

How to build a Potato Cannon

There are many different ways to build potato cannons. The two most common types of cannons are combustion-powered and air-powered. You will learn how to build a very durable and versatile combustion-powered cannon using these instructions. There is one section that varies due to the fact that not all grill igniters are exactly the same.

There is a quick build section on the last page for people that are used to these kinds of components.

Ingenuity will be required for this step as mounting the igniter inside the chamber will vary with each igniter. Steps for a certain brand of igniter will be shown, but it very well may differ from the one you purchase.

The primer requires about 6 hours to dry, and the cement about 24 hours.

****I am not responsible for anything bad that happens with this. This is purely instructional and not meant for the use of any harm or vandalism.

WARNING

As mentioned above, this is an explosive device. It is extremely dangerous, and even more powerful. DO NOT aim at any living person/thing. Serious injury will occur. This instruction set is meant as a fun scientific project, not a deadly weapon.

DO NOT deviate from the specified list of parts needed that are given below. A very powerful explosion does occur in the cannon and if not constructed properly, the cannon could explode in your hands. Please do not build this if you do not have any prior knowledge of or experience with PVC piping. PVC pipe can't handle a lot of pressure. If the pipe does explode, pieces of PVC will end up in you like shrapnel. PVC DOES NOT, I repeat, DOES NOT show up on X-rays and is almost impossible to get out.

The use of a saw is needed as well. If you have never used one before, ask for help. Do not try it on your own.

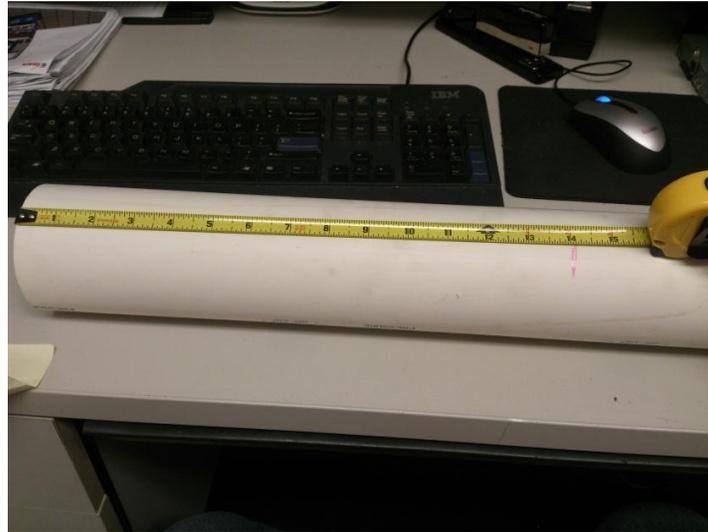
Parts Needed

All of the parts can be purchased at either a Home Depot or a Lowes, and should cost a little less than \$50 USD. To avoid repetition, all components except for the replacement grill igniter and screws are made of PVC and can be found in the plumbing isles. Home Depot sells 2' sections of PVC pipe which will work for the 3" diameter as only 14" are needed. All of these components are labeled in separate boxes in the plumbing isles either at Home Depot or Lowes.

- 3" diameter pipe, at least 14" in length
- 1.5" diameter pipe, at least 4' in length
- 3" coupler, quantity of two
- 3" to 1.5" reducer
- 3" female screw on adapter
- 3" screw on cap
- PVC primer
- PVC cement (the primer and cement are sold in a two pack, small cans. This pack is perfect)
- Replacement grill igniter
- 1 screw 1.0" in length
- Screw gun with drill bits
- Bow saw/table saw
- Measuring tape
- Caulk or some other type of sealant, I used Rector Seal EP 200 epoxy puddy
- Electrical tape
- Thread tape
- Pen/marker/something to mark measurements

Step 1 – Making the Chamber

Take the measuring tape and measure out 14" from one end of the 3" pipe. Mark this location with the pen or marker. With a saw, cut the 14" section off of the rest.



*Don't worry if the cut isn't perfectly straight. It won't hurt anything.

Step 2 – Making the Barrel

Use the measuring tape to measure out 4' along the 1.5" pipe. Mark this location with the pen or marker. With your saw, cut the 4' section off of the rest.

*Try to make this cut as straight as possible. This will allow the potato to have a straighter trajectory.

Step 3 – Ignition System

This is going to be the hardest part of building the potato cannon, and the most dangerous. This is the step where your ingenuity kicks in. The steps shown work for most types of igniters, but not all.

- Take one of the 3" couplers and place it on one end of the 14" section of pipe.
- Measure at least 2" from the coupler and no more than 4", and mark a dot.
- Drill a hole at this dot big enough for the screw you have, as seen below. This will be the spot for the mounting screw.



- Take the grill igniter and build it using the instructions given inside of it, but since you aren't attaching it to a grill, you have to rig it on there. The one I used is pictured below.



*If the lighter you purchase does not have the mounting holes, which would be either of the two smaller holes in the metal piece shown above, you will need to drill a hole into it away from the sparker.

- As many wires as are coming off of the housing, drill the same amount of holes in the chamber to allow the wires to pass through the pipe. In my case, only one of the two wires needed to pass through the pipe, so I only needed one extra hole.
- Connect the wires to the housing. If the wires are connected to the push button, disconnect them from the push button. Run the ends that go to the push button through the pipe, then connect them to the push button.
- Through the original hole you drilled in the pipe, put the screw at least 1.0" long through that hole and through the mounting hole on the housing of the igniter.

*The pictures of my finished ignition system are too big to fit on this page. They are on the next page. Also, it is important that all bare wire and contacts are covered by electrical tape, otherwise there is a huge risk of being electrocuted.

WARNING

DO NOT use duct tape. Duct tape is conduction and will defeat the purpose and still shock you. Use electrical tape only.



This is a view of inside the chamber of how I mounted it



This is what the wires look like connected from the outside



Electrical tape the wires to avoid getting shocked



Use the electrical tape on the clicker. Cover up the contacts especially. The shock from this part that results is quite painful.

Step 4 – Priming the Components

The PVC primer makes for a cleaner contact point to connect the components together. The primer has a brush built in to the cap and is purple.

WARNING

Use the primer in a well-ventilated area. Do not ingest.

Take the PVC primer and prime the following components as shown:

- 3" pipe, both ends

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- 1.5" pipe, one end, just like the 3" section
- 3" to 1.5" reducer, as shown below



- 3" female adapter, as shown below



- Both 3" couplers, both edges, as shown below



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Let this dry for at least 6 hours, ideally a day. If the primer does not dry properly, it will also double as another propellant. The PVC primer will leave purple stripes on the components, as seen.

Step 5 – Seal the Hole in the Chamber

Using whatever sealant you have, seal up the hole or holes. Depending on your igniter, seal the gaps around the wires so the flames from the explosion don't burp out and burn your arm. I learned the hard way. Smear the sealant around the hole(s). Let it dry.

The primer makes it very easy to see where the cement needs to go. Everywhere there is a purple stripe, cement is needed. The PVC cement works the same way as the primer. The brush is built in to the lid.



Step 6 – Cement Everything Together

The primer makes it very easy to see where the cement needs to go. Everywhere there is a purple stripe, cement is needed. The PVC cement works the same way as the primer. The brush is built in to the lid.

WARNING

Use the cement in a well-ventilated area. Do not ingest.

- A. Take the 3" to 1.5" reducer and the 1.5" pipe. Put the cement on the smaller circle, the 1.5" side. Take the 1.5" pipe and put the cement on the purple stripe. Connect them and place the reducer on the ground. Push down on the pipe hard until it won't go any farther.



- B. Take one of the 3" couplers and the 3" female adapter. Put cement on one purple stripe of the coupler and on the purple stripe of the female adapter. Place them together and put the adapter on the ground. Push hard until the coupler won't go any farther.



- C. Take the new piece from part B and the 3" chamber. Put the cement on the other purple stripe of the coupler and on the purple stripe of the chamber that has the side of the igniter. Push together again until it won't go any farther.

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- D. Take the coupler that isn't in use and the new piece from part A. Cement one stripe of the coupler and the purple stripe left on the new part from part A. Push together until the parts won't move any more. Use the ground for leverage.



- E. Take the part from part D and the part from part C. Part C is the chamber with the coupler and the female adapter, and D is the barrel with the reducer and the coupler. Cement the two stripes left and push together until neither will move any more. What results should be the full cannon now, as shown below on the right. Below on the left are the two components needed.



Let everything dry for at least one (1) day, preferably two (2) days. The PVC cement is also flammable.

Step 7 – Tape the 3" Male Adapter

Take the thread tape and tape the threads of the 3" male adapter. This will keep the threads from getting gummed up from the propellant you use. Use the tape to tape all the way around the threads. Go around two or three times. When you are done, simply rip the tape and rub it on the threads to make it stay. It is meant to come off easily so it can be replaced easily.



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Screw the male adapter on to the rest of the cannon and the cannon is complete. You are now ready to have fun after the cement has dried. It should look like the picture shown below.



Quick Start Guide

1. Cut a 14" section of the 3" PVC.
2. Cut a 4' section of the 1.5" PVC.
3. Mount the grill igniter inside of the 3" PVC section somehow. Make sure it is secure.
4. Prime everything. Only prime one side of the 4' section of pipe.
5. Seal up all holes from the igniter on the pipe and use electrical tape to cover up any bare contacts.
6. Use the cement to put a coupler and 3" section you cut together.
7. Cement the 3" female adapter to the part made in step 6.
8. Take the 4' section of 1.5" pipe and cement that to the reducer.
9. Cement the new piece from part 8 to the other coupler.
10. Cement the parts from step 9 and step 7 and put them together.
11. Put the thread tape on the 3" male adapter and you're all set.

Conclusion

The potato cannon is ready for use. In order to use it, unscrew the 3" male adapter, take a potato and mash it in the top of the barrel. Take a broom stick or something long and ram it down to the bottom of the barrel, or close to the bottom. Look inside the 3" chamber to see when the potato is getting close. Once that is done, place the end of the barrel on the ground, take your propellant, for which I prefer to use Old Spice aerosol spray, spray it for three seconds inside the chamber, and close the chamber off by screwing on the 3" male adapter.

Once that is complete, aim at something that isn't alive or that can be damaged, and click the igniter. It will be loud, and there will be recoil.

If for any reason the cannon does not fire, unscrew the 3" male adapter and let the chamber air out. Before you do anything else, aim the chamber away from you or anyone else and click the igniter. This will burn off any dangerous gases inside of the chamber. Try less fuel, meaning either two or two and a half seconds. If that doesn't work, air out the chamber and burn off the excess fuel again and cut off a half of a foot off of the barrel. Those things can be the only reasons it isn't working.

I hope you enjoy this as much as I do. It is a fun way to waste time and it is a really neat piece of equipment.

Be careful, use right judgment, and please, don't do anything insane with it.