

## The Size of the Sun

### OVERVIEW —

Children explore the relative size of the Sun in this large group activity. By creating their own large model of the relative scale of the Earth and Sun, the size of the Sun becomes easier for children to visualize. It can be done as a class, in an informal group setting, or as part of an event where children participate individually throughout the event.

**Ages:** 5 years and up

**Duration:** 5 minutes

### WHAT'S THE POINT?

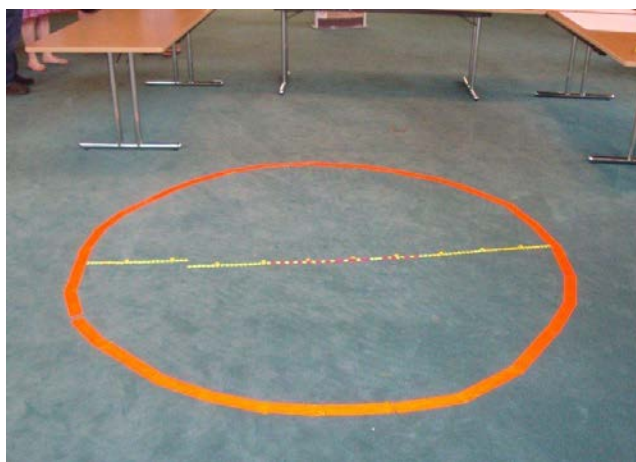
- The Sun is much bigger than the Earth; about 110 Earths could fit across the Sun.

### MATERIALS —

- 110 1" diameter round blue stickers (plus a few extras)
- Masking tape
- A pen or pencil
- One sheet of yellow paper, with "Sun" written or printed on it.

### PREPARATION —

- Mark a 9-foot diameter circle on the floor (or wall) with tape, to represent the Sun
- Put a line of tape across the center of the circle, marking the equator.
- Tape the word "Sun" to the floor near the circle, avoiding the Sun's tape equator.



### ACTIVITY —

1. Ask the children about the size of the Sun. *Is the Sun bigger or smaller than the Earth?*
2. Share with the children that the taped circle represents the Sun. *How big should the Earth be compared to this large circle Sun?* (Much smaller—the size of a circle sticker—show one of the stickers.)
3. Ask the children to predict how many Earths will fit across the Sun. Invite them to suggest ways to test their prediction.

As much as possible, enable the children to explore their suggestions and to respond to each other's ideas and experiences. Consider responding to the children's more elaborate ideas by asking the other children to politely share their opinions: *What do you think about \_\_\_\_'s idea—would that be a good way to see how many Earths fit across the Sun?*

4. Share that they will be measuring the size of the Sun compared to the Earth with this model, using the taped circle as the Sun and counting the number of Earths that fit across it. Invite each child to place a sticker along the tape line marking the Sun's equator, one at a time without space between

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the stickers. As each child places a sticker on the “Sun” ask them to number their sticker; the first child marks their sticker with a “1.” The next child labels their sticker “2,” and so on.

5. As the activity progresses, invite the children to revise their predictions. If the activity is part of a public event, invite the children to return to see the final result.

### ***IN CONCLUSION —***

Invite the children to examine the final product and share whether the answer matches their predictions. Share that the Sun is really about 110 times wider than the Earth. Follow-up questions for discussion could include:

- *If the Sun is 110 times wider than the Earth, about how many Earths could fit inside of the Sun?* (Many more; about a million Earths.)
- *Did the model match the real scale of the Sun and Earth? If not, what were some possible problems with the model?* (The stickers may have overlapped or had too much space between them; they might not have been placed in a straight line, they may have been mis-numbered.)
- *What other scale models can they create of the Sun and Earth?* (The children may suggest balls, balloons, different scales, and more.)

### ***FACILITATOR INFORMATION***

#### **Ties to the Next Generation Science Standards**

NGSS Performance Expectations: 5-ESS1-1.

- Support an argument that differences in the apparent brightness of the sun compared to other stars is due to their relative distances from the Earth.

Disciplinary Core Ideas: ESS1.A: The Universe and its Stars

- The sun is a star that appears larger and brighter than other stars because it is closer. Stars range greatly in their distance from Earth. (5-ESS1-1)

Science and Engineering Practices: Analyzing and Interpreting Data

- Represent data in graphical displays (bar graphs, pictographs and/or pie charts) to reveal patterns that indicate relationships. (5-ESS1-2)

Crosscutting Concepts: Scale, Proportion, and Quantity

- Natural objects exist from the very small to the immensely large. (5-ESS1-1)

#### **Websites For More Information and Resources**

**NASA Wavelength:** <http://nasawavelength.org>

This is a digital collection of Earth and space science resources for educators of all levels – from elementary to college, to out-of-school programs. Search by keyword (such as Sun) or browse by topic or audience.

**NASA SpacePlace:** <http://spaceplace.nasa.gov/menu/sun/>

Features ways to look at our sun and earth, solar system and the universe beyond, with information and activities for children.

**NASA StarChild:** [http://starchild.gsfc.nasa.gov/docs/StarChild/solar\\_system\\_level1/sun.html](http://starchild.gsfc.nasa.gov/docs/StarChild/solar_system_level1/sun.html)

Primarily for budding astronomers under the age of 14, with a special section on our Sun. StarChild includes student activities, graphics, a glossary, and is offered in several languages.

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**Windows to the Universe:** <http://www.windows2universe.org/Sun/Sun.html>

Windows to the Universe launches viewers into a variety of Sun topics on all levels. The site is user-friendly and includes a section on Sun myths and stories from around the world.

**Solar System Exploration:** <http://solarsystem.nasa.gov>

Follow the latest in NASA solar system science and exploration, with news, missions, multimedia, and other resources.

**NASA Heliophysics:** <http://science.nasa.gov/heliophysics>

Information about NASA's efforts to study the Sun and its influences on Earth.

**Space Weather:** <http://sunearthday.nasa.gov/spaceweather/>

This Flash-based viewer allows you to view real-time NASA satellite images of the Sun and the Earth. Near real-time images from a variety of NASA satellites and ground-based observatories are presented. Enjoy zooming and panning the images! A scale tool with the size of the Earth is also presented with the solar images.

**DIY Sun Science**

[http://www.lawrencehallofscience.org/do\\_science\\_now/science\\_apps\\_and\\_activities/diy\\_sun\\_science](http://www.lawrencehallofscience.org/do_science_now/science_apps_and_activities/diy_sun_science)

The DIY Sun Science app provides 13 free, easy to use, hands-on activities, plus images, videos, and more.