

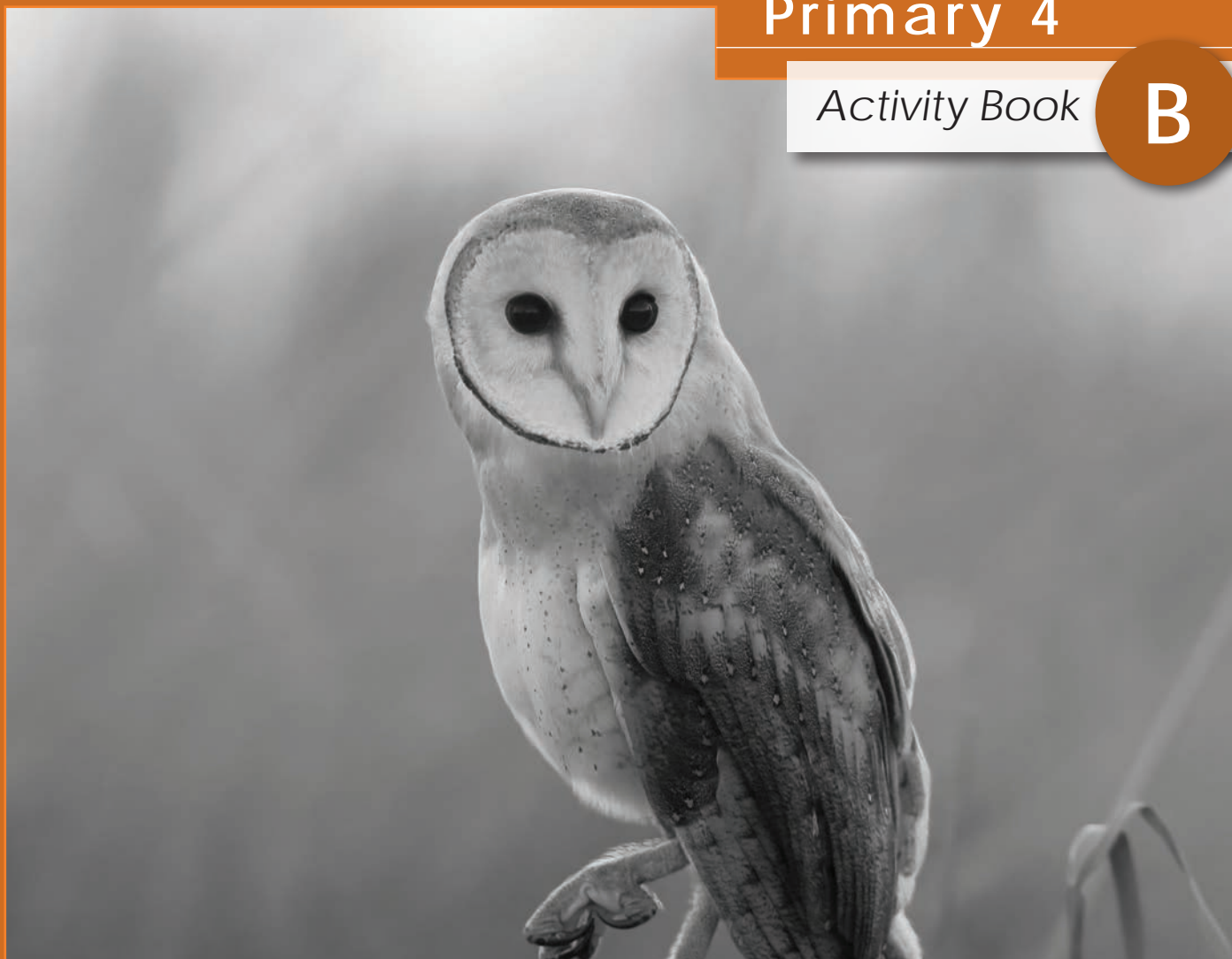


Let's Do SCIENCE

Primary 4

Activity Book

B



Let's Do Science

Let's Do Science is based on the United States Next Generation Science Standards (NGSS). The series consists of full-color textbooks and full-color activity books for Grades K to 6.

Let's Do Science engages students with a highly visual presentation of the disciplinary core ideas in the textbooks and places an emphasis on applying scientific knowledge using NGSS practices through numerous scientific investigations. Let's Do Science sees engineering as an essential element of science education and as such is tightly integrated into both the textbooks and activity books.

The Let's Do Science activity books include the following features:

AB Activity

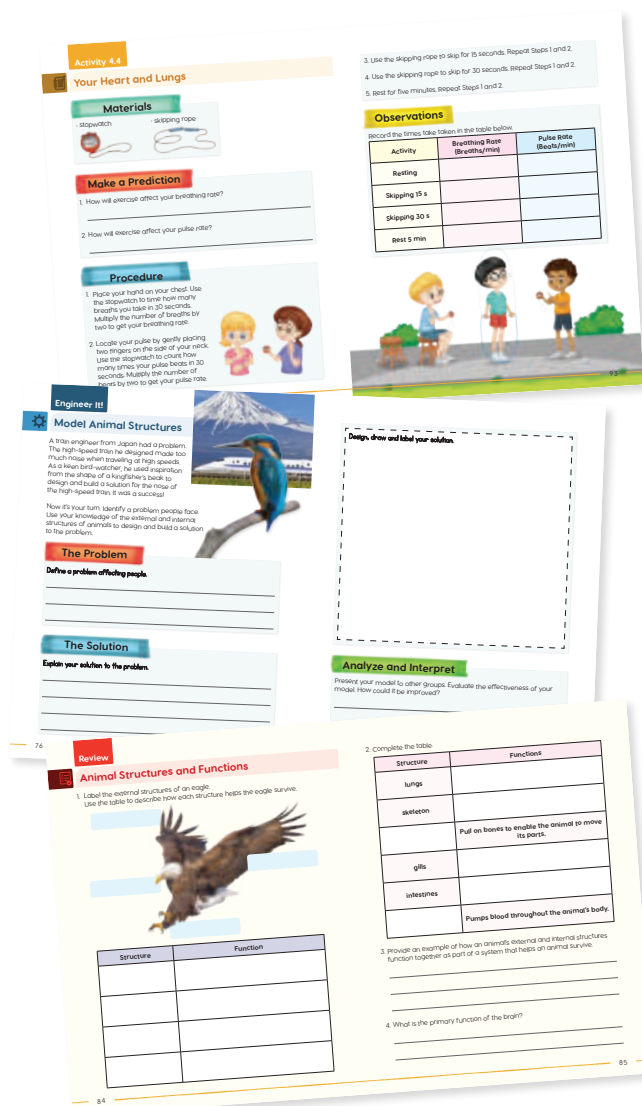
Activities and investigations related to concepts and topics covered in the Let's Do Science Textbook.

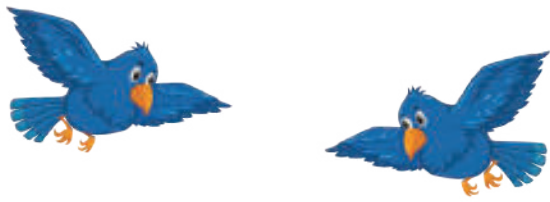
Engineer It!

Goes beyond inquiry by encouraging students to design, model and build to engineer solutions to defined problems.

Review

Topical questions at the end of each chapter for formative assessment.





Contents

Unit 6 - Processes That Shape the Earth 2

Unit 7 - Mapping the Earth's Surface 59

Unit 8 - Using Earth's Resources 86

Unit 9 - Energy and Motion 104

Unit 10 - Waves and Information 133



Activity 6.1

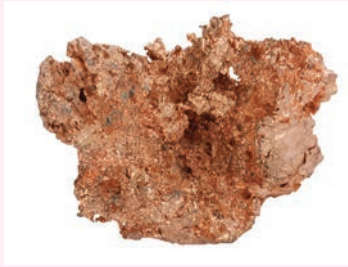


Minerals and Their Uses

1. What are minerals and where are they found?

2. Describe how each mineral is used by people.

(a) copper



(b) talc



(c) salt





(d) diamond



(e) copper



3. Why are minerals important to plants and animals?

4. How do plants get the minerals they need?

5. List two minerals used by humans. Describe how they help the body.

Activity 6.2



Properties of Minerals

Materials

· assorted minerals



· hand lens



· porcelain tile



· flashlight



· metal nail



Procedure

1. Your teacher will set up mineral testing stations around the classroom. Each station is set up to test a specific property of the minerals.
2. Conduct the test and record your observations. Then move on to the next station.





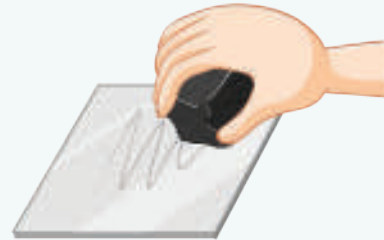
Color and Luster

Shine the flashlight on the mineral and observe it closely using the hand lens. Record your observations.



Streak

Take a mineral and firmly strike it along the surface of the porcelain tile. Observe the mark it makes on the tile and record your observations.



Hardness

Take the metal nail and scratch the mineral. Observe how the mineral is scratched and record your observations.



Observations

Mineral: _____

Color

Luster

shiny dull

Streak

(describe the color)

Hardness

(1 – scratches easily, 5 – does not scratch)

1 2 3 4 5



Mineral: _____

Color

Luster

shiny dull

Streak

(describe the color)

Hardness

(1 – scratches easily, 5 – does not scratch)

1 2 3 4 5

Mineral: _____

Color

Luster

shiny dull

Streak

(describe the color)

Hardness

(1 – scratches easily, 5 – does not scratch)

1 2 3 4 5



Mineral: _____

Color

Luster

shiny dull

Streak

(describe the color)

Hardness

(1 – scratches easily, 5 – does not scratch)

1 2 3 4 5

Mineral: _____

Color

Luster

shiny dull

Streak

(describe the color)

Hardness

(1 – scratches easily, 5 – does not scratch)

1 2 3 4 5

Review



Processes That Shape the Earth

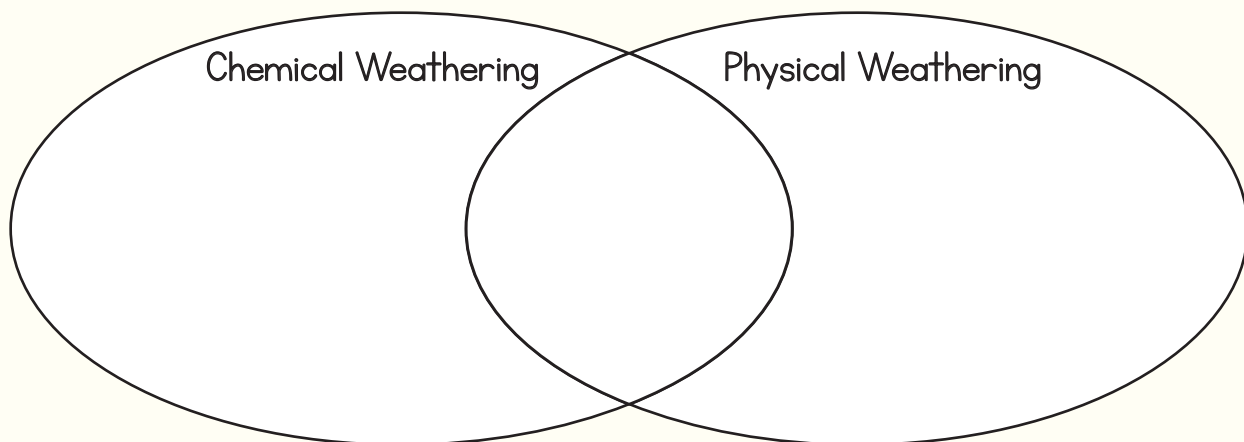
1. Why are minerals important to plants and animals?

2. How do plants and animals get the minerals they need?

3. Why is it useful to know about the properties of minerals?

4. How is sand different from humus?

5. Use the Venn diagram to compare and contrast chemical and physical weathering.



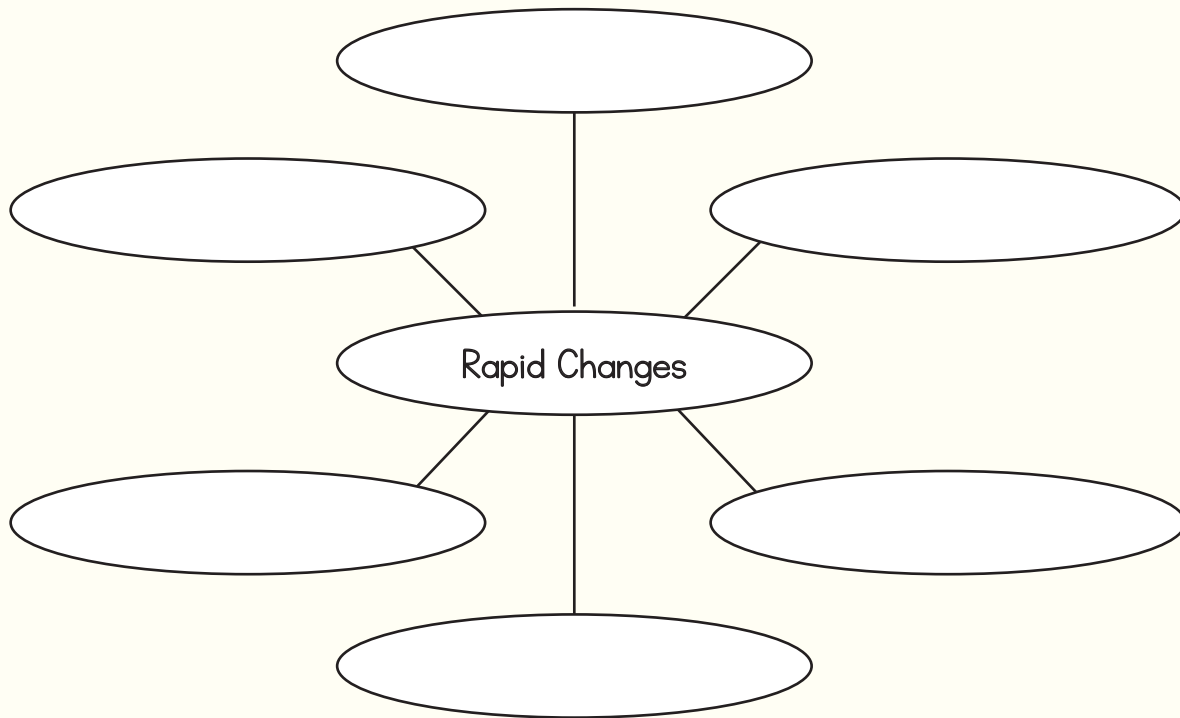


6. Describe the process of frost wedging.

7. List three forces in nature that cause erosion.

8. How does removing vegetation from an area affect the rate of erosion?

9. Use the diagram to list six ways in which the surface of the Earth can be changed rapidly.





10. Describe how living things affect the physical characteristics of their environments.

11. List the three layers of the Earth.

12. List three natural hazards that can occur due to interactions at the boundaries of tectonic plates.

13. Provide an example of how we can reduce the impacts of floods.

14. Scientists discover fossils in three different rock layers in the same location. What can they infer about the fossils in the bottom layer of rock? Explain your answer.



Activity 9.1



What Is Energy?

1. What is energy? Give two examples.

2. Where do plants get the energy they need?

3. Give three examples of how you use energy in your daily life.

4. Where do animals and people get the energy they need?

5. Use your textbook to help you fill in the blanks.

(a) Energy cannot be _____ or _____ .

It can be _____ from one form to another.

(b) A television is a device that uses _____ energy.

The _____ energy is transformed into

_____, _____ and

_____ energy.

Activity 9.2



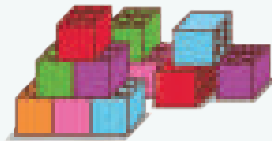
Potential and Kinetic Energy

Materials

· toy car



· blocks



· cardboard or
corrugated plastic



· measuring
tape



Procedure

1. Use the cardboard and blocks to make a ramp.
2. Place the toy car at the top of the ramp and release it.



3. Measure the distance the car travels from the bottom of the ramp. Repeat four times and record your observations.





4. Use more blocks to increase the height of the ramp.
Repeat Steps 2 and 3.



Observations

Draw the two ramps you constructed. Show the difference in height.





Record the distance the toy car traveled in each trial in the table below.

Trial	Ramp 1	Ramp 2
1		
2		
3		
4		
5		

Analyze and Interpret

1. Compare the speed of the toy car when released from each ramp.

2. Which ramp resulted in the toy car traveling further?

3. Describe your results in terms of potential and kinetic energy.

4. Based on your observations, what can you infer about an object's speed and its energy?

Activity 9.3



Potential and Kinetic Energy Conversion

Color the bars to show how the amount of potential energy and kinetic energy of a roller coaster car changes as it moves.

(a) The car is at rest at the top of the track.



Kinetic
Energy

Potential
Energy

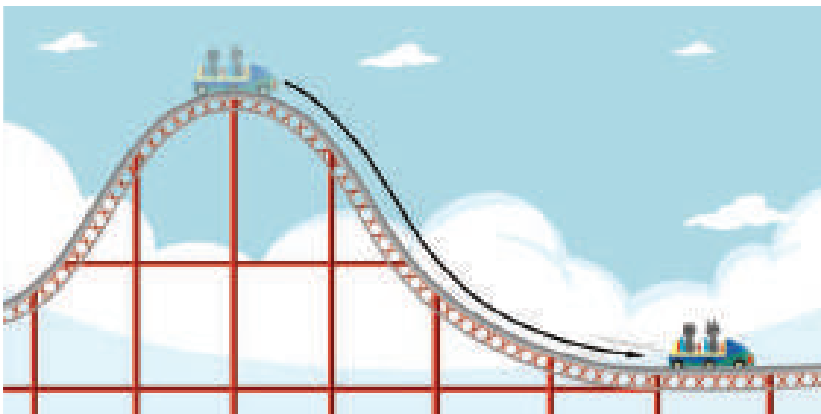
(b) The car is about half way down the track.



Kinetic
Energy

Potential
Energy

(c) The car is at the bottom of the track.



Kinetic
Energy

Potential
Energy



Activity 9.4



Energy and Mass

As a class, plan and conduct an investigation to find out how mass effects the kinetic energy of a moving object.

Materials

List the materials you will use to carry out the investigation.

Make a Prediction

Will objects with greater mass have greater kinetic energy? Explain your answer.

Procedure

List the steps you will take to carry out the investigation.



Draw a Model

Draw a labeled model to show how you carried out the investigation.



Observations

Describe what you observed during the investigation.

Analyze and Interpret

1. Was your prediction correct? Based on your observations, what can you infer about the effect of mass on the kinetic energy of an object?

2. Which things did you keep the same in this investigation? Why was this important?

Activity 9.5



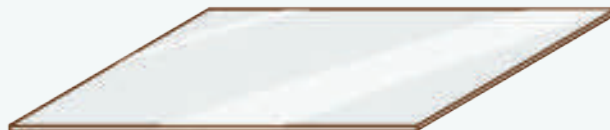
Coin Collisions

Materials

· roll of pennies

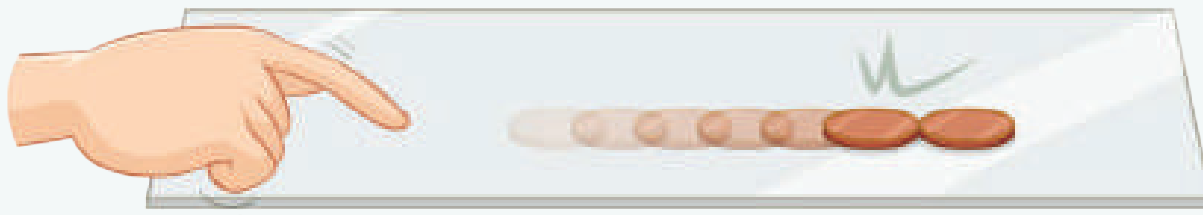


· smooth surface

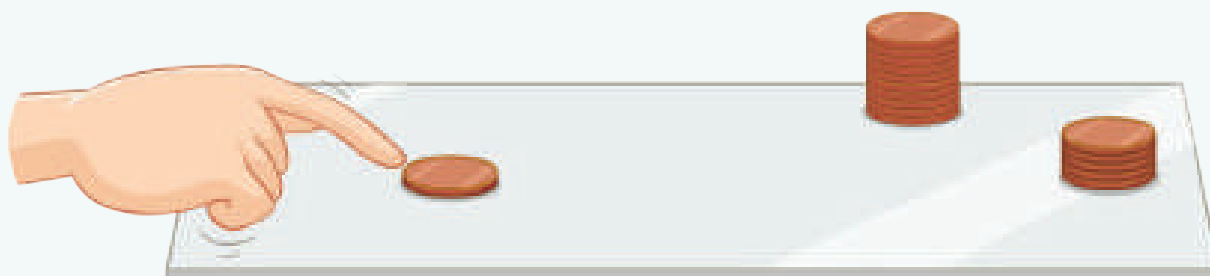


Procedure

1. Place a penny on a smooth surface such as a table top. Take another penny and slide it towards the placed penny with a small force. Observe the sound when the two pennies collide. Observe their new positions.



2. Repeat Step 1 but apply a greater force to the sliding penny.
3. Make a stack of 5 pennies and repeat Steps 1 and 2.
4. Make a stack of 10 pennies and repeat Step 3.





Observations

Draw the pennies after the collision.
Describe the sound made by the collision.

One penny

small force	large force

Five pennies

small force	large force



Ten pennies

small force

large force

Analyze and Interpret

1. In what ways did applying a larger force to the penny affect the collisions?

2. In what ways did the larger stacks of pennies affect the collisions?

Activity 9.6



Forms of Energy

1. Complete the tables for each form of energy.

Sound Energy	
Brief Description	<hr/> <hr/>
Example Source	<hr/> <hr/>
How is it useful?	<hr/> <hr/>

Thermal Energy	
Brief Description	<hr/> <hr/>
Example Source	<hr/> <hr/>
How is it useful?	<hr/> <hr/>



Light Energy	
Brief Description	<hr/> <hr/> <hr/>
Example Source	<hr/> <hr/> <hr/>
How is it useful?	<hr/> <hr/> <hr/>

Electrical Energy	
Brief Description	<hr/> <hr/> <hr/>
Example Source	<hr/> <hr/> <hr/>
How is it useful?	<hr/> <hr/> <hr/>



Chemical Energy	
Brief Description	<hr/> <hr/> <hr/>
Example Source	<hr/> <hr/> <hr/>
How is it useful?	<hr/> <hr/> <hr/>

2. Give an example of a device that outputs two or more forms of energy. Draw and label a diagram of the device.

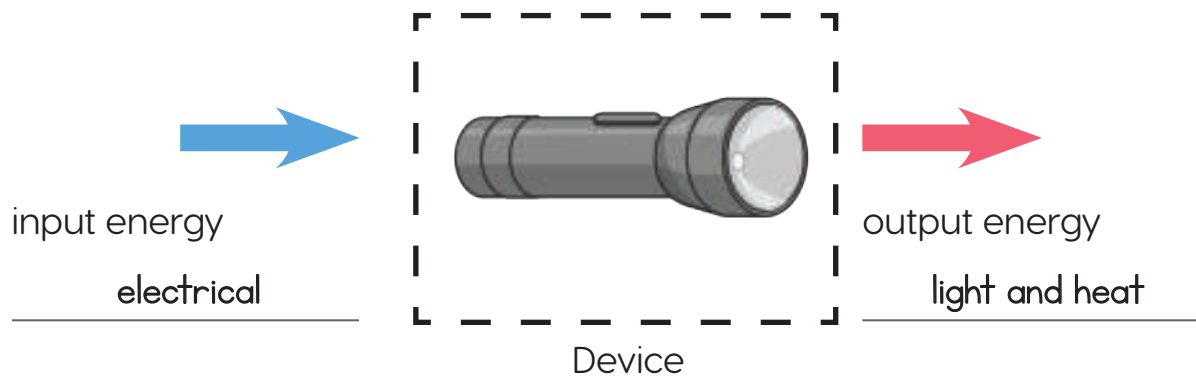
A large dashed rectangular box intended for drawing a diagram of a device that outputs two or more forms of energy.

Engineer It!



Transforming Energy

Many devices you are familiar with transform energy from one form to another. A flashlight transforms electrical energy into light and heat. Flashlights are useful as they solve a human problem of seeing in the dark.



Now it's your turn. Identify and define a human problem that can be solved with a device that transforms energy from one form to another. Design, build and test the device.

Materials

List the materials you will use to build your device.

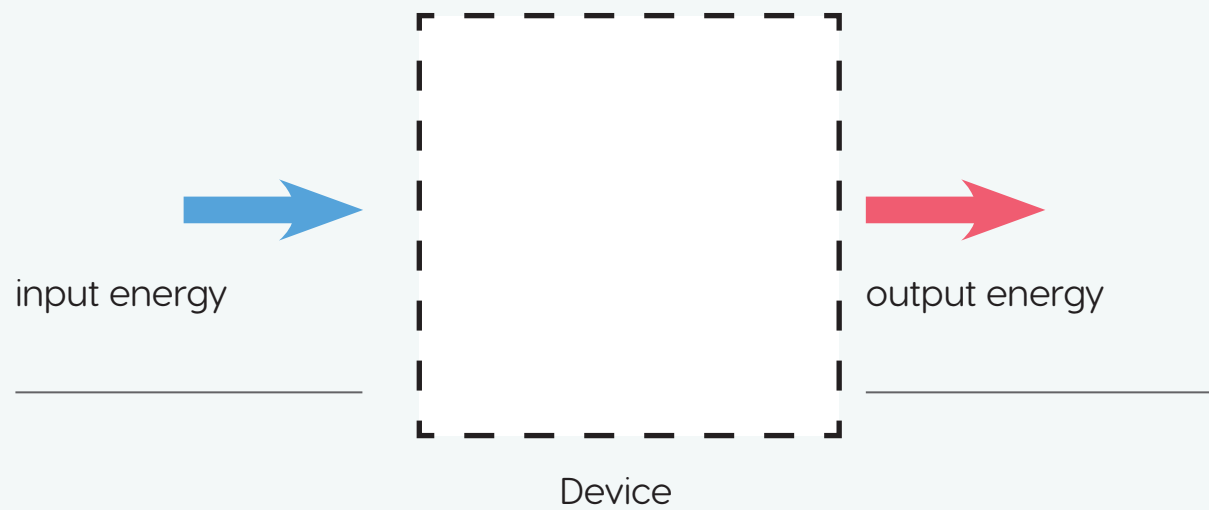


Draw a Model

1. Draw a labeled diagram of your design.



2. Show how your device transforms energy.





Procedure

Write the steps you will take to build and test your device.

Analyze and Interpret

1. What properties of the materials you used make them suitable for their purpose?

2. Describe how your device solved a human problem.

3. Evaluate the effectiveness of your design in solving the human problem.

4. How could the design be improved?

Activity 9.7



Energy Conversion

1. What energy conversion takes place when you rub the palms of your hands together?



→

2. What energy conversion takes place when you clap your hands?



→

3. What energy conversion takes place when a stretched bow is released?



→



4. What energy conversion takes place in a solar panel?



→

5. What energy conversion takes place when a gas burner is lit?



→

6. What energy conversion takes place when a flashlight is switched on?



→ →