



**GREEN
LIVING
SCIENCE**

ACTIVITIES

FOR EDUCATORS



**PREPARED BY:
GREEN LIVING SCIENCE EDUCATORS**

ENERGY CHARADES

Objectives: Students will compare the differences between renewable and nonrenewable resources in how they impact our planet when used to generate electricity.

Time Needed: 30 Minutes

Participant Information: 3rd-8th grade, 25 kids

Appropriate Settings for Activity: In Class Lesson, Outdoor Classroom, After School, Recycling Team Training

Supplies/Materials Needed:

Energy Charade step Cards

Procedures:

- Ask students if they know the process of how energy sources like coal or wind become the electricity needed to turn on a light bulb. Show students pieces of coal and explain that energy comes when we burn coal, making it the source of energy. Then show students a pin wheel, explain that this is similar to a wind turbine and that wind creates energy by making the blades of a turbine move, making wind be the source of energy.
- Explain to students that they will be playing a game of charades to gain a better understanding of how we get energy from renewable and nonrenewable resources. Be sure to emphasize that in charades there is no talking only acting to show each step in the process. Explain that students will work with a partner or group to create an action that depicts a given step in the process of extracting resources to create the energy required to turn on a light bulb. Divide students into groups and distribute steps. Allow five minutes for students to create an action that shows their step.
- Depending on space constraints have students either come to the front of the room or stand near the edge of the room so all other students can see the group act out the step. Be sure that the rest of the class understands that while this might get a bit silly it is important to remain respectful and quiet while their classmates act their step.
- Explain that when their step is read they will stand; first read through the step then have students start acting as it is read through for the second time. Post a large print of the steps on the board as students finish acting.
- Start with coal, and after acting all of the steps ask students what type of resource is coal. Explain that coal is a nonrenewable resource and ask a student to explain why it is considered a nonrenewable resource. Have students recall how many steps were required to turn on a light bulb using coal. (8). Then move on to the steps that will act out wind.
- After acting out all of the steps ask students what type of resource wind is. Explain that wind is a renewable resource then ask students why it is considered a renewable resource. Have students recall the number of steps required to turn on a light bulb using wind (5).
- Have students compare and contrast coal and wind. Focus on how wind requires less steps than coal because it does not need to be transported. Also discuss how wind does not need to be processed like coal; ask students to remember the processes that occurred inside the energy factory that require energy (pulverized, burned, transported on conveyors). Be sure to point out that both coal and wind both cause electrons to flow by making a turbine move except coal must be burned to create steam while the wind occurs naturally.

Procedures:

- Ask students which of these they think is better to reduce the impact upon the environment and why. Be sure that students understand that coal requires hidden energy costs like the transportation of the coal from the mine to the energy factory and the machines that move and pulverize the coal inside the plant which also require energy; making coal a more harmful choice in terms of the energy it takes to create energy. Also be certain students understand that burning coal creates pollution released into the air that can harm the environment.

Charade Steps

Coal:

1. Coal Miner: the miner digs coal out of an underground mine, sends it above ground, and puts it in a truck.
2. Coal Truck: when the truck is full, a worker drives it to the energy factory and unloads the coal onto a conveyor.
3. Energy Factory Conveyor Belt: the belt moves the coal from the truck to the inside of the energy factory
4. Energy Factory Pulverizer: a large machine called a pulverizer crushes the coal
5. Energy Factory Furnace: the coal is set on fire and burns in a large oven. As the coal burns, it produces steam
6. Energy Factory Generator: steam forces a turbine to move in a circle, which causes electrons to flow and create electricity
7. Power Lines: power lines bring electricity from the energy factory to the school
8. Light Bulb: when you turn on a light switch the electricity is delivered to the light bulb and it turns on

Wind:

1. Wind: wind blows up in the sky where the turbine is located
2. Turbine Blades: the fast blowing wind causes the three blades of the turbine to turn in a circle
3. Generator: the spinning blades of the large turbine cause a smaller turbine inside to spin even quicker. The spinning of the smaller turbine cause electrons to flow and create electricity
4. Power Lines: power lines bring electricity from the energy factory to the school
5. Light Bulb: when you turn on a light switch the electricity is delivered to the light bulb and it turns on



ABOUT US

NONPROFIT ORGANIZATION

Green Living Science is a 501(c)3 nonprofit organization founded in 2011 as a result of the City of Detroit recognizing the need to improve the environmental sustainability efforts of the city.

Funded through grants, corporate sponsorship, and individual donors our programs engage the youth, neighborhoods, and businesses in and around Detroit.

OUR MISSION

To transform Detroit by teaching about waste and recycling.

Green Living Science is dedicated to working alongside Detroiters to increase recycling participation and awareness of environmental issues and personal responsibility through education.

OUR VISION

Universal environmental literacy, advocacy, stewardship, and justice.

Green Living Science envisions a Detroit with a robust circular economy and citizens who are mindful about our environment and natural resources.



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