

Section 2

Understanding Structures and Mechanisms

EXPLORATION 2

Make a trolley!

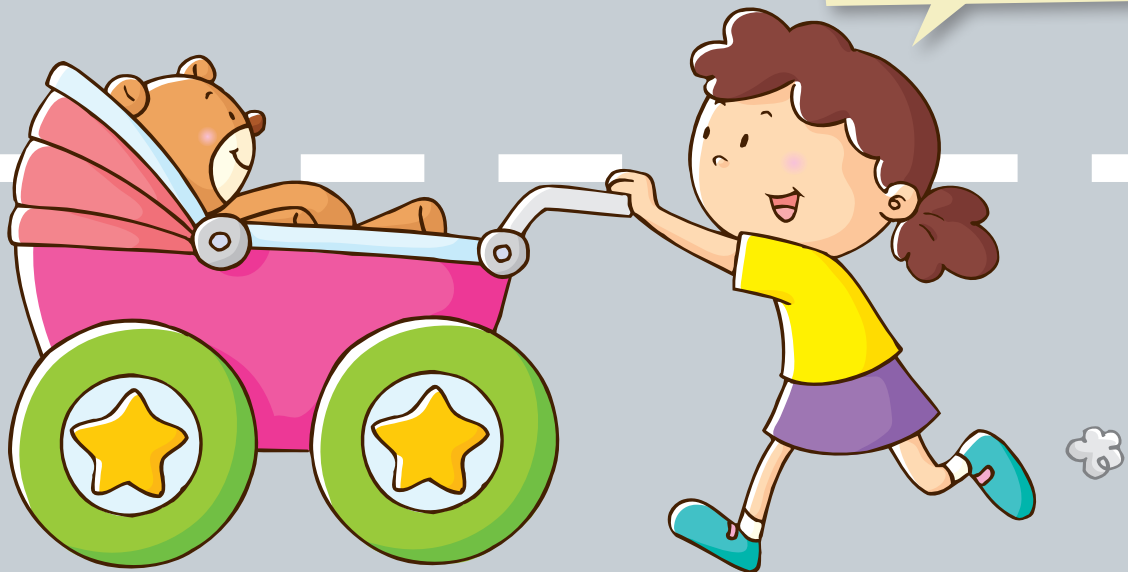
Learn how the wheel and axle help us move things.

Did you know that the wheel and axle is one of the greatest inventions ever made? A wheel and axle has two basic parts: wheel and axle. The wheel is a circle and the axle is a rod that goes in the centre of the wheel. Together, the wheel and axle help carry heavy loads and can be used in many different ways.

Examples of Wheel and Axle in Our Daily Lives:

- electric fan
- Ferris wheel
- bicycle
- pizza cutter

My stroller also has wheels and axles!



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In this experiment, you will learn how the wheel and axle helps us do work with less effort.

Level of Difficulty:

advanced

Time Needed:

1 hour

Hypothesis:

Circle the word to show your hypothesis.

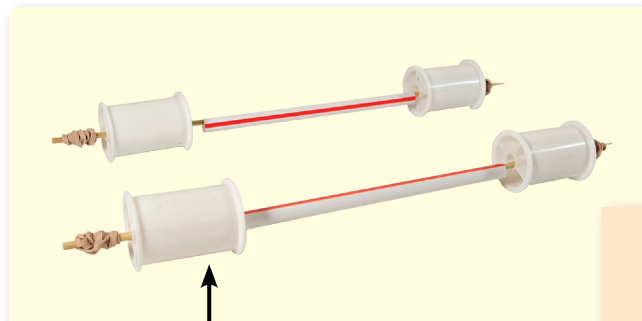
The wheel and axle **can / cannot** help us do work with less effort.

Materials:

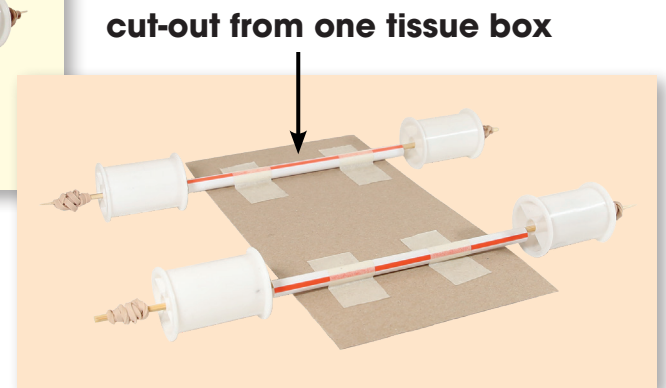
- 2 tissue boxes
- 2 straws
- 4 small spools
- 2 skewers
- 4 elastic bands
- tape
- string

Steps:

1. Assemble the spools, skewers, straws, elastic bands, and cut-out as shown to build a trolley.



two sets of wheels and axles



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2. Create a load by filling the other tissue box with small objects. Tie a piece of string around the tissue box.
3. Drag the load across the floor with the string.
4. Tape the load to the trolley and pull it across the floor with the string.
5. Compare the amounts of force needed to pull the load with and without the trolley.



Conclusion:

Read the conclusion. Circle the correct word.

You should have noticed that it was easier to move the load across the floor using the trolley with wheels and axles.

My hypothesis was **correct / incorrect** .

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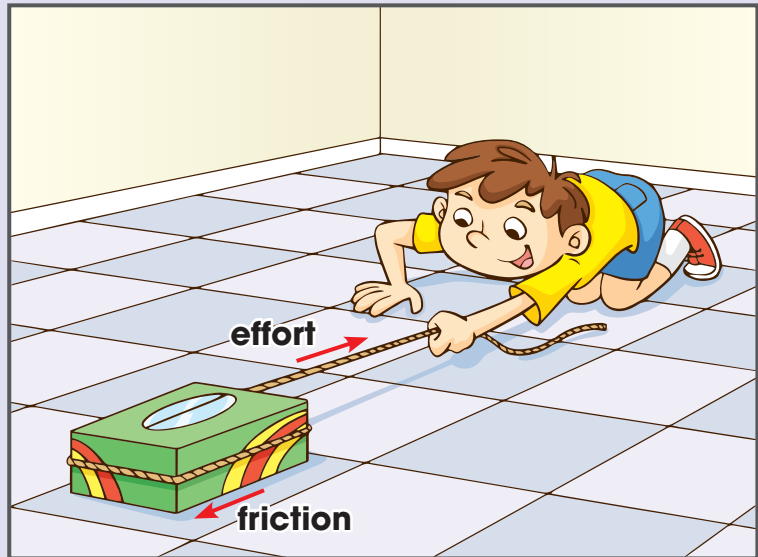
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Explanation:

When the load was dragged across the floor without the trolley, the side of the tissue box in contact with the floor created a lot of friction, which opposed your effort.



However, with the trolley, only the wheels were touching the floor. This created a lot less friction. As a result, less effort was needed to move the load.