**Guided Notes: Moon Phases**

**Big Idea:** The \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of the moon are caused by the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ between the Earth, Sun, and Moon.

**Key Concepts:**

• The moon \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ around Earth while Earth \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ around the sun.

• The moon does not produce its own light, it only \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ sunlight.

• The moon rotates at the same rate as its \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ around Earth, keeping the same side facing Earth.

• Half of the moon is always \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ by the sun, just like half of Earth.

• From Earth's perspective, we see different \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of the lit portion of the moon.

• The moon cycles through 8 main phases: \_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_\_\_, full moon, \_\_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_\_.

• When the moon's lit side is facing Earth it is a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

• When the lit side is facing away from Earth it is a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

• The moon goes through a cycle of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (getting more illuminated) and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (getting less illuminated).



**Real World Examples:**

1. Just as the tilt of Earth's axis causes day/night and seasons from our perspective of the sun's illumination, the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of the Earth, Sun and Moon causes the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ to appear illuminated differently each night.

2. Many cultures traditionally use the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ to mark time and schedule events, since it is a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ cycle in nature.

**Guided Notes: Eclipses**

**Big Idea:** Eclipses occur when one \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ body moves into the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of another.

**Key Concepts:**

• A \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ eclipse occurs when the moon moves between the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and Earth.

• This causes the moon to cast its \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ on Earth's surface, blocking the sun from view.

• A \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ eclipse can only occur during the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ moon phase.

• A \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ eclipse occurs when Earth moves between the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and moon.

• This causes Earth to cast its \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ on the moon's surface.

• A lunar eclipse can only occur during the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ moon phase.

• During a total lunar eclipse, the moon appears to go from \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ to \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

• The moon has a reddish appearance during a total lunar eclipse due to \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ effects.



**Real World Examples:**

1. Special \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ glasses are needed to safely view a solar eclipse, since looking directly at the sun can \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ your eyes.

2. Some cultures historically scheduled important events like festivals and ceremonies based on the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ cycles.

**Guided Notes: Reason for the Seasons**

**Big Idea:** The \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of Earth's axis relative to the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ causes the seasons.

**Key Concepts:**

• Earth \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ around its tilted \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

• Earth also \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ around the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ in an oval orbit.

• When a hemisphere is tilted \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ the sun, it receives more \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ rays and experiences \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

• When a hemisphere is tilted \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ from the sun, it receives less \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ rays and experiences \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

• The \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is when Earth's axis is tilted sideways, so both hemispheres receive equal sunlight.

• The \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is when one hemisphere's tilt toward/away from the sun is at its maximum.

• The beginning of each season marks a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ or \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ in Earth's orbit.



**Real World Examples:**

1. The changing length of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and sun positions throughout the year is caused by the change of the seasons.

2. The timing of plant growth is based on the varying amount of \_\_\_\_\_\_\_\_ at different times of year.

**Guided Notes: Not Enough Hours**

**Big Idea:** The tilt of Earth's \_\_\_\_\_\_\_\_\_\_ combined with its \_\_\_\_\_\_\_\_\_\_ around the sun causes the changing day lengths and seasons throughout the year.

**Key Concepts:**

* Earth rotates on a tilted \_\_\_\_\_\_\_\_\_\_ which causes different parts of Earth to face the sun at different times throughout the year's orbit.
* When the Northern Hemisphere is tilted \_\_\_\_\_\_\_\_\_\_ the sun, it experiences longer daylight hours (summer). When tilted \_\_\_\_\_\_\_\_\_\_ from the sun, it has shorter daylight hours (winter).
* The Spring and Fall \_\_\_\_\_\_\_\_\_\_ occur when neither hemisphere is tilted toward or away from the sun, resulting in 12 hours of daylight everywhere.
* The \_\_\_\_\_\_\_\_\_\_ mark when one hemisphere is tilted most toward the sun (longest day) and the other is tilted most away (shortest day).



**Real World Examples:**

1. At the \_\_\_\_\_\_\_\_\_\_ Pole on the summer solstice, the sun is in the sky for a full \_\_\_\_\_\_\_\_\_\_ hours because the North Pole is tilted directly toward the \_\_\_\_\_\_\_\_\_\_ at that point in the orbit.
2. In Ecuador, near the equator, the length of daylight changes very little throughout the year because its low \_\_\_\_\_\_\_\_\_\_ means it doesn't experience an extreme tilt toward or away from the sun.