

Dinosaurs Big and Small

Suggested Grade Levels: **K-4**

Description: **Students learn about the sizes of dinosaurs, then measure objects around their classroom and school for comparison.**

Standards Targeted:

- **Fossils provide evidence about living things that inhabited Earth long ago. [LS4.A]**
- **Fossils can be compared with one another and to living organisms according to their similarities and differences. [LS4.A]**

Skills Targeted: **Measure**

Goals:

- 1. To illustrate the great variety of different types of dinosaurs**
- 2. To provide students opportunities to practice estimating and measuring**
- 3. To demonstrate the usefulness of comparing extinct animals to presently observable objects in order to better understand them**

Objectives—By the end of this activity, students will be able to:

- 1. Measure the size of objects**
- 2. Describe how some dinosaur species were very large while others were actually quite small**
- 3. Describe how dinosaur eggs and babies may have been much smaller than the adults**

Time Needed: **45 minutes to multiple days**

Materials:

- **Lists of lengths and heights of 6 to 12 common dinosaurs (including juveniles and eggs)**
- **Long measuring tapes**
- **Pencils**
- **Blank paper or data collection sheets with list of items to measure**

Step-By-Step Instructions:

- 1. Before the lesson, prepare a list of common dinosaurs with their lengths and heights (or plan for students to research this information themselves). Also, consider possible objects that the students might measure as comparisons to the dinosaurs. Some possibilities include: the length and height of desks in the classroom, the length and height of the chalkboard, the height of the classroom door and windows, the height of**



the wall clock above the floor, the width of the entire classroom, the distance between the classroom door and the next door down or other landmarks down the hallway, the length and height of various playground equipment, the lengths of cars in the school parking lot, the length of a school bus, the length of the entire school or some portion of it.

2. Start the lesson by asking students to think about what they know about dinosaurs. Ask students how big they think dinosaurs were. Were they all big? Were any dinosaur species small? What do they mean by “big” and “small”? What about dinosaur babies—how big were they? What about dinosaur eggs?
3. Note how students describe size. Are they comparing the size of a dinosaur to something else? Ask the students whether they think comparing sizes of different objects would be a good way to explain the size of an object to someone.
4. Tell students that they are going to be given a data set of dinosaur lengths and heights, and then they will measure other objects in and around the school to use as comparisons to better understand these sizes.
5. Distribute the data set, measuring tapes, and paper or data collection sheet to student teams of 2 to 4 students each.
6. Have teams disperse to measure objects in and around the classroom. Depending on the grade level, students may come up with their own ideas of what to measure or you may provide specific items to measure on the data collection sheet. Depending on the size of the class, different teams may be assigned different items or areas to measure to divide up the work and avoid congestion. Students may need a brief lesson on how to use a measuring tape and on how to add measurements together when measuring something longer than the tape.
7. Once all the data have been collected, gather the students back together. Ask each student team to report its results, writing the heights and lengths down on the board so everyone can see them.
8. Ask the students to work in their teams to compare these measurements with the data set of dinosaur measurements. For each dinosaur, what school item measured would they choose to express the dinosaur’s size? For example, “*Stegosaurus* was almost as long as the distance from the classroom door to the water fountain and was as tall as the ceiling”. Each team might write down a sentence like this for each of the dinosaurs in the data set, or assign just one or two dinosaurs to each team to divide up the work.
9. Have the teams report out one of their descriptive sentences and solicit reactions and feedback from the other teams.



10. When all the teams have reported out, call the students' attentions back to the idea of how to describe dinosaurs. **Were** all dinosaurs big? Were they surprised that some dinosaurs were very small? Why or why not? How big were dinosaur babies and eggs? Were they surprised that small eggs and babies could grow into giant adults? Why or why not?
11. Variation A: Have students begin by measuring each other's heights to use as a comparison. This activity could be done on an earlier day, as an introduction to using a measuring tape and making a table of data.
12. Variation B: Each student can be tasked with researching the size of his or her favorite dinosaur; these values can then be pooled to produce the data set of dinosaur sizes.
13. Variation C: Student teams can be asked to explore the classroom surroundings and develop a list of good items to measure. These can be collected and reviewed, then re-distributed on a second day to actually do the measurements.

Resources:

The Paleontology Portal: <http://www.paleoportal.org/>
Website with vetted educational materials, including nearly 1,000 photographs of fossils

University of California Museum of Paleontology Online Exhibits:

<http://www.ucmp.berkeley.edu/exhibits/index.php>

Extensive website with many images and background information for every major fossil group; also has extensive K-12 educational resources, online activities, modules, etc.

Royal Ontario Museum Image Database: <http://images.rom.on.ca/public/>

Searchable database from the ROM in Toronto; search for "dinosaur" to bring up many good images of dinosaurs from Canada

American Museum of Natural History Science Website for Kids:

<http://www.amnh.org/ology/index.php?channel=paleontology>

Tons of information, activities, interviews with AMNH paleontologists and more

Wikipedia:

<http://en.wikipedia.org>

Wikipedia entries for dinosaur groups generally include size information, including length and height



National Geographic Creature Features

<http://kids.nationalgeographic.com/kids/animals/creaturefeature/>

Online information “cards” on various animals, including numerous dinosaurs

Zoom Dinosaurs:

<http://www.zoomschool.com/subjects/dinosaurs/>

Online “book” about dinosaurs

DK Publishing. 1994. *Big Book of Dinosaurs*. DK Publishing, New York.

DK Publishing. 2006. *First Dinosaur Encyclopedia*. DK Publishing, New York.

Lessem, Don, and Franco Tempesta (illustrator). 2010. *National Geographic Kids Ultimate Dinopedia: The Most Complete Dinosaur Reference Ever*. National Geographic, Washington, DC.

Scotchmoor, Judith G., Dale A. Springer, Brent H. Breithaupt, and Anthony R. Fiorillo (editors). 2002. *Dinosaurs: The Science Behind the Stories*. American Geological Institute, Alexandria, VA.

