LESSON 4

NOTES AND ACTIVITY – US 7509

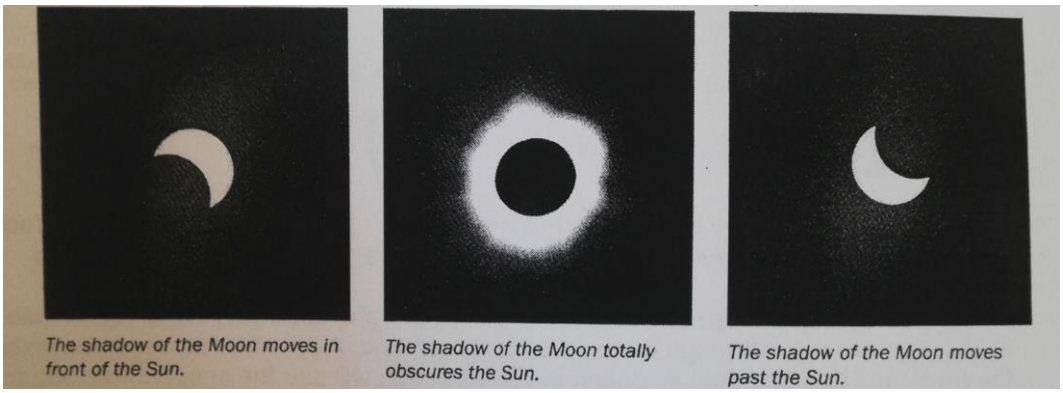
THEME: Earth and Beyond

TOPIC: Eclipses

At the end of this unit, you should be able to:

1. Define and distinguish between solar and lunar eclipses.
2. Explain how and when these eclipses occur.
3. Identify partial and total eclipses.
4. Draw and label aligned and non-aligned eclipse diagrams.

A. WHAT IS AN ECLIPSE?



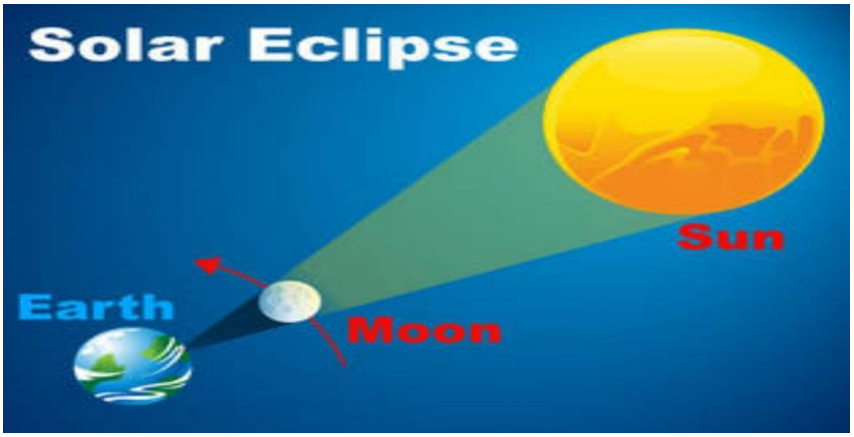
1. An **Eclipse** is a darkening of a celestial body, e.g. the Sun or the Moon as illustrated in the diagram above.
2. For an eclipse to occur, the **THREE** celestial bodies, i.e. **the Sun, Moon and Earth** must symmetrically align – meaning in a straight line so to say. This is called **TOTAL ECLIPSE**; refer to picture in the middle of the diagram.
3. If one of the three celestial bodies may be out of the alignment, no or partial eclipse may occur. The first and last picture of the diagram shows partial eclipse.

- The FIRST PICTURE, shows the shadow of the Moon moving in front of the Sun.
- The THIRD or LAST PICTURE, shows the shadow of the Moon moving past the Sun.

B. TYPES OF ECLIPSE

There are TWO types of eclipses, namely, Solar Eclipse and Lunar Eclipse.

B1. SOLAR ECLIPSE



1. Sometimes when the Moon orbits Earth, it moves between the Sun and the Earth. When this happens, the Moon blocks the light of the Sun from reaching the Earth. This causes an **eclipse of the Sun** or **Solar eclipse**, as illustrated in the diagram above. The Sun, Moon and Earth are aligned or in conjunction.
2. During a solar eclipse, the Moon casts a small shadow onto the Earth's surface.
3. This total eclipse can only be seen by people in the area situated in the middle of the Moon's shadow.
4. The Sun gets completely darkened for a few minutes, as in the following diagram.

4.1 The ring of light shining around the Moon is called **Corona.**

5. Solar eclipse can only occur when there is a **New Moon**.
6. Precaution must be taken when viewing solar eclipse by wearing protective eye-wear, because the strength and intensity of the light as the Moon passes the Sun might cause permanent damage to one's eyes.

B2. LUNAR ECLIPSE

1. This is the type of an eclipse occur when the Earth passes between the Sun and the Moon. The Earth, then casts a shadow onto the Moon, as the Moon orbits the Earth.

2. During an eclipse of the Moon or Lunar eclipse we see the Earth's shadow as it travels across the Moon's face.
3. Lunar eclipse only occurs when there is a **Full Moon**.
4. Total eclipse of the Moon is not as common. **Partial eclipses** occur about twice a year.
5. Because the Earth is large compared to the Moon it casts a big shadow on the Moon. The Moon may be blocked from view for more than an hour during a total eclipse.
6. The diagram below provides description to the strength of shadows the Earth casts on the Moon.

6.1 The darker part of the shadow is the **umbra**, and the part that is a little lighter is the **penumbra**.

6.2 They can only be experienced on Earth, but more readily in space, such as during a solar eclipse, when the Moon moves in front of the Sun and leaves a shadow on the Earth.

ACTIVITY

1. Differentiate between solar eclipse and lunar eclipse.
2. What similarity is found in both solar and lunar eclipses?
3. What eye illness can be caused by carelessly viewing solar eclipse?
4. Illustrate a partial solar eclipse by drawing diagrams of three celestial bodies.
5. Is there an alignment of celestial bodies when there is a partial lunar eclipse? Explain.
6. What type of instrument can be used to view an eclipse?
7. Give the name of scientists who studies eclipses.
8. Are eclipses a natural or non-natural phenomenon.
9. Why there is no corona in lunar eclipse?
10. True or false, there is penumbra in partial eclipse.
