Section 2

**Understanding Structures and Mechanisms** 



## **The Power of Compressed Air**

Explore what compressed air can do.

Have you ever been pushed by a strong gust of wind? If you have, you should know how powerful air can be. But did you know that air can become even more powerful when it is compressed? There are many uses of compressed air in our daily life. For example, compressed air in aerosol cans can be used as dusters



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Dad, moving air is so powerful! It can keep the windmill moving. I wonder how much more powerful air can be when it is compressed.

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# **The Power of Compressed Air**

In this experiment, you will learn that air can exert a force when compressed.

# Level of Difficulty: moderate Time Needed: 30 minutes

## **Hypothesis**:

#### Circle the correct word to show your hypothesis.

Air can be compressed and compressed air **can / cannot** exert a force.

#### Materials:

- a plastic bottle
- a tea candle
  a balloon
- tape

#### **Steps:**

- 1. Remove the cap from the bottle and cut off the bottom of the bottle.
- 2. Cut off the neck of the balloon. Stretch the balloon to cover the cut-off end of the bottle. Secure the balloon with tape.
- 3. Ask an adult to light the tea candle.
- 4. Pull the balloon outward.
- 5. Point the opening of the bottle toward the candle and release the balloon. Observe.



Be very cautions when you are around a lit candle!

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# **The Power of Compressed Air**

## **Conclusion:**

#### Circle the correct words after conducting the experiment.

The release of the balloon **caused / did not cause** the candle flame to blow out.

My hypothesis was correct / incorrect .

## **Explanation:**

The candle flame was blown out by the force exerted by the compressed air in the bottle. When the balloon was pulled, the volume of the bottle increased and more air was sucked into the bottle. When the balloon was released, the air inside the bottle was compressed immediately and it rushed out to escape through the opening of the bottle, exerting enough



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# Read about the uses of compressed air. Then circle the things that make use of compressed air.

Compressed air and gas are all around us, powering many things in different forms. Compressed nitrogen gas is often used in packaged foods to prolong their shelf life and to keep them sanitary and safe for consumption. A pneumatic system is a system that makes use of the pressure of a gas to create forces. In many household items, compressed air in aerosol cans is mixed with different substances, from those for hair spray to paint. It is also applied in braking systems to allow cars to decelerate and stop.

