

CALCULATING THE ECLIPSE WITH RATIOS

A solar eclipse is a mesmerizing event that occurs when the Moon passes in between the Earth and the Sun in its orbit, causing the Sun to cast a shadow of the Moon onto the Earth.

On Earth, the Moon and the Sun take up almost the same amount of space in the sky, so that during a total solar eclipse the Moon can almost completely “block out” the Sun. This is special to Earth – on other planets in our solar system, the moon(s) may be too small in the sky to fully block out the Sun or too big and block out the corona (the Sun’s atmosphere) as well.



*An image of the 2017 total solar eclipse.
Credit: Rémi Boucher*

In this activity, we will use ratios to calculate the relative sizes of a moon and the Sun in the sky for Earth, Mars, and Jupiter. All measurements given are average values provided by the [Canadian Space Agency](#) and [NASA](#).

Earth

Measurements:

- ★ Moon diameter: 3476 km
- ★ Moon distance from Earth: 384,400 km
- ★ Sun diameter: 1,400,000 km
- ★ Sun distance from Earth: 150,000,000 km

- What is the ratio of the Moon’s distance from Earth to its diameter?
- What is the ratio of the Sun’s distance from Earth to its diameter?
- Why does the Moon fully “block out” the Sun during a solar eclipse from Earth?

