

Section 2

Understanding Structures and Mechanisms

EXPLORATION 2

How do gears work?

Understand the mechanism of gears.

If you look closely, you will find that gears are everywhere. They are on bicycles, in wind-up toys, clocks, cars, and many machines. They are usually circular and have teeth all around them. Their most important feature is the ability to transfer motion. But how do gears do this?

The gears on my bicycle allow me to travel long distances with less effort than running.



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How do gears work?

In this experiment, you will build your own gears and learn how they work.

Level of Difficulty:

moderate

Time Needed:

1 hour

Hypothesis:

Check to show your hypothesis.

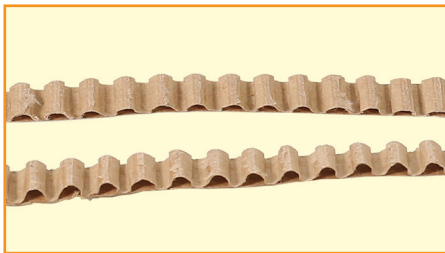
- When one gear turns, the other gear turns in the same direction.
- When one gear turns, the other gear turns in the opposite direction.

Materials:

- glue
- scissors
- thick cardboard
- 2 pins
- a marker
- 2 plastic lids

Steps:

1.



Cut two thin and long strips of cardboard. Peel off one side of each strip carefully to expose the zigzag structures.

2.



Glue the flat side of the strips to the plastic lids to make two gears.

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3.



Pin the centres of the lids to the cardboard. Draw a line on each lid and position it vertically.

4.



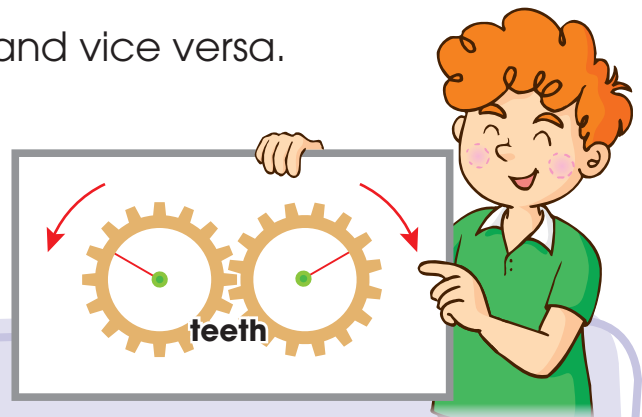
Turn the gears and observe the directions they move in.

Conclusion:

Circle the correct words after conducting the experiment.

When one gear is turned clockwise, the other one turns **clockwise / counterclockwise** and vice versa.

My hypothesis was **correct / incorrect**.



Explanation:

In this experiment, when you turned one gear, the other gear turned too but in the opposition direction. The teeth on the gear that you turned caused the other gear to turn. So when one gear turns clockwise, the other gear turns counterclockwise. This allows gears to work together to change the direction of motion.