TEACHING NOTES

ROCKET LAUNCHER

This worksheet is to help you to support your teaching after your students have watched the 'Rocket Launcher' video. It contains a summary of the science knowledge, experiment instructions, topics for further inquiry, and links to the curriculum.

For this session, your class will each need:

- **Clean, empty plastic bottle e.g. soda or milk bottle**
- **Small plate to draw around**
- **Paper**
- **Scissors**
- **Tape**
- **Ruler**
- **Pencil**
- **(Optional) colouring supplies**

NZ CURRICULUM STRAND: PHYSICAL WORLD

Achievement Aims / Nature of Science	Learning Outcomes
• Physical inquiry: explore everyday examples of physical phenomena such as movement, forces, electricity and magnetism, light, sound, waves and heat • Understanding about science: identify ways in which scientists work together and provide evidence to support their ideas • Investigating in science: Ask questions, find evidence, explore simple models and carry out appropriate investigations to develop simple explanations • Communicating in science: begin to use a range of scientific symbols, conventions and vocabulary	• Understand that a rocket launches by setting off a controlled explosion and a release of pressure to create thrust • Understand the role of the force of 'thrust' in the motion of a rocket

Rockets:

When a rocket takes off, it needs to create enough of a force known as 'thrust' to overcome the force of gravity and accelerate into space. Rockets create their thrust by setting off a huge controlled explosion which creates a build-up and then release of pressure. In this experiment your students will create a sudden release of pressure by pushing down on their bottles. This will force air out of the straw that they built and stuck to the end of their bottle which will become trapped inside their rocket. Eventually the build up of this pressure will be so great that it will generate enough thrust to push the rocket upwards, overcoming gravity for a few moments before heading back down to earth.

ACTIVITY — Rocket Launcher

Watch the 'Rocket Launcher' episode of Nanogirl's Lab to help with the design of the launcher.

- Draw and cut out a circle. A plate placed upside down on a sheet of paper makes it easier.
- Fold the circle in half and cut along the fold to make two semicircles.
- Take the two corners and curl inwards to make a cone shape. Tape it in place.
- If you want you can decorate this cone rocket.
- Cut a large rectangular strip off the bottom of the piece of paper you drew your circle on.
- Take the lid off the bottle, roll and tape the paper rectangle tightly on the mouth of the bottle to make a straw.
- Find the middle of the tube, and draw a small cross by making a horizontal and vertical line.
- Draw a diagonal line through the middle of that cross, then cut along the diagonal line. This is called a 'mitre cut.'
- Take one of the cut ends and rotate so that it makes a right angle with the other end.
- Tape the two half-straws in place, making sure no air can escape this 90 degree joint.
- Tape one end of the tube over the neck of the bottle, making sure that there are no air gaps.
- Hold your bottle with the tube pointing upwards.
- Place one of your cones onto the open end of the straw.
- Squeeze the middle of the bottle to launch the cone!

EXPLORE FURTHER

(Use these prompts to start a discussion or further inquiry on the topic of light)

- How high can you get your rocket to launch?
- Can you catch your rocket before it lands?
- What happens when you squash the bottle quickly with a lot of energy - why do you think that is?
- Why do you think your rocket has a pointy tip?
- How many rockets are launched every year into space?
- How does a rocket get back to earth after its space mission?
- What is 'space junk' and where do you find it?
- Do you think that a rocket moves very fast, or very slowly in space?
- What do you think the fins on the side of a rocket do?
- How many astronauts are there in space at the moment, and what sort of jobs are they doing?

If you have any questions, please contact info@nanogirllabs.com or check out Nanogirl's Lab at www.nanogirlslab.com