HUDSON
RIVER
MUSEUM

Daily Planet Teaching Resource

Ages: 5–11 (Grades 1–6)

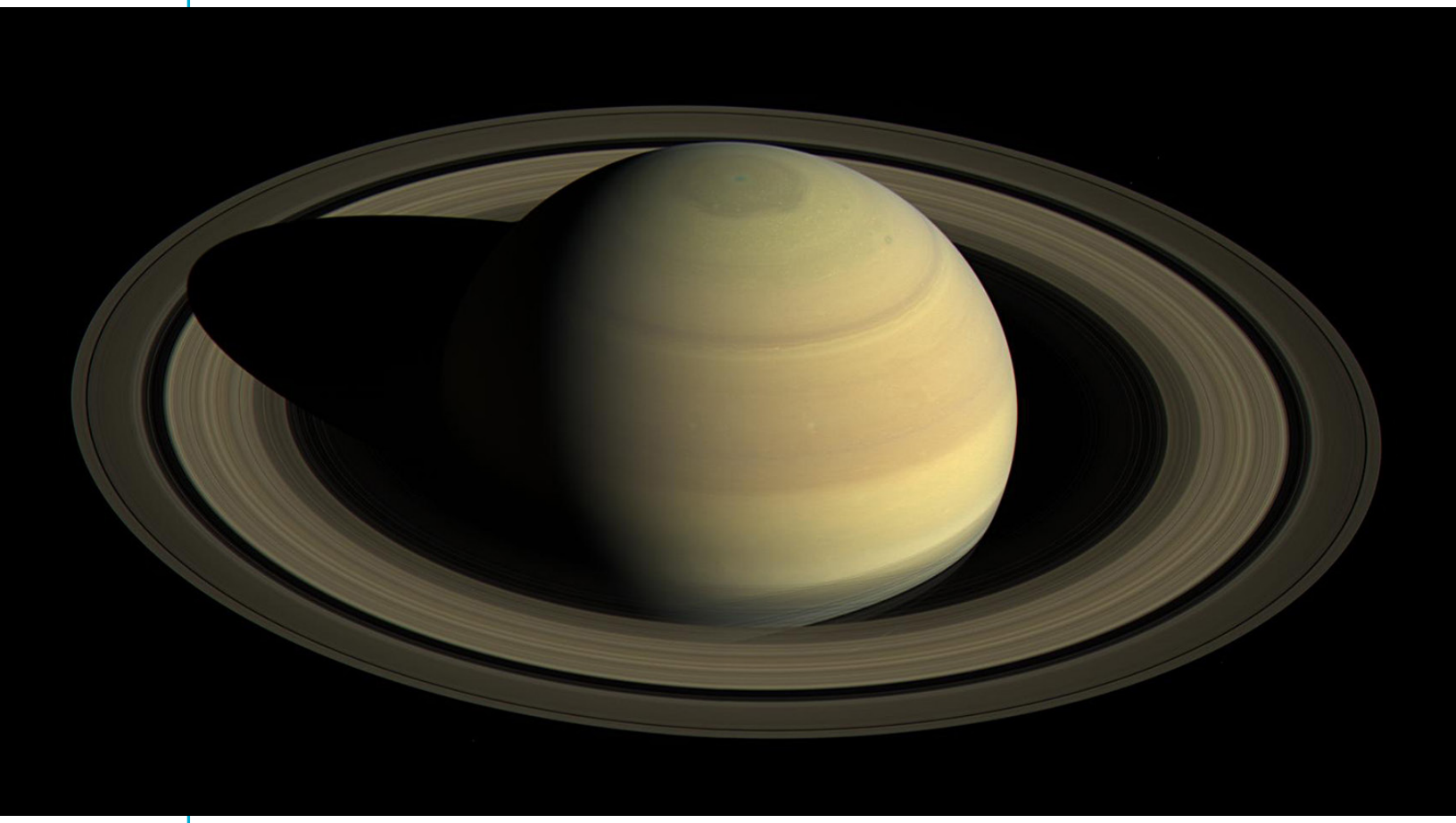
Materials needed:

- Two large pieces of paper
- A pencil and markers/crayons
- Scrap newspaper/paper
- Stapler or tape
- Optional: something to trace a big circle (for example a bowl or can!)

Duration: 1 hour (includes two 20–30-minute activities)

Essential Questions:

- What are the key characteristics of the planets in our solar system?
- What are the visual elements of each planet?
- What are some ways to envision, create, and collaborate about the unique aspects of planets?



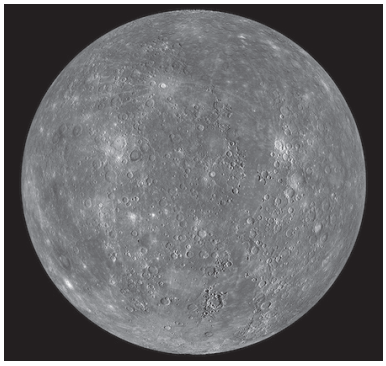
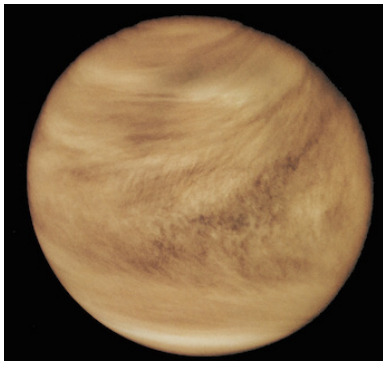
Part 1: Learn About the Planets!

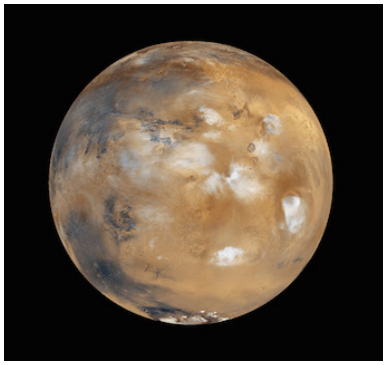
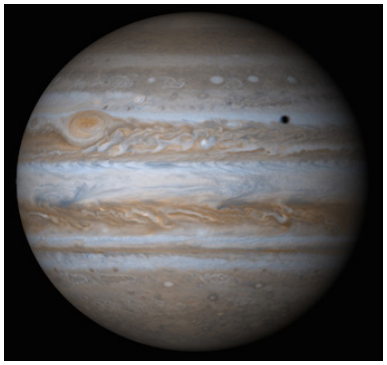
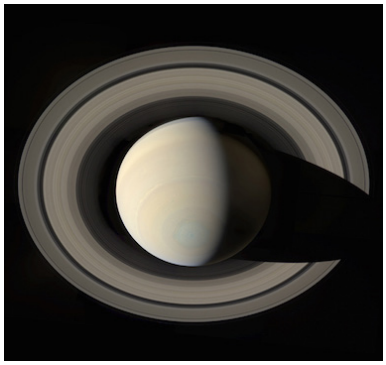
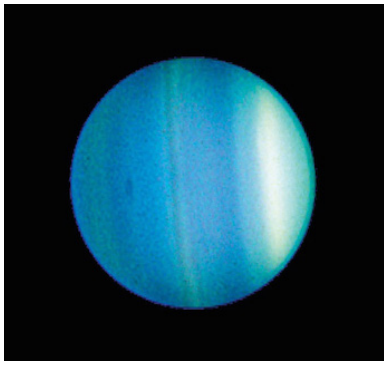
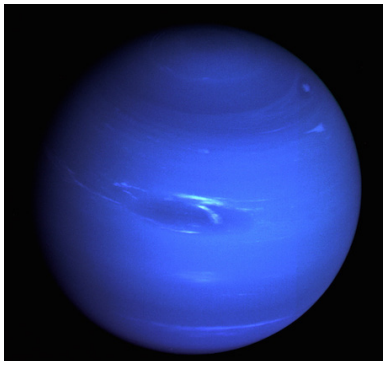
There are eight **planets** in our **solar system**, and they all orbit around the Sun in a specific order: Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, Neptune.

To help remember the order of the planets, just think of this sentence: **M**y **V**ery **E**xcited **M**onkey **J**ust **S**lurped **U**p **N**oodles! The first letter of each word is the same first letter of the planet it corresponds with in the same order. The **M** in **M**y stands for **M**ercury, and both are first in their order, the **V** in **V**ery stands for **V**enus, and both are second, and so on.

Can you think of your own silly sentence to remember the order of the planets?

Take the time now to explore what distinguishes the eight planets in our solar system from one another. You can learn details about and observe the surface features of the planets in our solar system on NASA's website: https://spaceplace.nasa.gov/planets/en/

Part 2: Discuss

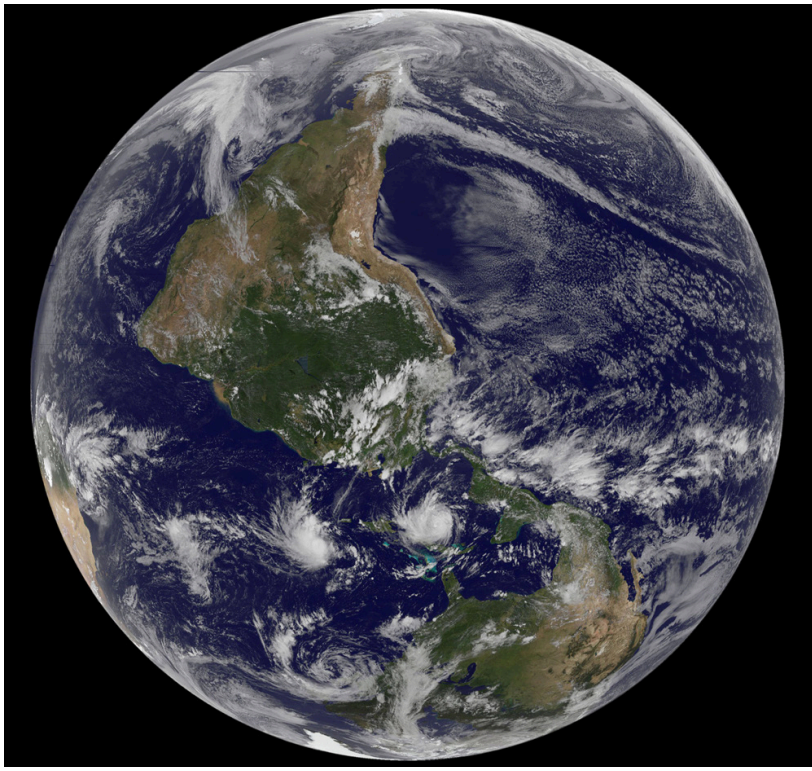
Which planet interests you the most?

What are the characteristics of that planet that make it unique?

Does the planet you chose have any similarities with other planets in the solar system?

Is it a **rocky planet** or a **gas giant**? To remind yourself of the difference between these categories, check the glossary included below.

Read about the planet Earth at NASA's Space Place. What are the characteristics of Earth that allow it to sustain life? Think about what you need to live. https://spaceplace.nasa.gov/all-about-earth/en/

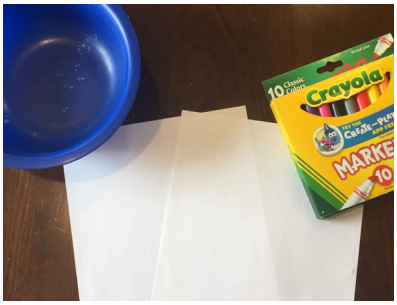


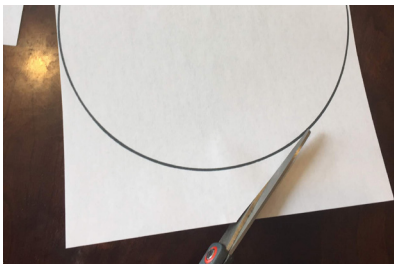
Part 3: Create Your Own Planet (Activity 1)

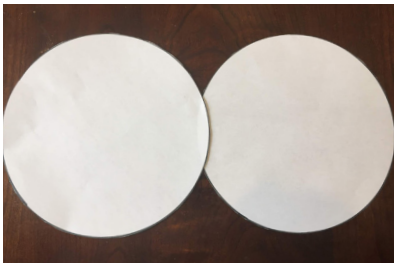
Duration: 30 minutes

Materials needed:

- Two large pieces of paper
- A pencil and markers/crayons
- Scrap paper, like old newspapers or magazines
- Stapler or tape
- Optional: something to trace a big circle with (for example a bowl or can!)







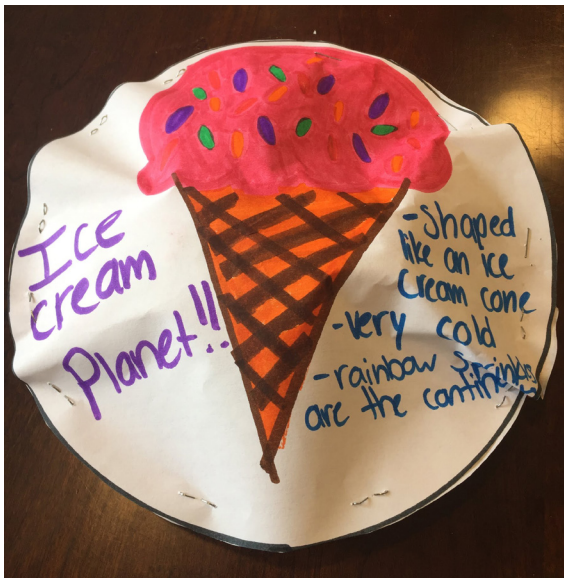
Procedure:

1. Take your two pieces of paper. On each piece, trace or draw a circle of equal size. Try to make the circle as large as you can fit it on the paper.
2. Cut out both circles.
3. Place the circle cutouts on top of each other, and safely using the stapler (you may need to ask a grown-up for help!), place a few staples on the bottom half of the circles leaving the top half open. It should resemble a pocket. If you don't have access to a stapler, use tape instead.
4. Choose a planet and look closely at the image. If you would like a closer look, visit the NASA webpage and zoom in on the planet.
5. What color is the planet? Are there any features that are unique to the planet, such as the Great Red Spot on Jupiter or the rings of Saturn? What is the texture of the surface? Is it rocky? Does it have wind storms on the surface? Are there clouds?
6. What is the size of the planet? How does it compare to other planets in the solar system? Is the planet really hot or really cold?
7. On one side of the circle pocket that you made, recreate the planet you chose. Look closely at the planet, and think about the colors needed to make an accurate depiction of your planet.

8. Flip your circle pocket over, and make your own imaginary planet! Your planet can be something silly, like a pizza planet, a unicorn planet, or a basketball planet. You can also pretend that you discovered a new planet, and make one that resembles the planets that we have in our solar system. Think about whether or not there are living creatures on that planet, and what they would need to survive. Name your imaginary planet when you have finished.
9. Once you have completed both sides of the circle pocket, crumple up one or two pieces of newspaper and stuff them into the pocket. After stuffing your planet, continue to staple (with the help of an adult) the rest of the circle pocket.

Share your work:

Take a photo of your picture and post it to Instagram using the hashtags #MuseumFromHome and #DailyPlanet, and tag the Museum.



Part 4: Exploring Gravity (Activity 2)

Duration: 20–30 minutes

Materials needed:

- Pencil
- Markers/crayons

Introduction:

Have you ever wondered why you land back on the ground after you jump up high in the air? Or questioned what causes all the planets to **orbit** around the Sun? The answer is **gravity**! Gravity is the invisible force that pulls objects towards each other. Every object with **mass** has gravity (even you!), but what causes gravity to have the strength to pull other objects towards its center is the size of its mass and the distance between the two objects. The mass of the Earth is large enough to pull people, animals, and even heavy rocks and buildings down to the surface. The mass of the Sun is significant enough to not only pull the Earth, but all the planets in the solar system towards its center, causing the planets to orbit around the Sun instead of floating off into space.

Why do **astronauts** "float" when they are in space? Gravity is still pulling on them, but a spacecraft in flight is *moving with* the pull of gravity, and so are the astronauts, whether they are orbiting the Earth or moving between planets. Standing on a planet, what we really feel is the ground *pushing up* on us, keeping us from falling, as the Earth is pulling us down.

Watch this short video explaining gravity from Crash Course Kids.

To learn more about gravity, follow this link to NASA for Kids.

Procedure:

1. Watch this video of an astronaut making a peanut butter and jelly sandwich on the International Space Station.
2. Imagine what your home would look like if there were no gravity. How would some of the tasks you do every day look different? What are some possible solutions to the problems this would cause?
3. Complete the worksheet below.

Share your work:

Take a photo of your picture and post it to Instagram using the hashtags #MuseumFromHome and #DailyPlanet, and tag the Museum.

Breakfast Without Gravity by Bridget McCormick

Worksheet: Exploring Gravity

Name / Class / Date:

What would it be like in your home if there were no gravity?

Draw a picture to show what your home would be like without gravity.

Part 5: Glossary

Astronaut: A person who travels in space. The word, 'astronaut' comes from the Greek words meaning 'space sailor.'

Gas giant planets: Four of the planets in the solar system. They are between four and twelve times the width of the Earth and up to 330 times as massive, but far less dense. All have deep atmospheres, rings or ring fragments, and no distinct solid surfaces. Two, Jupiter and Saturn, are similar in composition to the Sun and considerably larger and more massive than anything else orbiting the Sun, containing complex systems of moons and rings and powerful magnetic fields. Slightly smaller are the two "Ice Giants," Uranus and Neptune, that are composed of substantial amounts of methane, water, and ammonia in thick mantles, larger cores, and mysteriously off-center magnetic fields.

Gravity: The attractive force of a body. The larger or more dense the body, the greater the gravitational force.

Mass: The amount of matter or substance that makes up an object. Mass always stays the same, while weight changes with changes in gravity.

Orbit: The path an object takes as it moves around another object.

Planet: A celestial body moving in an orbit around a star.

Rocky (terrestrial) planets: Four of these exist. Two, Earth and Venus, are nearly identical in size. They are larger than the other two and have molten cores, kept hot by leftover heat from their formation and radioactive decay that cause them to exhibit active volcanism. The other two, Mars and Mercury, are smaller. Mars, the slightly larger one of the pair, has several enormous volcanoes on its surface, but they are no longer active. Mercury has no signs of geological activity that we know of.

Solar system: A star orbited by celestial bodies.

Sun: A star, and the linchpin, or vital element, of our solar system. The Sun is large enough to "burn" hydrogen into helium, releasing energy. Without the gravity of the Sun, there would be no solar system.

Part 6: Additional Resources & Glossary

PBS Science Trek: Gravity
https://www.pbs.org/video/gravity-m3swlv/

NASA Space Place
https://www.youtube.com/user/nasaspaceplace

Crash Course Kids: Rocky Planets
https://www.youtube.com/watch?v=Dvhl891zGqU

Crash Course Kids: Gas Giants
https://www.youtube.com/watch?v=WoPtsnlcSv8

NASA Space Place: You will find more information about the planets, additional crafts, videos, and games.
https://spaceplace.nasa.gov/

Astronomer: A scientist who studies planets, stars, galaxies, and anything else in space.

Atmosphere: A gaseous shell surrounding a planet or other member of the solar system.

Comets: Bodies similar in structure and size to asteroids but with orbits that bring them close enough to the Sun that their ice "boils off" and forms a very fine cloud. If they get close enough to the Sun, they can even form tails as so much material boils off that it is swept away from the Sun in a long stream.

Constellation: A group of stars that, when the dots are connected, people have identified with an image, often representing a myth or legend.

Core: The center of a planet. It is usually solid and often composed of hot, dense material.

Eclipse: When light from a celestial body is obscured as it passes through the shadow of a second body.

Galaxy: A collection of stars, gas, and dust. Our solar system resides in the Milky Way galaxy.

Greenhouse effect: When heat is trapped near the surface of a planet by atmospheric gases and clouds.

Light year: The distance traveled when moving at the speed of light for one year. It equals 5.88 trillion miles.

Magnetic field: A force field around the Sun or planets caused by electrical currents, in which a magnetic influence is felt by other currents.

The Kuiper Belt: This is a zone of many hundreds of asteroid-like objects which begins slightly closer to the Sun than Neptune's orbit, and extends out to about 50 times the distance of the Earth from the Sun. Many of the objects are larger than most asteroids and contain more ice. Very little is known about their structure, but they may be more "solid" than asteroids since they have suffered fewer collisions.

Part 7: Standards

Common Core Learning Standards

English Language Arts

Reading Informational Text:

Key Ideas and Details: CCSS.ELA-LITERACY.RI.K-3.1
Range of Reading and Level of Text Complexity: CCSS.ELA-LITERACY.RI.K-3.10

Foundational Reading Skills:

Print Concepts: CCSS.ELA-LITERACY.RF.K-1.1
Phonological Awareness: CCSS.ELA-LITERACY.RF.K-1.2
Phonics and Word Recognition: CCSS.ELA-LITERACY.RF.K-3.3
Fluency: CCSS.ELA-LITERACY.RF.K-3.4

Writing:

Texts Types and Purposes: CCSS.ELA-LITERACY.W.K-3.1-2
Research to Build and Present Knowledge: CCSS.ELA-LITERACY.W.K-3.7-9

Speaking and Listening:

Comprehension and Collaboration: CCSS.ELA-LITERACY.SL.K-3.1-3
Presentation of Knowledge and Ideas: CCSS.ELA-LITERACY.SL.K-3.4-6

Language:

Conventions of Standard English: CCSS.ELA-LITERACY.L.K-3.1-2
Knowledge of Language: CCSS.ELA-LITERACY.L.K-3.3
Vocabulary Acquisition and Use: CCSS.ELA-LITERACY.L.K-3.4-6

New York State Learning Standards

Mathematics, Science and Technology

Standard 4: Science

English Language Arts

Standard 1: Language for Information and Understanding

Standard 2: Language for Literary Response and Expression

The Arts

Standard 1: Creating, Performing and Participating in the Arts

Standard 2: Knowing and Using Arts Materials and Resources