Primary Energy Infobook Activities

A companion guide to the Primary Energy Infobook that includes activities to reinforce basic energy information and introductory facts about the energy sources.

Grade Level:

Pri Primary

Subject Areas:

Science Social Studies

Language Arts
NEED Mission Statement

The mission of The NEED Project is to promote an energy conscious and educated society by creating effective networks of students, educators, business, government and community leaders to design and deliver objective, multi-sided energy education programs.

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Teacher Advisory Board

In support of NEED, the national Teacher Advisory Board (TAB) is dedicated to developing and promoting standards-based energy curriculum and training.

Energy Data Used in NEED Materials

NEED believes in providing teachers and students with the most recently reported, available, and accurate energy data. Most statistics and data contained within this guide are derived from the U.S. Energy Information Administration. Data is compiled and updated annually where available. Where annual updates are not available, the most current, complete data year available at the time of updates is accessed and printed in NEED materials. To further research energy data, visit the EIA website at www.eia.gov.
Primary Energy Infobook Activities

NEED Curriculum Resources
For more in-depth information, inquiry investigations, and engaging activities, download these curriculum resources from shop.need.org:
- Primary Energy Infobook
- Energy Stories and More
- Primary Science of Energy

Also, check out our digital and interactive infobook activities at www.need.org/energyinfobooks

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Standards Correlation Information

**Next Generation Science Standards**

- This guide effectively supports many Next Generation Science Standards. This material can satisfy performance expectations, science and engineering practices, disciplinary core ideas, and cross cutting concepts within your required curriculum. For more details on these correlations, please visit NEED’s curriculum correlations website.

**Common Core State Standards**

- This guide has been correlated to the Common Core State Standards in both language arts and mathematics. These correlations are broken down by grade level and guide title, and can be downloaded as a spreadsheet from the NEED curriculum correlations website.

**Individual State Science Standards**

- This guide has been correlated to each state's individual science standards. These correlations are broken down by grade level and guide title, and can be downloaded as a spreadsheet from the NEED website.
Background

*Primary Energy Infobook Activities* is a series of student worksheets designed to act as companion pieces that reinforce the vocabulary and concepts in the *Primary Energy Infobook*. You can download the *Primary Energy Infobook* from www.NEED.org/energyinfobooks. Digital and interactive versions of some of these activities can also be accessed at www.NEED.org/games.

Preparation

- Decide which worksheets you will use and make copies for each student.
- Duplicate and enlarge, or project the *Energy Source Graphics* on pages 13-17 as visual aids when teaching the students the *Energy Chants* on pages 11-12.

Procedure

1. After you have read the *Primary Energy Infobook* with the students and discussed the information, have the students complete the *Light, Heat, Motion, Sound,* and *Growth* worksheets. Discuss the worksheets with the students.
2. Using the energy source graphics, teach the students the *Energy Chant* for each source of energy.
3. Have the students complete the energy source worksheets on pages 18-21. Discuss the answers when completed.
4. Have the students make a multi-page flip book of the tasks energy performs or of one of the energy sources.
5. Use the *Evaluation Form* on page 27 to evaluate the activities.

Grade Level

- Primary, grades K-2

Time

Approximately 30 minutes to one hour to read the information with students and complete the worksheets. More time may be required to learn the chants and complete source worksheets.

Additional Resources

The *Primary Energy Infobook* can be downloaded as an e-publication for easy use on tablets or interactive boards.

*Energy Stories and More* contains short stories and hands-on activities to further reinforce the information presented in the *Primary Energy Infobook*. Download *Energy Stories and More* from shop.need.org.
Light

- Draw a circle around the objects that people use for light.
Heat

Draw a circle around the objects that people use for heat.
Motion

- Draw a circle around the objects that burn fuel to move.
- Color the objects that need "people power" to move.

Objects:
- Airplane
- Bicycle
- Canoe
- Rollerblades
- Car
- Hot air balloon
- Lawn mower
- Steam train
Sound

- Draw a circle around the objects that send warnings with sound.
Growth

Make an X on the objects that DO NOT use the sun's energy to grow.

Color the objects that need the sun's energy to grow.
Renewable Energy Chants

**BIOMASS**
Garbage, wood, landfill gas...it’s all BIOMASS!

Hold your nose while chanting, "Garbage, wood, landfill gas." During "it's all BIOMASS", shake your hands near your shoulders.

**GEOTHERMAL**
Geo-Earth, Thermal-heat—GEOTHERMAL—Earth-heat!

Hold arms in a circle in front of you during “Geo-Earth.” Cross arms and hug yourself for “Thermal-heat.” Shout “GEOTHERMAL,” then repeat the motions quickly for “Earth-heat.”

**HYDROPOWER**
Falling water, HYDROPOWER, HYDROPOWER!

With your finger tips touching, hold your hands under your chin and glide your hands down like a waterfall during “Falling water.” For “HYDROPOWER, HYDROPOWER” spin your hands like a turbine.

**SOLAR**
SOLAR ENERGY—sun shine bright, SOLAR ENERGY—give me light!

Begin with arms over head in a big circle, swaying from side to side during “SOLAR ENERGY.” Spread arms out wide during “sun shine bright.” Repeat motions for second part of chant.

**WIND**
Energy is flowin’ in the WIND!

Make big arm circles, mimicking a wind turbine, as you say this chant.
Nonrenewable Energy Chants

COAL
COAL in the hole—makes light in the night!
During “COAL in the hole,” point down with thumbs, hands in fists. During “makes light in the night,” point thumbs upward in rhythm with the cadence of the chant.

NATURAL GAS
Burn clean, burn fast—NATURAL GAS!
During “Burn clean,” bring one hand up in front of you, palm facing inward. During “burn fast,” bring the other hand up to the first hand. During “NATURAL GAS,” move hands upward together to make the shape of a flame.

URANIUM
URANIUM, URANIUM—split goes the atom!
Clap twice during “URANIUM, URANIUM.” During “split goes the atom,” clap and bring hands out and up, representing the splitting atom.

PETROLEUM
Pump, pump—PETROLEUM!
Place hands together in fists in front of you. During “Pump, pump,” partially extend fingers twice and return them to a fist. During “PETROLEUM,” fully extend hands and move them upward, representing oil shooting from a well.

PROPANE
Put a little pressure on me—PROPANE!
Begin with hands wide apart and bring palms closer together at each word of the chant.
BIOMASS

COAL
NATURAL GAS

URANIUM

U^{235}
PETROLEUM

PROPANE
Energy Source Matching

Write the number of the energy source on the line next to its symbol.

1. Petroleum (oil) __________
2. Wind __________
3. Biomass __________
4. Uranium __________
5. Propane __________
6. Solar __________
7. Geothermal __________
8. Hydropower __________
9. Coal __________
10. Natural Gas __________
## Energy Source Matching

Write the number of the energy source on the line next to its definition.

<table>
<thead>
<tr>
<th></th>
<th>Number</th>
<th>Energy Source</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Petroleum (oil)</td>
<td>____________</td>
<td>Black rock burned to make electricity.</td>
</tr>
<tr>
<td>2.</td>
<td>Wind</td>
<td>____________</td>
<td>Energy from heat inside the Earth.</td>
</tr>
<tr>
<td>4.</td>
<td>Uranium</td>
<td>____________</td>
<td>Energy from wood, waste, and garbage.</td>
</tr>
<tr>
<td>5.</td>
<td>Propane</td>
<td>____________</td>
<td>Energy from moving air.</td>
</tr>
<tr>
<td>7.</td>
<td>Geothermal</td>
<td>____________</td>
<td>Portable fossil fuel gas often used in grills.</td>
</tr>
<tr>
<td>8.</td>
<td>Hydropower</td>
<td>____________</td>
<td>Fossil fuel for cars, trucks, and jets.</td>
</tr>
<tr>
<td>10.</td>
<td>Natural Gas</td>
<td>____________</td>
<td>Energy in rays from the sun.</td>
</tr>
</tbody>
</table>
Renewable or Nonrenewable?

- Draw a circle around the renewables.
- Draw a square around the nonrenewables.

Biomass
Coal
Geothermal
Propane
Solar
Hydropower
Wind
Uranium
Natural Gas
Petroleum
Propane
Uranium
Wind
**Energy Source Crossword**

**ACROSS**

2. The energy of moving air.
5. The portable gas.
7. Gas moved in pipelines.
8. An atom of this element can be split.

**DOWN**

1. The energy of waste and wood.
3. Heat energy from inside the Earth.
4. The energy in flowing water.
5. Liquid fossil fuel.
Draw a circle around the objects that people use for heat.

Draw a circle around the objects that people use for light.
**Sound Answer Key**

- Draw a circle around the objects that send warnings with sound.

**Motion Answer Key**

- Draw a circle around the objects that burn fuel to move.
- Color the objects that need "people power" to move.
Growth Answer Key

❌ Make an X on the objects that DO NOT use the sun's energy to grow.

Color the objects that need the sun's energy to grow.
Energy Source Matching (page 18) Answer Key

Write the number of the energy source on the line next to its symbol.

1. Petroleum (oil)  3
2. Wind  4
3. Biomass  7
4. Uranium  8
5. Propane  10
6. Solar  1
7. Geothermal  5
8. Hydropower  6
9. Coal  9
10. Natural Gas  2

Energy Source Matching (page 19) Answer Key

Write the number of the energy source on the line next to its definition.

1. Petroleum (oil)  9 Black rock burned to make electricity.
2. Wind  7 Energy from heat inside the Earth.
4. Uranium  3 Energy from wood, waste, and garbage.
5. Propane  2 Energy from moving air.
7. Geothermal  5 Portable fossil fuel gas often used in grills.
8. Hydropower  1 Fossil fuel for cars, trucks, and jets.
10. Natural Gas  6 Energy in rays from the sun.
Renewable or Nonrenewable?

- Draw a circle around the renewables.
- Draw a square around the nonrenewables.

Energy Source Crossword

ACROSS
2. The energy of moving air.
5. The portable gas.
7. Gas moved in pipelines.
8. An atom of this element can be split.

DOWN
1. The energy of waste and wood.
3. Heat energy from inside the Earth.
4. The energy in flowing water.
5. Liquid fossil fuel.

Primary Energy Infobook Activities Evaluation Form

State: ___________  Grade Level: ___________  Number of Students: ___________

1. Did you conduct all of the activities in the guide?  
   - Yes  - No

2. Were the instructions clear and easy to follow?  
   - Yes  - No

3. Did the activities meet your academic objectives?  
   - Yes  - No

4. Were the activities age appropriate?  
   - Yes  - No

5. Were the allotted times sufficient to conduct the activities?  
   - Yes  - No

6. Were the activities easy to use?  
   - Yes  - No

7. Was the preparation required acceptable for the activities?  
   - Yes  - No

8. Were the students interested and motivated?  
   - Yes  - No

9. Was the energy knowledge content age appropriate?  
   - Yes  - No

10. Would you teach this guide again?  
     - Yes  - No

*Please explain any ‘no’ statement below.*

<table>
<thead>
<tr>
<th>How would you rate the guide overall?</th>
<th>excellent</th>
<th>good</th>
<th>fair</th>
<th>poor</th>
</tr>
</thead>
<tbody>
<tr>
<td>How would your students rate the guide overall?</td>
<td>excellent</td>
<td>good</td>
<td>fair</td>
<td>poor</td>
</tr>
</tbody>
</table>

What would make the guide more useful to you?

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

Other Comments:

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

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National Fuel
National Grid
National Hydropower Association
National Ocean Industries Association
National Renewable Energy Laboratory
NC Green Power
New Mexico Oil Corporation
New Mexico Landman’s Association
NextEra Energy Resources
NEXTracker
Nicor Gas
Nisource Charitable Foundation
Noble Energy
Nolin Rural Electric Cooperative
Northern Rivers Family Services
North Carolina Department of Environmental Quality
North Shore Gas
Offshore Technology Conference
Ohio Energy Project
Opterra Energy
Pacific Gas and Electric Company
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