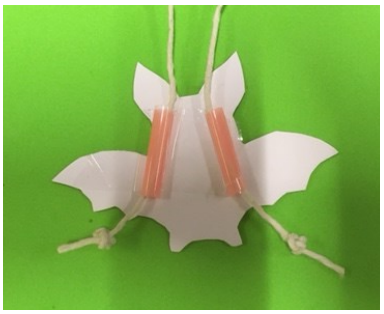
Squealing balloon

What do you need?
A balloon
A metal nut or a 20p coin

What do you do?
Place the metal nut or 20p coin inside the balloon
Inflate the balloon carefully and tie a knot.
Spin the balloon, making the metal nut or 20p coin move along the side of the balloon in a circle.
Can you hear a spooky noise?

What's going on?
The metal nut or 20p coin has flat sides and corners which stop it travelling around the balloon freely. Instead the nut/coin vibrates as it passes around the edge of the balloon creating the great sound you hear. When you spin the balloon faster you give the nut/coin more energy which is converted from movement energy (Kinetic) into sound energy.

Friction climber



What do you need?
2 pieces of cardboard (about 10cm x 10cm big)
Scissors and sticky tape
Small amounts of drinking straw
2 x 50cm string plus a 20cm piece

What do you do?
- Draw a picture of something that is going to climb or fly on the one piece of card. Cut it out with scissors. (You can decorate it if you like)
- Cut 2 short pieces of drinking straw about 3cm long. Use sticky tape to stick the pieces of straw to the back of your drawing, like in the picture.
- Thread the each of the longer bits of string through each piece of straw. Tie a big knot at the end of each bit of string that will be at the bottom of your picture.
- Draw another picture on the other piece of card and cut it out.
- Use sticky tape to attach the other ends of the long bits of string to the back of your second picture. Make a loop out of the smaller bit of string and use tape to stick that to the back of the same picture and hang it on a hook or doorhandle.
- Pull one of the ends of string, then pull the other, and watch the climber move!

What's going on?
Look closely at your climber...when you pull one end that piece of string becomes parallel to the straw that it passes through. The movement makes the other string perpendicular (at a 90^{o} angle) to its straw allowing the string to 'grip' to the straw and hold the climber in position. It can 'grip' because of the force of friction between the straw and the string. Try using different types of string: Which type of string produces the most friction, race your climbers to see!

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Freaky Hand

What do you need?
Plastic disposable glove or washing up glove
Elastic band
A small jar or glass
Vinegar
Bicarbonate of soda

What do you do?
- Add vinegar to the jar - There should be at least a thumbs' width.
- Add a couple of teaspoons of bicarbonate of soda to the inside of the glove. Shake it down so that the powder goes to the bottom of the fingers.
- Put the glove over the jar, and secure with the elastic band. Be careful not to spill the powder from the fingers into the jar yet. Pull the glove down, and push the elastic band up, to make sure the glove is on the jar.
- Lift a finger of the glove to tip the powder into the jar. Observe what happens!

What's going on?
When bicarbonate of soda (an alkali) and vinegar (an acid) react together, they produce carbon dioxide gas. The gas increased the pressure, and the glove starts to inflate like when you blow up a balloon.

Foamy Mouth Monsters

What do you need?
A foam monster head (make one from craft foam and double sided tape)
A tube, e.g. a test tube (**please be careful—ours are made from glass)**
Vinegar
Bicarbonate of soda
Food colouring

What do you do?
- Put the foam monster head on your tube so the mouth is just above the top of the test tube.
- Add vinegar to the tube until there is at least a thumb's width at the bottom of the test tube.
- Add a small drop of food colouring to the vinegar if you wish.
- Add a small teaspoon of bicarbonate of soda into the tube.

What's going on?
When bicarbonate of soda (an alkali) and vinegar (an acid) react together, they produce carbon dioxide gas. The gas gets trapped in bubbles and the liquid foams up and out of the tube, and through the monsters mouth.

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