ExpeRimental —
Bringing Science Home

More info about —
Rubber band cannons

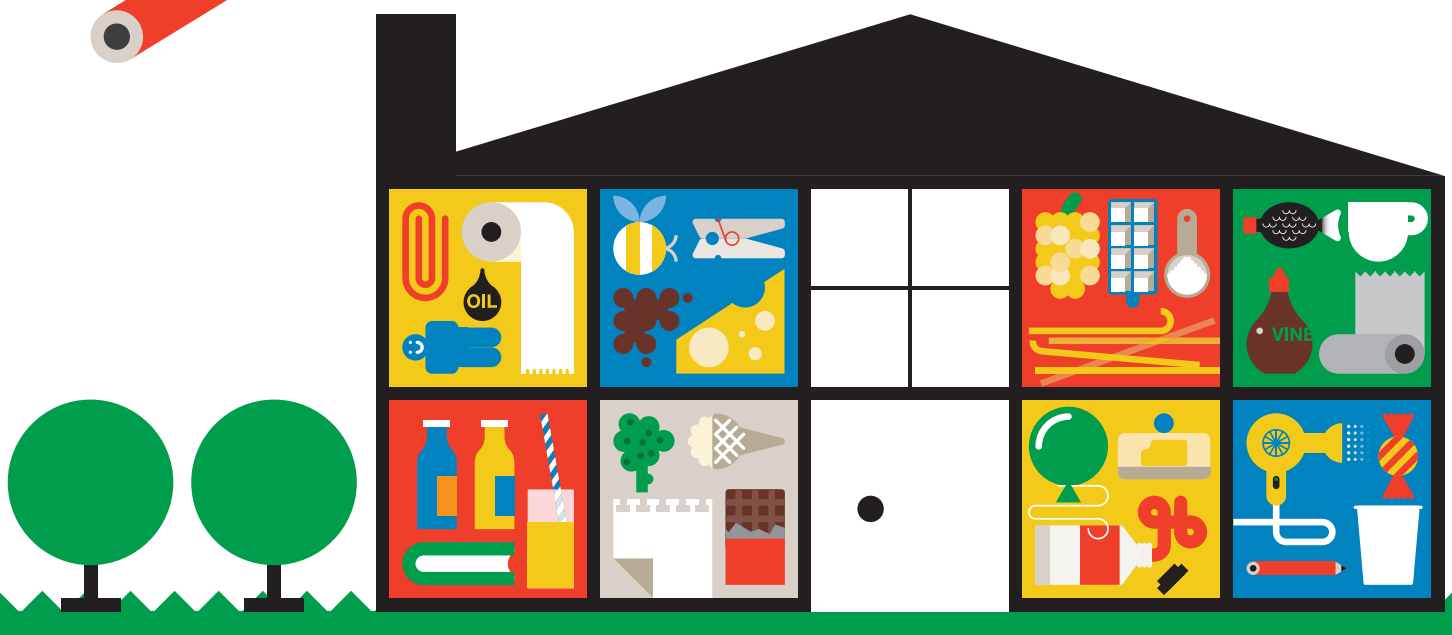
Rubber band cannons

The activity

Make a cannon, or catapult, using elastic bands, a plastic drink bottle and a crisp tin.

ExpeRiment by making changes to your cannon and explore how things fired from it move through the air.

Learn about energy and what affects the motion of a projectile (the thing flying through the air).



ExpeRimental —
Bringing Science Home

More info about — Rubber band cannons

What you'll need

- A Pringles or other crisp tin
- A 500ml soft drink bottle
- Elastic band (at least two of the same type)
- Masking tape or sellotape.
- Scissors
- Tin foil

Special materials

We've used a 500ml drink bottle and a Pringles tin for our cannons, but you can use other materials and objects for the same purposes as long as they do similar things.

What to do

Make a cannon – Watch the video and follow Andrea's instructions for making a cannon.

Investigate how the angle at which you fire your catapult affects how far the ammunition travels.

Investigate whether the weight of your ammunition affects how far it will fly.

Investigate whether stretching the rubber bands more makes the ammunition go further.

Invent a challenge – Decide with your child or children what you're going to try and do with your cannons. You could try to hit a particular target, launch your ammunition into a basket or use it to knock something down.

Try out different designs for your cannon. You could add more elastic bands or try out longer or thinner ones.

ExpeRimental —
Bringing Science Home

More info about — Rubber band cannons

Questions to ask children

What makes a good cannon? How far it fires something? How high?

How could we measure those things?

What do you think will affect how far we can fire something?

What effect do you think it will have if we fire the cannon at a steeper angle?

What if we use a more or less stretchy elastic band?

The science

Our rubber band cannons, like catapults, are simple devices for storing energy in a stretched rubber band then transferring it quickly to a projectile.

A projectile is any object fired through the air. When you pull the firing pin (the bottle) back, you are stretching the rubber bands. Energy from you is stored in the rubber bands. When you let go of the bottle, the energy stored in the elastic bands is transferred rapidly to the projectile.

It might seem that the more energy you give a projectile, the farther it will travel. However, this is not necessarily the case. The distance a projectile travels depends on its mass, the amount of energy it's initially given (and so the speed at which it leaves the cannon) **and** the angle at which it's launched. It also depends on the strength of gravity, but we can ignore that since the strength of gravity is pretty much the same on the surface of the Earth.

Andrea has some equations written on his cannon in the video. These are in fact equations for projectile motion which you can learn about here: http://bit.ly/Projectile

Being safe

Take care when firing objects from the cannon. We recommend using rolled up bits of tin foil as they are unlikely to cause any damage to objects they hit. Do not aim projectiles at each other.

ExpeRimental —
Bringing Science Home

More info about — Rubber band cannons

Going Further

You can experiment with ways of making a 'better' cannon once you have defined what better means to you.

You could make the activity more scientific by using scales to measure the mass of your ammunition. Then use a tape measure to measure how far they travel.

You can watch this video about projectile motion http://bit.ly/ProjMotionVid

A tastier way of exploring projectiles http://bit.ly/TastyCannon