

Under Pressure

Purpose

To illustrate expansion of gases under reduced pressure.

Materials

- Shaving cream
- Marshmallow
- Soda water
- Doll's head
- Balloon
- Tape
- Vacuum pump with bell jar

Safety

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| <ul style="list-style-type: none">• Wear safety glasses and gloves.• Ensure there are no cracks in the bell jar. |
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Procedure

1. Fill an empty doll's head with shaving cream from the neck opening. Ensure openings are present at the eyes and ears.
2. Tape the neck opening closed.
3. Place the doll's head in a bell jar connected to vacuum pump.
4. Evacuate the chamber of air.
5. Other items that can be placed in the bell jar include soda water, small balloon, or a marshmallow.

Results

- As the surrounding pressure decreases, the shaving cream/marshmallow expands.

Follow-up Teaching Notes

- Shaving cream is a foam (type of colloid) that consists of a gas evenly distributed in a liquid.
- As the surrounding pressure is decreased, the gas expands in size.

Connections

- Gas laws, solubility of gases, decompression sickness, colloids

Extension

- Can be related to decompression sickness.

Disposal/Clean-up

- The marshmallow and shaving cream can be disposed of in the garbage.
- The soda water can be washed down the drain.