Planet Observation

Prep Time: 30 minutes	**Grades:** 5-8	**Lesson Time:** 45-60 minutes

Essential Questions:

- Why do we know more about some planets and how can we continue to learn more?

Objectives:

- SWBAT make different types of observations on the same object and reflect on the quality of each observation.

Standards:

- CCSS.ELA-LITERACY.RST.6-8.3 - Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks.

Teacher Prep:

- Create a Planet X. You can create multiple planets, depending on the size of your class. These can be made from any materials available, such as play-doh, fruit, styrofoam balls, and should have plenty of additions, large and small, for students to observe (stickers, markings, texture). You can even make orbiting bodies using toothpicks, or an atmosphere and clouds with cotton balls. Using vinegar or perfume, you can add scents. Be creative as you want but be sure to include details that will cause students to be able to notice new characteristics about the planet with each closer observation.
- Separate students into groups of 4-5.

Teacher Notes/Background:

- This lesson was adapted from the Strange New Planet lesson.

Planet Observation

Engage (5 minutes)	**Making Observations** Introduce the idea that one way we learn things in science is through observation. Have students brainstorm types of observations they can make about something. This can be visual observations, like shape or color, physical observations, like touch, or observations based on smell.	**Materials:** N/A
Explore (5 minutes)	**Review Let's Launch! and What is Known about Each Planet** Review with students that the way we know about each of these planets is from making observations and doing tests. Based on how close planets are to Earth, to the Sun, and other characteristics of the planets, humans have been able to study other planets to different degrees. Have students think about which planets have we landed on and explored (Earth, Mars, Venus). Which planets do we know the least about? Why?	**Materials:** N/A
Explain (10 minutes)	**Observing Planet X** Break your students into groups of 4-5 students and put the planet(s) at a table with a towel over it. Explain that they will be making four rounds of observations: pre-launch study, fly-by, orbiter, and lander. For each observation, they will be using their "viewers," so the first step will be to create their viewers. These can be made from rolled up paper or a toilet paper/paper towel roll and should be used to look through. **Pre-Launch Study**: This represents observations done from Earth. Students will put a piece of blue cellophane over their viewers to simulate the Earth's atmosphere. From their desks, they will observe their planet for 1 minute. **Fly-By**: Each team gets to walk quickly by one side of the planet from 5 feet away. Cover the other side of the planet with a cloth. **Orbiter**: Each team gets 2 minutes TOTAL to orbit their planet. Only one person can orbit at a time, so this time must be divided between all members. They will orbit the planet from 2 feet away. **Lander**: Students will be able to select a location on the planet to study through their viewer, closely, for a total of 5 minutes. They can put a toothpick or pushpin into the planet to denote their landing site. The students must keep their landing site in their viewer throughout their observation.	**Materials:** • Studying Planet X Handout • Planet X Viewer • Planet X • Cloth to cover one side of planet • Blue Cellophane (optional)

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Elaborate (20-30 minutes)	**Perform Observations** Students will now perform each of the observations. For each observation, they must look through their "viewer." They will have colored cellophane (optional) on for the pre-launch study but taken off for the remainder of the observations. The time limits are as follows: Pre-Launch Study – 1 minute at desks with colored cellophane on viewer Fly-By – Walk by quickly from 5 ft away Orbiter – 2 minutes per team at 2 ft away Lander – 5 minutes of close study of one location After each round of observations, allow students a few minutes to record their observations and set research goals for their next round of observations. If all groups are all observing the same planet, they can record information as other groups are observing.	**Materials:** • Studying Planet X Handout • Planet X Viewer • Planet X • Cloth to cover one side of planet • Blue Cellophane (optional)

Evaluate (5 minutes)	**Connection to Solar System** Ask students questions connecting it back to how much we still don't know about distant planets, such as Uranus and Neptune. Why do we know so much more about Mars than Neptune? Why is it important to continue investing in space science and developing tools to study more distant planets? What more could we learn about Uranus, Neptune, and beyond by advancing tools? Students can be evaluated on the completeness of their observation sheet.	**Materials:** N/A

Extensions and Enrichment:

- If you have extra time, you can have students create their own Planet X for another group to observe.
- With extra time, have students present their findings to the class and then reveal what the complete Planet X actually looks like.

Additional Resources:

- **Launchpad: Kepler**
  Join NASA on the Kepler Mission as this traveling telescope images the light from faraway stars to locate Earth-sized and smaller planets. Using the transit method, the Kepler telescope measures the brightness of a star and uses the data to predict habitable zones.
  https://nasaeclips.arc.nasa.gov/video/launchpad/launchpad-kepler

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Planet Observation

Studying Planet X

A new planet has been discovered! Your task is to complete research on the new planet to learn as *much as possible. With your group, you will be completing four rounds of observations of Planet X using your viewer. Complete the chart after each round of observation. You will record your observations and ask questions to focus on for your next round of observations.*

	Observation Notes	**Questions for Further Study**
Pre-Launch Study		
Fly-By		
Orbiter		
Lander		

What did you notice about your observations with each round? Did you observe anything that ended up being false? Were there things you missed in the earlier rounds? Reflect on your process.

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