



YOUR CHALLENGE



Make a cannon using some materials from around your home and try aiming at targets.

Investigate and experiment to find out what affects how far your cannon can fire by changing the variables.

You can have a competition with someone at home to see who can fire the furthest or who can hit the most targets!

YOU WILL NEED:

- Cylinder crisp tin such as Pringles
- 500ml drinks bottle
- Two elastic bands of equal size
- Sellotape or masking tape
- Pencil
- Scissors
- Tin foil





INVESTIGATE

- Does changing the angle affect the distance your cannon can fire?
- Try firing different objects from your cannon such as cotton balls, a ping pong ball or tennis ball. Do heavy or light objects work best?
- Does using longer or shorter elastic bands make a difference?







STEP 1

Cut the bottom off of your crisp tin.

STEP 2

Cut two slits each about 1 inch deep marked here in black pen. Repeat this on the opposite side.

STEP 3

Attach an elastic band onto the slits you have just created on either side.

STEP 4

Tape around the edge of your crisp tin to secure the elastic bands in place and to make the top of the tin stronger.

STEP 5

Take your plastic bottle and poke a hole in your bottle like shown. Repeat this on the opposite side.

















STEP 6

Take a pencil and push it through the two holes you have created.

STEP 7

Put your bottle in the opposite end of the crisp tin and pull the elastic bands over the pencil to secure it.

STEP 8

Your cannon is ready! Scrunch up your tin foil into a ball and put it in the open end of your cannon, pull back the bottle and let go to fire!

STEP 9

Set up a target such as a stack of cups or a bowl to aim for.

Challenge someone at home to a competition. Who can fire the furthest? Who can hit the most targets?

STEP 10

Test it out and aim for your target!

Have a look at our 'Investigate' section on page 1 for variables you can change to experiment!

















THE SCIENCE

From this challenge we can learn about energy, forces and motion. When you pull back your bottle and stretch the elastic bands you put tension on them and store potential energy. When you let go of the bottle, the energy stored in the elastic bands converts into kinetic energy and is transferred to the projectile.

What is a projectile? It is any object which is fired through the air, so in this case it is whatever you choose to fire from your cannon!

The distance your projectile travels will depend on different variables which you can experiment with. The distance travelled depends on the mass of the projectile, the energy it is given, the speed which it leaves the cannon and the angle you fire it at.



COMPETITION TIME!

- Complete 4 challenges and submit an entry to our poster competition to be in with a chance of winning an EDT Experience Day at your school.
- For funded schools, you have the opportunity to receive the Industrial Cadets Challenger Award click <u>here</u> for full details.
- Share a photo or video of your experiment with us on social media and use the hashtag #STEAMstars

