

Classroom Energy Flow

Objective

- Students will identify the flow of energy through various objects within their classroom.

Procedure

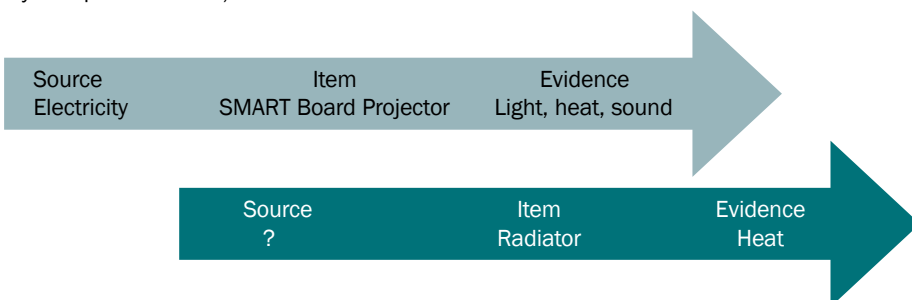
- Review as necessary the evidence of energy in students' lives (movement, light, sound, and heat). Make sure students recognize common sources of energy (electricity, batteries, human effort, etc.).
- Inform the class that they're going to make an energy map of the classroom.
- Divide the class into small groups. Give each group an **Energy Flow Arrow**. Tell students they will be posting the arrows on items in the room that display evidence of energy.
- Explain that the arrow has three parts. In the middle of the arrow, students will write or draw an item in the room. On the pointed end of the arrow, students should write or draw the evidence of energy the item displays. On the base of the arrow, students should write the source of energy for the item. Tell them to draw a question mark if they do not know the source.
- Share the following two examples. In the first example, the SMART Board Projector emits light and gets its power from electricity. Students might also notice that the projector gives off heat and sound. Decide if you want to add that to the same arrow or use a separate arrow for each evidence of energy. In the second example, students might know that heat comes from a radiator, but they don't know what the energy source is (indicated by the question mark).

6. Ask each group to identify one item and make an arrow for it. If students have trouble finding items, refer them to the list of **Common Classroom Energy Items**. Hand out more arrows as needed until there are arrows over all appropriate energy items. NOTE: An alternative is to make a game out of the activity. For example, one group identifies an item and another group has to identify the energy form or the source or both.

7. After items in the room have been labeled, have the entire class share their labeled items and energy flows for the classroom. Work with students to fill in any blanks or clarify incorrect information. For example, if students do not know the source of heat for the radiator, whom could they contact to find out? They might want to invite the custodian or facility manager to explain or give them a tour of the heating and air conditioning system for the school.

Assessment

- Use the Energy Flow Arrows to quiz students on how items in the room transfer energy by having students fill in blank sections of the arrow; this assessment can be in a game format like in Step 7.
- Have students refer to the arrows to make a map of the room in their **Energy Learning Logs** and diagram the classroom energy flows (it might help to draw the map from a bird's-eye view). If the class is making an **Energy Flow Mural**, have them locate where their electricity or natural gas source comes from and put this information on the mural.



Summary:

Students create an energy flow diagram of their classroom by labeling and describing how objects in their classroom transfer energy.

Grade Levels: K-4

Subject Areas: Physical Science, Environmental Literacy & Sustainability

Setting: Classroom

Time:

Preparation: 10 minutes
Activity: Two 50-minute periods

Vocabulary: Energy, Energy source, Heat, Light, Light energy

Standards Addressed:

CC ELA: L.K.4.A, L.K.5.A&D, L.K.6, L.1.4, L.1.5.A-B, L.1.6, L.2.3&6, L.2.4.A-E, L.2.5.A-B, L.3-4.3, L.3.4.A-D, L.3.5.B, L.4.4.A-B, RI.2-3.10, RI.3-4, RI.4.3&10, SL.K.1.A, SL.K.3-4&6, SL.1.1.A-C, SL.1.4, SL.2.1.A-C, SL.2.2, SL.3.1.A-B&D, SL.3.6, SL.4.1.A-D, W.2.7, W.K.2&8

NGSS: 4PS3-2

SEP: Planning and Carrying Out Investigations

DCI: PS3.A: Definitions of Energy

CCC: Energy and Matter

EL&S: Explore: EX4.A.i, EX4.B.e

Engage: EN6.A.i, EN6.C.e

Materials:

- Copies of **Energy Flow Arrows**
- Masking tape
- Energy Learning Logs** and writing implements

Related KEEP Activities:

Have students participate in KEEP activities "Evidence of Energy" and "Where Does It Get Its Energy?" prior to this activity to help them recognize energy forms and sources. Available at keepprogram.org.



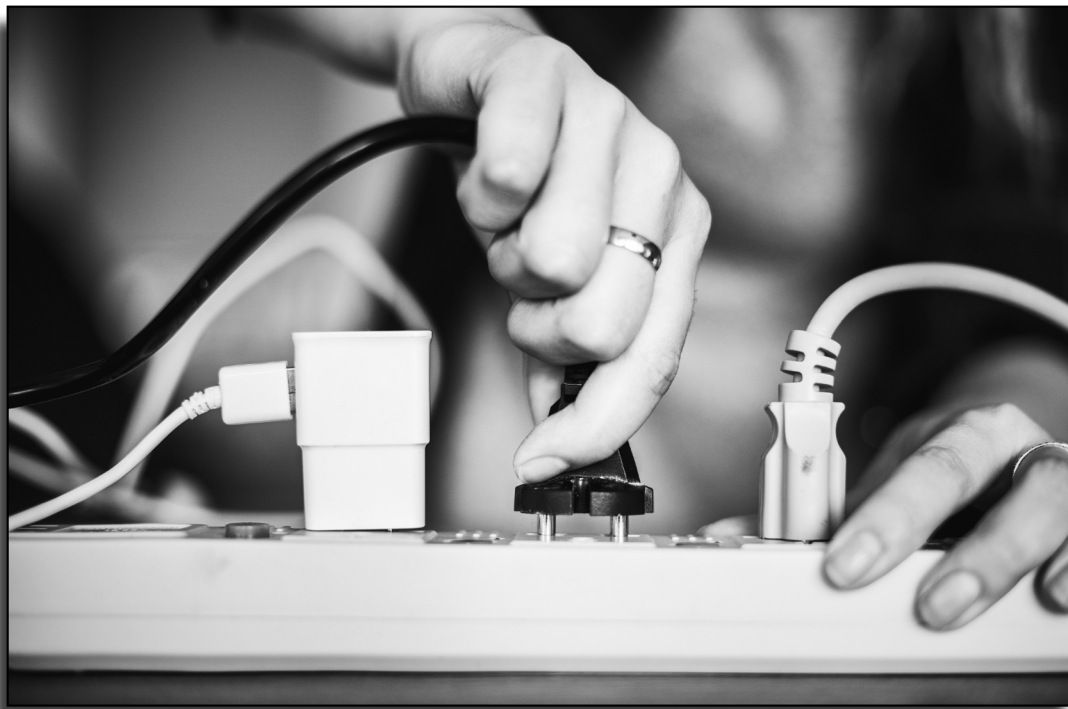
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Extension

Challenge students to trace the sources of energy further back. For example, they might have identified electricity as powering many items, but do they know where the electricity comes from? This activity would be a great opportunity to invite a representative from the community utility to present about electricity generation and energy resources, such as coal and nuclear. The representative can also share important electrical safety information.

Common Classroom Energy Items

- Lights, appliances
- Radio, television
- Furnace and air conditioner vents
- Gas hookups in science laboratories
- Projector
- Sinks (hot water)
- Computers
- Clocks





Energy Flow Arrows

