

MATERIALS AND EQUIPMENT

The unit requires a variety of materials to support various ways of learning (including doing, discussing, listening, watching, reading, and writing). Prepare in advance by collecting the materials and equipment needed for all the demonstrations and hands-on investigations.

Part A: Introduction to Energy

Lesson 1

- electric pencil sharpener and unsharpened pencil
- internet access and the means to project images/video for whole-class viewing (rocket launch)
- index cards for student vocabulary deck (3 per student)

Lesson 2

- flashlight with removable batteries
- large plastic cup
- balloon (dark color)
- table salt (a pinch)
- mobile phone or mobile audio device with a small speaker
- candle
- matches or a lighter

Part B: Energy and Motion

Lesson 3

- assorted marbles
- index cards for student vocabulary deck (2 per student)

Lesson 4

- books (to elevate ramps)
- cardboard (for ramp surfaces)
- 2 small, dense rubber balls of the same size and weight
- 2 paper cups
- pennies or pebbles for place markers
- shoeboxes (1 per group)
- play sand (about 5 pounds)
- index cards for student vocabulary deck (1 per student)

Lesson 5

- books (to elevate a ramp)
- cardboard (for a ramp surface)
- rubber ball
- a few lightweight blocks
- index cards for student vocabulary deck (1 per student)

Part C: Energy Transfer

Lesson 6

- sticky note paper (approximately 3 inches square, 1 piece per student)
- plastic cups (1 per student)
- internet access and the means to project images/video for whole-class viewing
- index cards for student vocabulary deck (2 per student)

Lesson 7

- index cards for student vocabulary deck (2 per student)
- flashlight
- hot plate
- spiral-cut paper plate on a string
- internet access and the means to project images/video for whole-class viewing

Lesson 8

- flashlight
- paintbrush (2–4 inches wide)
- chalk powder (finely crushed chalk)
- plate
- hot plate
- beaker
- ice cubes
- ice chest or ice box
- plastic bucket
- tongs
- tablet or cell phone (with low battery charge and a visible “charging” icon)
- tablet or cell phone charging cord
- surge protector with off/on switch

Lesson 9

- internet access and the means to project images for whole-class viewing

Part D: Collisions

Lesson 10

- 2 smaller toy cars
- 2 larger toy cars
- 2 clipboards
- 3–4 hardcover books for each ramp
- modeling clay
- index cards for student vocabulary deck (2 per student)

Lesson 11

- empty cans or water bottles (1 per group)
- plastic or wooden toy vehicles with wheels
- 2-foot-long ramps made of cardboard or wood (1 per group)
- small items such as marbles, dry beans
- internet access and the means to project images/video for whole-class viewing

Part E: Energy Transformation and Engineering for Energy

Lesson 12

- wind-up timer (or timer app on phone)
- index cards for student vocabulary deck (3 per student)

Lesson 13

A broad selection of materials from which students may choose for a design solution, such as:

- boxes
- aluminum foil
- clear plastic wrap
- craft paper
- springs
- rubber bands
- containers
- string
- table tennis and tennis balls
- cups
- sticks
- cardboard tubes of various sizes
- blocks
- glue
- clipboards for making ramps
- tape
- electric clock or pencil sharpener