



Connecting Experience Energy Experiments

AGE GROUP

11+

AMOUNT OF PEOPLE

3+

TIME

3 HOURS

OBJECTIVE

To learn about the different sources of clean Energy.

MATERIAL

Differs by activity, see below



Instructions

There are five main categories of Clean Energy.

- ▶ **Solar energy:** Energy from solar radiation. It only works when there is sun, but it can be used as an individual source of energy in your home and on a bigger scale
- ▶ **Wind power:** Uses the kinetic energy of the wind. It makes electricity when it's coupled with a generator. It only works when there is enough wind
- ▶ **Hydroelectric energy:** this category groups together all types of energy that uses water as sources of energy. It is used for large scale production
- ▶ **Biomass:** it's an organic matter origin energy. The most common type is the burning of wood. Biomass can only be considered as a renewable energy source if its regeneration is higher than its consumption
- ▶ **Geothermal energy:** the extraction of energy from the earth's crust. It is one of the only types of energy that is not weather dependant

Through these scientific experiments, the participants are going to discover each one of the 5 categories. If you have enough leaders and materials, divide the group into 5 teams and have each group try each experiment. Alternatively, do the experiments one by one as a group.

We recommend starting with the Sun experiment as some time is required to see the results.

Sun Power:

Materials: water, bowl, black paint, mirror, can of soda, thermometer

Instructions:

- ▶ Ask the group to create the best method to make the water hot
- ▶ The "better" method is to paint the can black and put the mirror above it
- ▶ Take the temperature of the water at the beginning and ask them to check on it every 30 minutes

Geothermal Energy:

Materials: chalk (red if possible, you'll need about 1/8 = 5 grams), 100 ml sunflower oil, flat-heat candle, clear glass container, tripod

Instructions:

- ▶ Grind the red chalk to a powder and add it to 20 ml of sunflower oil
- ▶ Carefully pour this coloured oil into the bottom of your container
- ▶ gently pour the rest of the oil along the wall of the container
- ▶ let it sit until both the oils are settled, with the coloured oil underneath the natural oil
- ▶ Put the container on the tripod and light the candle underneath

Youtube video

https://www.youtube.com/watch?v=HmBHKeemZVY&feature=emb_title



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Biomass:

Material: glass bottle, plant matter eg. leaves, vegetable peeling, source of heat (radiator or sun)

Instructions:

- ▶ Fill the glass bottle halfway with moist plant matter from the garden
- ▶ Seal the bottle
- ▶ Place the bottle near a source of gentle heat (sun, radiator) and let it ferment
- ▶ After 5 to 7 days, open the bottle, taking care to keep it away from any flame or heat source and not to point the bottle towards anyone's face
- ▶ When opening the bottle, you will hear a slight hissing sound and a foul odour will be released: the organic matter has fermented and biogas under pressure has formed!
- ▶ Repeat the experiment with other kinds of biomass, such as leftovers from dinner

Hydroelectric Energy:

Material: plastic bottle, straw (3 short pieces), water, bowl, string, modelling clay, somewhere to hang the bottle

Instructions:

- ▶ Make 3 holes in the bottom of the plastic bottle
- ▶ Put the half straw in each hole
- ▶ Seal well to make it watertight
- ▶ Hang the bottle above the bowl
- ▶ Put some water in the bottle
- ▶ Watch what happens!

Youtube video

<https://www.youtube.com/watch?v=dwx9vv206j0>

Wind Power

Material: a balloon, old CD, a bottle cap, Table or flat surface

Instructions:

- ▶ Take the bottle cap and make some small holes in it
- ▶ Glue that cap to the CD
- ▶ Inflate the balloon
- ▶ Put the balloon on the cap
- ▶ Put the disc and the balloon on the ground. The air from the balloon must escape under the disc (between the disc and the ground)
- ▶ The hovercraft moves smoothly until the balloon is completely deflated

Youtube video

<https://www.youtube.com/watch?v=tFrnlJr8ueI>



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