

A2 ACTIVITY 7: HEATING AND COOLING

Background

This activity allows students to explore the **heating** and **cooling** of a brick, a lump of iron and water. It is a lead-in to an exploration of various **energy systems** – **mechanical, electrical, thermal** and **chemical** – and creates an opportunity for students to observe **energy flows**.

This activity relies on access to the [PhET simulations](https://phet.colorado.edu/en/simulation/energy-forms-and-changes) from the University of Colorado, Boulder, USA. The simulations are interactive and have the added bonus of being available in different languages. The simulation [Energy Forms and Changes](https://phet.colorado.edu/en/simulation/energy-forms-and-changes) contains a comprehensive teacher's guide and a list of suggested ideas. It can be used with a projector to share the screen with the class; either the students may direct the action while the teacher makes suggestions, or vice versa.

What you need:

There are three ways to run [PhET simulations](https://phet.colorado.edu/en/simulation/energy-forms-and-changes):

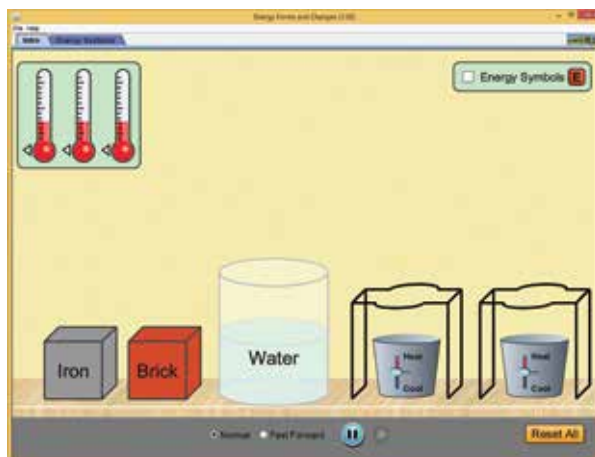
- Run them online in class, or;
- Install all the simulations onto a drive thus eliminating the need for an internet connection to run the simulations, or;
- Download the simulations needed, again eliminating the need for an internet connection to run the simulations.

Suggested approaches:

- This link: <https://phet.colorado.edu/en/simulation/energy-forms-and-changes> will take you directly to the simulation.
- Showing simulations on the whiteboard makes it possible for all the students to participate. Students can guide either the teacher or other students in the actions taken. Using the simulations this way helps to ensure that the whole class are seeing the same thing and allows the teacher to address any possible misconceptions as they come up.

Preview

- The first simulation is an **introduction to energy**. It shows how energy is **added** or **removed** through **heating** and **cooling**.



PhET Interactive Simulations
University of Colorado
<http://phet.colorado.edu>

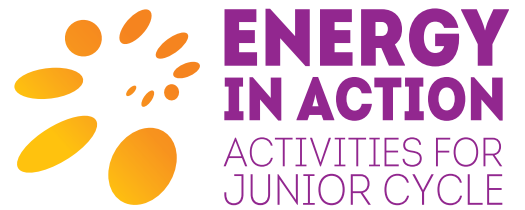


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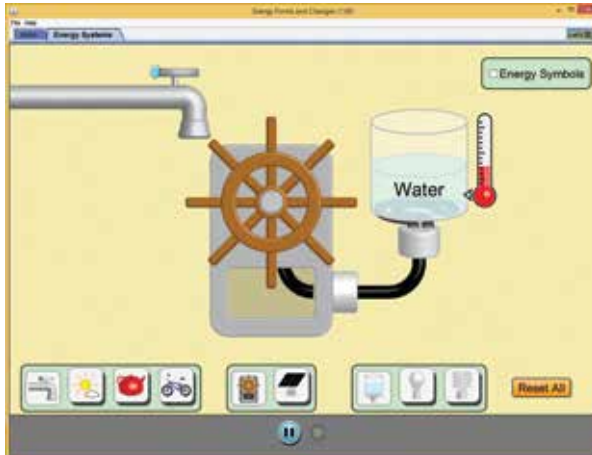
STRAND A

ENERGY AND SUSTAINABILITY

A2: CHANGING ENERGY



- ii. The second exercise simulates an investigation into energy flow and energy changes in various energy systems.



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