CURIOSITY AT HOME

SIZING UP THE STARS

Stars come in many colors, temperatures, and sizes. How do the sizes of two prominent stars in the sky compare to our own star, the Sun? Since stars can be of immense size, you'll make a scaled-down paper model of the stars in this activity.

MATERIALS

- Paper (different color paper including white, orange or red, and yellow is optional)
- Meter stick (or yard stick or ruler)
- Drawing compass (optional)
- Scissors
- String or chalk if appropriate (see procedure)
- Science notebook
- Something to write with

PROCEDURE

- Draw and cut out a circle that has a diameter, or width, of 1 cm (or 0.39 inches). This will represent the Sun, a yellow-dwarf star.
- Draw and cut out a circle 10 cm (3.93 inches) in diameter. This will represent Pollux, a red-orange giant star located in the Gemini constellation. Pollux is ten times bigger than our Sun.
- Trace a circle on the ground that is 700 cm (22 ft) in diameter. (One way to do this is by using string and chalk outside). This represents Betelgeuse, a red giant star in the constellation Orion. It has a diameter 700 times larger than the Sun's!

EXPLORE MORE

- Here are some other stars to cut out and compare to the Sun. For each one, we've provided how its size compares to the sun. In your science notebook, calculate the diameter of the star in centimeters. Then, trace and cut out in paper or draw on the ground.
- Sirius, a blue-white star, is about twice as large as the Sun.
- Arcturus, in the Bootes constellation, is 25 times larger than the Sun.
- Aldebaran is an orange-yellow giant in the constellation Taurus. It is 40 times the diameter of our Sun.

DID YOU KNOW?

- Since our Sun is considered to be a medium-sized star, there are stars smaller than the sun. A white dwarf is about the size of the Earth, or smaller. A neutron star is even smaller, with an estimated diameter of somewhere between 20 and 28.5 kilometers (12.4 to 17.7 miles)!
- Even though our Sun is an average size star, it's still very large compared to the Earth. If the Sun were hollow, it would take about one million Earths to fill it!

CURIOSITY AT HOME

SIZING UP THE STARS

- SUN
  (diameter: 865,370 miles)

- SIRIUS
  (2x the diameter of our sun)

- POLLUX
  (10x the diameter of our sun)

- ARCTURUS
  (25x the diameter of our sun)

- ALDEBARAN
  (40x the diameter of our sun)

- BETELGEUSE
  (700 times the diameter of our sun!)

PACIFIC SCIENCE CENTER

CURIOSITY AT HOME

SIZING UP THE STARS

3–5 GRADE EXPLORATION

Explore the following questions and write your responses in your science notebook.

- How tall are you?
- How tall would you be if you were twice as tall?
- What if you were 10 times as tall?
- In this activity, we made a **scale model** of the stars, where the stars were represented at a smaller size instead of their actual size. Although we changed the actual size of the stars in the model, the relationship between the sizes of the stars remained the same, helping us to visualize the comparison between star sizes. What is another example of an object that is too large or too small to create an exact size replica to study? Try making your own scale model of that object and how its size relates to other objects.

CURIOSITY AT HOME

SIZING UP THE STARS

6–8 GRADE EXPLORATION

Explore the following questions and write your responses in your science notebook.

- In about 6 billion years, calculations suggest that our Sun will enter the red giant phase of its existence. At this time, the Sun could be 300 times larger than it is now. If the Sun in this model has a diameter of 1 cm, what would the new diameter be? Calculate its new size and cut out a circular piece of paper with that diameter.
- Knowing that as a red giant the Sun will be 300 times larger than it is now, calculate how far into the solar system the sun would extend at that time. (The Sun's current diameter is 865,370 miles).
- In this activity, we made a **scale model** of the stars, where the stars were represented at a smaller size instead of their actual size. Although we changed the actual size of the stars in the model, the relationship between the sizes of the stars remained the same, helping us to visualize the comparison between star sizes. What is another example of an object that is too large or too small to create an exact size replica to study? Try making your own scale model of that object and how its size relates to other objects.