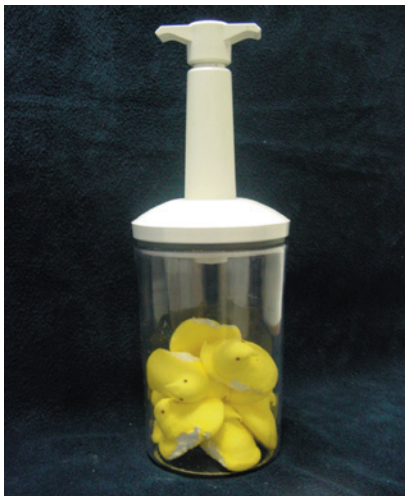
Peep Poofer

In this activity, students will observe the effect of air pressure on marshmallows, and then can dine on this delicious demonstration.



Grade Level
- 4th - 8th

Science Focus
- air molecules
- air pressure

Time Required
- 10 minutes

Supplies
This activity is designed as a Teacher demonstration. It can be done with Peeps (the marshmallow figures that appear at Easter and other holidays) but regular marshmallows will work, as will packing peanuts. But Peeps are a lot more fun.

Per Class

1 vacuum container & pump

Enough Peeps, marshmallows or packing peanuts to half fill the container

Doing the Activity
- This demonstration makes a great follow-up to the Marshmallow Masher experiment. Students will have done some thinking about what causes pressure, and what effect pressure has on gases. And this is a great way to repeat these lessons in a different context.
- Explain to your students what the vacuum container does. It has a tight fitting lid, with a valve on top. The pump pulls air out of the container, and the valve keeps the air from coming back in until it is released.
- First, begin with an empty container. Show that the lid to the container has no screw threads or clips to hold it in place. It is loose! Next, pump several times to remove a good deal of air from the container. Now, ask a student to try to remove the lid. They won't be able to—until you release the valve to let air back into the container, in which case the lid is easily removed. Ask the students what was holding the lid in place, and why.
- Next, ask students to predict: when you add some Peeps to the container and pump out some air, what will happen? Do this, and see if their prediction was correct. Ask them to explain in some detail just what is going on.
- It is interesting to let the Peeps stay under vacuum for a while. How do they change?

Active Questioning, Explanation, and Discussion

1. Why is the lid of the container so hard to remove when air is pumped from it? (There is less pressure inside, and this pressure difference results in a large force that presses the lid down.)

2. Why do the Peeps expand when the air is pumped from the container? (Pumping air molecules from the container reduces the pressure. The air inside the Peeps stays inside. When the pressure on the Peeps goes down, this air will expand—making the Peeps poof.)

3. Can you think of other things we could put in the container that would make an interesting effect? (Foam, shaving cream, packing peanuts, etc.)

4. This container is marketed as something to keep food fresh. Why might this be? (For one thing, it makes a very tight seal, as we have seen. A sealed container keeps flavors in. Another thing that can compromise freshness of certain foods like crackers and chips is moisture: they absorb moisture from the air, and this makes them seem less fresh as they are less crunchy. Pumping out air means pumping out oxygen and nitrogen—but it also means pumping out water vapor, so less moisture is absorbed. And pumping out oxygen means less oxidation, which also makes food taste less fresh.)