Inflatable Marshmallows  
Investigation #1

Description
Make some funny faces and find out how air pressure works!

Materials
- Glass Bell
- Vacuum pump
- Marshmallows
- Black Marker
- Paper plate

Procedure
1) Draw faces on several marshmallows with the marker.
2) Place the marshmallows on a paper plate. Cover the marshmallows with the glass bell.
3) Have a friend predict what will happen when the pump is turned on.
4) Turn on the vacuum pump.
5) What do you notice?
6) Repressurize the system. What happens to the marshmallows then?

My Results
Explanation
When the vacuum pump removes air from the bell, a marshmallow grows significantly larger. This is because one of the main ingredients in marshmallows is air that is trapped inside. As the air on the outside of the marshmallow leaves the bell, there are fewer air articles hitting the marshmallow on the outside. The air particles hitting the inside of the marshmallow push the marshmallow outward and expand the marshmallow. The syrup, sugar, and gelatin mixture are not rigid enough to withstand the air pressure and the marshmallow stretches. Place another marshmallow outside the bell and notice how much the volume of the marshmallow inside the bell has increased.

When the bell is repressurized, the air particles on the outside force the marshmallow smaller once again. This is an example of Boyle’s Law, named after Robert Boyle, a scientist who lived in the 1600s. He discovered that as pressure goes up, the amount of volume a gas takes up gets smaller, as the squished marshmallow shows. Gas volume expands when there is less pressure, demonstrated by the expanded marshmallow.

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