TEACHER RESOURCE: Solar Oven Activity
Grade 7-9

What's Included

The resources are in 3 sections:

1. This Teacher Resource

2. Student Activity Sheet

Solar Oven Activity (approx. 45 min.)

This activity can be used without the fact sheet and experiment for a lighter, more fun approach.

Experiment (approx. 2 days - 1 hour each day) - Optional

This provides an additional, more in-depth look at the solar oven using scientific procedures

- Compare inside vs outside temperature
- Compare cloud cover vs clear sky
- Further experiments could be added;
  - Morning vs afternoon
  - Direct sunlight vs indirect sunlight
  - Material variations (try designing an oven out of different materials)

3. Solar Thermal Energy Fact Sheet *(Advanced)*

This reviews many relevant science concepts which can be drawn from the activity.

- The Importance of Sunlight
- Electromagnetic spectrum
- Thermal energy
- What is Albedo?
- Uses of Solar Thermal Energy
- More Resources (for students to explore)

Learning Outcomes

This is low cost activity with a variable time commitment that makes the learning experience fun!

The solar oven pizza box is a great opportunity to demonstrate how solar thermal energy can be harnessed to do work. This is demonstrated in a way they can see, feel and taste!

This is a great complimentary exercise if you and your students are exploring society's impact on the environment in regards to greenhouse gases, with a solution based, hands on project that makes learning fun.

This can also be used to connect the demonstration of solar thermal energy to other real-world low carbon technologies such as solar thermal space heating and solar thermal hot water technologies.

Curriculum Connections

Science 7- Key Concepts

- Heat transfer
- Thermal energy
- Temperature
- Insulation and thermal conductivity

Science 8 – Key Concepts

- Transmission and absorption of light (transparent and opaque materials, albedo)

Science 9 – Key Concepts

- Identify forms of energy (light and thermal energy)
- Energy transformation and transfer (light Energy to thermal energy).
- Renewable and non-renewable energy

All curriculum connections were derived from https://www.alberta.ca/programs-of-study.aspx.

More Resources

What Colors Absorb More Heat?
https://sciencing.com/colors-absorb-heat-8456008.html

Thermal Energy - Feel the Burn - SolarSchools.net
https://www.solarschools.net/knowledge-bank/energy/types/thermal

The 5 Most Common Examples Of Solar Power
https://news.energysage.com/most-common-solar-energy-uses/

Solar Energy to the Earth - Energy Education
https://energyeducation.ca/encyclopedia/Solar_energy_to_the_Earth

Word of the Week: Electromagnetic spectrum - EarthSky
https://earthsky.org/space/what-is-the-electromagnetic-spectrum#:~:text=The%20electromagnetic%20spectrum%20is%20the,alternating%20electric%20and%20magnetic%20fields.

How exactly does light transform into heat - Scientific American
https://www.scientificamerican.com/article/how-exactly-does-light-tr/

Albedo - Encyclopaedia Britannica
https://www.britannica.com/science/albedo

Solar: A brilliant way to get energy - David Suzuki Foundation
https://davidsuzuki.org/story/solar-a-brilliant-way-to-get-energy/

Energy storage gives renewables a jump-star- David Suzuki Foundation
https://davidsuzuki.org/story/energy-storage-gives-renewables-a-jump-start/

VIDEO - Solar Thermal 101 - YouTube - Student Energy
https://www.youtube.com/watch?v=FgjfJGfusdE

VIDEO - Concentrating Solar Power-Power Towers - KeepItCleanCreative
https://www.youtube.com/watch?v=QTNU1JMhzxA