

# Inside Energy Pre and Post-visit Classroom Activity

## Classroom Activity

### Brief Synopsis:

Students will be presented with situations about different topics connected to energy use. Students will need to decide how strongly they agree with one of each pair of five statements. Optional second post-activity involves students in an energy audit of either their own homes or the school building itself.

**Ages:** Designed for 4th—8th grade

**Time Considerations:** 2 sessions: 30 minutes before your Eagle Bluff trip, and 30 minutes after your Eagle Bluff trip

**Materials:** Rope or yarn (long enough for the whole class to stand next to it), Statement and Supporting Fact cards, clothespins (6/student + 6 for teacher use).

### Vocabulary:

Belief, respect, energy, opinion, fact.

### Outcomes:

1. Students will be able to express their beliefs about energy use.
2. Students will be able to describe whether their beliefs about energy use changed because of hearing additional information and/or because of discussions with other students.

### Minnesota Academic Standards:

**Language Arts:** 5.8.4.4, 5.10.1.1, 5.10.3.3, 6-8.9.4.4

**Science:** (only for the optional post activity) 5.1.3.4.1, 5.3.4.1.3, 5.4.4.1.1, 6.1.3.4.1, 7.1.3.4.2, 8.1.1.1.1, 8.1.3.4.2

**Math:** Various depending on which audit activity (optional post activity) is chosen.

**Set up:** Attach the rope to a wall, or lay it across the floor, designating one end as “A” and the other as “B”. It will be helpful if the rope can stay up for a while, or be easily taken down and re-set-up for later use. Mark the clothespins (6/student) with colored stickers, or written labels (1-6) to demark six different sets. Print off the six pairs of statement cards, giving each of these their own clothespin.

**Pre-Visit Activity: Where do You Stand?** (see alternate Pre-visit option on next page)

**Background:** This activity gives students the opportunity to share their beliefs and opinions. Some students will eagerly share their opinions, but may not be able to explain why they believe as they do, or may have based their beliefs on incomplete or erroneous information. Part of what students should learn in doing this activity is to provide support for beliefs based on sound information and to understand that it is okay to change your opinions and beliefs when you learn new information. Other students may find it hard to understand that it is possible for there to be different acceptable opinions for the same topic. Be sure that students understand that they need to speak and act respectfully as others share opinions.

### Procedures:

Ask students to name things that are important to them. Guide them to understand that these can include materials items, people, principles, and beliefs. Ask them to explain why those things are important.

Introduce the idea of belief: an understanding or conviction that something is true or right; to be convinced of the truth or existence (of). Discuss with the students that beliefs affect the decisions we make – why and how we do things. Discuss that sometimes, our beliefs change as we learn new information and gain a deeper understanding of the situation.

Share with the students some of the key beliefs of your school (e.g. the importance of education, respect, cooperation, etc.). You may want to use your school’s code of conduct policy, or other agreement you have with your students.

Next, ask the students to think about different ways people use energy. After several students have shared their ideas, focus the discussion on how people may use energy differently based on their knowledge of how or why it should be used.

Hand out a set of clothespins (6) to each student, having them add their name to each of their clips (pencil, tape, etc.) Explain to the students that they will be presented with two different perspectives at a time and will need to decide, to what degree, they agree with either statement. Point out the rope and signs. Explain that they should position themselves at a point along the rope where their beliefs lie. Remind them that this is not a popularity contest and that they should not go somewhere just because a friend is there. Also remind them to respect others’ opinions. Depending on the size of the group, you may need to have only half of the group go up at a time.

Read a pair of statements, clipping them to the corresponding ends of the rope (“A” vs. “B”) Give the students a set amount of time to pick the spot for their clothespin. You may want to have students return to a specified area to signal they are done adding their appropriately colored or marked clothespin to the rope.

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Ask a few students to explain why they choose this point on the rope, choosing students from either end, or from the middle to compare reasoning. Encourage students to back up their opinions with facts, examples, or information. Some students may have trouble articulating why they believe as they do. Point out that sometimes, we may need more information to help understand what we believe.

Read another statement, following the same procedure as you did earlier, leaving all the clothespins in place, until all six sets of statements have been used.

Tell students they will be learning more about energy and our environment during their Eagle Bluff visit, and that the class will be re-visiting this opinion / perspective line when you come back from your trip. The clips will stay in place until the next use.

### Post-Visit Activity: Where do You Stand?

#### Procedures:

Review with the class what experience they had with the *Inside Energy* class at Eagle Bluff. Have students brainstorm what activities they were involved in and what was learned during class. Use the fact cards from this lesson to help students remember what was covered in *Inside Energy*.

Second, remind students of the opinion/perspective line they created before their trip, and let them know you will be doing the same activity again. This time students will locate where they left their clothespin before each pair of statements is read, listen to the two statements, then decide if they want to move their clip or keep it in the same location.

As before, ask a few students to explain why they choose this point on the rope, this time choose students who changed position, and have them focus on what changed their minds. Encourage students to back up their opinions with facts, examples, or information. If students have trouble articulating why they believe as they do, ask why they may be struggling, and encouraging them to seek additional information.

#### Additional Suggested Activities:

##### Pre-Visit Activity: Energy Vocabulary Worksheet

The final two pages of this document are the student page and answer key for an Energy Vocabulary Worksheet. This Pre-visit activity is recommended for students who need practice with energy terminology, especially understanding the difference between FORMS and SOURCES of energy.

##### Post-Visit Activity: Home or School Energy Audit

Have students conduct an energy audit of their own home or of the school building itself. There are several worksheet and digital calculators to assist in designing the energy audit best suited for your class. See *Additional Resources* in the shaded column to the right for suggested websites.

## Teacher Tips

- Use a neutral voice and body language while reading each value statement, to avoid revealing your own opinions
- Use a different color clothes pin for each pair of statement cards
- If the classroom itself has a scale set up, you can use the wall or floor in place of the rope or yarn, and use colored sticky notes to place each students' values on the wall or floor.
- Add more pairs of value statements which may be more appropriate to your classrooms' focus
- Remove pairs of value statements to keep the activity shorter or more simplified

### Additional Resources

The Where do You Stand activity is adapted from Lesson 8 of the *Doing the 4Rs: A Classroom Activity Guide to Teach Reduce, Reuse, Recycle and Rot* create by irecycle@school program from Alameda County's StopWaste.Org program.

<http://www.calacademy.org/teachers/resources/lessons/energy-audit/>

A complete lesson plan designed by teachers for the California Academy of Sciences, highlighting data collection and many mathematical concepts. Includes down-loadable lessons and worksheets.

[http://www.enwin.com/kids/downloads/kidszone\\_home\\_audit.pdf](http://www.enwin.com/kids/downloads/kidszone_home_audit.pdf)

A 3-page, multiple-choice survey for kids to conduct on their home. Includes both water and energy use in the survey. Provides scoring at the bottom of the survey so students can grade themselves on the spot.

<http://www.nwf.org/Eco-Schools-USA/Become-an-Eco-School/Pathways/Energy/Audit.aspx>

A school energy audit created by the National Wildlife Federation's Eco-Schools USA. This site includes three downloadable documents including a school energy audit form (pdf), a carbon calculator (excel spreadsheet), and school tally sheet (excel spreadsheet), to evaluate the entire school building.

**Statement One A**

**I should be able to use energy resources in any way I need or choose.**

**Statement One B**

**Some resources are more valuable than others and should only be used if really needed.**

**Statement Two A**

**Saving the energy we already have is more important than finding new sources of energy.**

**Statement Two B**

**Finding new sources of energy is more important than saving the energy we already have.**

**Statement Three A**

**Recycling and composting is hard and takes a lot of time. Putting things in a landfill is the best way to deal with waste.**

**Statement Three B**

**Recycling and composting are always worth doing because we should stop putting things in landfills.**

**Statement Four A**

**I think about how my choices impact the earth, because it is important when I make a decision.**

**Statement Four B**

**I do not think about how my choices impact the earth, because it is not important for making decisions.**

**Statement Five A**

**What I believe and think are true facts and those who disagree wrong.**

**Statement Five B**

**Everyone gets to have their own opinion, even if it is different from mine.**

**Statement Six A**

**Technology will be able solve any problem if there is enough time to figure it out.**

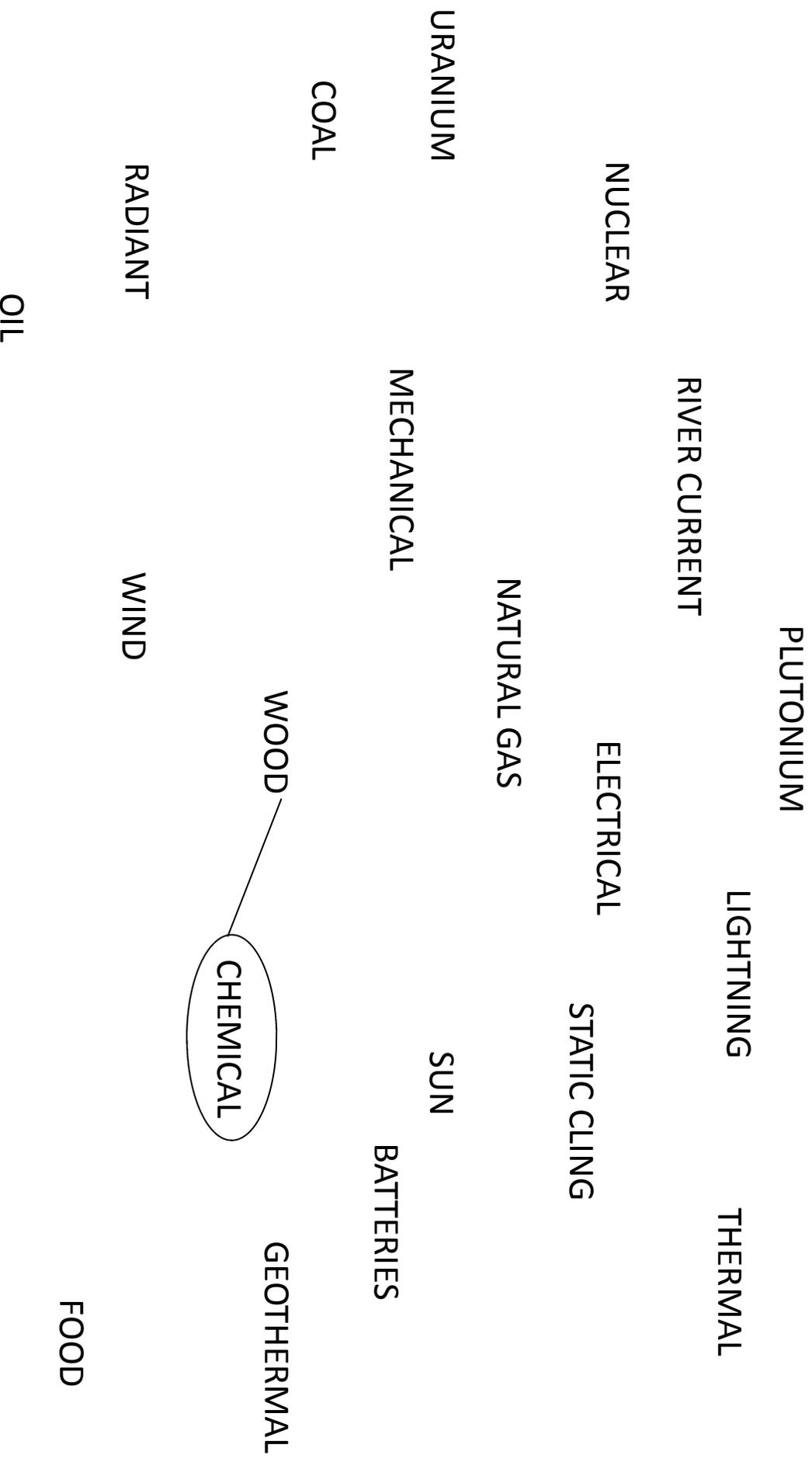
**Statement Six B**

**Ideas can solve any problem we have now, without any new technologies.**

## Energy Forms and Sources

Energy is an important part of our everyday lives. Not only does everything we do involve energy, everything that happens in the entire universe involves energy. It is all around us, but we cannot touch energy, because it has no mass. You can, however see and feel the effects of energy on many materials because energy can produce motion, heat, or even light. Energy comes in six main **FORMS**, which are all related to each other and can be converted or changed from one form to another. Each form in turn can be from a number of **SOURCES**. For example a **SOURCE** of **CHEMICAL** energy is **WOOD**.

Circle all **SIX FORMS** of energy, then draw a **line connecting** each **FORM** to each of its **SOURCES**. The first one has been done for you.



## Energy Forms and Sources—ANSWER KEY

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