

## Station 1 - Applicability Reading – Total Solar Eclipse

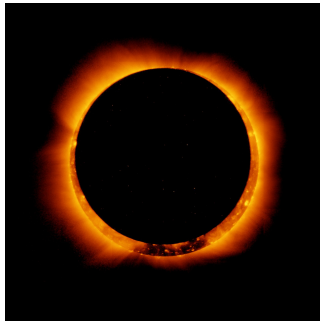
**Instructions:** Read the following information article and answer the associated questions found below.

Total solar eclipses occur when the Moon comes between the Sun and the Earth and casts the darkest part of its shadow (the umbra) on Earth. The darkest point of the eclipse is almost as dark as night. During a total eclipse of the Sun, the Moon covers the entire disk of the Sun. In partial and annular solar eclipses, the Moon blocks only parts of the Sun. Eclipses are named after their darkest phase. If a solar eclipse is total at any point on Earth, it is called a total solar eclipse, even though it's seen as a partial eclipse in most parts of the world.

### 5 Phases

There are 5 stages in a total solar eclipse:

1. **Partial eclipse begins (first contact):** The Moon's shadow starts becoming visible over the Sun's disc. The sun looks as if a bite has been taken from it.
2. **Total eclipse begins (second contact):** Almost the entire disc of the Sun is covered by the Moon. Observers in the path of the Moon's umbra may be able to see Baily's beads and the diamond ring effect.
3. **Maximum eclipse or totality:** The Moon completely covers the disc of the Sun. Only the Sun's corona is visible. This is the most dramatic stage of a Total Solar Eclipse. At this time, the Sky goes dark, temperatures fall drastically and birds and animals often go quiet.
4. **Total eclipse ends (third contact):** The Moon's shadow starts moving away and the Sun reappears.
5. **Partial eclipse ends (fourth contact):** The Moon stops overlapping the Sun's disc. The eclipse ends at this stage.



### **Protect Your Eyes!**

Never look directly at the Sun, eclipsed or otherwise, without proper protective eyewear. The Sun's UV radiation can burn the retinas in your eyes, and cause permanent damage or even blindness.

The only way to safely see a solar eclipse is to wear protective eclipse glasses or to project an image of the eclipsed Sun using a pinhole projector.

### **Special Sights at Totality**

Certain phenomena can only be seen during a Total Solar Eclipse:

§ **Baily's beads:** Seen about 10-15 seconds before and after totality, Baily's beads are little bead-like blobs of light at the edge of the Moon. These happen because the gaps in the mountains and valleys on the Moon's surface allow sunlight to pass through in some places but not others.

§ **Diamond ring:** As the Moon moves to cover the entire disc of the Sun, Baily's beads disappear, leaving one last bead a few seconds before totality. At this point in the eclipse, the Sun's corona forms a ring around the Moon. The ring around the Moon and the leftover Baily's bead gives the appearance of a diamond ring.

§ **The Sun's chromosphere:** The Sun's atmosphere has 3 layers: the *photosphere*, the *chromosphere* and the *corona*. The chromosphere, which gives out a reddish glow can only be seen for a few seconds right after the diamond ring disappears during a total eclipse of the Sun.

§ **The Sun's corona:** Like the chromosphere, the Sun's corona is only visible during a Total Solar Eclipse. It can be seen as a faint ring of rays surrounding the dark Moon during totality.

§ **Shadow bands:** About one minute before and after totality, moving wavy lines of alternating light and dark can be seen on plain-colored surfaces. These shadow bands are the result of the light emitted from a thin solar crescent being refracted by the Earth's atmosphere.

## **Applicability Reading – Total Solar Eclipse Questions**

1. What is a Total Solar Eclipse?
2. What occurs during the Maximum eclipse or totality phase?
3. What are the consequences of UV radiation for human eyes?
4. What is the chromosphere and when can it be seen?

## Station 2 - Learn From The Expert

Instructions: Go to <https://goo.gl/RfPBmV> and watch the video. While you are watching the video, answer each question below. You may re-watch the video as many times as you need.

1. What is an Eclipse?
2. During a Solar Eclipse, why does the sun gets blocked?
3. During a Lunar Eclipse, why does the moon gets darker?
4. During a solar eclipse, what phase is the moon in?
5. During a total lunar eclipse, what phase is the moon in?
6. During a total lunar eclipse, how the tides will be?
7. Why is a complete solar eclipse only seen by small portion of the Earth?

## **Station 3 - Get Hands-On**

Using the classroom models, move them on the desk to show their positions during a solar and lunar eclipse. Take a picture of each set-up and paste below:

<p><b>Solar Eclipse:</b></p> <p><i>Paste picture here</i></p>	<p><b>Lunar Eclipse:</b></p> <p><i>Paste picture here</i></p>
---	---

## **Station 4 -Research**

Using your search engine, research:

1) How many solar or lunar eclipses occur in one calendar year?

2) Why aren't there eclipses at every full and new moon?

## **Station 5 - Explain yourself**

Write down an opinion to the following question in **paragraph form**.

Each year, the Moon moves further and further away from Earth. In your opinion, what would be the consequences of this for solar and lunar eclipses?

## **Station 6 - Test Your Knowledge**

*Answer the following 5 multiple choice questions then provide a written explanation for how/why you came to your conclusions.*

1. **A solar eclipse is when the:**
  - a) **the Sun, Moon and Earth are in the same position.**
  - b) **Moon blocks the Sun from the Earth.**
  - c) **Earth blocks the Sun from the Moon.**
  - d) **Sun blocks the Moon from the Earth.**
  - e) **none of the above.**

**Explanation:** \_\_\_\_\_  
\_\_\_\_\_

2. **A lunar eclipse is when the:**
  - a) **Earth blocks the Sun from the Moon.**
  - b) **Moon blocks the Sun from the Earth.**
  - c) **Sun blocks the Moon from the Earth.**
  - d) **Quarter Moon is visible from the earth.**
  - e) **Moon is not visible from the earth.**

**Explanation:** \_\_\_\_\_  
\_\_\_\_\_



3. Solar eclipses are very rare, and only last a few minutes because:
- a) the Moon is so much bigger than the Sun.
  - b) the Moon is so much smaller than the Earth.
  - c) the Moon is so much smaller than the Sun.
  - d) they only occur during quarter moons.
  - e) the Moon moves too fast.

Explanation: \_\_\_\_\_

---

4. Solar eclipses only happen during a new moon because during a new Moon:
- a) the Moon passes between the Earth and Sun.
  - b) the Sun passes between the Earth and the Moon.
  - c) the Earth passes between the Moon and Sun.
  - d) the Moon moves faster.
  - e) the Earth moves slower.

Explanation: \_\_\_\_\_

---

5. The Moon appears:
- a) blue during a total lunar eclipse.
  - b) red during a total lunar eclipse.
  - c) smaller during a total lunar eclipse.
  - d) white during a total lunar eclipse.
  - e) bigger during a total lunar eclipse.

Explanation: \_\_\_\_\_

---

# **Station 7 - Become The Question Master**

You must create 2 multiple-choice questions, 2 true/false questions and 1 short answer question that relates directly to Eclipse – Solar and Lunar. You must also supply the answers and you may not re-use any of the questions you have seen in this packet.

You must create 2 multiple-choice questions, 2 true/false questions and 1 short answer question in the space below. Your questions must relate directly to Eclipse – Solar and Lunar.

**Multiple-Choice:**

1. **Answer:**

2. **Answer:**

**True/False:**

1. **Answer:**

2. **Answer:**

**Short Answer:**

**Answer:**