



## SWENext Engineering Challenge #6

### Air Cannon

For this next challenge you will be making an air cannon from things around your house. It is an exciting game you can build with your friends during your summer break!!

Once you finish making the first air cannon, try using different types of material – such as a simple version using a plastic soda bottle or a juice box. Step #9 in the directions shows some great ideas on how to modify the game and play with your friends ☺.

**Which material worked best for this experiment? What kind of games did you create?**

Good luck and have fun

Source: <http://www-tc.pbskids.org/designsquad/pdf/parentseducators/aircannon-english.pdf>

Ready for an EXTRA Challenge?!! ... [Design and build an air-powered rocket that can hit a distant target!](#)

### #SocialMedia

Share your pictures and videos from this activity on Facebook, Instagram or other social media with us and other SWENexters. Show us your creative games and see what kind of games other SWENexters created!

Use the hashtags:

#SWEtheFuture #SWENext #BeThatEngineer #DesignSquad #AirCannon

*To have your design featured by SWE please keep a lookout for an email on how to do this!*



# Air Cannon

## 1

### Here's what you need to make your Air Cannon!

- Large paper cup (e.g., 12- or 16-ounce size) (Or: Ice-cream or yogurt container, milk carton, oatmeal box, 1-pound salt container, mailing tube, or juice box)
- Newspaper bag (Or: Duct tape stuck together to make an airtight square of cloth, a bag from a grocery store's produce section, shopping bag used to carry purchases, or elastic material that's cut square from a balloon or stretchy rubber)
- Pom-poms (small- and medium-sized) (Or: Cotton balls or mini marshmallows)
- Duct tape
- Scissors



## 2

### Poke a hole in the cup

- Poke a hole half the size of your pom-pom in the bottom of the cup.
- Smooth the edges of the hole. For example, put the tip of your finger in the hole and twist gently.



## 3

### Cover the open part of the cup

- Tape a plastic newspaper bag over the mouth of the cup.
- *TIP: If you don't have a plastic bag... Make a "stretchy-style" Air Cannon. Tape a piece of stretchy rubber (e.g., a piece of balloon or rubber glove) tightly across the opening of your Air Cannon's body. Or make a "flexi-wall-style" Air Cannon. Tape airtight fabric like duct tape or plastic across the opening.*



## 4

### Make the cup airtight

- Carefully tape the bag to the cup so that it's airtight.
- Pump the bag to find leaks. Seal any leaks with tape. Air should only go through the hole you poked in the cup.



## 5

### Fill the Air Cannon with air

- Inflate the bag by blowing through the hole in the cup.
- The secret to success is trapping air inside the Air Cannon.



## 6

### Load the ammo

- The pom-pom should fit snugly in the hole. Think of it as a plug that seals the hole.
- *TIP: If the hole is too big... Use a bigger pom-pom, or seal the old hole with tape and make a new one.*
- *TIP: If the hole is too small... Use a smaller pom-pom or make the hole a bit bigger. Go slowly.*
- *TIP: Each time you make the hole bigger, test the new size with a pom-pom.*



# 7

## Squeeze the bag and LAUNCH

- Press firmly on the bag. When you squeeze the bag, the air rushes out the hole. The stream of fast-flowing air carries the pom-pom with it.
- *TIP: If the bag bursts... Repair or replace the bag. Next time, don't press so hard.*
- *TIP: If the pom-pom doesn't go far...Squeeze the air quickly and harder. The more you compress the air all at once, the faster it blasts out of the hole. Check the hole size. The pom-pom should fit snugly in the hole you made.*

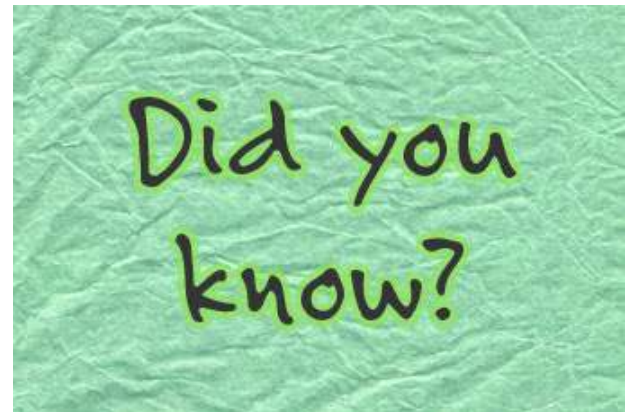


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# 8

## Did you know?

Because the pom-pom sits tightly in the hole, no air can get past. The pom-pom is a plug, sealing the air chamber. But it is a weak plug that can pop out. When you squeeze, you increase the air pressure inside the Air Cannon. At some point the air pressure overpowers the pom-pom's seal. Now, the air rushes out, carrying the pom-pom with it. Pea shooters, spitball shooters, leaf blowers, paint sprayers, pop guns, and air rifles all blast out a column of air that can be used to launch objects.



# 9

## Try this next!

- **Make a stomp launcher.** Take an empty juice box and seal it with a piece of duct tape to make it airtight. Poke a small hole near one end. Fit a pom-pom into the hole. Set it on the floor and stomp on it. The pom-pom will fly up. Can you catch it? Invent a tabletop game.
- **Make a stomp cannon.** Lay an empty plastic milk jug on its side on the ground. Plug the opening with a small ball. Jump up, and then land on the milk jug. How far did the ball shoot?
- **Super-size it.** Make a giant Air Cannon. Use a big plastic deli soup container or large oatmeal box. How about a five-gallon bucket with a flexible cover that you kick?



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