Eclipses

A. Fill in the Blanks

1. A _____ eclipse occurs when the Earth casts a shadow on the Moon.
2. For a solar eclipse to occur, the Sun, Moon, and Earth must be in perfect _____.
3. If you are in the _____, you will only see a partial eclipse.
4. A solar eclipse can only happen during the _____ Moon phase.
5. The faint, outer atmosphere of the Sun that is visible during a total solar eclipse is called the _____.

B. Match the Following;

Match the term in Column A with its correct description in Column B.

Column A	Column B
1. Solar Eclipse	A. The partial shadow where the light source is only partially blocked.
2. Lunar Eclipse	B. The Sun's outer atmosphere, visible during a total solar eclipse.
3. Umbra	C. Occurs when the Moon is too far from Earth to completely cover the Sun.
4. Penumbra	D. Occurs when the Moon passes between the Sun and Earth.
5. Corona	E. The full, dark shadow where the light source is completely blocked.
6. Annular Eclipse	F. Occurs when the Earth passes between the Sun and the Moon.

C. Practice Problems

These questions require a bit more detail and understanding.

1. Draw a simple, labeled diagram of a solar eclipse. Include the Sun, Moon, and Earth in their correct alignment. Label the umbra and penumbra.
2. Draw a simple, labeled diagram of a lunar eclipse. Include the Sun, Earth, and Moon in their correct alignment. Label the umbra and penumbra.

3. During which phase of the Moon does a solar eclipse occur? Explain why.
4. During which phase of the Moon does a lunar eclipse occur? Explain why.
5. Explain the difference between the umbra and the penumbra.
6. If we have a New Moon and a Full Moon every month, why don't we have a solar and lunar eclipse every month?
7. What is an annular solar eclipse? What causes it?
8. Why is a total lunar eclipse sometimes called a "Blood Moon"?
9. What is the correct alignment for a solar eclipse?

(Circle one)

- Sun - Earth - Moon
- Moon - Sun - Earth
- Sun - Moon - Earth

10. If you are standing in the path of totality during a solar eclipse, are you in the umbra or the penumbra?

D. Warm-up Questions

Answer these quick questions to test your basic knowledge.

1. What is an eclipse?
2. What are the two main types of eclipses? _____ and _____.
3. During a solar eclipse, which celestial body casts a shadow on the Earth?
4. What is the name for the darkest, central part of a shadow?
5. Is it safe to look directly at a solar eclipse without special eye protection?

E. Challenge Questions

Think critically to answer these more difficult questions.

1. An astronaut is standing on the side of the Moon facing Earth during a total lunar eclipse. What would the astronaut see when they look at Earth?
2. The Sun's diameter is about 400 times larger than the Moon's. How is it possible for the tiny Moon to block out the enormous Sun during a total solar eclipse?
3. Could a lunar eclipse ever happen during a New Moon phase? Explain your reasoning.
4. Imagine you are on Mars. Mars has two moons, Phobos and Deimos, which are much smaller than Earth's Moon. Do you think Mars could experience a total solar eclipse like we do on Earth? Why or why not?

5. If the Moon's orbit was perfectly aligned with Earth's orbit around the Sun (no 5-degree tilt), what would happen every month?

F. Word Problems & Application

Connect the science of reflection to the real world.

1. Your family is planning a trip to see a total solar eclipse. Your dad says, "We don't need special glasses; we can just use regular sunglasses". Is he correct? Explain the potential danger.
2. An astronomy club is setting up telescopes to view a lunar eclipse. They announce that the event will start at 10:00 PM. Is it safe for the club members to look at this eclipse through their telescopes without special filters? Why?
3. A science fiction movie shows a "lunar eclipse" where the Moon passes in front of the Sun, making the day turn to night. What is scientifically inaccurate about this scene?
4. You are camping and notice a Full Moon in the sky. Your friend says, "I hope we see a solar eclipse tonight"! Explain to your friend why that is impossible.
5. During a total solar eclipse, the sky gets dark and the temperature can drop. What part of the Sun's atmosphere, which is usually hidden, becomes visible as a faint white halo?

G. True or False

1. A lunar eclipse happens when the Moon gets between the Sun and Earth. _____
2. The Moon appears reddish during a total lunar eclipse because of pollution in Earth's atmosphere. _____.
3. You can see a lunar eclipse from anywhere on the night side of Earth._ _____
4. The path of totality for a solar eclipse covers about half of the Earth's surface. _____
5. An annular eclipse is a type of lunar eclipse. _____