teacher guide

Energy transformations 2: Investigating energy

Components

	NAME	DESCRIPTION	AUDIENCE
	*Investigating energy* teacher guide	This guide explains how students can explore concepts of energy types and transformations through practical activities.	teachers
	*Junk cars* procedure sheet	Students use recycled material to make a car that rolls as far as possible down a slope. They investigate a variety of ways to provide their car with energy, including: wind energy, solar energy and chemical energy.	students
	*Waste energy* procedure sheet	A series of short activities demonstrates that waste energy is released as heat during various energy transformations.	students

Purpose

Students **Explore** ways energy can be converted to kinetic energy to make a car move. They also explore how energy is wasted, as heat, during energy transformations.

Outcomes

Students:

- understand that energy is required to bring about change or make things happen;
- list some types of energy and give examples of their sources;
- explain that energy can be transformed from one type to another;
- understand that energy transformations are not always efficient, and that energy is often wasted as heat; and
- design and carry out an investigation to solve a problem.

Activity summary

ACTIVITY	POSSIBLE STRATEGY
Students perform an investigation described in the procedure, *Junk cars*. Suggestions and possible examples are included below in **Teacher notes**.	small groups
Students use the procedure sheet, *Waste energy*, to explore where wasted energy goes.	small groups

Technical requirements

The teacher guide and procedure sheets require Adobe Reader (version 5 or later), which is a free download from www.adobe.com. The procedure sheets are also provided in Microsoft Word format.

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Elastic band powered

Equipment:

- basic junk car with rotating rear axle
- 2 elastic bands

Chemical reaction powered

Equipment:

- basic junk car
- film canister
- sodium bicarbonate
- vinegar and tape
- or you could use antacid tablet and water for reaction

Alternative activity

Small solar cars may be used as an alternative to this activity. Students can plan and execute an open investigation into factors that affect the performance of a solar car.

SPICE resources and copyright

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Associated SPICE resources

Energy transformations 2: Investigating energy may be used in conjunction with related SPICE resources to address the broader topic of energy transfer, transformation and conservation.

DESCRIPTION	LEARNING PURPOSE
Energy transformations (overview)	
Energy transformations 1: Comparing cars A video compares conventional internal combustion powered cars to REV vehicles and introduces some associated energy transformations.	**Engage**
Energy transformations 2: Investigating energy Students make model vehicles that use different energy sources to investigate energy transformations.	**Explore**
Energy transformations 3: Analysing energy Students develop explanations of energy transformations by analysing data from a simulated electric vehicle journey.	**Explain**
Energy transformations 4: Car choices Students use data about a range of conventional, electric and hybrid vehicles to decide and communicate which car is suited to specific purposes.	**Elaborate**