

NEW BEDFORD WHALING MUSEUM

# WHALES GIANTS OF THE OCEAN

## Facilitator's Guide - Lesson 4 How Big Are Whales?

Lesson time: 60 minutes



Whales, dolphins, and porpoises can be as short as 5 feet (1.5 meters) or as long as 100 feet (30.5 meters). In this lesson, students will learn about and try to replicate the size of some of the larger species. They will also compare those animals to familiar objects.

## WELCOME!

This facilitator's guide will assist you in leading ***Whales: Giants of the Ocean*** lesson – **How Big Are Whales?** It includes links to resources that can be used to present the material to students. The guide can be used with the "[How Big Are Whales](#)" video or on its own. All resources listed can also be found on the New Bedford Whaling Museum website at [www.whalingmuseum.org/learn](http://www.whalingmuseum.org/learn)

## GUIDING QUESTIONS

- How big are whales? How does the size of different whales compare with the size of common objects?

## BY THE END OF THIS LESSON, STUDENTS WILL BE ABLE TO:

- Use different objects to compare lengths
- Know relative sizes of measurement units within one system of units
- Record measurement equivalents in a two-column table
- Reason abstractly and quantitatively



### KEY TERMS

Measurement, Length, Comparison, Equivalent, Estimate



### BACKGROUND INFORMATION

There are approximately 90 species of whales, dolphins, and porpoises (cetaceans). There are several species that are shorter than a car. There are several that are longer than a school bus. There are plenty of species in between those two extremes. Using a measuring tool, students will learn about the lengths of several species of cetacean.



### MATERIALS NEEDED

- A ruler, yardstick, or measuring tape
- 100 foot (30.5 meters) rope, marked in 10 foot (3 meters) increments. If rope is not available, other means of measuring.
- Books, hats, rocks, blocks, etc. to serve as outdoor markers
- [Whale size chart](#)
- [Whale size table](#)



### ACADEMIC STANDARDS

- **NGSS** | LS1.A. Cross-Cutting Concepts: Scale, Proportion, and Quantity; Analyzing and Interpreting Data; Using Mathematics and Computational Thinking
- **Common Core** | ELA RI.4.4, RI.4.7, RL.4.7, SL.4.1, SL.4.2, W.4.1, W.4.2, W.4.3, W.4.4 | MATH 4.OA.A.3, 4.NBT.A.2, 4.NBT.A.3, 4.NBT.B.4, 4.MD.A.1, 4.MD.A.2, 4.MD.B.4
- **Mathematical Practices** | Make sense of problems and persevere in solving them; Reason abstractly and quantitatively; Construct viable arguments and critique the reasoning of others; Use appropriate tools strategically; Attend to precision.

# LESSON DIRECTIONS



## INTRODUCTION

Showing the [Whale Size Chart](#) direct students to focus on the length of the blue whale and take notice of the other species and objects in the illustrations.



## ACTIVITY - ESTIMATE AND MEASURE

- Take students to a large open space (gymnasium, cafeteria, playground, etc.)
- Mark a starting point using an object (book, block, chalk mark, etc.) and then ask students to estimate the length of a blue whale by placing another object at the distance they believe is the appropriate end point.
- Ask students to do the same for other species - sperm whale, right whale, humpback and orca.
- Next, using a 100 foot (30 m) rope representing the length of a blue whale, have students compare their blue whale estimate.
- Use the [Whale Size Table](#) to show the actual lengths of other species and repeat the process of comparing actual lengths to their estimates. Note\* You can also use the Whale Size Table to work with some smaller lengths.

### Using other units of measurement:

- Ask students to predict how many of their classmates, lying head-to-toe, would equal the length of one blue whale.
- Next, ask students to lie down head-to-toe to test their predictions. Ask students to write their result in the [Whale Size Table](#).
- Continue the process for some or all of the other whale species listed.



## ACTIVITY - Measuring from Large to Small

In this activity, students visualize lengths with the 100 foot (30 m) rope

- Start with students holding each end of the 100-foot rope, with the rope fully extended. This represents the length of a blue whale.
  - Fold the rope in half (50 feet, 15.5 m) by having one student remain stationary while the other student walks towards them. The student who walked will give the end of the rope to the stationary student and walk to the folded end of the rope. Pull the rope taut. This represents the approximate length of a right whale.
  - Repeat the process and fold the rope in half again (25 ft, 7.6 m) to represent the approximate length of an orca or a blue whale calf.
  - Repeat the process and fold the rope in half again (12.5 ft, 3.8m) to represent the length of a right whale calf or a bottlenose dolphin.
- One more folding of the rope (6 ft, 1.7m), represents a harbor porpoise.



## WRAPPING UP

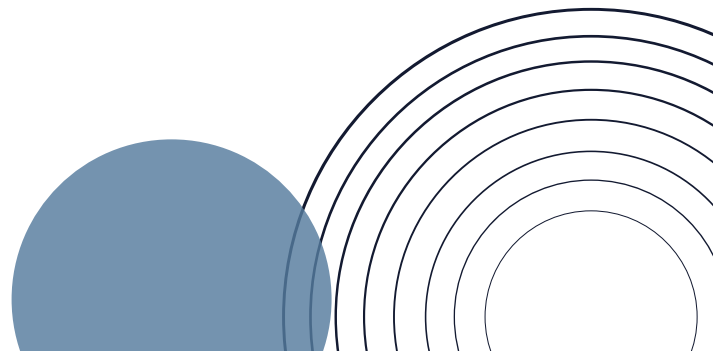
### Calculation

- Ask students to measure the height of one student and calculate the number of that student needed to equal one blue whale while the other students lie down to measure.
- How close are the two estimates?

### Comparison

- Have students choose an object with a length that can be easily found online or in a book (bus, car, television) or measured in class (desk, new pencil).
- Direct them to use the length of that object and create their own size comparison to the blue whale and at least two other whales in the table.
- Ask students to write the results of their calculations in the Whale Size Table.

Have students finish the lesson by completing the [Think About It](#) page.





## Have more time?

Try this additional activity to help students think about the idea of scale.

- Choose a whale species and draw an outline of it on the playground. You may want to make a small version first and do some calculations to scale up the drawing.

### Need Additional Resources?

[NOAA Whale Pages](#)

[American Cetacean Society](#)



Ready for the next lesson?

[Lesson 5 - Create a Critter](#)

