HILL AEROSPACE MUSEUM
HILL AIR FORCE BASE | UTAH

Weather

The Magic Air Pressure Bottle

This activity and lesson align with Utah SEEd Standard 6.3.2

This activity will demonstrate to students that air has mass and moves from areas of high pressure to areas of low pressure.

Students will need the following materials:

- a sturdy empty plastic water bottle (sturdier bottles work better)
- a balloon
- a sharp object to poke a hole in the bottle

Have students place the balloon and roll the lip of the balloon over the opening of the water bottle. (See image to the right)

Use the worksheet attached below to guide students through experiments and record their observations.

- **For Questions 1 & 2** instruct students to blow up the balloon in the bottle. Instruct students to record their observations on the worksheet provided below. The balloon will not expand because the bottle is full of air. The air has mass which takes up space and creates an area of high pressure, restricting the balloon from expanding.
- **For Question 3** have students poke a hole in the bottom of the water bottle and then try to blow up the balloon. Now that the air in the bottle can go from an area of high pressure (the bottle) to an area of low pressure (outside the bottle) there is space for the balloon to expand. Instruct students to record their observations/predictions on the worksheet provided below.
- **Now for the last questions** have students blow up the balloon and cover the hole with their finger. As long as the hole remains covered, the balloon will stay inflated even if students remove their mouths from the balloon opening. Instruct students to record their observations and hypothesis on the worksheet below. The balloon stays inflated because the high pressure in the balloon pushes outward towards the area of low pressure in the bottle.

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Place your balloon inside your bottle and wrap it over the mouth of the bottle. Once your Magic Balloon Bottle is ready follow the steps and answer the questions below:

1. Create a hypothesis for why or why not the balloon will expand in the bottle when you blow air into it.

2. Describe or draw a diagram of what the air in the Magic Balloon Bottle is doing.

Now poke a hole in the bottle of your Magic Balloon Bottle

3. What happens when you blow into the balloon and there is a hole in the bottle? Why?

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4. Blow the balloon up with a hole in the bottle then place your finger over the hole. What happens to the balloon. Why?

5. Draw a diagram of what you think the air is doing inside the balloon and bottle.