Solar Eclipse Background Information

What is a solar eclipse?
A solar eclipse occurs when the moon passes in a direct line between the Earth and the sun. The moon's shadow travels over the Earth's surface and blocks out the sun's light as seen from Earth.

Why isn't there a solar eclipse every month?
Because the moon orbits the Earth at an angle, approximately 5 degrees relative to the Earth-sun plane, the moon crosses the Earth's orbital plane only twice a year. These times are called eclipse seasons**,** because they are the only times when eclipses can occur. For an eclipse to take place, the moon must be in the correct phase during an eclipse season; for a solar eclipse, it must be a new moon. This condition makes solar eclipses relatively rare.

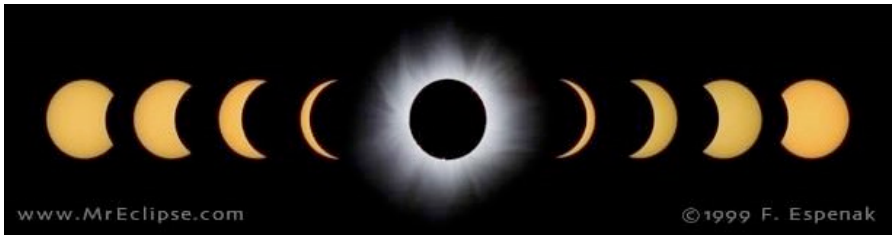
Is a solar eclipse caused by alien forces?
An eclipse is a natural phenomenon. Nevertheless, in some ancient and modern cultures, solar eclipses have been attributed to supernatural causes or regarded as bad omens. A total solar eclipse can be frightening to people who are unaware of its astronomical explanation, as the Sun seems to disappear during the day and the sky darkens in a matter of minutes.

Is it safe to look at a solar eclipse without special eye protection?
No!!! Because it is dangerous to look directly at the Sun, observers should use special eye protection or indirect viewing techniques when viewing a partial eclipse, or the partial phases of a total eclipse.

Observing Glasses like those pictured here allow you to view the sun safely. Unlike regular sunglasses, they block over 99% of the visible light.
When looking at a solar eclipse, never look directly at the sun whenever ANY PART, no matter how small, is visible.
It is dangerous to look at a partially eclipsed Sun but take your glasses off if the Sun is completely covered by the Moon.

Different types of solar eclipses

- A **total eclipse** occurs when the dark silhouette of the Moon completely obscures the intensely bright light of the Sun, allowing the much fainter solar corona to be visible.
- An **annular eclipse** occurs when the Sun and Moon are exactly in line, but the apparent size of the Moon is smaller than that of the Sun. Hence the Sun appears as a very bright ring surrounding the dark disk of the Moon.
- A **hybrid eclipse** shifts between a total and annular eclipse. At certain points on the surface of Earth it appears as a total eclipse, whereas at other points it appears as annular. Hybrid eclipses are comparatively rare.
- A **partial eclipse** occurs when the Sun and Moon are not exactly in line and the Moon only partially obscures the Sun.



A total eclipse sequence
From any location near Arusha, only about 80% of the sun will be obscured at the mid-point of the eclipse. (Similar to the first 3 and last 3 images above.)

Questions:

1. Since this is a Hybrid Solar Eclipse, where would you need to travel to in order to see the Total eclipse – the Selous Game Reserve in Southern Tanzania, or Lake Turkana in Northern Kenya?

2. Try to learn when the next solar eclipse will occur over Tanzania. What type will it be -- Total, Annular, Hybrid, or Partial?

Exercises:

1. Write a three paragraph story about your experience of viewing the eclipse.
2. Read the story on page one to two friends
3. Invite a friend to join you on 3 November to view the eclipse. (Be sure to use proper eye protection or a projection device!!!)

For information about the night sky in Tanzania visit:
https://sites.google.com/site/astronomyintanzania/
and **http://unawetanzania.org/**

The solar eclipse background information is taken from Wikipedia.
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An Unusual Solar Event!

Neema and Elizabeth were talking together after Geography class. They couldn't wait to talk to their friends Gifton and Andrew about the unusual solar event they had learned about.

Their teacher, Mr. Sarakikya, had been talking about the Sun, Moon, and Earth in geography class that morning. He said that a **hybrid solar eclipse** (see page 3) was going to occur over Africa on Sunday, 3 November. And, Mr. Sarakikya had told them that near Arusha, almost 80% of the Sun would be hidden behind the moon at about 5:30pm that day.

Neema and Elizabeth had also learned that the eclipse would begin at about 4:15pm when the edge of the moon first began to obscure the suns outer edge. The whole event would end by 6:30pm – right at sunset.

Their teacher told them that it was important to be safe when viewing an eclipse. **Never look at the sun directly** – solar radiation can damage your eyes. The best way to observe the sun is to use special glasses (see page 2) or by projecting the image. Mr Sarakikya told us how to safely project the sun's image.

1. Get two pieces of cardboard or stiff paper (flaps from a box, backs of paper tablets).
2. With a pin or pencil point, poke a small hole in the center of one piece (no bigger than the pin or pencil point).
3. Take both pieces in your hands.
4. **Stand with your back to the sun! Do not look directly at the sun through the small hole!!!**
5. In one hand, hold the piece with the pinhole; place the other piece (the screen) behind it. Look for the image of the sun on the screen.
6. The sunlight will pass through the pinhole and form an image on the screen Adjust the distance between the two pieces to focus and change the size of the image.

Neema and Elizabeth hoped that Gifton and Andrew would help them make many pinhole projection devices so that could invite other students to a solar eclipse party on the afternoon of 3 November.