

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 models of the stars.

MATERIALS

- paper (different color paper including white, orange or red, and yellow is optional)
- meter (yard) stick and meter ruler or drawing compass
- pencil
- scissors
- string or chalk if appropriate (see procedure)

PROCEDURE

- Draw and cut out a circle that has a diameter of 1 cm. This will represent the Sun.
- Draw and cut out a circle 10 cm 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. (This is best 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!

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. 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.

WHAT'S HAPPENING

Since our Sun is considered to be a medium-sized star, there are stars smaller than the sun. A white dwarf, following our model would be about the size of the Earth, or even smaller. A neutron star would be even smaller!

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!

Experiment continued on next page...



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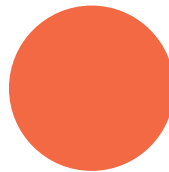


● SUN

(diameter: 865,370 miles)

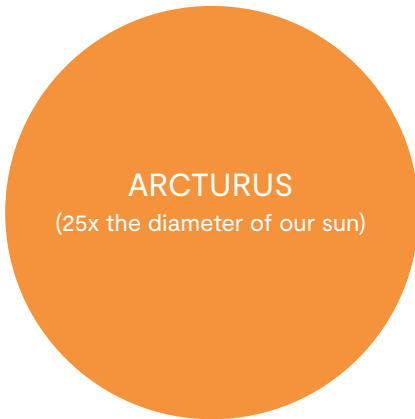
○ SIRIUS

(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

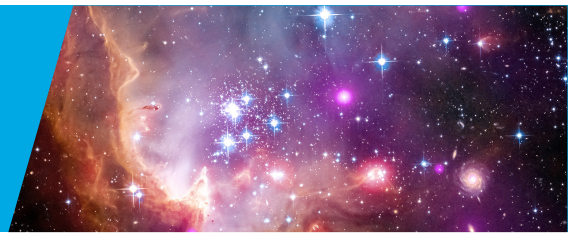
(700 times the diameter of our sun!)

Experiment continued on next page...



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3–5 GRADE EXPLORATION

Explore the following questions and write your observations 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?



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6–8 GRADE EXPLORATION

- 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 diameter.
- If the Sun was 300 times larger than it is now, calculate how far into the solar system the sun would extend at that time? (Sun's diameter is 865,370 miles).



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