

Mysteries of the Moon: Phases and Facts!

Materials Needed:

- One ball (like a tennis ball or styrofoam ball) to represent the Moon
- One lamp with the shade removed OR a strong flashlight (to represent the Sun)
- A dark or dimly lit room
- Phoebe's science notebook or paper
- Pencil or pen
- Optional: Oreo cookies (8 per participant) and a paper plate/napkin for the 'Oreo Phases' extension activity

Lesson Activities (45 Minutes)

1. Introduction: Moon Mania! (5 mins)

Ask Phoebe: "What amazing things do you already know or wonder about the Moon? Have you ever heard people say the Moon affects things on Earth, or even people's behavior? Today, we'll become Moon detectives! We'll explore why the Moon seems to change shape (its phases) and investigate some popular ideas about its power."

2. Activity: Modeling Moon Phases (15 mins)

Setup: Go into a dimly lit room. Place the lamp (Sun) in the center. Phoebe will be Earth, standing a few feet away from the lamp. She will hold the ball (Moon) out in front of her.

Instructions:

- **New Moon:** Phoebe holds the Moon between herself (Earth) and the lamp (Sun). Ask: "Can you see the lit side of the Moon from where you're standing?" (No, it's facing the Sun). "This is the New Moon."
- **Waxing Crescent:** Phoebe slowly turns counter-clockwise just a little bit. Ask: "What do you see now?" (A small sliver of light on the right side - 'waxing' means growing).
- **First Quarter:** Phoebe turns until the Moon is at a 90-degree angle relative to the Sun and herself. Ask: "How much of the Moon looks lit from your view?" (Half - the right half). "This is the First Quarter."
- **Waxing Gibbous:** Keep turning slowly. More than half is lit.
- **Full Moon:** Phoebe turns until the Moon is on the opposite side of her from the Sun. Ask: "Now what do you see?" (The whole face is lit!). "This is the Full Moon."
- **Waning Gibbous:** Continue turning. The light starts to shrink from the right ('waning' means shrinking).
- **Third Quarter:** Keep turning until the Moon is at the next 90-degree angle. Ask: "Which half is lit now?" (The left half). "This is the Third Quarter."
- **Waning Crescent:** Turn more until only a left sliver is visible.
- **Back to New Moon:** Complete the turn.

Discussion: "Did the Moon actually change shape? (No!) What caused the different shapes we saw? (Our viewing angle of the part lit by the Sun as the Moon orbits us)."

3. Activity: Moon Myths vs. Science Facts (15 mins)

Discussion: "We often hear stories about the Moon. Let's explore!"

- **Tides:** "Does the Moon affect the oceans?" (Yes! Its gravity pulls on Earth's water, causing

high and low tides. This is a major scientific fact.)

- **Sleep:** "Have you heard people say it's harder to sleep during a Full Moon?" (Some studies show small effects, but it's not fully proven and could be related to brightness. Not a strong scientific link like tides.)
- **Mood/Behavior ('Lunacy'):** "What about the idea that the Moon makes people act strangely?" (This is a very old myth! There's no scientific evidence that the Moon directly affects people's behavior or health in this way. Large studies have found no connection.)
- **Werewolves?** (Definitely a fun myth from stories!)

Encourage Phoebe to think critically: "Why do you think some myths stick around, even if science doesn't back them up?" (Maybe coincidence, stories, historical beliefs).

4. Wrap-up & Check-in (10 mins)

Review: "Let's quickly name the phases again as you imagine turning in our model."

Assessment: "Can you tell me one phase and where the Sun, Earth, and Moon are during it? What's one proven effect of the Moon (tides!) and one thing that's more of a myth?"

Reflection: "What was the most surprising or interesting thing you learned about the Moon today?"

Optional Extension: 'Oreo Phases': Use Oreo cookies. Twist them open and scrape the filling to represent the different Moon phases you learned. A fun (and tasty) way to review!