

KERPOOF LESSON PLAN

The Planets



TOPIC

Astronomy, the Solar System

GRADES

3-5

OBJECTIVES

Students will learn different ways to classify the planets of our solar system and reinforce this new knowledge by completing creativity exercises on Kerpoof. At the end of the unit, they will bring all aspects of the lesson together to write a creative story about what it would be like to live on a different planet.

STANDARDS

McREL Benchmarks for Science

Level II

3.2: Knows that the Earth is one of several planets that orbit the Sun and that the Moon orbits the Earth

3.4: Knows that planets look like stars, but over time they appear to wander among the constellations

3.5: Knows that astronomical objects in space are massive in size and are separated from one another by vast distances

Level III

3.1: Knows that planets differ in size, composition, and surface features

3.7: Knows that the Earth is distinguished from other known celestial bodies in that it is the only planet known to harbor life, although similar planets might yet be discovered in the universe

MATERIALS AND RESOURCES

- Kerpoof's Make a Drawing, Make a Storybook, and Spell a Picture
- Student Worksheets
- Additional Resources

ACTIVITY 1: Distance from the Sun

STEP 1: Begin the lesson with a fun 10 minutes in the space scene of Spell a Picture. If you have projection capabilities, project the scene and have your students shout out “space words” they know. Spell the words together and informally discuss definitions. If you do not have projection capabilities, have students log into Kerpoof and host an informal spelling “competition” - see who can spell the most space-related words in five minutes. Then come back together and discuss.

Words to Introduce

- The names of all the planets
- Asteroid
- Moon
- Sun
- Astronaut
- Moons like Ganymede and Io
- Comet
- Constellation (Try some names of different constellations!)

STEP 2: Tell your students that this lesson will focus on the planets of the Solar System, and how they are classified, or put into groups. There are many different ways we can classify the planets of the Solar System:

- By distance from the Sun
- By size
- By composition
- By history—when were each of the planets discovered, and how?

STEP 3: As a formal introduction to the planets of the Solar System, have your students memorize their names according to their distance from the Sun. Create an example mnemonic on Kerpoof, and project it or pass it out. On the next page is a ready-to-use example, which can also be accessed online at:

<http://www.kerpoof.com/#/view?s=2qs118P39Mo5e3k4wPs0-e-2656e2-x>

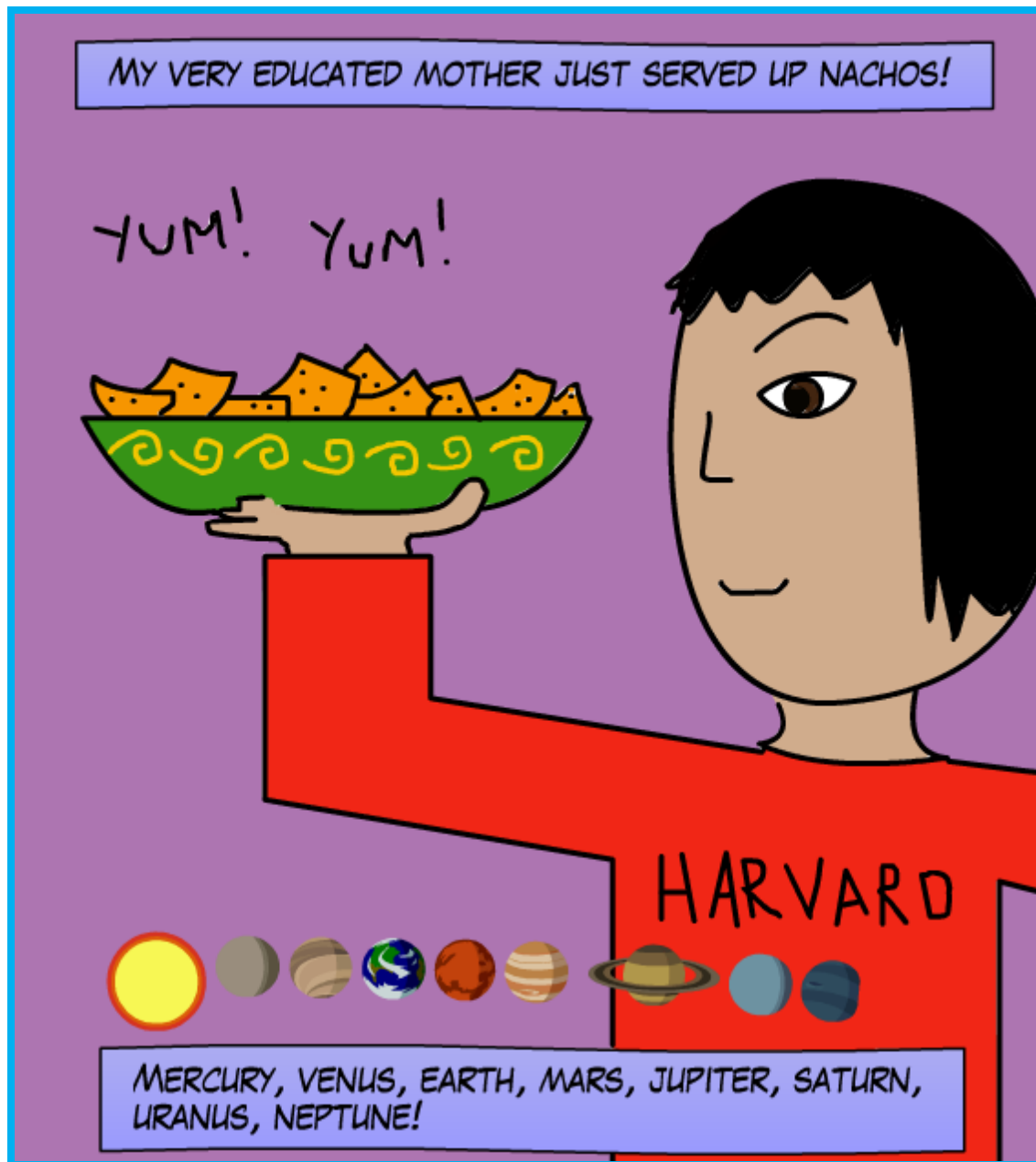
Optional: Take your class out to the playground and place a marker on the pavement representing the sun and each of the planets. Using a measuring tape, place Mercury about 4 inches from the Sun, Venus about 7 inches from the Sun, etc. Neptune should be about 280 inches, or about 23 1/3 feet, away from the Sun. This will help your class to visualize the great distances involved, and the positions of the planets relative to each other.

STEP 4: Go through vocabulary words and answer the following questions as a class:

- On average, how far away are the planets from the sun?
 - Mercury: 36 million miles
 - Venus: 67 million miles
 - Earth: 93 million miles

- Mars: 142 million miles
 - Jupiter: 483 million miles
 - Saturn: 888 million miles
 - Uranus: 1,784 million miles
 - Neptune: 2,794 million miles
- How long does sunlight take to travel all that distance?
 - It takes sunlight about 8 minutes to travel to Earth, but about 4 hours to get to Neptune. Imagine for a moment that we could look at other planets millions of light years away—even farther away than Neptune. Looking at these other planets would be like looking back in time, since it would take light from those planets years and years to reach Earth.
- How long does it take each planet to orbit the Sun—in other words, how long are the other planets' years?
 - Mercury: about 88 Earth days
 - Venus: 225 Earth days
 - Earth: one year
 - Mars: just under two Earth years
 - Jupiter: almost 12 Earth years
 - Saturn: almost 30 Earth years
 - Uranus: about 84 Earth years
 - Neptune: about 165 Earth years

STEP 5: Now it's time to head to the computer lab and log in to Kerpoof. Ask your students to create their own mnemonic to help them memorize the planets' names in the order of their distance from the Sun. They will type the mnemonic and draw a matching scene in Make a Drawing.



Activity 1 Example

ACTIVITY 2: Planet Profile (Size, Composition, and History)

STEP 1: Now it's time to delve into a couple of other interesting ways to classify the planets. Discuss with your students the **size** and **composition** of the planets. Ask: Which do you think is the biggest planet? [Jupiter] Which is the smallest planet? [Mercury]

STEP 2: Pass out the Student Worksheet. Help students fill in the table on the front of the work-sheet, so that they have classified the planets by size and listed each planet's diameter in kilometers.

STEP 3: Now talk about the composition of the planets. Roughly speaking, all of the planets in the solar system can be split up into two groups: **rocky planets**, and **gas giants**. Discuss the difference between the two types, and have your students fill in the proper column on their worksheets. (Below is a rundown of important facts—feel free to supplement with your own sources!)

Rocky planets: Mercury, Venus, Earth, Mars

- Rocky planets are also called terrestrial or telluric planets.
- Rocky planets are mostly made up, or composed, of—you guessed it—rock! This means that they have canyons, craters, mountains, and volcanoes.
- Rocky planets all have the same basic internal structure: a core made up of mostly iron, a mantle, and a crust.

Gas Giants: Jupiter, Saturn, Uranus, Neptune

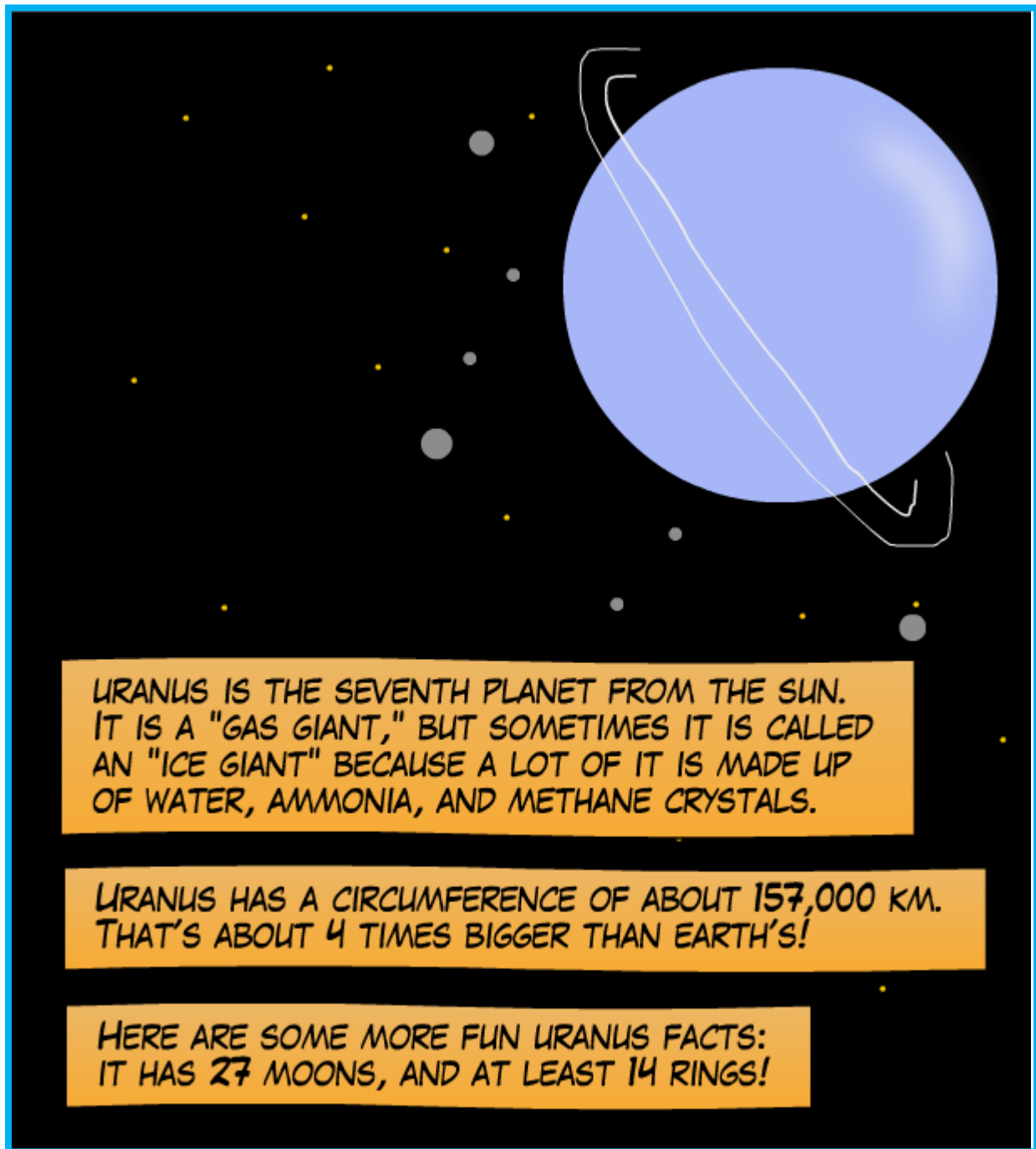
- Gas giants are big planets that aren't mostly made up of rock or other solid matter.
- The cores of gas giants are the only parts made of solid matter.
- Jupiter and Saturn are mostly made up of the elements hydrogen and helium.
- Uranus and Neptune are sometimes called "ice giants" because they are mostly made up of **water**, **ammonia**, and **methane** crystals.

STEP 4: Now it's time for students to log on to Kerpoof and create a "planet profile." Assign each student a planet (other than Earth), about which they will create an illustrated Planet Profile in Make a Drawing.

Optional: Guide students in doing research in the library or on the computer about their selected planet. Have them break up into groups according to their assigned planets and perform an informal KWL activity—they will list what they know about the planet, write down what they want to know about the planet, and then hit a list of recommended books or websites to track down the answers.

Possible Questions:

1. When was the planet discovered? How, and by whom?
2. How fast does the planet rotate?
3. Does this planet have an atmosphere?
4. How many moons does this planet have?
5. Has NASA sent spacecraft to observe this planet? What did the spacecraft find out?



Activity 3 Example

ACTIVITY 4: Creative Writing Project

STEP 1: To wrap up the unit and cement their new knowledge, your students will use Kerpoof's Make a Storybook to complete a creative writing project about the planet for which they did the Planet Profile. Choose a story starter from the suggestions below, or have your students pick their favorite:

- What would it be like to live on your planet for a day?
- Tell the story of how your planet was discovered
- If your planet were a character in a fairy tale, what kind of person would he or she be, and why? Tell the story!
- Write and illustrate a song about your planet.

STEP 2: Students can outline and note down some ideas for their story on the back of the Student Worksheet before they go to Kerpoof and begin to write. Although they should include facts that they've discovered about their planet, they should feel free to use creative license.



Activity 4 Example

ADDITIONAL RESOURCES

On the planets:

http://en.wikipedia.org/wiki/Mercury_%28planet%29

<http://en.wikipedia.org/wiki/Venus>

<http://en.wikipedia.org/wiki/Mars>

<http://en.wikipedia.org/wiki/Jupiter>

<http://en.wikipedia.org/wiki/Saturn>

<http://en.wikipedia.org/wiki/Uranus>

<http://en.wikipedia.org/wiki/Neptune>

On size:

<http://www.sciencenetlinks.com/interactives/messenger/psc/PlanetSize.html>

<http://idahoptv.org/ntti/nttilessons/lessons2000/lau11.html>

<http://www.universetoday.com/36649/planets-in-order-of-size/>

More general information:

<http://solarsystem.nasa.gov/planets/index.cfm>

<http://www.enchantedlearning.com/subjects/astronomy/planets/>

<http://pds.jpl.nasa.gov/planets/>

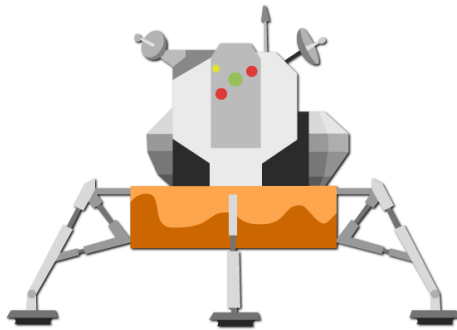
http://www.kidsastronomy.com/solar_system.htm

VOCABULARY LIST



- **Mercury:** Mercury is the smallest planet in the Solar System, and the closest planet to the Sun.
- **Venus:** Venus is the second planet from the Sun. Aside from the moon, it's the brightest object in the night sky.
- **Earth:** Earth is the planet we live on, the third planet from the Sun. It's the only place in the Solar System known to support life.
- **Mars:** Mars is the fourth planet from the Sun. It has both the highest mountain, Olympus Mons, and the biggest canyon, Valles Marineris, in the Solar System.
- **Jupiter:** Jupiter is the largest planet in the Solar System, and the fifth planet from the Sun. Jupiter is known for its "Great Red Spot," which is a big storm on Jupiter's surface.
- **Saturn:** Saturn is the sixth planet from the Sun. It is known for its nine rings and 62 moons!
- **Uranus:** Uranus is the seventh planet from the Sun. It was the first planet discovered with a telescope.
- **Neptune:** Neptune is the eighth and farthest planet from the Sun. Neptune was discovered by a mathematical prediction in 1843, and first seen through a telescope a few years later.
- **Moon:** A moon is a celestial body that orbits a planet. Moons are also called natural satellites. Earth only has one moon, but a lot of the planets in our Solar System have more than one.

- **Gas giant:** Gas giants are large planets that are not made of rock or other solid material. Jupiter, Saturn, Uranus and Neptune are gas giants.
- **Rocky planet:** Rocky planets are smaller planets made up of rock and solid material. Mercury, Venus, Earth, and Mars are rocky planets.
- **Asteroid:** An asteroid is a celestial body that orbits the Sun, but is smaller than a planet. Asteroids are sometimes called minor planets or planetoids. The asteroid belt is a region of the Solar System between the orbits of Mars and Jupiter that contains many asteroids.



THE PLANETS

NAME _____ DATE _____

Size and Composition Table

Planet

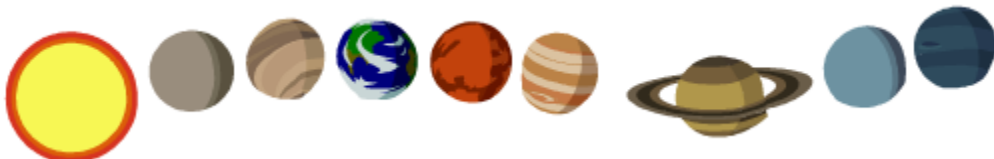
Diameter

Composition

Biggest



Smallest



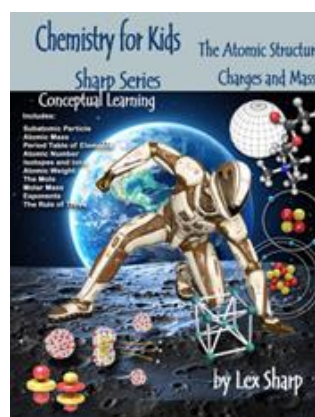
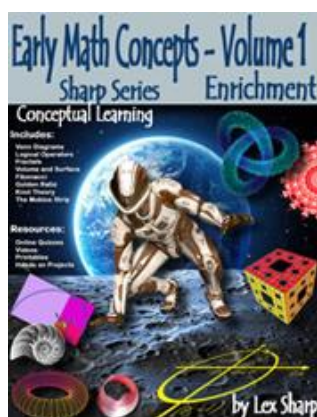
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Coding with Scratch Workbooks

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Volume 3: <https://www.amazon.com/dp/1720042837>, Volume 4: <https://www.amazon.com/dp/1728935458>.



Find "Early Math Concepts" on amazon at: <https://www.amazon.com/dp/B06X3TFLPM>.

Find "Chemistry for Kids" on amazon at: <https://www.amazon.com/dp/B07BR5FH29>.



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