

## 2017 Eclipse: Research-Based Teaching Resources

### Eclipse Concept Survey

**Description:** Use this instrument as a pre/post tool to reveal student thinking about describing solar versus lunar eclipses, what is observed during a solar eclipse, how location of the observer affects what is observed, the times of day/night when eclipses can be observed, and the geometry of the Earth, Sun, and Moon during solar eclipses.

**Survey Questions:** See the following page.



Find more teaching resources at [aapt.org/Resources/Eclipse2017](http://aapt.org/Resources/Eclipse2017)

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- 1. You may have heard the terms “solar eclipse” and “lunar eclipse” before. In your own words, give a definition of each of these events.

Solar eclipse:

Lunar eclipse:

- 2. Imagine that Nadia is a student in Atlanta, GA, who is observing a total solar eclipse (using, of course, proper safety equipment for eye protection).

- A. In the space at right, sketch what you think Nadia would observe in the sky at the time of the total solar eclipse. For instance, sketch how the Sun would appear, and sketch what other celestial objects must be in the sky as well. **Clearly label all objects in your sketch.**



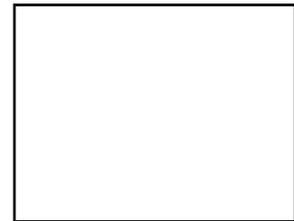
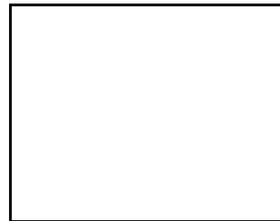
During which of the following times could Nadia be making this observation? Circle **all** that are possible.

Sunrise      Noon      Sunset      Midnight

What Nadia sees in the sky  
(Atlanta)

Explain how you know.

- B. Nadia, while observing the solar eclipse in Atlanta, immediately phones friends in Lansing, MI, and Cincinnati, OH. (Note: All three of these cities lie very near a single line running from north to south, with Lansing being northernmost and Atlanta being southernmost.)



What the friend in Lansing,  
MI, sees in the sky

What the friend in Cincinnati,  
OH, sees in the sky

As you did above, sketch what you think Nadia's friends in these cities would observe in the sky. **Clearly label all objects in your sketch.**

- C. In the space below, in words and with a diagram, explain what causes the total solar eclipse. In your sketch, **clearly label** the *Sun*, *Earth*, and *Moon*.

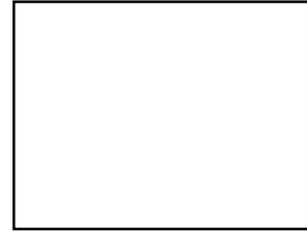
3. During another time of year, Bobby, in San Francisco, CA, observes a total lunar eclipse.

A. In the space at right, sketch what you think Bobby would observe in the sky at the time of the total lunar eclipse. For instance, sketch how the Moon would appear, and sketch what other celestial objects must be in the sky as well. **Clearly label all objects in your sketch.**

During which of the following times could Bobby be making this observation? Circle **all** that are possible.

Sunrise      Noon      Sunset      Midnight

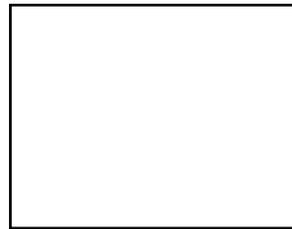
Explain how you know.



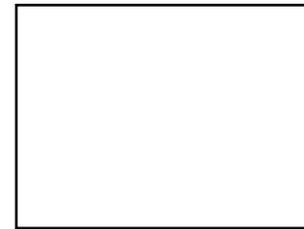
What Bobby sees in the sky  
(in San Francisco)

B. Bobby, while observing the lunar eclipse, immediately phones two friends in Portland, OR, and Seattle, WA. (Note: All three of these cities lie very near a single line running from north to south, with Seattle being northernmost and San Francisco being southernmost.)

As you did in part A, sketch what you think Bobby's friends in these cities would observe in the sky. **Clearly label all objects in your sketch.**



What the friend in Portland,  
OR, sees in the sky



What the friend in Seattle,  
WA, sees in the sky

C. In the space below, in words and with a diagram, explain what causes the total lunar eclipse. In your sketch, **clearly label** the *Sun*, *Earth*, and *Moon*.

4. Have you ever seen (in person) a solar eclipse? (Y/N)

Have you ever seen (in person) a lunar eclipse? (Y/N)