



STEM clubs

co-ordinated by merseySTEM

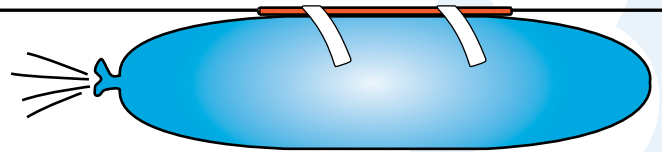
BALLOON ROCKETS

Focus: Physics

A balloon provides a simple example of how a rocket engine works. The air trapped inside the balloon pushes out the open end, causing the balloon to move forward. The force of the air escaping is the “action”; the movement of the balloon forward is the “reaction” predicted by Newton’s Third Law of Motion.



For students to create a rocket balloon which travels the furthest



Equipment:

- A drinking straw
- Different shapes and sizes of balloon
- A peg
- Sticky tape
- Stop watch
- Washing up liquid
- Two chairs
- A metre ruler / measuring tape

Instructions:

- Blow up the balloon, fold over the neck and secure it with the peg it to stop the air coming out.
- Thread the string through the straw.
- Tie the string to two chairs about 2 metres apart.
- Stick the balloon to the straw as illustrated in the diagram.
- Remove the clip from the neck of the balloon and watch your rocket zoom away.
- One person measure the distance the balloon travels and one person time how long it takes the balloon to travel to a stop. Make a note of the time taken / distance travelled.
- Repeat the experiment after covering the string with washing up liquid, discussing the effect of friction with the students.

Discuss:

Why did certain balloon rockets travelled further than others? What could students have done differently to make their rocket travel further?

They will need to think things such as:

- The friction between the balloon rocket and the string.
- The shape / weight of their balloon rocket.
- The position of the ‘mouth’ of the balloon in relation to the string guide line.

Useful Links:

European Space Agency - Web pages on launchers, European rockets, rockets in war and peace and the first rockets.
www.esa.int/esaKIDSen/SEMVVIXJD1E_Liftoff_0.html

The Physics Classroom – Focus on Newton’s Third Law of Motion
www.physicsclassroom.com/Class/newtlaws/u2l4a.cfm

NASA - Balloon Rocket activity extension activity
http://exploration.grc.nasa.gov/education/rocket/BottleRocket/Shari/propulsion_act.htm



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