have a sophisticated echolocation system that allows them to sense objects underwater even in very low visibility conditions. They can even use it to locate fish that are buried under the sediment on the ocean floor. The dolphin produces a sound (called a CLICK) and it travels through the bump that they all have on their foreheads - we call that the MELON. The melon acts like a cone, so it not only makes the sound (CLICK), it also focuses the sound in one direction. The click then travels through the water until it bounces off of an object.

Dolphin Sound Production

Grades: 3-8

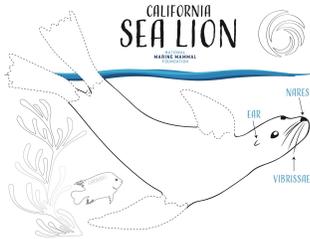
NGSS: 4-LS1-2. Use a model to describe that animals receive different types of information through their senses, process the information in their brain, and respond to the information in different ways.

CROSSWORD PUZZLE



Dolphin Doctor Crossword Puzzle

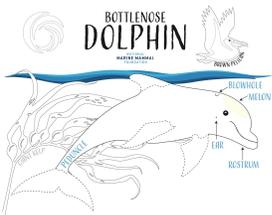
Grades: All



Sea Lion Paper Doll Craft

Grades: K-5

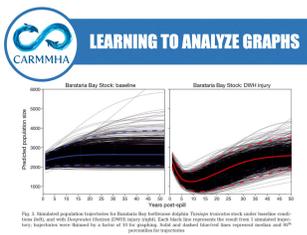
NGSS: 4-LS1-1. Construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction.



Dolphin Paper Doll Craft

Grades: K-5

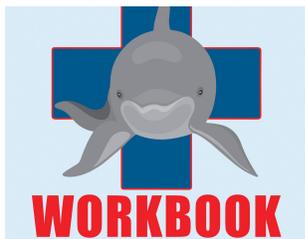
NGSS: 4-LS1-1. Construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction.



Learning To Analyze Graphs

Grades: 6-12

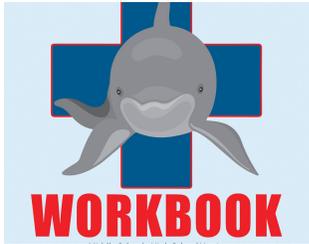
NGSS: HS-LS2-1. Use mathematical and/or computational representations to support explanations of factors that affect carrying capacity of ecosystems at different scales.



Dolphin Doctor Workbook MS - HS

Grades: 6-12

Multiple activities



Dolphin Doctor Workbook K-5

Grades: K-5

Multiple activities

Sound and Health

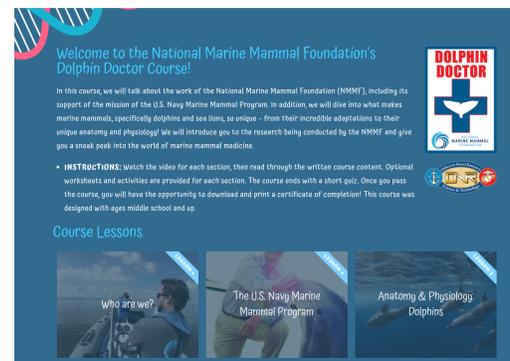
Did you know that we can learn a lot about how animals are feeling just by listening to them?

How do you sound when you have a runny nose? Or what noise might you make if you bumped your head? The NMMF Sound & Health team (link) has developed a software package that helps us identify sounds that dolphins make when they don't feel good. You can find a link to an educational activity about Sound & Health on the San Diego Office of Education webpage (link). <https://sites.google.com/view/sdcoesteamhub/steam-activitites/dolphin-communication>

Want to learn more about bioacoustics? Check out our [Voices in the Sea](#) workshop page for more fun interactive activities and worksheets about sound!

Online Course

Want to learn more? Visit the NMMF online learning portal to learn more in our Dolphin Doctor course! A printable certificate is emailed to participants upon completion of the course.



Welcome to the National Marine Mammal Foundation's Dolphin Doctor Course!

In this course, we will talk about the work of the National Marine Mammal Foundation (NMMF), including its support of the mission of the U.S. Navy Marine Mammal Program. In addition, we will dive into what makes marine mammals, specifically dolphins and sea lions, so unique - from their incredible adaptations to their unique anatomy and psychology! We will introduce you to the research being conducted by the NMMF and give you a sneak peek into the world of marine mammal medicine.

INSTRUCTIONS: Watch the video for each section, then read through the written course content. Optional worksheets and activities are provided for each section. The course ends with a short quiz. Once you pass the course, you will have the opportunity to download and print a certificate of completion! This course was designed with ages middle school and up.

Course Lessons

- Who are we?
- The U.S. Navy Marine Mammal Program
- Anatomy & Physiology: Dolphins

Additional Resources:

NMMF Website: www.nmmf.org

Facebook and Instagram: [@nmmf.org](#) , [@nmmfoundation](#)

