

Section 4

Understanding Earth and Space Systems

EXPLORATION 1

Storing Energy

Understand how energy is stored and what it can transform into.

Batteries and food store chemical energy.

I'm sorry, Lindsay. The stored energy in my phone's battery is running out. I'll have to call you later.



Batteries can convert stored chemical energy into electrical energy to power your electrical devices.

The stored energy in these delicious foods will provide me with the energy my body needs.

After eating, our bodies can convert the chemical energy stored in food into energy that our bodies need to grow and carry out daily activities.



Are there other things that can store energy?

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In this experiment, you will learn that energy can be stored.

Level of Difficulty:

advanced

Time Needed:

1 hour

Hypothesis:

Circle the correct word to show your hypothesis.

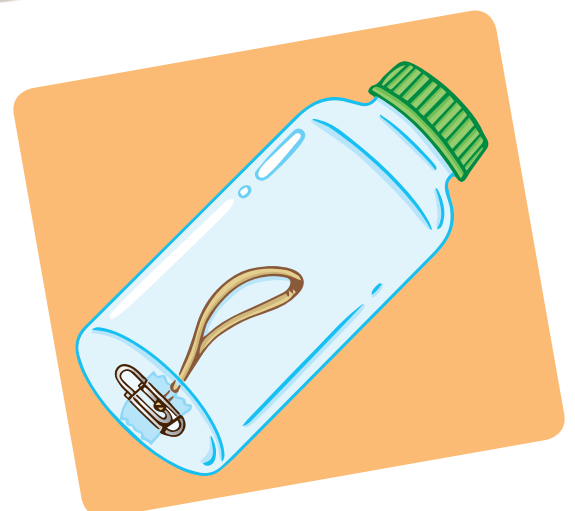
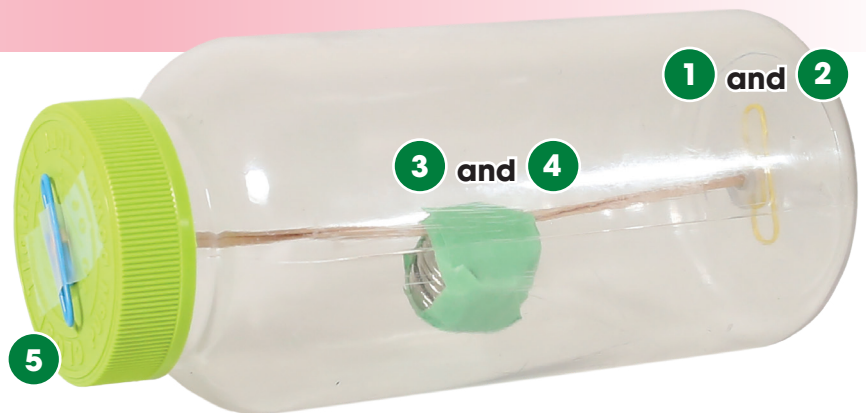
An elastic band **can / cannot** store energy.

Materials:

- a plastic bottle with a wide mouth
- an elastic band
- tape
- 2 paper clips
- 5 quarters
- a hammer
- a nail

Steps:

1. Ask an adult for help to poke a hole in the centre of the two ends of the plastic bottle. Make sure the holes are large enough for the elastic band to pass through.
2. Insert the elastic band through the hole at the bottom of the bottle. Secure the end with a paper clip and use tape to keep it in place.



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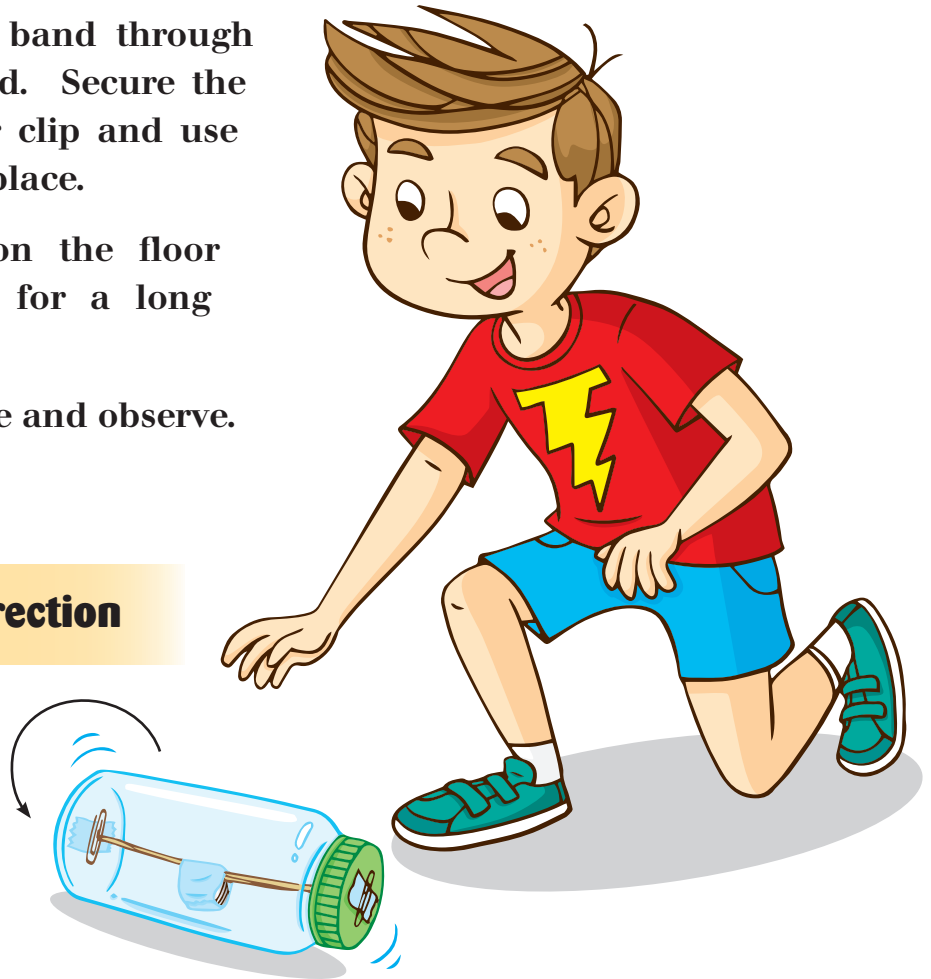
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3. Stack and tape the quarters together to create a weight.
4. Stretch the elastic band and tape the weight to the centre of the elastic band.
5. Insert the elastic band through the hole in the lid. Secure the end with a paper clip and use tape to keep it in place.
6. Roll the bottle on the floor in one direction for a long distance.
7. Let go of the bottle and observe.

rolling in one direction



Conclusion:

Circle the correct words after conducting the experiment.

After letting go of the bottle, it **did not roll / rolled** on its own.

My hypothesis was **correct / incorrect** .

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Explanation:

Were you surprised to see the bottle rolling on its own? This occurred because the energy stored in the elastic band turned into mechanical energy. While you were rolling the bottle, the elastic band was twisting and coiling, enabling it to store more and more energy. When you let go of the bottle, the elastic band began to unwind to return to its original form. While doing so, it was also transforming the energy stored in it into mechanical energy, causing the bottle to roll.

Further Exploration:

- What would happen if the bottle is rolled for a longer distance? Would it cover the same distance travelled?
- What would happen if elastic bands of different lengths or thicknesses were used in this experiment? Would the result be the same?

