

## 2.4. Those Who Know the Difference Come Here

**Aim:** To recognize sustainable and renewable and non-renewable energy sources and to distinguish between environmentally friendly ones.

**Duration:** 40 minutes

**Preliminary Preparation:**

- The number of students is divided by 7. The words "Solar, Wind, Geothermal, Hydroelectric, Fossil Fuel, Nuclear, Biomass" are written on a draft A4 paper. For example, if you have a class of 30 students, 4 of each of the five words you will choose because it is not exactly divided, and 5 of each of the other two words. If it divides exactly, for example, if you have a class of 28 students, you write 4 of each word. Cut and fold the papers and put them in a bowl.
- "Sustainable Energy Coloring Page" is reproduced as many as the number of students.

**Instruction:**

### Does Anyone Know the Difference?

Write "Renewable Energy", "Sustainable Energy", "Non-renewable Energy" on the board. The following explanation is summarized in the teacher's own words:

Are the words "Renewable Energy" and "Sustainable Energy" synonymous? Answers are received from 2-3 students.

"Both aim to reduce carbon footprint and mitigate climate change, but they are not the same thing. Sustainable energy is also renewable, but not all renewable energy is sustainable. For example, solar, wind, geothermal and hydropower are both sustainable and renewable energies and are the best option for the environment. Geothermal energy is produced by the decay of radioactive materials in the rock and fluid in the Earth's core. Geothermal energy is renewable because the Earth has an almost unlimited supply of heat generated by its core. Hydroelectric energy, obtained through water, is renewable because the water cycle is a continuous process that recharges itself. Biomass energy is a renewable organic energy source derived from plants and animals. However, it is not sustainable because, for example, the rate of plant harvesting can exceed the rate of plant growth, in which case it is no longer sustainable. Some energies are also non-renewable. Does anyone know?"

2-3 students respond. "Fossil fuels and nuclear energy can be categorized under two main headings. Fossil fuels are natural resources with high levels of carbon in their structure. These energy sources obtained from living remains include oil, coal and natural gas. They are very harmful for the environment."



## Grouping

Each student draws one of the prepared papers from the bowl. Students who have the type of energy and the answer to the definition/explanation come together and form a group.

- Sustainable and renewable radiant energy (solar)
- It is the energy obtained from non-renewable fuels such as coal, oil and natural gas, which are formed by the dissolution of dying living organisms in an oxygen-free environment for millions of years. (Fossil Fuel)
- Sustainable and renewable, it is the energy of movement of air currents (Wind).
- Sustainable and renewable, it is the energy generated by the heat from hot water, steam or magma deep in the earth coming to the surface through cracks. (Geothermal)
- A renewable, non-sustainable, organic energy source derived from plants and animals (Biomass)
- Sustainable and renewable energy obtained by utilizing flowing water (Hydroelectricity)
- A non-renewable form of energy derived from the nucleus of the atom (Nuclear)

After the groups are formed, this instruction is given. "Those who have environmentally friendly energy, hold your arm up with your thumb up 👍 and jump by saying "YEEEEEEEEES".  
Solar, wind, hydroelectric, biomass and geothermal groups jump.

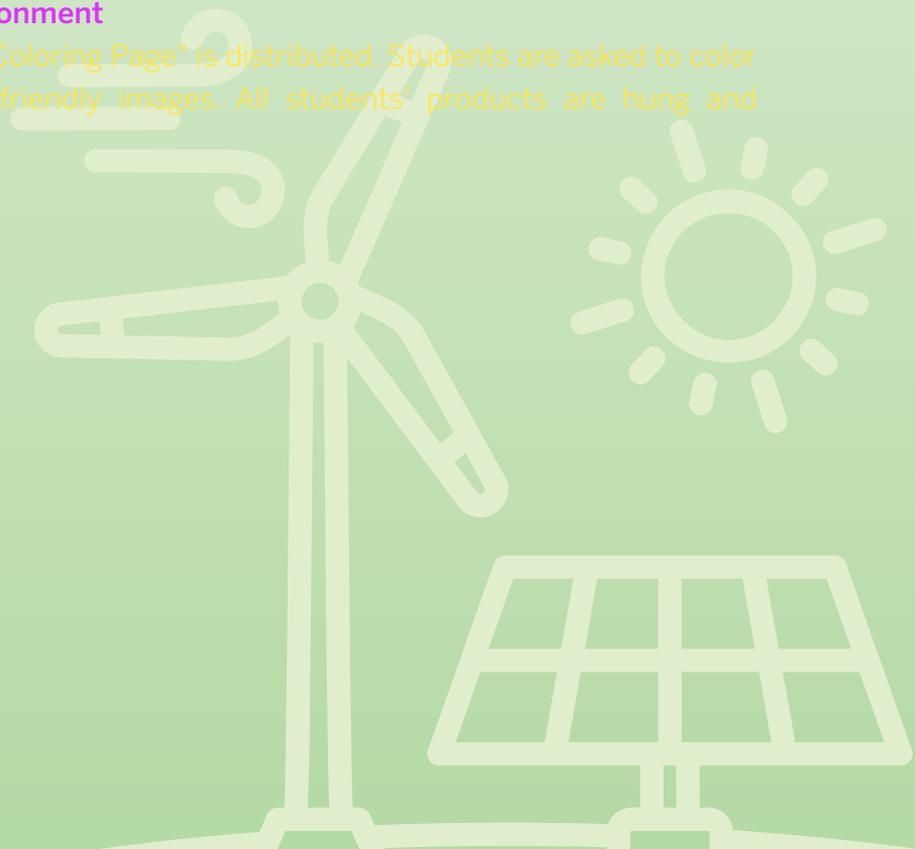
"Those who have not environmentally friendly non-renewable energy, squat with your thumbs down 👎 cross your arms and say "NOOOOOO". Fossil fuel and nuclear energy groups squat.

## Find the 7 Differences

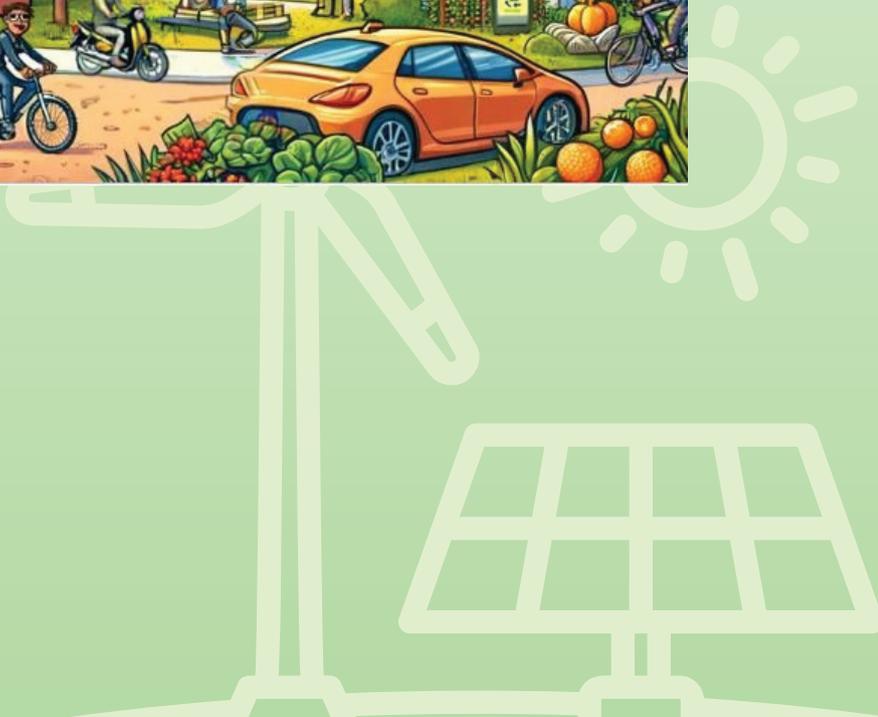
The attached "Find the 7 Differences" activity is projected on the smart board. 7 groups work silently until they find all the differences and take notes. Then each group is asked to show and tell one difference. When all the differences are found, the whole class applauds themselves.

## Let's Paint for a Sustainable Environment

The attached "Sustainable Energy Coloring Page" is distributed. Students are asked to color only sustainable environmentally friendly images. All students' products are hung and exhibited.



APPENDIX: FIND THE 7 DIFFERENCES



APPENDIX: FIND THE 7 DIFFERENCES ANSWER KEY



APPENDIX: SUSTAINABLE ENERGY COLORING PAGE

