

# **EARTH SCIENCE** Lesson Plan

## Quarter 4, Week 2, Day 1



### **Outcomes for Today**

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Standard Focus: Earth Sciences 4.a “students know the relative amount of incoming solar energy compared with Earth’s internal energy and the energy used by society”, 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”, 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.**

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In the U.S., particularly in California, there are areas with sufficient, steady winds and enough open land to make wind farms feasible. The consistent winds drive wind turbines that generate electricity. While wind turbines, or windmills, are non-polluting, there are drawbacks. They can be hazardous, especially to migratory birds and some people object to the way they transform the landscape.

#### **2. Vocabulary Word Wall.**

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Introduce 3-5 important words from today’s reading

**wind farms   nuclear fission   Three Mile Island   Chernobyl**

- 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.**

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#### **4. Read directions for investigation/activity.**

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#### **5. Read text.**

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Ch. 26.2, pp. 694-696

## RESPOND

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

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

Students might mention:

- Most of the wind farms in the U.S. are in California.
- Nuclear energy is an energy source that does not come from the Sun.
- Nuclear plant accidents lead to the conclusion that nuclear power was not a solution to the world's energy needs.

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

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## EXPLORE

### 8. Explore today's investigation with inquiry activities.

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### 9. Explore today's simulation with inquiry activities.

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### 10. Collect data and post.

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**One possible activity:** Wind Power, Part 1 – What is Wind Power and How Can It Be Used?

**Procedure:** Students research background information on wind power

**Discussion:** Discuss/review the concept of renewable and non-renewable resources

**Key question:** What are the benefits of wind power as a resource?

**Source:** <http://www.pbs.org/now/classroom/wind.html>

## EXTEND

### 11. Prompt every student to write a short product tied to today's reading.

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### 12. Close with a short summary.

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

# **EARTH SCIENCE** Lesson Plan

## Quarter 4, Week 2, Day 2



### **Outcomes for Today**

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

#### **PREPARE**

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

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Biomass, such as corn, can be used for liquid fuels, methanol (methyl alcohol) and ethanol (ethyl alcohol), to power internal combustion engines in automobiles and city buses. However, producing it in sufficient supply and making it conveniently available to the general public is still a long way off.

##### **2. Vocabulary Word Wall.**

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Introduce 3-5 important words from today's reading

**biomass fuels**

**biogas**

**gasohol**

**ethanol**

- 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.**

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##### **4. Read directions for investigation/activity.**

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##### **5. Read text.**

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Ch. 26.2, pp. 696-697

## RESPOND

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

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

Students might mention:

- As long as biomass materials are replaced, biomass is a renewable energy resource.
- The burning of biomass releases carbon dioxide and particulate matter into the environment.
- The use of gasohol can extend gasoline supplies and reduce dependency on foreign oil.

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

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## EXPLORE

### 8. Explore today's investigation with inquiry activities.

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### 9. Explore today's simulation with inquiry activities.

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### 10. Collect data and post.

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**One possible activity:** Energy and Cars: What does the Future Hold?, Day 1

**Procedure:** Students work in groups to explore changes in automobile technology and power sources

**Discussion:** In preparation for the scenario, discuss archeological sites and how excavations are done

**Key question:** Why might we see changes in how cars are powered?

**Source:**

<http://www.school.discoveryeducation.com/lessonplans/programs/energyandcars/energyandcars.rtf>

## EXTEND

### 11. Prompt every student to write a short product tied to today's reading.

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### 12. Close with a short summary.

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

# **EARTH SCIENCE** Lesson Plan

Quarter 4, Week 2, Day 3



## **Outcomes for Today**

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Standard Focus: Earth Sciences 4.a

### **PREPARE**

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

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As more and more countries become developed and the world continues to be globally connected with goods, services, manufacturing, and business, the energy needs will continue to increase. All of the alternative sources has disadvantages and there will likely need to be some concessions made in order to develop sources sufficiently to impact the need and demand for energy.

#### **2. Vocabulary Word Wall.**

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Introduce 3-5 important words from today's reading

**energy efficiency**

**energy conservation**

- 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.**

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#### **4. Read directions for investigation/activity.**

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#### **5. Read text.**

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Ch. 26.3, pp. 698-699

## RESPOND

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

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

Students might mention:

- Using resources more efficiently is a type of conservation.
- Conserving energy is less expensive in the long run, than finding new energy sources.

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

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## EXPLORE

### 8. Explore today's investigation with inquiry activities.

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### 9. Explore today's simulation with inquiry activities.

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### 10. Collect data and post.

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**One possible activity:** Wind Power, Day 2

**Procedure:** Students present reports on the information gathered previously

**Discussion:** Discuss why consumers are reluctant to alter their driving habits and choice of vehicles

**Key question:** How could design features improve energy efficiency?

**Source:**

<http://school.discoveryeducation.com/lessonplans/programs/energyandcars/>

## EXTEND

### 11. Prompt every student to write a short product tied to today's reading.

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### 12. Close with a short summary.

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

# **EARTH SCIENCE** Lesson Plan

## Quarter 4, Week 2, Day 4



### **Outcomes for Today**

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Standard Focus: Earth Sciences 4.a

#### **PREPARE**

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

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Increases in technology and energy go hand in hand. Through history, humans have found ways to extend their energy resources which are accompanied social and economic changes. As economies move from a rural, agriculture base to an industrial, urban one their energy needs greatly increase.

##### **2. Vocabulary Word Wall.**

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Introduce 3-5 important words from today's reading

**cogeneration**

**mass transportation**

- 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.**

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##### **4. Read directions for investigation/activity.**

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##### **5. Read text.**

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Ch. 26.3, pp. 700-702

## RESPOND

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

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

Students might mention:

- Electricity is costly to produce and not used efficiently.
- Cogeneration can produce income and reduce the need for additional energy resources.

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

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## EXPLORE

### 8. Explore today's investigation with inquiry activities.

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### 9. Explore today's simulation with inquiry activities.

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### 10. Collect data and post.

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**One possible activity:** Designing an Energy-Efficient Building, text pages 704-705

**Procedure:** Students brainstorm and design a model home

**Discussion:** Discuss the heat conservation issues that might be considered

**Key question:** What design features will be incorporated?

## EXTEND

### 11. Prompt every student to write a short product tied to today's reading.

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### 12. Close with a short summary.

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



# **EARTH SCIENCE** Lesson Plan

Quarter 4, Week 2, Day 5



## **Outcomes for Today**

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Standard Focus: Earth Sciences 4.a

### **PREPARE**

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

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The exterior design of home and businesses can contribute to the reduction of energy needs. Landscape design, such as the location and placement of trees around buildings can assist by blocking the Sun's rays and providing cooling shade. The choice of building materials to be used can also assist in energy conservation, as can the use of passive and active solar heating.

#### **2. Vocabulary Word Wall.**

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Introduce 3-5 important words from today's reading

**insulation**

**sustainable 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.**

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#### **4. Read directions for investigation/activity.**

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#### **5. Read text.**

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Ch. 26.3, pp. 702-703

## RESPOND

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

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

Students might mention:

- Many things can be done at home to conserve energy.
- Building materials are rated according to their insulation abilities.
- Energy resources on Earth are interrelated and affect one another.

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

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## EXPLORE

### 8. Explore today's investigation with inquiry activities.

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### 9. Explore today's simulation with inquiry activities.

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### 10. Collect data and post.

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**One possible activity:** Designing and Building an Energy-Efficient building

**Procedure:** Students construct and test their building designs

**Discussion:** Discuss problems encountered

**Key question:** Could some of your design features be incorporated into you own homes?

## EXTEND

### 11. Prompt every student to write a short product tied to today's reading.

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### 12. Close with a short summary.

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