

## **CBL Earth Science**

### **Earth Science: Geology, the Environment, and the Universe**

**Quarter 4, Week 6, Day 1**

**Standard Focus:**

## **PREPARE**

**1. Background knowledge necessary for today's reading**

The outer part of the solar system is comprised of the fifth through the eighth planets. In order from the Sun, they are Jupiter, Saturn, Uranus, and Neptune. They are known as gas giants, also called Jovian planets. Jupiter being the largest planet is believed to have formed first.

**2. Vocabulary Word Wall**

Introduce 3-5 important words from today's reading

**liquid metallic hydrogen**

**belts**

**zones**

- Show, say, explain, expand, explode or buzz about the word briefly
- Show, say, define the word quickly and add to the word wall.

## **READ**

**3. Review the vocabulary and concepts previously covered in this chapter.**

**4. Read directions for the investigation**

**5. Read text: Ch. 29.3, pp.786-789**

## RESPOND

### 6. Fix the facts. Clarify what's important.

Discuss the reading and add 3-5 events/concepts to the billboard

Students might mention:

- Jupiter has a banded appearance as a result of atmospheric flow patterns.
- Gas giant planets have low densities, no solid surfaces, ring systems, many moons, and are very large.
- The rings of Saturn are brighter and broader than the rings of other planets.

### 7. Post information to the billboard. Add new information to ongoing whole class projects.

## EXPLORE

### 8. Explore today's investigation

### 9. Explore today's simulation

### 10. Collect data and post

One possible activity: How to Make Your Model Saturn

Procedure: Students create a model of Saturn

Discussion: Discuss unique features of Saturn

Key question: What are Saturn's Rings composed of?

Source: [http://spaceplace.nasa.gov/en/kids/cassini\\_make2.shtml](http://spaceplace.nasa.gov/en/kids/cassini_make2.shtml)

## **EXTEND**

11. **Prompt every student to write a short product tied to today's Reading**
12. **Close with a short summary**

Extend the reading to the students' lives or to the world

**CBL Earth Science**  
**Earth Science: Geology, the Environment, and the Universe**  
**Quarter 4, Week 6, Day 2**  
**Standard Focus**

## **PREPARE**

**1. Background knowledge necessary for today's reading**

While man's first attempts into space began in 1957 for the Russians and 1958 for the U.S., exploration of the outer planets did not start until USA's Pioneer 10 in 1972. Pioneer 10 passed Jupiter on December 1, 1973 sending back over 500 images of Jupiter and data on its magnetic field. Later, Pioneer 11 visited Saturn and Jupiter and sent back images of both planets, especially Jupiter's Red Spot and Saturn's Rings. Voyager 2 flew by Jupiter in 1979, Uranus in 1986, and Neptune in 1989. In 1995 Galileo entered Jupiter's atmosphere and is still transmitting. The Cassini probe launched in 1997 is studying Saturn. The New Horizons launched in 2006, will be the first spacecraft to visit Pluto.

**2. Vocabulary Word Wall**

Introduce 3-5 important words from today's reading

**synchronous rotation**

- Show, say, explain, expand, explode or buzz about the word briefly
- Show, say, define the word quickly and add to the word wall.

## **READ**

**3. Review the vocabulary and concepts previously covered in this chapter.**

**4. Read directions for the investigation**

**5. Read text: Ch. 29.3, pp.789-792**

## RESPOND

### 6. Fix the facts. Clarify what's important.

Discuss the reading and add 3-5 events/concepts to the billboard

Students might mention:

- Uranus and Neptune appear bluish because of the methane gas in their atmosphere.
- Neptune was predicted to exist before it was discovered.
- Pluto is not classified as a gas giant or a terrestrial planet.

### 7. Post information to the billboard. Add new information to ongoing whole class projects.

## EXPLORE

### 8. Explore today's investigation

### 9. Explore today's simulation

### 10. Collect data and post

One possible activity: Lithograph: Jovian Planets

Procedure: Students study images from the Hubble Space Telescope and read accompanying text

Discussion: Questions develop questions based on the images

Key question: how do the Jovian planets compare with the terrestrial planets?

Source:

<http://amazingSPACE.stsci.edu/eds/overviews/print/lithos/jovian.php.p=Teaching+tools@,edu>

## **EXTEND**

11. **Prompt every student to write a short product tied to today's reading**
12. **Close with a short summary**

Extend the reading to the students' lives or to the world

## CBL Earth Science

Earth Science: Geology, the Environment, and the Universe

Quarter 4, Week 6, Day 3

**Standard Focus: Earth Sciences 1.a “students know the differences and similarities among the sun, the terrestrial planets, and the gas planets may have been established during the formation of the solar system” and 1.b “students know the evidence from Earth and moon rocks indicates that the solar system was formed from a nebular cloud of dust and gas approximately 4.6 billion years ago”**

## PREPARE

### 1. Background knowledge necessary for today’s reading

Meteorites are tangible evidence from space on the formation of the solar system. These fragments of asteroids are remnants that did not burn up completely in Earth’s atmosphere. When they hit the Earth, they cause huge impact craters like those on the moon and Mars, however, many craters on Earth are no longer visible due to erosion.

### 2. Vocabulary Word Wall

Introduce 3-5 important words from today’s reading

interstellar clouds

planetesimals

- Show, say, explain, expand, explode or buzz about the word briefly
- Show, say, define the word quickly and add to the word wall.

## READ

### 3. Review the vocabulary and concepts previously covered in this chapter.

### 4. Read directions for the investigation

### 5. Read text: Ch. 29.4. pp. 793-795

## RESPOND

### 6. Fix the facts. Clarify what's important.

Discuss the reading and add 3-5 events/concepts to the billboard

Students might mention:

- The solar system formed from a collapsing interstellar cloud that flattened into a disk from which the planets formed.
- Different elements and compounds were able to condense depending on their distance from the Sun.
- Jupiter was the first planet to develop in the outer solar system.

### 7. Post information to the billboard. Add new information to ongoing whole class projects.

## EXPLORE

### 8. Explore today's investigation

### 9. Explore today's simulation

### 10. Collect data and post

One possible activity: Solar Nebula Theory

Procedure: Students act as visible presentations of atoms in a nebular cloud

Discussion: Discuss the formation of a star

Key question: What is the role of gravity in the creation of a star and planets?

Source:  
[http://ioncmaste.ca/homepage/resources/web\\_resources/CSA\\_Astro9/files/html/mod](http://ioncmaste.ca/homepage/resources/web_resources/CSA_Astro9/files/html/mod)

## **EXTEND**

- 11. Prompt every student to write a short product tied to today's reading**
- 12. Close with a short summary**

Extend the reading to the students' lives or to the world

**CBL Earth Science**  
**Earth Science: Geology, the Environment, and the Universe**  
**Quarter 4, Week 6, Day 4**  
**Standard Focus**

## **PREPARE**

1. **Background knowledge necessary for today's reading**  
Besides the planets, thousands of smaller, rocky bodies called asteroids, also orbit the Sun. Most asteroids are located in belt between Mars and Jupiter, and have irregular surfaces. Most range in size from a few kilometers to about 1000 km. Asteroids are thought to be leftover remnants of planetesimals that did not become planets when the solar system formed.
2. **Vocabulary Word Wall**  
Introduce 3-5 important words from today's reading

**asteroids      meteoroid      meteor      meteorite**

- Show, say, explain, expand, explode or buzz about the word briefly
- Show, say, define the word quickly and add to the word wall.

## **READ**

3. **Review the vocabulary and concepts previously covered in this chapter.**
4. **Read directions for the investigation**
5. **Read text:** Ch. 29.4, pp. 795-796

## RESPOND

### 6. Fix the facts. Clarify what's important.

Discuss the reading and add 3-5 events/concepts to the billboard

Students might mention:

- Asteroids are leftovers from the formation of the solar system that orbit the Sun.
- Most asteroids are located between the orbits of Mars and Jupiter within the asteroid belt.
- Any visible meteor craters on Earth are relatively young, otherwise they would have been erased by erosion.

### 7. Post information to the billboard. Add new information to ongoing whole class projects.

## EXPLORE

### 8. Explore today's investigation

### 9. Explore today's simulation

### 10. Collect data and post

One possible activity: Impact Craters

Procedure: Students demonstrate how craters are created

Discussion: Discuss characteristics of craters and how they are formed

Key question: Why are impact craters more evident on lunar or planet surfaces than on Earth?

Source: [http://www.spacegrant.hawaii.edu/class\\_acts/CratersTe.html](http://www.spacegrant.hawaii.edu/class_acts/CratersTe.html)

## **EXTEND**

11. **Prompt every student to write a short product tied to today's reading**
12. **Close with a short summary**

Extend the reading to the students' lives or to the world

**CBL Earth Science**  
**Earth Science: Geology, the Environment, and the Universe**  
**Quarter 4, Week 6, Day 5**  
**Standard Focus**

## **PREPARE**

1. **Background knowledge necessary for today's reading**  
Comets are also remnants from the formation of the solar system. They are composed of rock, dust, and ice, with elongated orbit around the Sun. When comets come close enough to the Sun, heat makes the comet's nucleus start to evaporate and the released gas and dust form the comet's tail or coma. The tails point away from the Sun. Halley's Comet is visible on Earth every 76 years.

2. **Vocabulary Word Wall**

Introduce 3-5 important words from today's reading

comets                      coma                      nucleus                      meteor shower

- Show, say, explain, expand, explode or buzz about the word briefly
- Show, say, define the word quickly and add to the word wall.

## **READ**

3. **Review the vocabulary and concepts previously covered in this chapter.**
4. **Read directions for the investigation**
5. **Read text:** Ch. 29.4, pp. 796-797

## RESPOND

### 6. Fix the facts. Clarify what's important.

Discuss the reading and add 3-5 events/concepts to the billboard

Students might mention:

- Comets are remnants from the formation of the solar system made of rock and ice.
- Comet orbits are highly erratic.
- The tail of comets point away from the Sun regardless of the direction the comet is moving.

### 7. Post information to the billboard. Add new information to ongoing whole class projects.

## EXPLORE

### 8. Explore today's investigation

### 9. Explore today's simulation

### 10. Collect data and post

One possible activity: Comparison on Comets and Asteroids

Procedure: Students complete a graphic organizer to compare comets and asteroids

Discussion: Discuss why asteroids are considered to be good indicators of the age and early conditions of the solar system

Key question: How comets and asteroids similar and different?

Source: <http://amazing-space.stsci.edu/resources/organizers/cometsasteroids.php.p=Astronomy+basics@edu,edsastronomy-basics,php&a=,eds>

## **EXTEND**

11. **Prompt every student to write a short product tied to today's reading**
12. **Close with a short summary**

Extend the reading to the students' lives or to the world