

EARTH SCIENCE Lesson Plan

Quarter 4, Week 7, Day 1



Outcomes for Today

Standard Focus: Earth Sciences 1.e *“Students know the Sun is typical star and is powered by nuclear reactions, primarily the fusion of hydrogen to form helium”*

PREPARE

1. Background knowledge necessary for today’s reading.

Much of the information scientists have about stars comes from what has been gathered about the Sun. The Sun is a star, the closest one to us. The Ulysses orbiter mission began in October 1990. Ulysses’ orbit, unlike that of others, is perpendicular, so that it is able to observe the Sun from a polar perspective and compare its data with data gathered from solar equatorial observations.

2. Vocabulary Word Wall.

Introduce 3-5 important words from today’s reading

photosphere

chromosphere

corona

solar wind

- 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 investigation/activity.

5. Read text.

Ch. 30.1, pp. 805-807

RESPOND

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

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

Students might mention:

- Most of the light emitted from the Sun comes from the photosphere, the lowest level of its atmosphere.
- Charged particles from the solar wind collide with gases in Earth's atmosphere to cause the aurora.
- The Sun contains 99% of all the mass in the solar system.

7. Post information on the billboard. Add new information to ongoing projects on the wall.

EXPLORE

8. Explore today's investigation with inquiry activities.

9. Explore today's simulation with inquiry activities.

10. Collect data and post.

One possible activity: You Light Up My Life

Procedure: Students construct a graph from data gathered by a communications satellite

Discussion: Students read and discuss the article "Earth, Wind, and Fireworks: Sun's Storms Blow Northern Lights South"

Key question: What problems on Earth can be caused by aurora?

Source:

<http://nytimes.com/learning/teachers/lessons/200328tuesday.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

EARTH SCIENCE Lesson Plan

Quarter 4, Week 7, Day 2



Outcomes for Today

Standard Focus: Earth Sciences 1.e

PREPARE

1. Background knowledge necessary for today's reading.

By observing how long it takes a particular sunspot or group of sunspots to go completely around the Sun, scientists can measure the Sun's rate of rotation. The Sun rotates more rapidly at the equator than it does at its poles, and it also varies with depth inside the Sun. Helioseismology is the science of studying solar pulsations, similar to how seismology studies waves caused by earthquakes.

2. Vocabulary Word Wall.

Introduce 3-5 important words from today's reading

sunspots

solar flares

prominence

- 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 investigation/activity.

5. Read text.

Ch. 30.1, pp. 808-809

RESPOND

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

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

Students might mention:

- Solar sunspots are non-permanent features that typically last about 2 months.
- The length of the solar activity cycle is approximately 22.4 years.
- Solar flare and prominences are associated with sunspots and their occurrences vary with the solar activity cycle.

7. Post information on the billboard. Add new information to ongoing projects on the wall.

EXPLORE

8. Explore today's investigation with inquiry activities.

9. Explore today's simulation with inquiry activities.

10. Collect data and post.

One possible activity: Sunspots and Climate

Procedure: Students make a graph of number of sunspots over time and interpret a graph of data from the Little Ice Age

Discussion: Discuss the cycle of solar activity

Key question: What is the relationship between Earth's climate and sunspots?

Source:

http://eo.ucar.edu/educators/ClimateDiscovery?LIA_lesson7_9.28.95.pdf

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

EARTH SCIENCE Lesson Plan

Quarter 4, Week 7, Day 3



Outcomes for Today

Standard Focus: Earth Sciences 1.e

PREPARE

1. Background knowledge necessary for today's reading.

The Sun is composed of about 70% hydrogen, 28% helium, and about 2% heavier elements. About 98% of the energy generation happens in the core where hydrogen fuses into helium. Above the core is a region where radiation transports the energy to a zone near the solar surface where the energy can be transported by convection.

2. Vocabulary Word Wall.

Introduce 3-5 important words from today's reading

fusion **fission**

- 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 investigation/activity.

5. Read text.

Ch.30.1, pp. 809-811

RESPOND

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

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

Students might mention:

- Fusion and fission are opposite processes.
- The Sun is thought to be about halfway through its life cycle, with another 5 billion years or so left.
- The solar interior consists of the core and the radiative and convection zones.

7. Post information on the billboard. Add new information to ongoing projects on the wall.

EXPLORE

8. Explore today's investigation with inquiry activities.

9. Explore today's simulation with inquiry activities.

10. Collect data and

One possible activity: The Interior of the Sun

Procedure: students build a model of the layers of the Sun's interior

Discussion: Review the concepts of radiation and convection as discussed in previous chapters

Key question: How large or small would the Earth be, compared to the model of the Sun?

Source:

http://ioncmaste.ca/homepage/web_resources/CSA_Astro9/files/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

EARTH SCIENCE Lesson Plan

Quarter 4, Week 7, Day 4



Outcomes for Today

Standard Focus

PREPARE

1. Background knowledge necessary for today's reading.

Passing sunlight through a prism breaks it into a colorful band of color, the colors of the rainbow, its spectrum. The visible spectrum is a tiny part of a huge electromagnetic spectrum, that runs from short gamma rays to long radio waves on either side of the visible spectrum. Astronomers use spectrographs affixed to telescopes to record spectra photographically. Spectra are also reproduced graphically.

2. Vocabulary Word Wall.

Introduce 3-5 important words from today's reading

spectrum

- 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 investigation/activity.

5. Read text.

Ch. 30.1, pp. 811-812

RESPOND

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

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

Students might mention:

- There are three types of spectra: continuous, emission, and absorption.
- The composition of the Sun is very similar to that of the gas giant planets.
- Most stars have proportions of the elements similar to the Sun.

7. Post information on the billboard. Add new information to ongoing projects on the wall.

EXPLORE

8. Explore today's investigation with inquiry activities.

9. Explore today's simulation with inquiry activities.

10. Collect data and post

One possible activity: Prisms and Rainbows

Procedure: Students explore with prisms and light

Discussion: Discuss the visible spectrum as part of the electromagnetic spectrum

Key question: What happens when the light from the Sun shines through a prism?

Source:

http://stargazers.gsfc.nasa.gov/educators/in_different_light/iadf_table_contents.htm

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

EARTH SCIENCE Lesson Plan

Quarter 4, Week 7, Day 5



Outcomes for Today

Standard Focus: Earth Sciences 1.d “students know the evidence indicating that the planets are much closer to Earth than the stars are”, 2.d “students that stars differ in their life cycles and that virtual, radio, and x-ray telescopes may be used to collect data that reveal those differences”

PREPARE

1. Background knowledge necessary for today’s reading.

Early civilizations named the brightest stars and groups of stars after animals, everyday objects, and mythological characters. The 48 ancient constellations were created from the brightest patterns of stars. In the early twentieth century, additional modern constellations were invented from the faint stars between the classical figures to bring the total constellations to 88.

2. Vocabulary Word Wall.

Introduce 3-5 important words from today’s reading

constellations

binary star

- 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 investigation/activity.

5. Read text.

Ch.30.2, pp. 813-814

RESPOND

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

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

Students might mention:

- Some constellations can be seen all year long and others can only be seen at certain times of the year.
- Stars that are gravitationally bound to each other are called clusters.
- Most binary stars appear to be single stars to the human eye.

7. Post information on the billboard. Add new information to ongoing projects on the wall.

EXPLORE

8. Explore today's investigation with inquiry activities.

9. Explore today's simulation with inquiry activities.

10. Collect data and post.

One possible activity: Graphic Organizer: Comparing globular star clusters and open star clusters

Procedure: Students create a Venn diagram to compare and contrast globular and open star clusters

Discussion: Discuss familiar constellations

Key question: What are the similarities and differences in types of star clusters?

Source:

<http://amazing-space.stsci.edu/eds/overviews/organizers/starclusters.php.p+Teaching%20+tool>

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.