

CBL Earth Science

Earth Science: Geology, the Environment, and the Universe

Quarter 4, Week 1, Day 1

Standard Focus: Earth Sciences 4.a, “*students know the relative amount of incoming solar energy compared with the Earth’s internal energy and the energy used by society*”, 4.b “*students know the fate of incoming solar radiation in terms of reflection, absorption, and photosynthesis*”, and 7.b “*students know the global carbon cycle; the different physical and chemical forms of carbon in the atmosphere, oceans, biomass, fossil fuels, and the movement of carbon among these reservoirs*”

PREPARE

- 1. Background knowledge necessary for today’s reading**
Energy use in the U.S. today is heavily dependent on petroleum products and the world’s oil supplies. In the 1970s and 1980s there was a great national interest in energy conservation and the development of alternative energy sources, as a result of huge increases in the price of oil during difficulties in the Middle East.
- 2. Vocabulary Word Wall**
Introduce 3-5 important words from today’s reading

photosynthesis

food chain

solar energy

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. 26.1, pp. 683-684

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 energy used everyday comes from the Sun.
 - The sun's energy is captured by green plants through photosynthesis.
 - Energy is stored in organic materials.
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: The Formation of Fossil Fuels

Procedure: Students complete worksheets describing various energy resources

Discussion: Discuss renewable and nonrenewable sources of energy

Key question: Why are nonrenewable resources of such concern to us?

Source:

http://www.ase.org/uploaded_files/educatorlessonplans/fossil.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

CBL Earth Science

Earth Science: Geology, the Environment, and the Universe

Quarter 4, Week 1, Day 2

Standard Focus: Earth Sciences 4.a, 4.b, and 7.b

PREPARE

1. **Background knowledge necessary for today's reading**
From the earliest of times, wood and coal were the primary energy source for cooking and heating. Gathering, cutting, hauling and stacking wood was time intensive as was monitoring the fire to insure that it didn't go out. Coal even though it was dirty, heavy, and cumbersome to use, was seen as an improvement. Today coal is used more for generating electrical power in power plants than to heat homes in the U.S.

2. **Vocabulary Word Wall**
Introduce 3-5 important words from today's reading

fuels biomass bogs peat

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. 26.1, pp. 684-686**

RESPOND

- 6. Fix the facts. Clarify what's important.
Discuss the reading and add 3-5 events/concepts to the billboard**

Students might mention:

- Wood and coal were the first fuels used by humans.
- Any material that is in good supply and also burns can be used for fuel.

- 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: The Formation of Fossil Fuels

Procedure: Students create a timeline that compares times required for energy production

Discussion: Discuss various sources of energy

Key question: How long will U.S. fossil fuel reserves last?

Source: http://www.ase.org/uploaded_files/educatorlesson_plans/fossil.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

CBL Earth Science

Earth Science: Geology, the Environment, and the Universe

Quarter 4, Week 1, Day 3

Standard Focus: Earth Sciences 4.a, 4.b, and 7.b

PREPARE

- 1. Background knowledge necessary for today's reading**
The majority of industrialized countries in the world rely primarily on nonrenewable fossil fuels for their energy needs. As the standards of living rises in other nations so do their energy needs. While historically the price of oil has been low, and the oil abundant, increases in prices over the last 35 years or so and conflicts in the Middle East, have at times focused attention on the development of alternative forms of energy.

- 2. Vocabulary Word Wall**
Introduce 3-5 important words from today's reading

fossil fuels

petroleum

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.26.1, pp. 688-589

RESPOND

6. Fix the facts. Clarify what's important.
Discuss the reading and add 3-5 events/concepts to the billboard

Students might mention:

- Nonrenewable resources such as fossil fuels formed over thousands or millions of years.
- All fossil fuels originated from organic material trapped in sedimentary rock.

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: The Issue of Renewable Energy, Activity 2

Procedure: Students use data to create graphs to compare consumption levels for different energy sources

Discussion: Discuss energy efficiency and economic efficiency

Key question: How do primary energy sources differ from secondary sources?

Source:

http://www.ase.org/uploaded_files/educatorlessonplans/renewable.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

CBL Earth Science

Earth Science: Geology, the Environment, and the Universe

Quarter 4, Week 1, Day 4

Standard Focus: Earth Sciences 4.a, 7.b, and 9.a

“students know the resources of major importance in California and their relation to California’s geology”

PREPARE

1. **Background knowledge necessary for today's reading**
Initially, the interest in renewable energy resources, such as solar power, wind, geothermal and biomass, took hold during the oil crisis in the 1970s. Environmental concerns about global warming and acid rain, also coincided to raise the public awareness regarding the burning of fossil fuels.
2. **Vocabulary Word Wall**
Introduce 3-5 important words from today's reading

photovoltaic cells

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. 26.2, pp. 690-692**

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 energy is free and doesn't cause any kind of pollution.
- Solar energy is converted into electrical energy by photovoltaic cells and stored in batteries.

- 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: The Issue of Renewable Energy, Activity 3

Procedure: Students use data to describe trends in research and development of alternative energy sources

Discussion: Discuss advantages and disadvantages of various alternative energy sources

Key question: Did the price of oil affect R and D spending?

Source:

http://www.ase.org/uploaded_files/educatorlessonplans/renewable.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

CBL Earth Science

Earth Science: Geology, the Environment, and the Universe

Quarter 4, Week 1, Day 5

Standard Focus: Earth Sciences 4.a, 7.b, and 9.a

PREPARE

1. **Background knowledge necessary for today's reading**
Historically, water power was converted to mechanical power to run mills and factories and pump water in early America. Today hydropower is used to produce electricity. Many dams and reservoirs were built by public works projects during the Depression to harness the power in major rivers for electricity. Geothermal energy comes from the intense heat within the Earth. In certain areas, it can be used to produce electricity, however it is difficult to transport.

2. Vocabulary Word Wall

Introduce 3-5 important words from today's reading

hydroelectric power

geothermal energy

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.26.2, pp. 692-694**

RESPOND

- 6. Fix the facts. Clarify what's important.
Discuss the reading and add 3-5 events/concepts to the billboard**

Students might mention:

- Hydroelectric power provides about 20% of the world's electricity.
- Geothermal energy is abundant and reliable at sites where it occurs, but transporting it is not practical.

- 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: The Issue of renewable Energy, Activity 4

Procedure: Students use data to compare energy consumption

Discussion: Discuss the need for energy efficiency

Key question: What can you and your family do to be more energy efficient?

Source: http://www.ase.org/uploaded_files/educatorlesson_plans/renewable.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

