SUITE SCIENCE

FOAM ROCKET!

CLASS: 3rd– 6th | 25 mins | PHYSICS

Learning Objectives - WALT (We are learning to…)

1. Energy and Forces
2. Mathematics
3. Making foam rockets!

Curriculum links
Energy and Forces

- **Physics** – Energy, forces and gravity
- **Maths** – Trigonometry and Angles
- **Geography** – Earth and Space

Breakdown:

Welcoming Class	*5 mins*	Finding space and settling
Theory	*5 mins*	Theory of experiment
Experiments	*10 mins*	Foam Rockets
Demonstration	*5 mins*	Evaluation and clean up

Equipment and Important Notes for Tutors:

- Foam rockets
- Meter stick
- Quadrant Tool

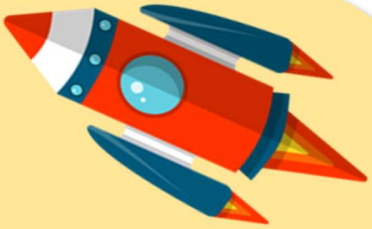
Safety

- Smaller children may need help firing the foam rockets, or may find themselves more stable sitting down
- Make sure children are not in the flight path

The design process is not included in this resource but can be found on *www.primaryscience.ie*

Make sure to incorporate the scientific learning process throughout this experiment. Establishing a sense of familiarity with the students on these will improve their scientific thinking as well as instilling the framework of future lessons. Remember to ask trigger questions and be inclusive. If children ask questions you do not know the answer to, **it is ok to say you don't know,** as it will show the children that science is about chasing the unknown and make them feel more at ease with you.
Theory and experiments will also overlap throughout the demonstration and it is important to remember to narrate through activities.

Introduction:
In this activity the children will be introduced to the concept of stored energy and projectiles. We will use a foam rocket and launch it into flight with the elastic band. When we pull the band it stores energy, when we let go it releases this energy and snaps back to its original shape, catapulting the foam rocket forward. The force of gravity will pull the rocket back to the ground
In this experiment, children will also learn what angles and distances are optimal for launching the rocket, improving their understanding of trigonometry and motion.



Experiment:

Set up: 5 mins
Have the children gather around and settle.

Theory: 5 mins
Ask the children if what they know about rockets, what we use them for, how they fly…etc. Ask them what will happen if we kick a ball straight up into the air, where will it land. Is angle important if we want to kick a ball high? (most children will have the basic concepts of right angles at least). Asking trigger **questions** and getting the children to **predict** outcomes improves their scientific thinking.

Activity: 20 mins
First, demonstrate the experiment to the children. Make sure the quadrant is secured to the middle of the meter stick. When the meter stick is titled the quadrant will indicate the corresponding angle. Take the foam rocket and loop the rubber band around the end of the stick, pull it back and ask the children to make a note of the distance and the angle on the quadrant. Launch the rocket!
Ask the children about the shape of the rockets path and explain the thrust of the band sent it up into the air before gravity pulled it back down.

Hand the equipment to the children in pairs. One will make note of measurements while the other launches. Ask them to try and find the best angle for launching the rocket (*usually around 45°*). Joke about how you send foam rockets to space all the time this way!

Reflection: 5 mins
Tell the children things that are sent into the air with no power of their own are called projectiles (footballs, foam rockets, ANGRY BIRDS!), and without power gravity pulls them back to the earth, this is why planes and rockets have fuel to keep them up. Ask the children now if angles play an important role in projectile motion.
Ask what we could do to improve the rocket (shape, better rubber bands, materials).

Finding the best angles helps me kick
The ball as far as I can!!

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