

Energy Values



GRADE LEVEL:

Upper Middle/ High School

SUBJECT AREAS:

Social Studies, Science

DURATION:

Preparation Time: 15 minutes
(photocopies)

Activity Time: one class period

SETTING:

Classroom

SKILLS:

Application, Analysis, Evaluation

KEY WORDS:

Belief, Value, Mandated

SUMMARY

In this exercise the students will evaluate the feelings, attitudes, and behaviors held by themselves and others towards energy use and energy resources

OBJECTIVES

THE STUDENT WILL:

- Explore their attitudes toward several energy related requirements
- Discuss the role of values in forming opinions
- Determine which energy statements lead to the most variation in opinion
- Discuss strategies to find solutions on divisive issues related to energy use
- Discuss society's disconnection from the sources of our energy systems (extension)

MATERIALS

- Energy value statements (one sheet per student)
- Constructed response cards (one set per class)

Extension

- Selection from Aldo Leopold's essay *The Good Oak* (one sheet per student)

BACKGROUND

A belief is an idea, which a person holds to be true. The idea may or may not be true, but the person believes it is. In many cases a person's beliefs are strongly tied to his or her values. A value is the worth a person (or group) places on something. Usually, our values guide us in the choices we make.

-Investigating and Evaluating Environmental Issues and actions, Hungerford, et. al.

Many of the daily decisions we make affect our environment and the Earth's natural resources. An individual's beliefs and values often influence their attitude and behavior concerning an environmental issue.

Often our initial opinions are based on beliefs we hold concerning an issue and are related to our personal values. This activity is designed to evaluate how the students' feel concerning various value-laden statements related to energy use. The students are given the opportunity to explore why they have the opinion that they express and to listen and learn from other student's opinions.

PROCEDURE

WARM UP

Set the stage by asking the students the following questions:

- *What causes a person to hold an opinion on a subject or issue?*
- *What is a personal value?*
- *What is a belief?*

Mention to the students that this activity is designed to allow the students to compare their beliefs and values related to energy use.

ENERGY STATEMENTS

Hand out to each student a copy of the energy-related statements and ask them to circle a personal response to each question that they feel best represents their opinion and include a brief reason for their opinion in the space provided.

While the students are answering the questions the teacher should attach the response cards to a wall or to the floor from left to right as listed below:

STRONGLY DISAGREE
DISAGREE
NEUTRAL
AGREE
STRONGLY AGREE

Once the students have completed the statement sheet, the instructor should write the first energy related statement on the board. Ask the students to stand under the response card they felt best represented their opinion concerning this statement.

In a large class it may be best to select a couple rows of students to respond to a given question.

Once the students have taken their places indicating their position on the given statement, ask a few students to explain why they made the decision they made.

Very Important:

Assure the class that everyone has a right to their own opinion and to respect each other's positions.

The goal is to learn more about others perspectives and to understand the complexity of opinions surrounding energy use.

Encourage the students to provide specific reasons for their choices. After each student has expressed himself or herself, ask if any students would perhaps change their initial response. Ask the students why they would alter their initial response?

The teacher should keep track of the results for each question.

After working through each of the statements have the students take their seats and review the results of the responses for each statement.

CLASS DISCUSSION

Have the class determine which statement generated lots of different opinions in each response category. Ask the class to consider what does this say about the value statement?

Next determine which statement generated mostly strongly agree and strongly disagree. Discuss with the class why this statement generated such a strong set of opposing opinions.

Ask the students to consider why it is hard to solve environmental issues where there are strong differences in beliefs. Can the students think of ways to reach a common ground for a statement that generated a very polarized response?

Ask the students if there was a statement that they would have liked more infor-

mation on, before answering? If so what information would have been helpful.

Consider statements where a number of participants modified their choice after discussion. What does this reflect concerning the statement?

ASSESSMENT

When people with different values end up on different sides of an issue, conflicts can arise. Have the students revisit the most divisive of the energy-related statements and address the following questions

- How did you decide on your response to the energy statement?
- Are there any questions you would like to have asked prior to answering the energy statement?
- After hearing the other responses to the energy statement, explain how your own beliefs/values may have changed.
- What strategies could be employed to help the differing opinions reach a settlement?

EXTENSIONS

Have the student read the attached selection from Aldo Leopold's essay "The Good Oak".

Discuss the change in values that occur when one invests personal time obtaining an item or caring for something as opposed to simply purchasing it.

GOING FURTHER

Design a mock advertising campaign to promote greater awareness of the energy-related statement that created the most varying opinions.

MISSOURI LEARNING STANDARDS:

SCIENCE GRADE LEVEL STANDARDS:

Earth and Space Sciences

ESS3 — Earth and Human Activity

Concept C: Human Impacts on Earth's Systems

- **6-8.ESS3.C.1:** Analyze data to define the relationship for how increases in human population and per-capita consumption of natural resources impact Earth's systems. [Clarification Statement: Examples of data include grade-appropriate databases on human populations and the rates of consumption of food and natural resources (such as freshwater, mineral, and energy). Examples of impacts can include changes to the appearance, composition, and structure of Earth's systems as well as the rates at which they change.]

Concept D: Global Climate Change

- **6-8.ESS3.D.1:** Analyze evidence of the factors that have caused the change in global temperatures over the past century. [Clarification Statement: Examples of factors include human activities (such as fossil fuel combustion, cement production, and agricultural activity) and natural processes (such as changes in incoming solar radiation or volcanic activity). Examples of evidence can include tables, graphs, and maps of global and regional temperatures, atmospheric levels of gases such as carbon dioxide and methane, and the rates of human activities.]

SOCIAL STUDIES GRADE LEVEL EXPECTATIONS:

Disciplinary Tools

2. Government Systems and Principals

Theme 1: Tools of Social Science Inquiry

6-8 Geography

- **A.** Using a geographic lens, analyze laws, policies and processes to determine how governmental systems affect individuals and groups in society.
- **B.** Analyze current human environmental issues using relevant geographic sources to propose solutions.

NGSS:

Earth and Space Sciences

MS-ESS3 Earth and Human Activity

- **MS-ESS3-4:** Construct an argument supported by evidence for how increases in human population and per-capita consumption of natural resources impact Earth's systems. [Clarification Statement: Examples of evidence include grade-appropriate databases on human populations and the rates of consumption of food and natural resources (such as freshwater, mineral, and energy). Examples of impacts can include changes to the appearance, composition, and structure of Earth's systems as well as the rates at which they change. The consequences of increases in human populations and consumption of natural resources are described by science, but science does not make the decisions for the actions society takes.]

Science and Engineering Practices

Engaging in Argument from Evidence

Engaging in argument from evidence in 6-8 builds on K-5 experiences and progresses to constructing a convincing argument that supports or refutes claims for either explanations or solutions about the natural and designed world(s).

- Construct an oral and written argument supported by empirical evidence and scientific reasoning to support or refute an explanation or a model for a phenomenon or a solution to a problem. (MS-ESS3-4)

Disciplinary Core Ideas

ESS3.C: Human Impacts on Earth Systems

- Typically as human populations and per-capita consumption of natural resources increase, so do the negative impacts on Earth unless the activities and technologies involved are engineered otherwise. (MS-ESS3-3), (MS-ESS3-4)

Crosscutting Concepts

Cause and Effect

- Cause and effect relationships may be used to predict phenomena in natural or designed systems. (MS-ESS3-1), (MS-ESS3-4)

Influence of Science, Engineering, and Technology on Society and the Natural World

- All human activity draws on natural resources and has both short and long-term consequences, positive as well as negative, for the health of people and the natural environment. (MS-ESS3-1), (MS-ESS3-4)

Science Addresses Questions About the Natural and Material World

- Scientific knowledge can describe the consequences of actions but does not necessarily prescribe the decisions that society takes. (MS-ESS3-4)

Energy Statements

Instructions: circle the response that best reflects your opinion on the given statement and provide a brief reason for your answer

1. Car-pooling should be mandatory with fines for anyone traveling to work alone in a car?

Strongly Disagree Disagree Neutral Agree Strongly Agree

Reason: _____

2. People who keep their house very warm in winter instead of wearing warmer clothes are very selfish.

Strongly Disagree Disagree Neutral Agree Strongly Agree

Reason: _____

3. Because energy is required to manufacture products from raw materials, all citizens should be mandated by law to recycle materials and should be fined for throwing materials that can be recycled in the trash.

Strongly Disagree Disagree Neutral Agree Strongly Agree

Reason: _____

4. Energy conservation is not a big deal because future changes in technology will address our energy needs.

Strongly Disagree Disagree Neutral Agree Strongly Agree

Reason: _____

5. Car makers should be mandated to produce more fuel-efficient automobiles

Strongly Disagree Disagree Neutral Agree Strongly Agree

Reason: _____

6. To reduce American dependence on foreign oil, we should open wilderness areas for oil and gas drilling.

Strongly Disagree Disagree Neutral Agree Strongly Agree

Reason: _____

7. It is selfish to drive a gas guzzling large sport utility vehicle (SUV).

Strongly Disagree Disagree Neutral Agree Strongly Agree

Reason: _____

8. No one should live a “trophy” house that exceeds the space needs of their family.

Strongly Disagree *Disagree* *Neutral* *Agree* *Strongly Agree*

Reason: _____

9. I would be willing pay more for my electricity if I knew that a portion of it was produced using renewable energy sources.

Strongly Disagree *Disagree* *Neutral* *Agree* *Strongly Agree*

Reason: _____

10. Students should not be allowed to drive to school when they can save energy by riding the bus or walking.

Strongly Disagree *Disagree* *Neutral* *Agree* *Strongly Agree*

Reason: _____

For more information:

DNR Youth Education and Interpretation
P.O. Box 176
Jefferson City, MO 65102-0176
1-800-361-4827 or (573) 522-2656 office
e-mail: naturalresources.ed@dnr.mo.gov
<http://dnr.mo.gov/education>



Selections from:
The Good Oak
A Sand County Almanac
Written by Aldo Leopold

There are two spiritual dangers in not owning a farm. One is the danger of supposing that breakfast comes from the grocery, and the other is that heat comes from the furnace.

To avoid the first danger, one should plant a garden, preferably one where there is no grocer to confuse the issue.

To avoid the second, he should lay a split of good oak on the andirons [wood stove], preferable where there is no furnace, and let it warm his shins while a February blizzard tossed the trees outside. If one has cut, split, hauled, and piled his own good oak, and let his mind work the while, he will remember much about where the heat comes from, and with a wealth of detail denied to those who spend the weekend in town astride a radiator.

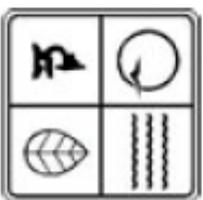
The particular oak now aglow on my andirons grew on the bank of the old emigrant road where it climbs the sandhill. The stump, which I measured upon felling the tree, has a diameter of 30 inches. It shows 80 growth rings, hence the seedling from which it originated must have laid its first ring of wood in 1865, at the end of the Civil War...thus [the oak tree] lived to garner eighty years of June sun. It is this sunlight that is now being released, through the intervention of my axe and saw, to warm my shack and my spirit through eighty gusts of blizzard. And with each gust a wisp of smoke from my chimney bears witness, to whomsoever it may concern, that the sun did not shine in vain...

...The good oak burns to red coals on white ashes. Those ashes, come spring, I will return to the orchard at the foot of the sandhill. They will come back to me again, perhaps as red apples, or perhaps as a spirit of enterprise in some fat October squirrel, who, for reasons unknown to himself, is bent on planting acorns.

-Aldo Leopold

ENERGY VALUES

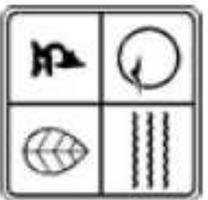
**Strongly
Disagree**



**Missouri
Department of
Natural Resources**

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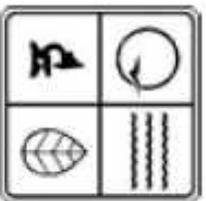
Disagree



Missouri
Department of
Natural Resources

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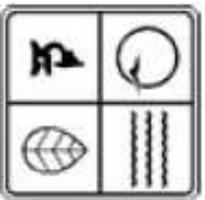
NEUTRAL



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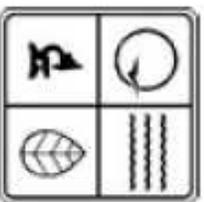
Agree



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Strongly Agree



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