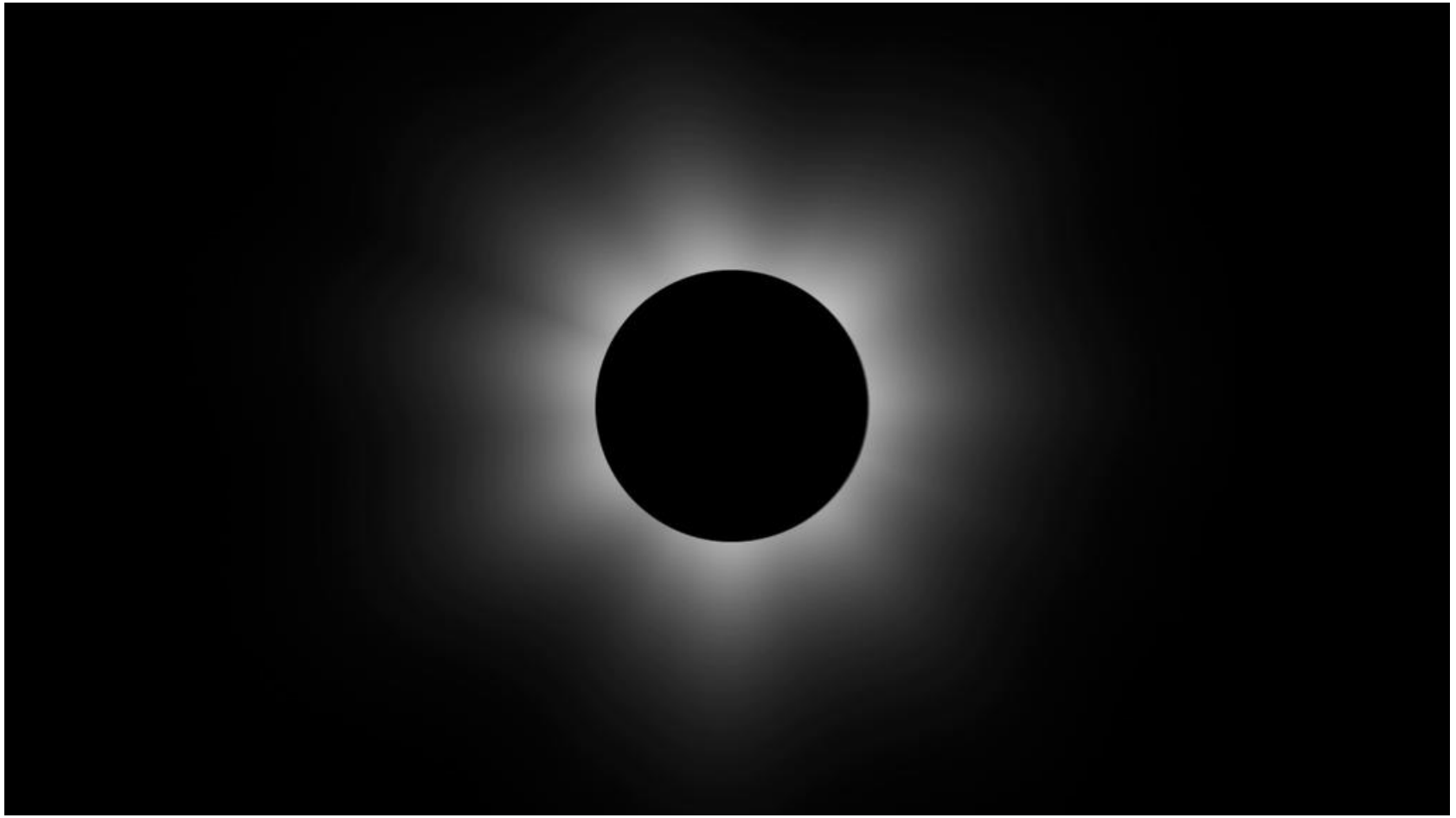
Lesson Objective:

Students will be able to distinguish between solar and lunar eclipses and be able to explain the conditions needed for their occurrence.

Ancient Civilizations

- Imagine looking up in the sky thousands of years ago and seeing this!



Ancient Civilizations:

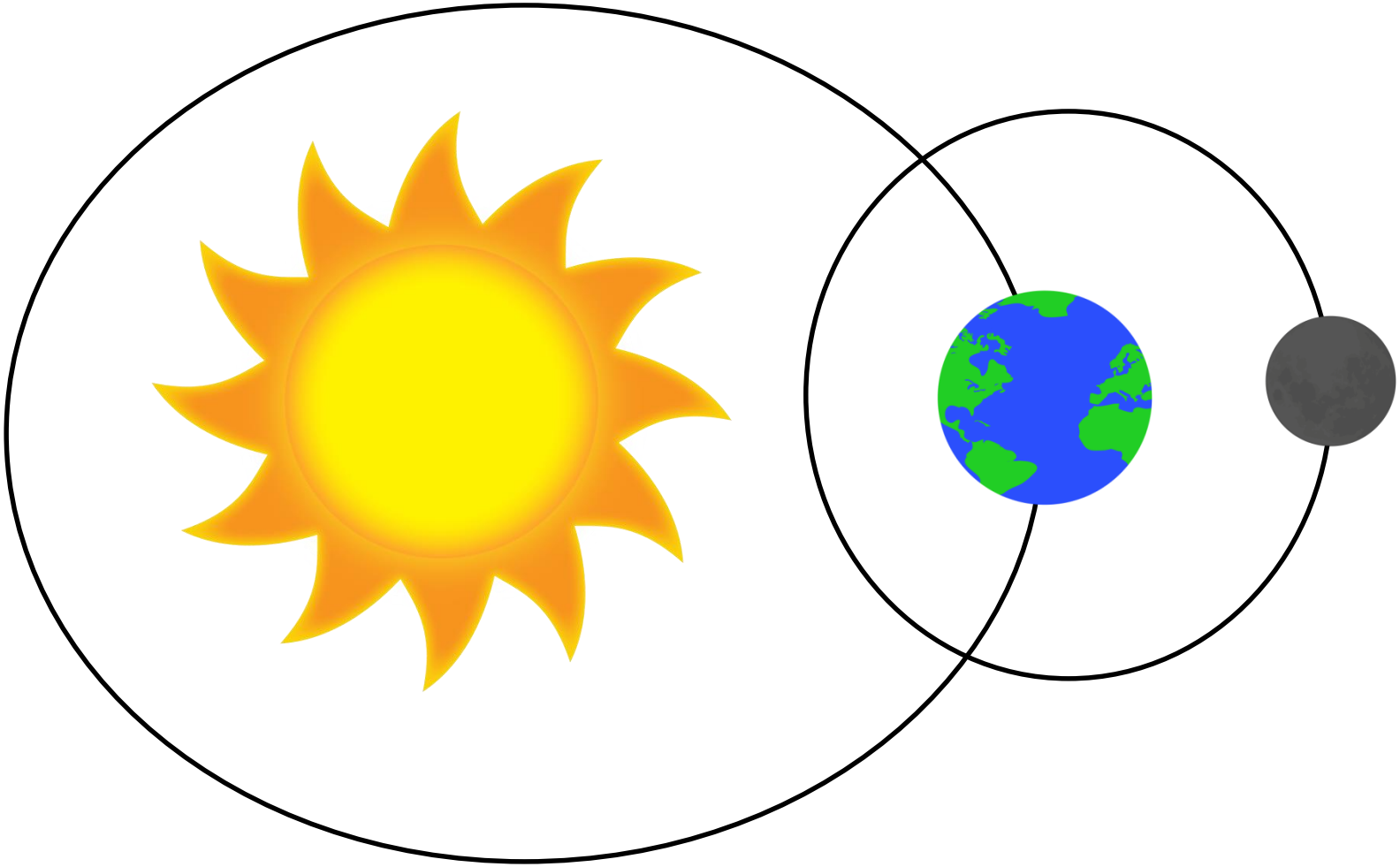
- Thousands of years ago, people did not have much knowledge on space.
- They viewed eclipses as omens.
- Some believed they meant a miracle would occur, others thought it forewarned doomsday!

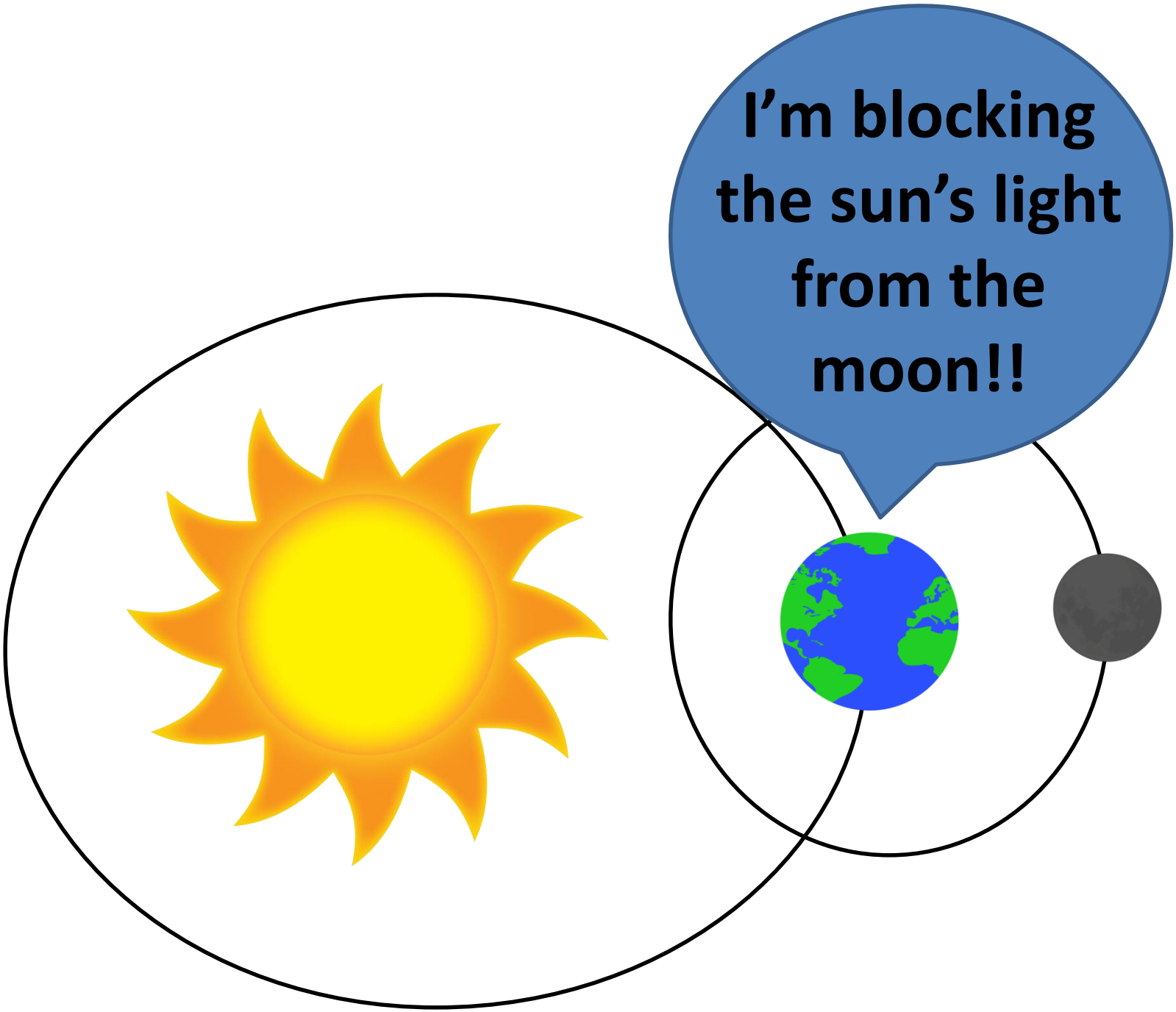
What is an Eclipse?

- An eclipse is when one celestial object moves into the shadow of another celestial object.
- There are two types of eclipses on Earth:
    1. Lunar Eclipse
    2. Solar Eclipse

Lunar Eclipses:

- A lunar eclipse occurs when earth moves between the sun and the moon.



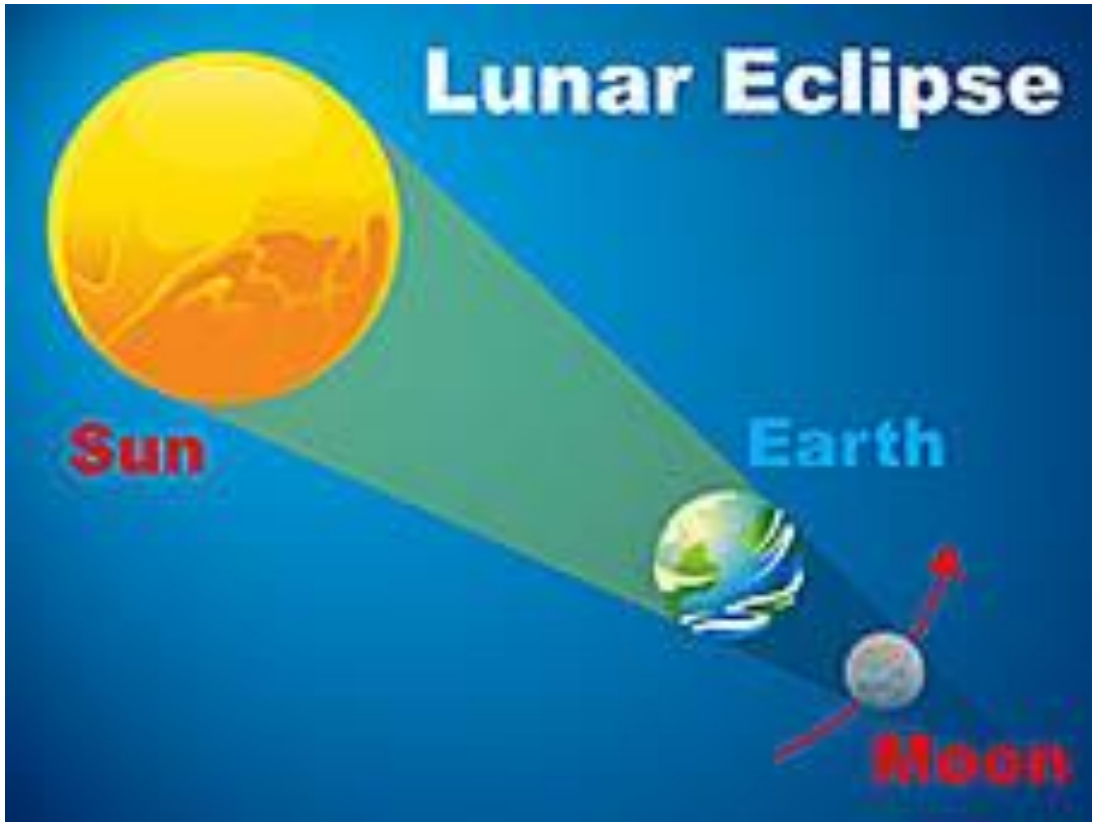

I’m blocking the sun’s light from the moon!!

Lunar Eclipses:

- Earth blocks the sunlight that is usually reflected off of the moon.
- The sunlight is what causes the moon to shine!
- Instead of sunlight hitting the moon, earth's shadow falls on it!

Lunar Eclipses:

- There are two types of lunar eclipses:
  1. Total lunar eclipse
  2. Partial lunar eclipse



Total Lunar Eclipses:

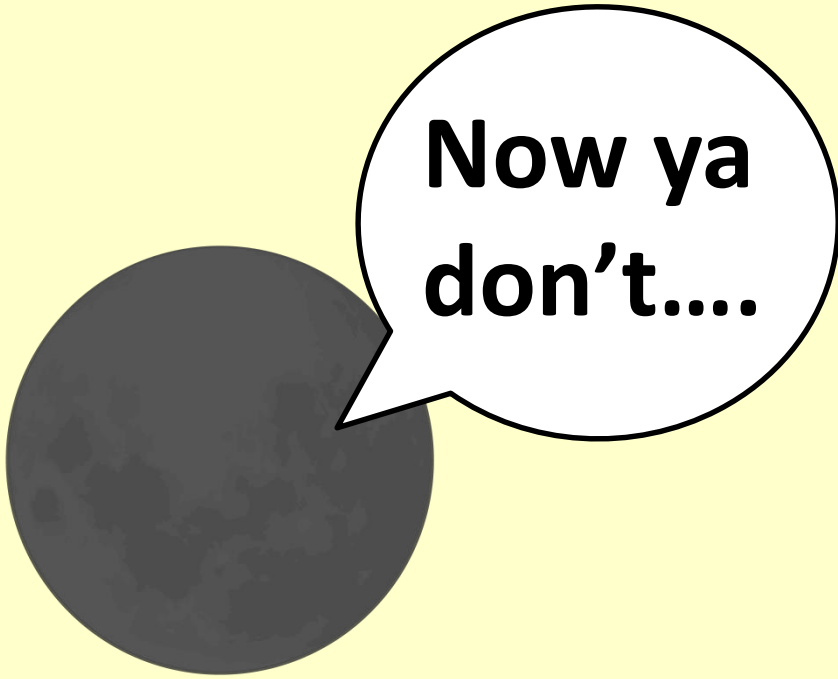
- When the moon and sun are on exact opposite sides of earth.
- Also called a "blood moon".
- Some sunlight still reaches the moon.
- It passes through earth's atmosphere which filters out the blue light.
- This causes the moon to look red.

Partial Lunar Eclipse:

- Happens when only a part of the moon enters earth's shadow.
- Earth's shadow appears very dark on the side of the moon.

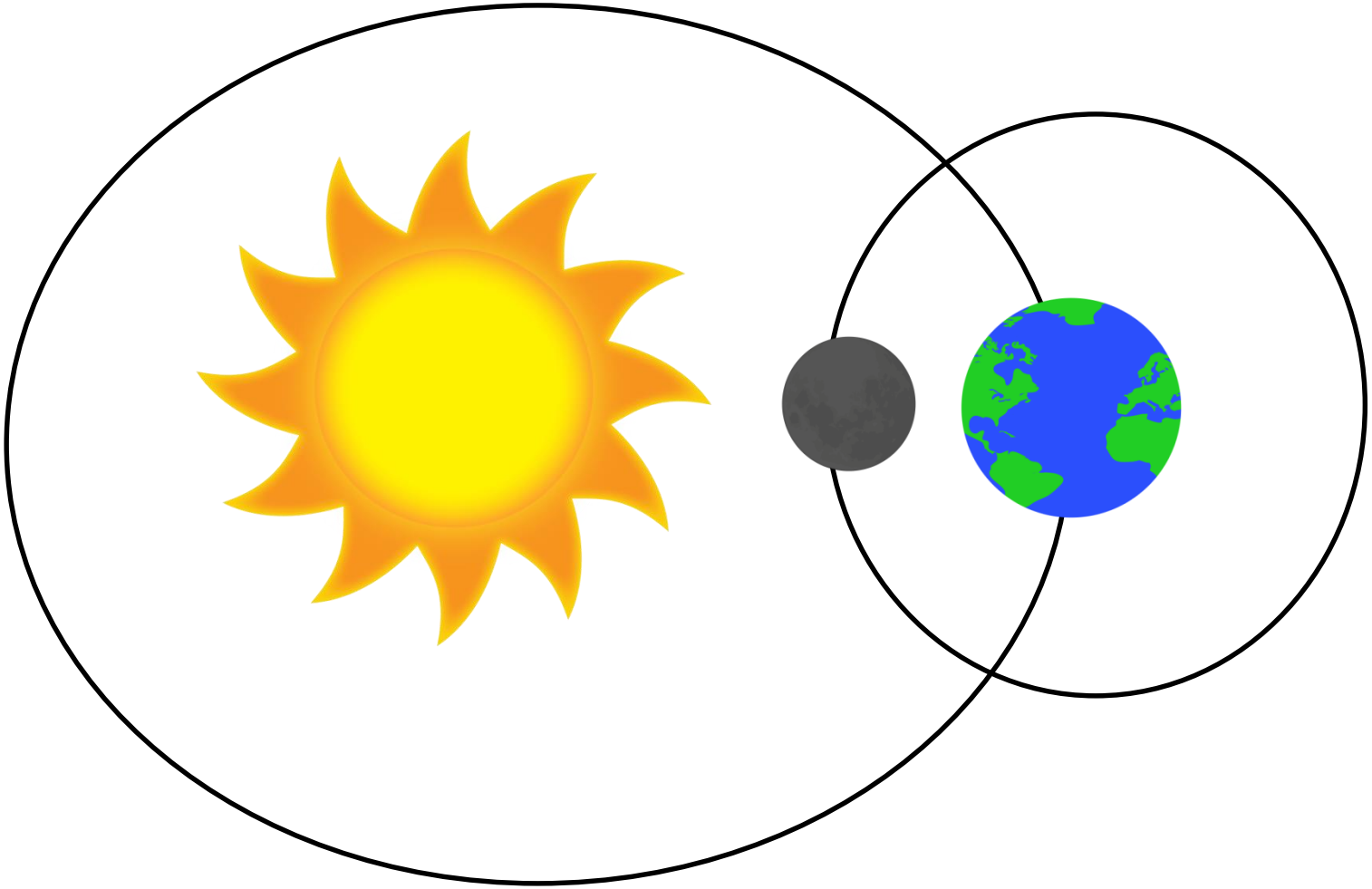
Lunar Eclipses:

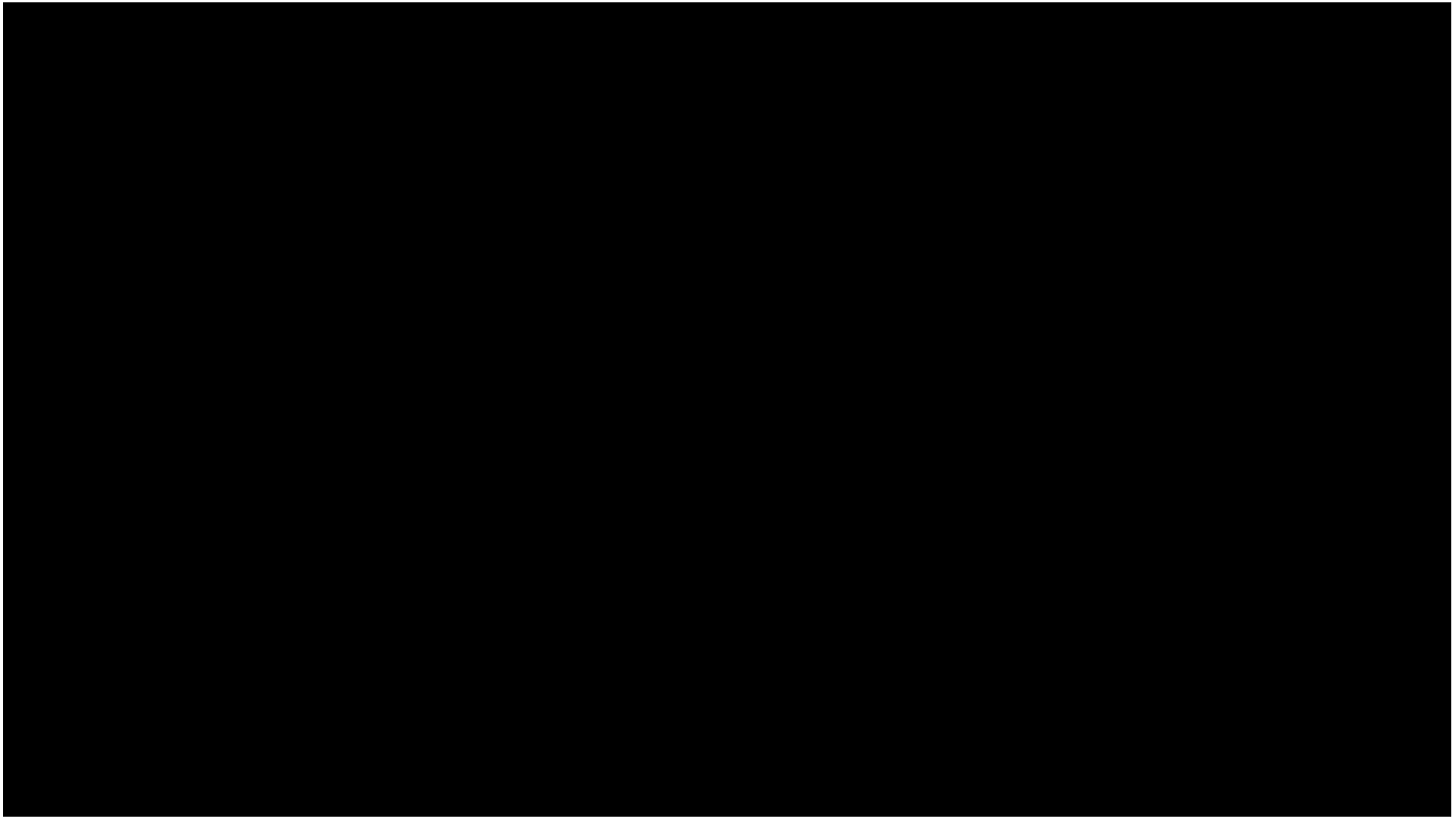
- At least **two** partial lunar eclipses happen every year.
- **Total** lunar eclipses are much more **rare**.
- Can last a few **hours**.



Solar Eclipses:

- A solar eclipse occurs when the moon moves between the sun and earth.



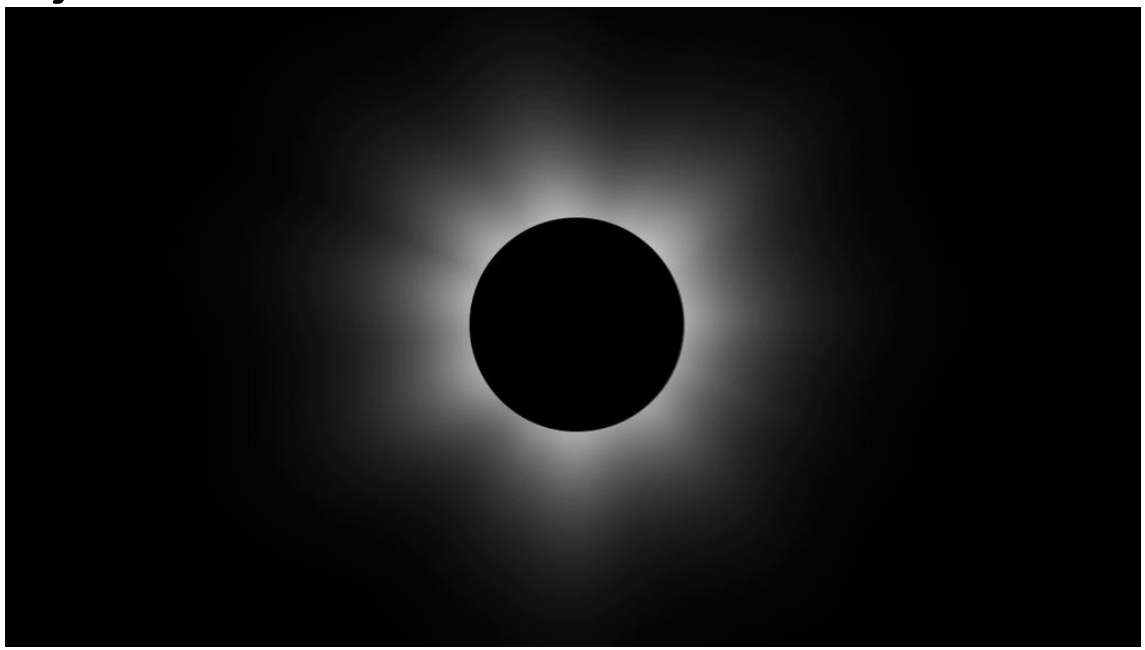


Solar Eclipses:

- During a solar eclipse, the moon casts a shadow onto earth.
- Three types of solar eclipses:
    1. Total solar eclipse
    2. Partial solar eclipse
    3. Annular solar eclipse

Total Solar Eclipses:

- Not everyone on earth can see it!
- Only seen in a small area that is directly in the moon's shadow when it hits earth!
- The sun, moon, and earth need to be in a direct line!

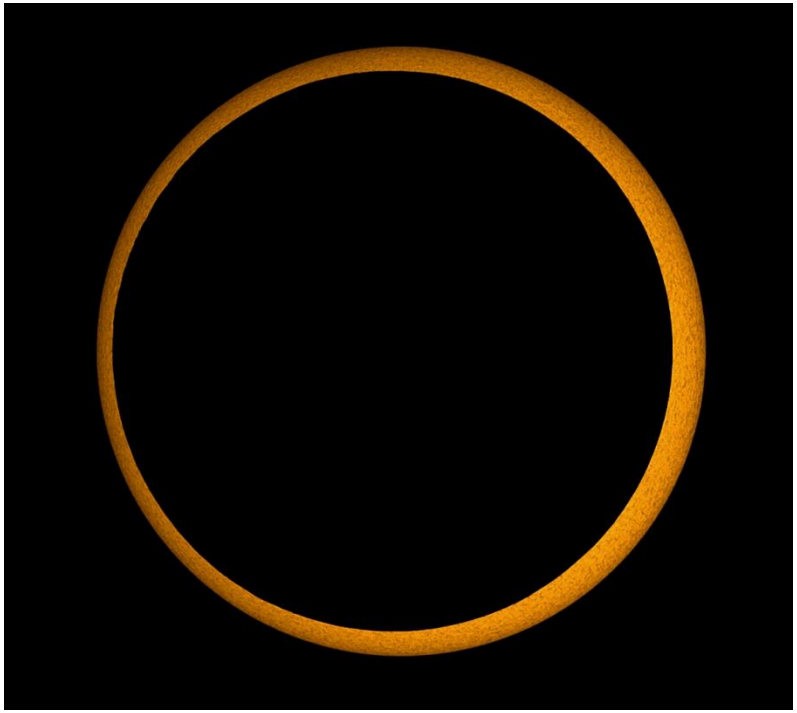


Partial Solar Eclipses:

- Occurs when the sun, moon, and earth are **not** in a **perfect** line.
- The sun has a **dark** shadow on only part of its **surface**.

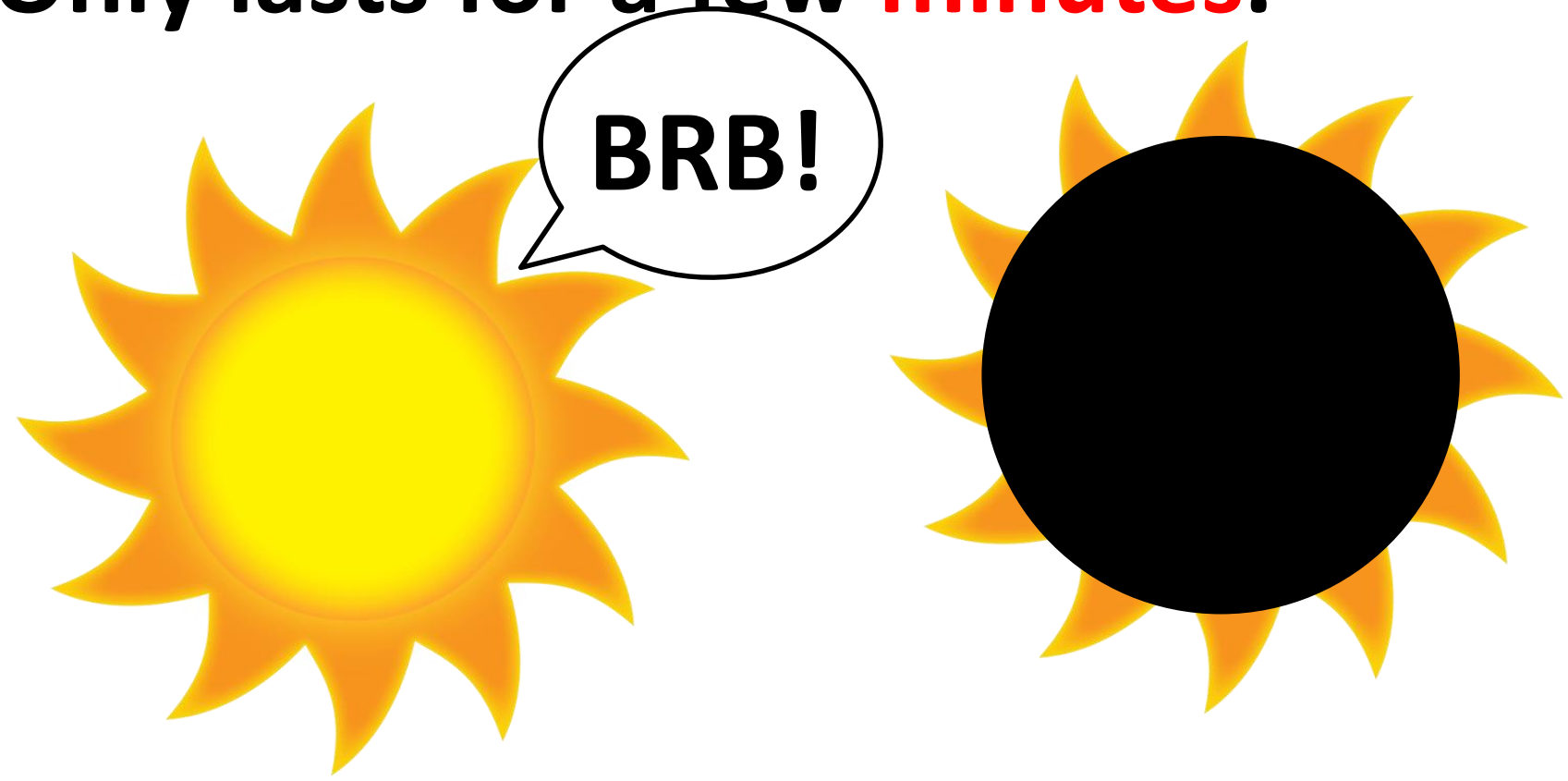
Annular Solar Eclipses:

- Occurs when the moon is farthest from the earth.
- The moon looks smaller so it does not completely block out the sun.
- The dark moon has a bright circle around it.



Solar Eclipses:

- Happens roughly once every 18 months.
- Only lasts for a few minutes.

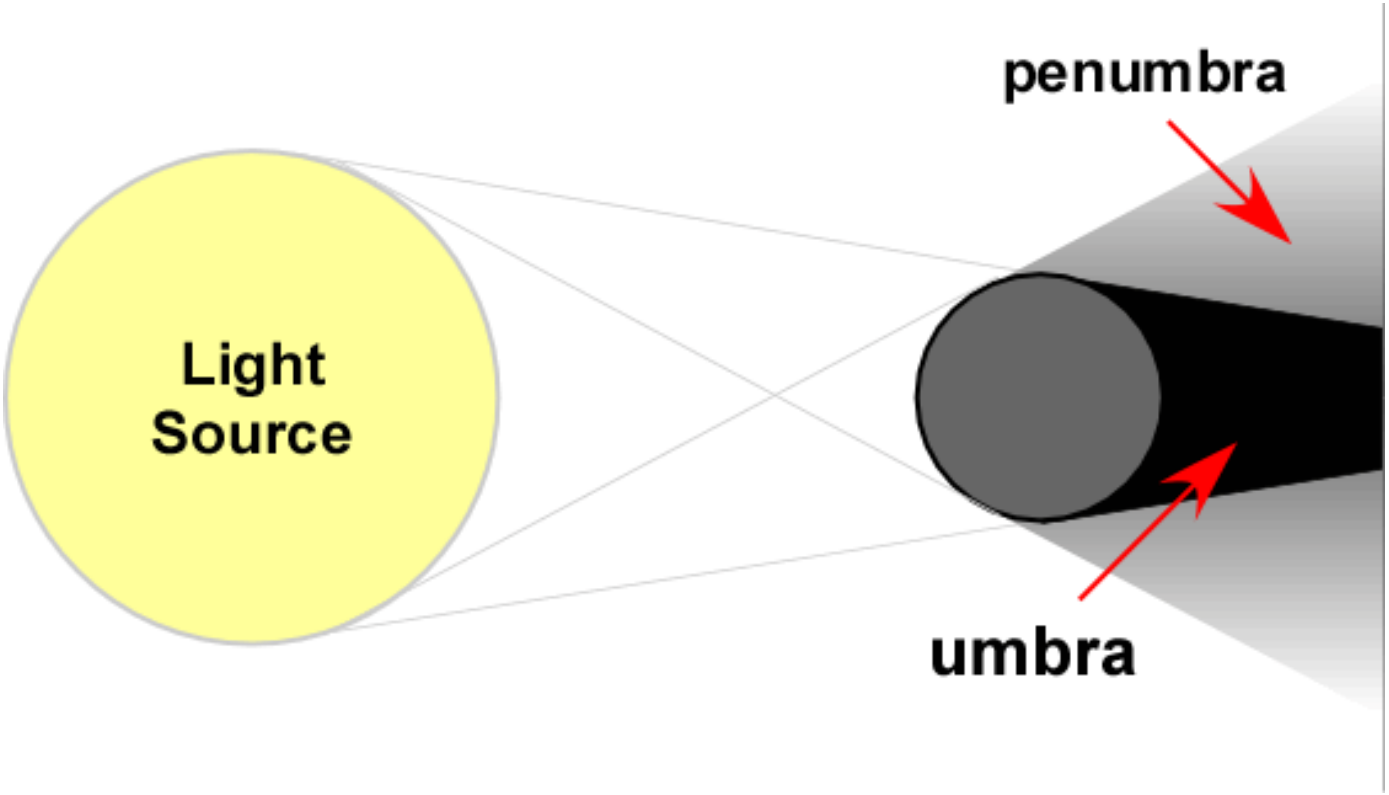


Umbra:

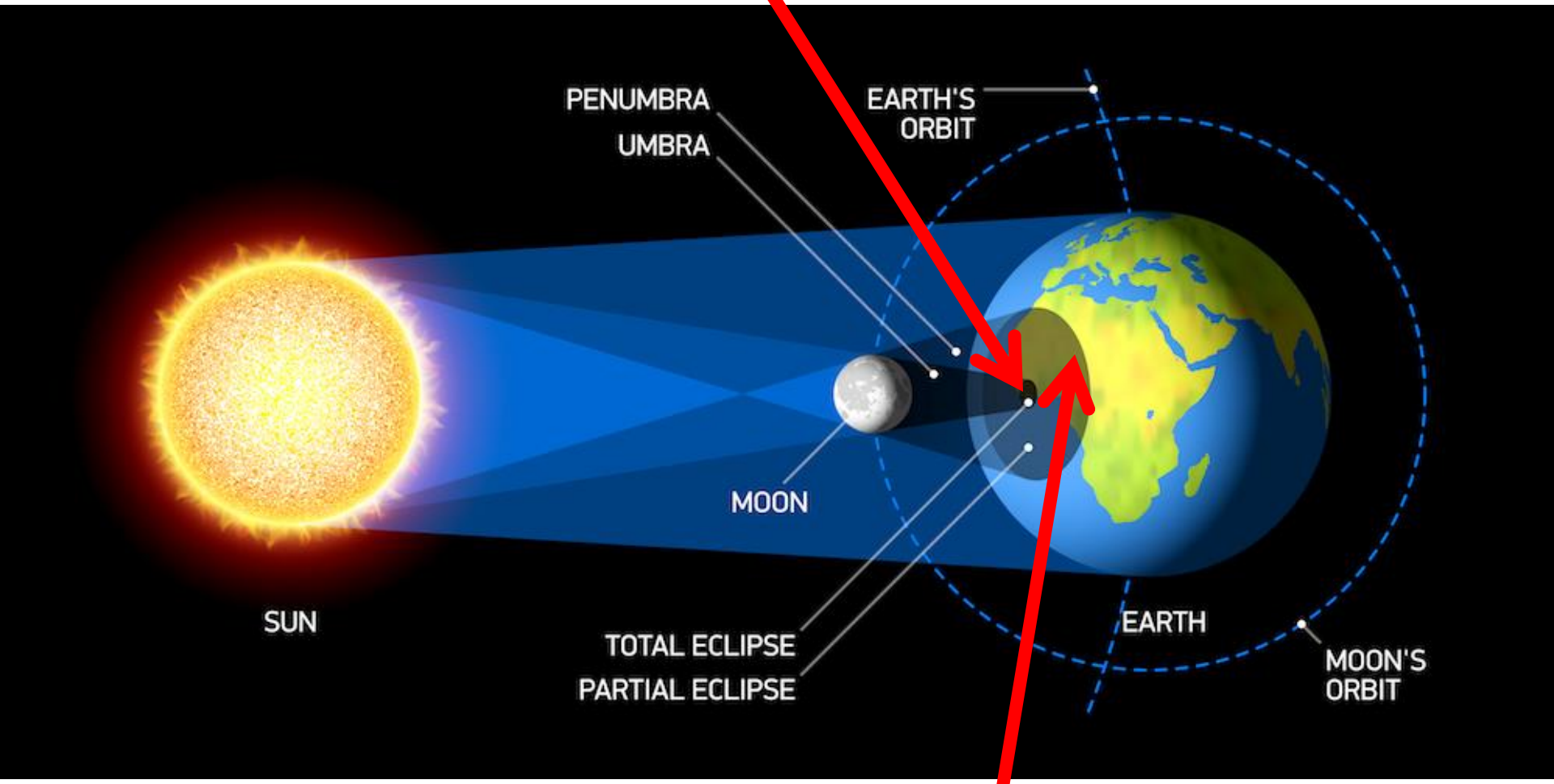
- The moon casts **two** shadows on earth during a **solar** eclipse.
- The **umbra** is very dark and gets **smaller** as it nears earth.
- People in the umbra shadow will see a **total** solar eclipse.

Penumbra:

- Shadow gets larger as it nears earth.
- People in the penumbra shadow will see a partial solar eclipse.



People here see a total solar eclipse!!



People here see a partial solar eclipse!!

Prove you got it!!

Which statement is true?

A – A lunar eclipse occurs when the sun is between the moon and earth.

B – A solar eclipse occurs when the moon is between the sun and earth.

C – A lunar eclipse occurs when the moon is between the sun and earth.

D – A solar eclipse occurs when the earth is between the moon and the sun.

Which of the following is not a type of eclipse?

A – Total solar eclipse

B – Total lunar eclipse

C – Annular solar eclipse

D – Annular lunar eclipse

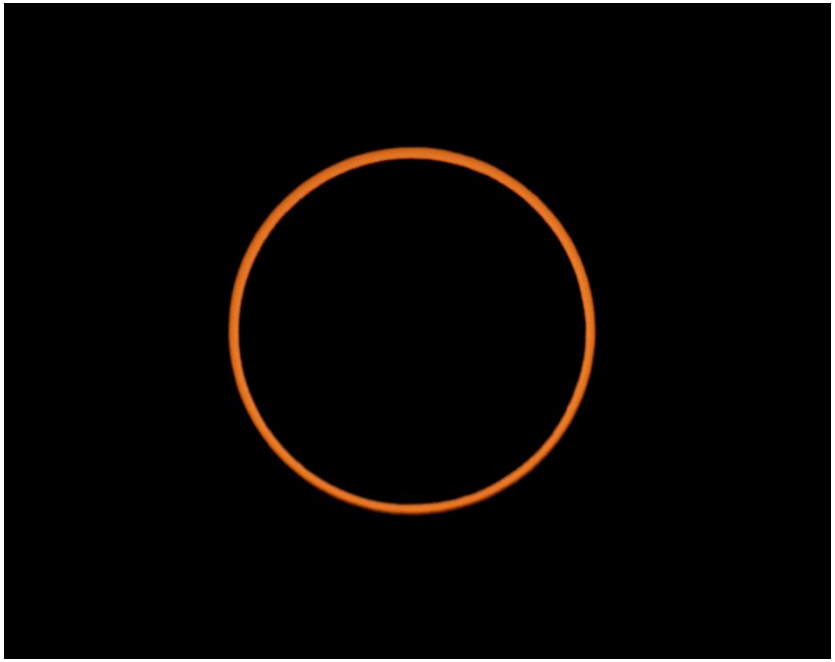
The following image would be considered a –

A – Total solar eclipse

B – Total lunar eclipse

C – Annular solar eclipse

D – Partial lunar eclipse



What happens during a lunar eclipse?

A – The earth blocks the sunlight from hitting the moon.

B – The moon blocks the sunlight from hitting earth.

C – The sun blocks the moonlight hitting earth.

D – The earth blocks the moonlight hitting the sun.

People in the umbra shadow see a _____, while people in the penumbra shadow see a _____.

A – partial solar eclipse, total solar eclipse

B – partial solar eclipse, partial solar eclipse

C – total solar eclipse, total solar eclipse

D – total solar eclipse, partial solar eclipse