Section 3
Our Planets

Activity 11: The Planets

Goal: Generate excitement about planets unit and increase content knowledge about solar system bodies

Materials:

Chart paper
8 large circles cut from construction paper
Markers
Crayons
Resource books

Description:

1. Ask students what they already know/ want to know about the planets in our Solar System. Record their ideas in a KWL chart.

2. Place the students into 8 groups and assign them each a planet. Give each group resource books with information about their planet. Have them decide what their planet looks like and how they would color it. Also have them pick out four identifying features of their planet.

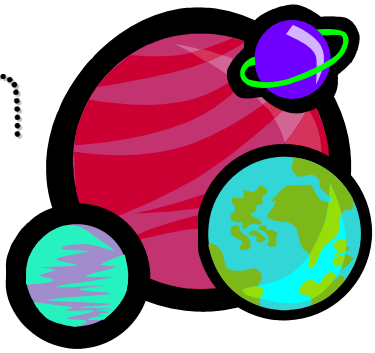
3. Hand out the construction paper planet for each group, and make sure each group has an accurate idea of how to color their planet. Ask students to color planets and write their four pieces of information on the back.

4. Let the students present their planets. Collect the planets and staple them together to make a class book of the Solar System.

Extension Activity

Have students write their four identifying features down on index cards and try to guess which planet belongs to each index card.

Our solar system



Activity 12: Our Solar System

Goal:
Students gain content knowledge about the solar system.

Materials: Computer
CD: Power Point Presentation: Our Solar System
My Pocket Planetary Guide

Description:

1. Ask students to remember and share a favorite piece of information about one of the planets.

2. Tell students they will be making their own planetary guide and pass out My Pocket Planetary Guide worksheets.

3. Show "Our Solar System" CD, pausing to allow students to fill in information on their sheets.

4. Have student use resource books on planets to record any information they missed.

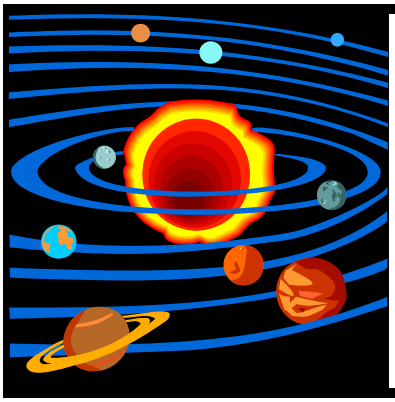
5. Let students cut out planet strips and staple guide together.

Teacher Background Information

A solar system consists of the sun, the planets, their moons, and smaller objects like comets and asteroids.
Planets are large objects that orbit around the sun. In our solar system we have eight planets: Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, Neptune. Each of our eight planets has very different characteristics that make each one unique.

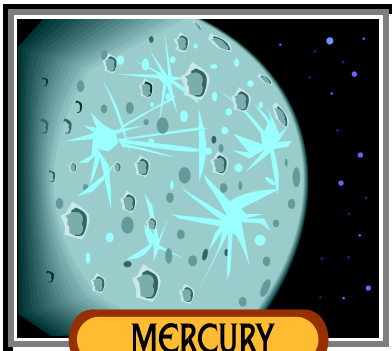
My Pocket Planetary Guide

Have students use resource books to look up facts on each planet. After each planet is studied have the students fill in the facts for that planet. After all of the planet facts are filled in have the students cut out each strip and staple together to make a book. This pocket sized fact flipper is ideal for a quick reference to facts about the planets.



Our Solar System

Name: _____



Rocky Midget or Gas Giant? _____
Distance from the sun _____
Number of moons _____
Interesting Fact:
_____
_____
_____
_____

Rocky Midget or Gas Giant? _____
Distance from the sun _____
Number of moons _____
Interesting Fact:
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Rocky Midget or Gas Giant? _____
Distance from the sun _____
Number of moons _____
Interesting Fact:
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Rocky Midget or Gas Giant? _____
Distance from the sun _____
Number of moons _____
Interesting Fact:
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JUPITER

Rocky Midget or Gas Giant? _____

Distance from the sun _____

Number of moons _____

Interesting Fact:

_____

_____

_____

_____

SATURN

Rocky Midget or Gas Giant? _____

Distance from the sun _____

Number of moons _____

Interesting Fact:

_____

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URANUS

Rocky Midget or Gas Giant? _____

Distance from the sun _____

Number of moons _____

Interesting Fact:

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_____

NEPTUNE

Rocky Midget or Gas Giant? _____

Distance from the sun _____

Number of moons _____

Interesting Fact:

_____

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_____

The Great Pluto Debate

Activity 13: The Great Pluto Debate

Goal:

Students learn how concepts in science change as new data are acquired. They participate in scientific debate and interpretation of data. They gain content knowledge about what constitutes a planet, and about the properties of Pluto, no longer classified as a planet.

Materials:

"The Great Pluto Debate" reading
Pluto and the Kuiper Belt Fact Files
"The Great Pluto Debate" worksheet
Pencils

Description:

1. Ask students what they have heard about Pluto. Do they think it is a planet? Why or why not?

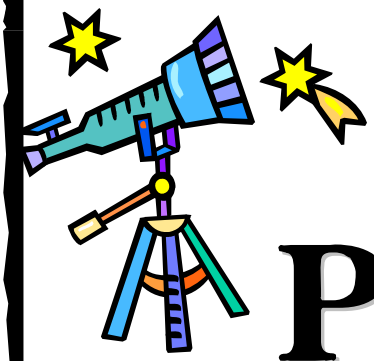
2. Have students work together to read "The Great Pluto Debate" and/or Pluto and the Kuiper Belt Fact Files.

3. Ask students to choose a position about whether or not Pluto is a planet. (Alternately, you may assign them a position.) They should work with their group to pick four or five pieces of information to support their position.

4. Allow students to share their pieces of information. You may choose to set up a debate during which students question and support this information.

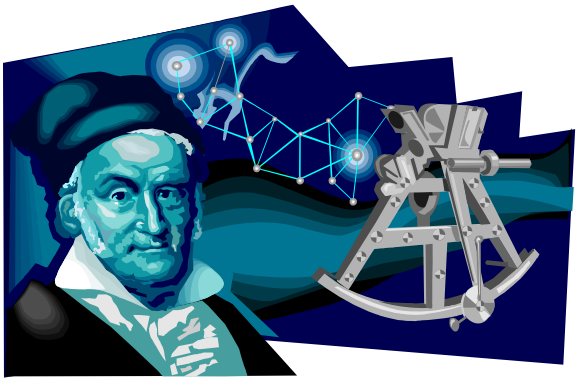
5. After students finish, share with them the recent decision of a panel of scientists (the International Astronomical Union) to declassify Pluto as a planet. A solar system planet is now defined as a round body orbiting the sun that has cleared out any other bodies in its orbit. Pluto is one of many bodies in its orbit, so scientists decided it should not be called a planet. You can support this activity with current websites or articles to illustrate how scientific discovery is constantly changing.

http://solarsystem.nasa.gov/planets/profile.cfm?Object=KBOs
http://www.enchantedlearning.com/subjects/astronomy/planets/pluto/
http://www.enchantedlearning.com/subjects/astronomy/



The Great Pluto Debate

It has long been debated whether Pluto is a planet or rather one of the many objects in the Kuiper belt. What do you think? Work with your team to gather facts to support your scientific opinion.

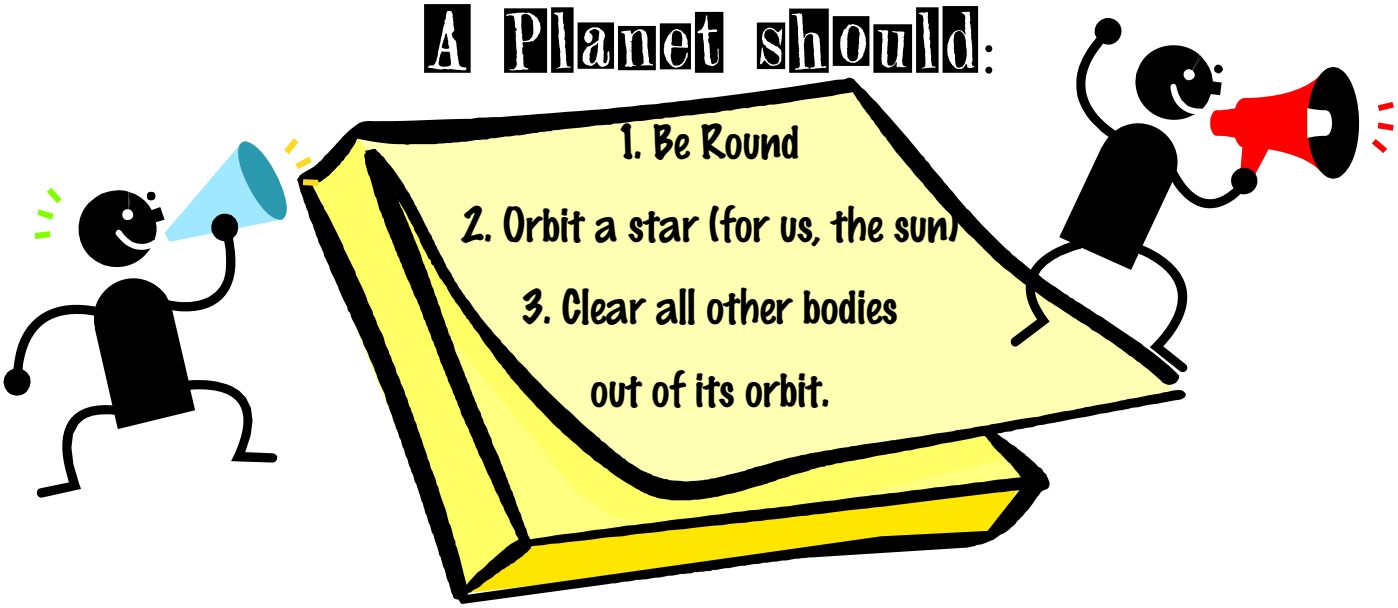


The Great Pluto Debate

A number of astronomers dispute whether Pluto, discovered in 1930, should really be classified as a planet. It is very different from the other eight planets in our solar system. It is 1/5 the mass of our moon, its orbit around the sun is tilted, and it has other bodies in its orbital path.

Many astronomers believe Pluto should be classified only as a Kuiper (koy-pur) belt object, part of an array of icy debris left from the formation of our solar system some 4.5 billion years ago. In 2006 the International Astronomical Union made a formal definition of a planet.

A Planet should:



Pluto has other bodies in its orbit, so astronomers said it should not be considered a planet.

It is now called a "dwarf -planet" just like Ceres, an object in our Asteroid belt. Not all astronomers agree. Some think Pluto should still be called a planet. So the debate continues…is Pluto a planet or simply an object in the Kuiper belt?

Fact File

Kuiper Belt Objects

The Kuiper (koy-pur)belt is a region beyond the planet Neptune in which at least 70,000 small, icy, slow-moving objects orbit. It is located about 30 to 50 Astronomical Units (AU) away from the Sun. In this region the planet-building process was stopped before any large objects (planets) were formed. There are only primitive remnants from our early solar system, formed 4.5 billion years ago.

Pluto and Charon (Pluto's moon) may be extremely large members of the Kuiper belt. If this is true, Pluto cannot be considered a planet at all.

** The Earth is 1 AU away from the Sun.

Fact File

Pluto

Pluto was considered to be the ninth planet, and was usually the farthest planet from the sun in our solar system. It was the smallest planet in our solar system and the last to be discovered. It is even smaller than many of the other planets' moons, including our moon.

Pluto is the only planet in our solar system that has not been visited by spacecraft yet. NASA currently has a mission headed for Pluto, which will arrive in the year 2015.

Its uncommon orbit, the presence of other bodies in its orbit, and its small size led scientist to believe that it might be part of the Kuiper belt objects. In 2006, astronomers changed Pluto's classification from planet to dwarf-planet, so our solar system has only eight planets now.

Information adapted from
www.enchantedlearning.com

Wear the Asteroid Belt!

Activity 14: Wear the Asteroid Belt! (Modified from www.nasa.org)

Goal: Students increase interest and gain content knowledge about the asteroid belt in this fun activity.

Materials:

Aluminum foil
Fish tank gravel
Small pebbles
Sand or glitter in a shallow tray
Elmer's glue
Paint brush
Index cards
Hole Punch
Markers
Paper clips
Newspapers to cover desks
Posterboard cut into belt sized strips 1 for each student
"Asteroid Fact sheet" worksheet
Asteroid Belt writing sheet

Description:

1. Set up stations with supplies: Aluminum foil, gravel, sand, pebbles.

2. Ask students to share what they remember about the asteroid belt. Tell them that they will each make an asteroid belt that they can wear. On this belt they will replicate the objects found in our asteroid belt.

3. Have students paint their posterboard belt with Elmer's glue. Dip the glue-painted belt into the tray of sand until the belt is covered. Let dry 1 hour.

4. Have students pick out a few pebbles, gravel and aluminum foil pieces students can roll these into small misshapen balls. They can do this while you glue their rocks onto their belt.

5. Using the asteroid fact sheet they can write down interesting facts on index cards. These index cards can be added to the holes of their belt using paper clips.

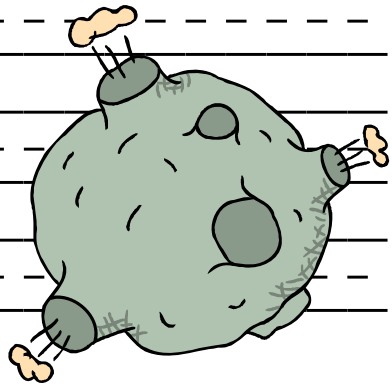
6. Once all the pieces are glued onto their belt and their fact cards are attached they can wear their fashionable work of art.

Writing Extension

Students can write a persuasive paragraph about how they believe the asteroid belt formed. Is it remnants of a planet that never formed or is it just space debris that is trapped by Jupiter's gravity?

Asteroid Belt

What do you think?
Missing planet or space debris?



Asteroids

An asteroid is a large rock in outer space. Some asteroids can be very large (1000km), while others are as small as a grain of sand. Astronomers group asteroids into different categories based on the way they reflect sunlight.

The main asteroid belt is located between Mars and Jupiter. It is divided into an inner belt (closer to Mars) and an outer belt (closer to Jupiter). Asteroids in the inner belt are made mostly of stony material and metal, like our Rocky Midget planets. The outer belt is farther from the sun and wasn't heated as much. Asteroids in the outer belt may have more carbon and ice.

Asteroids are materials left over from the formation of the Solar System. These materials never became a planet because they were so close to Jupiter's strong gravity. Sometimes asteroids, or parts of asteroids, get kicked out of orbit and reach Earth. We call these meteorites.

For further information please visit:
http://www.kidsastronomy.com/asteroid.htm

ART CONNECTION

Activity 15: Papier Maché Planets

Goal: This is a fun way to end the planets unit.

Materials:
8 balloons
Newspaper
Glue
Water
Red, blue, orange, yellow, green, tan, gray tissue paper
Fishing line
Craft wire
Planet Name labels

Description:

1. Blow up the balloons. Have students use strips of newspaper and a mixture of glue and water to create 8 papier mache' planets. Let dry overnight.

2. When the planets are dry use the same procedure to add appropriately colored tissue paper to them. Rings can be added by gluing tissue paper to craft wire.

3. Hang planets around the classroom with fishing line. If students already made the sun, place the planets in the appropriate order from the sun. You won't be able to make distance from sun (or size of planet) to scale in a classroom.

4. To represent the asteroid belt, use aluminum foil and brown paper bags or tissue paper to make large misshapen forms. Hang between Mars and Jupiter.

Cut the words out and use them to label your Papier Mache Solar System

sun

Mercury


Venus


earth

Asteroid Belt


jupiter


saturn


uranus


neptune

comets