

# Potato Gun Launcher

You just cannot have much more fun than with a potato gun, a 14 pound sack of spuds, and a big cup of coffee. Okay, it's not really a "gun" - more of a potato pusher – but the results are amazing. Be careful, you might even teach some science along the way!

## Before Getting Started . . .

This version of the potato gun was inspired by the Weird Science team out of Illinois. It's made out of high quality extruded acrylic tubing that will last a long time provided that it is cared for properly. Before delving into the instructions, it's important to take a moment to consider the several safety factors:

- (1) Perform the demonstration outside or in a large room
- (2) Warn members of the audience that a projectile potato might be coming their way
- (3) Wear safety glasses
- (4) Use care when handling the flared end of the tube as the edges may be sharp.

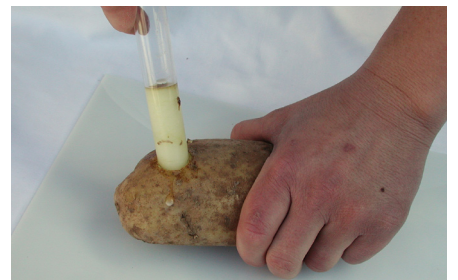
This science demonstration only uses the power of compressed air to demonstrate Boyle's Law... unlike other "potato guns" which use flammable liquids to create an explosion to launch the potato - this is not recommended!

## Here's What You'll Need . . .

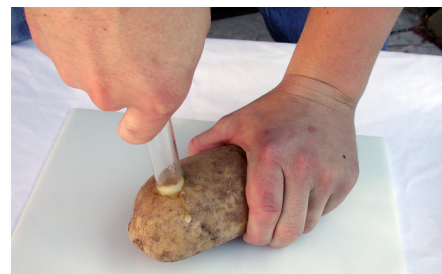
- Potato Gun tube and plunger, potatoes (duh!), flat surface, safety glasses

## Try It!

1. There are two part to the potato launcher - the plunger and the tube. Let's start with the plunger. Notice the rubber stopper attached at one end of the rod. Slide the stopper up so that it is approximately 5 inches from the end. This is where you will hold onto the plunger. You'll also notice that both ends of the clear tube have been flared. Use care as the ends of the tube can be sharp or have rough edges.
2. Let's not forget about the potato. Place the potato on a flat surface. Hold the potato securely with one hand while pushing the tube through the potato with the other hand. Pull the tube out of the potato to see your "potato plug".
3. Use the plunger (rod) to move the piece of potato to the other end of the tube (actually a few inches from the other end). This is a little tricky until you get the hang of it. Always keep your pushing hand behind the rubber stopper to keep the sharp edge of the tube from hurting our hand.



- The reason for moving the potato plug is to free up the end to accept another piece of potato. Position the potato securely on a flat surface while pushing the tube into the potato. Now both ends of the potato are plugged!
- Assuming that you're right handed, hold the clear plastic tube in the middle with your left hand and the plunger in your right hand. The plunger goes into the end where the potato is a few inches from the end of the tube. Push upwards on the bottom piece of potato with the plunger until the top potato piece pops out of the tube. POW!



Notice that the rubber stopper keeps the plastic rod from pushing both pieces of potato out of the tube (pretty cool design!) If adjusted properly, the bottom potato should now be positioned a few inches from the top of the tube, and the bottom end of the tube is ready to accept another unsuspecting piece of potato.



- It takes the average potato-launching-science-enthusiast about 30 launches before feeling completely confident about the mission. Never aim the flying potato at anyone. It's best to do this demo outside... away from all forms of life. When you are finished, wash and rinse the tubing with mild soap and water.



## How does it work?

The potato gun beautifully illustrates Boyle's Law which states that pressure and volume are inversely proportional. In other words, as you decrease the volume of the air trapped in between the two pieces of potato, the pressure exerted by the gas increases. This increase in pressure eventually forces the top end potato to exit the tube with great pizzazz.

## Additional Information

So, it's fun to launch a potato, but how can you use it to teach science. Consider the following:

- Use the demo to introduce the properties of air – it occupies space and exerts pressure
- Visually demonstrate the relationship between volume and pressure of a gas. As the pressure increases, the volume decreases.
- Introduce the potato launcher demo using the Straw Through the Potato activity (you'll find a complete write-up for this activity at [www.SteveSpanglerScience.com](http://www.SteveSpanglerScience.com) in the experiment library.

## Safety Information

Remember, this is a science demonstration... not a bombing mission. Always wear safety glasses when presenting this demonstration. Never point the flying potato at anyone. Use caution as the edges of the clear tube can sometimes be sharp. Finally, just a word of warning...be careful where you aim the flying pieces of potato and keep the potato bullets off of your neighbor's roof.