

NYCDOE Magnet Program District 25 & 28

JHS 185 Magnet School Grade: 8th grade The Earth, Sun, and Moon System

Essential Question: How does the movement of celestial objects affect your daily life?

Suggested Time Frame: 5 weeks

Magnet Theme: Social Justice

Stage 1- Desired Results	
Standards-Based Learning Goals: PS 1.1e,h; PS 1.1i; PS 1.1g; PS 1.1e; PS 1.1 a-c,j; PS 1.1 c-I; PS 5.1 a-c	
Concepts	
Big Ideas for this Unit: The roles that forces play in the patterns and relationships of the universe and our solar system.	Magnet School Theme: Social Justice Relevant/Connected Big Idea: The debate on: Is it worth the money to continue space exploration? – includes issues on how resources and funds are distributed. This debate directly relates to social justice in terms of how justly those funds and resources are distributed.
Enduring Understandings: <ul style="list-style-type: none"> - Students will understand how the movement of celestial objects creates predictable events in our solar system. - Students will understand the theory of the creation of the Universe and our solar system. - Students will understand that the Earth, Moon and Sun interact in ways that affect our planet. 	Overarching Essential Question(s): <ul style="list-style-type: none"> - How does the movement of celestial objects affect your daily life? - How does the force of gravity affect all matter in the universe? - In what ways do the Earth, Sun and Moon affect each other? - How might advances in science and technology affect society?
Content and Skills	
Content (nouns) Students will know... Rotation: Cause of day and night Revolution: Changes throughout the year Seasons: The tilt of Earth on its axis Solstices and Equinoxes Moon phases- Waxing and Waning Solar and Lunar eclipses Neap and Spring tides The formation of the solar system Formation of the universe/ galaxies The 8 planets (Terrestrial and Jovian)	Skills (verbs) Students will be able to... -Recognize and analyze patterns and trends -Sequence of events -Identify and discuss cause and effect relationships -Conducting research by utilizing books, internet and library resources -Understand the meaning of the words pro and con -Identify what season the N. Hemisphere is in based on the positioning of the Earth and Sun. -Understand why seasons are different for the N. Hemisphere and S. Hemisphere (patterns and

<p>Comets/ Asteroids Constellations Absolute magnitude/ Apparent magnitude Light year The formation of our sun and other stars. The life cycle of stars.</p>	<p>trends) -Identify the moon phases in the night sky -Identify type of eclipse based on the Sun, Moon and Earth position -Identify tides based on the Sun, Moon and Earth position. (Cause and effect) -Inner and outer planets in order from the sun -Describe each inner and outer planet -Compare and contrast the planets -Understand other objects in space such as meteorites and asteroids -Explain why some constellations are visible -Distinguish between absolute and apparent magnitude -Explain that the sun is the closest star to Earth -Compare the sun to other stars -Describe how stars evolve -Explain how stars are classified -Understand the Sun's position in the Milky Way Galaxy</p>
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Stage 2- Summative Assessment Evidence
If students understand, know and are able to do the items in Stage 1, they should be able to show their understanding by completing an authentic task found in the world beyond the

classroom.

➤ Design the Culminating/Summative Project:

G- (goal) Students will decide if space exploration is worth the cost, considering the financial problems our country is experiencing at this time.

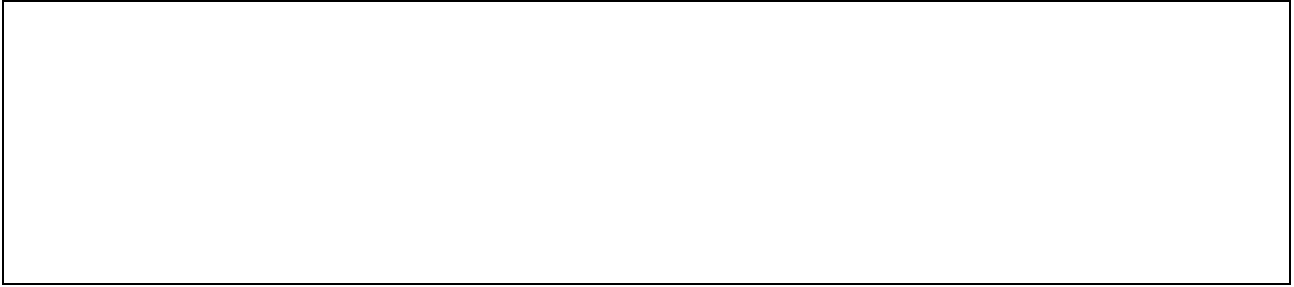
R- (role) Government Research Advisor

A- (audience) NASA officials

S- (situation) Our country is experiencing financial problems, NASA wants to spend U.S money to explore planets within our solar system. It is the students' job to research and decide pros and cons for further research of one particular planet.

P- (purpose and product) Students will research one planet (besides Earth) and research assigned facts about their planet. Then they will figure out all the pros and cons in further exploration of their planet. They will then decide if it is worth the cost and time to explore the planet further, and explain why or why not. They will package all the information into an informative brochure and present to their peers.

S- (standards for performance) Clearly identify facts about the planet and state their opinions on further exploration on their planet in a neat brochure.



Culminating Project

(Write the culminating project on this page, as you would present it to your students)

Part I: Topics to Research and Include in Your Report: (Planet Outline)

- **The Planet's Name:** What does its name mean?
- **Position in the Solar System:** Where is your planet located (for example, Mars in the fourth planet from the Sun)? How far from the Sun does it orbit? Is its orbit unusual?
- **Rotation on its Axis:** How long does it take for your planet to rotate on its own axis? (This is one day on your planet.)
- **Size:** How big is your planet? How does it rate in terms of the other planets in terms of size (is it the biggest, the smallest)? What is your planet's mass?
- **Gravity:** What is the force of gravity at the surface of your planet? For example, what would a 100-pound person weigh on that planet?
- **Orbit:** How long does it take for your planet to orbit the Sun? (This is one year on your planet.)
- **Atmosphere:** What is the composition of the atmosphere of your planet? Is it a thick or a thin atmosphere?
- **Temperature:** What is the temperature range of your planet? How does this compare to the temperature on Earth?
- **Composition of Your Planet and its Appearance:** What type of planet is it (is it rocky or a gas giant)? What is its internal composition? What does your planet look like?
- **Moons:** If there are moons orbiting your planet, describe them and when they were discovered.
- **Rings:** If there are rings orbiting your planet, describe them and when they were discovered.
- **How Would a Human Being Fare on Your Planet:** On your planet, would a person choke in the atmosphere, be squashed by the extreme gravity, float with ease, freeze, burn up, or something else?
- **Something Special:** Is there anything special about your planet? This can often be the best part of the report, taking you off on interesting topics. For example, are there 100-year-long storms on your planet? Are there giant volcanoes? Does your planet have a very tilted axis (giving it extreme seasons)? Have spacecrafts visited your planet? If so, what have they discovered? Is your planet in an orbital resonance with another body?
- **Discovery of Your Planet:** The planets that are not visible using the naked eye were discovered after the invention of the telescope (these are Uranus, Neptune, and Pluto). Tell when your planet was discovered and by whom.

Part II: Planet Brochure

Should the U.S explore your planet further?

Your brochure must include:

1. A page with all the facts about your planet.
2. Pictures of your planet and its moons.
3. Answer: Do you think it would be worth U.S dollars to explore your planet further?
4. Explain both sides, the pros and cons of further exploration.

Questions to keep in mind:

1. Would it be expensive? (About how much?)
2. If the U.S is already in so much debt, should we be spending money on space exploration?
3. Wouldn't it be helpful to know about our solar system and help explain where we came from?
4. How could further exploration help our country?
Could we find anything useful on another planet?
5. What information are we missing about your planet? (Do we know everything?)

Model of Culminating Project

(Create a model of the culminating project that you can share with your students)