Mini STEM Showdown

An Adelaide University, School of Education
STEMpire program

Science

Name:_____

Mini STEM Showdown is a series of STEM (Science, Technology, Engineering and Maths) activities to complete. Sometimes you will work individually, sometimes in groups.
Make sure you write your name and anyone else you are working with above. Have fun!

What is static electricity? (Teacher to read out to the class)



Have you ever gone down a slide and had your hair stand up? Or touched a doorknob and felt a little zap? That's static electricity!

Static electricity happens when tiny particles called electrons move from one object to another. This makes one object have a positive charge and the other have a negative charge. When things have different charges, they can stick together like magnets, or they can create little shocks!

It's called "static" because the electricity stays in one place instead of moving like the electricity that powers lights and TVs.

Examples of Static Electricity:

- **Going down a slide:** When you slide down, the friction transfers electrons and the person becomes charged. This can make their hair stand up and even create a zap when they touch someone.
- **Walking on a carpet**: When you drag your feet, especially with rubber soled shoes, on the carpet, electrons are transferred and you become charged. Then, when you touch someone or something, like a doorknob, you feel a little shock!

Static electricity is all around us—it can be fun, but sometimes it can be shocking too!

Let's try some experiments and learn more about static electricity.

Task 1 – What material makes the most static charge?

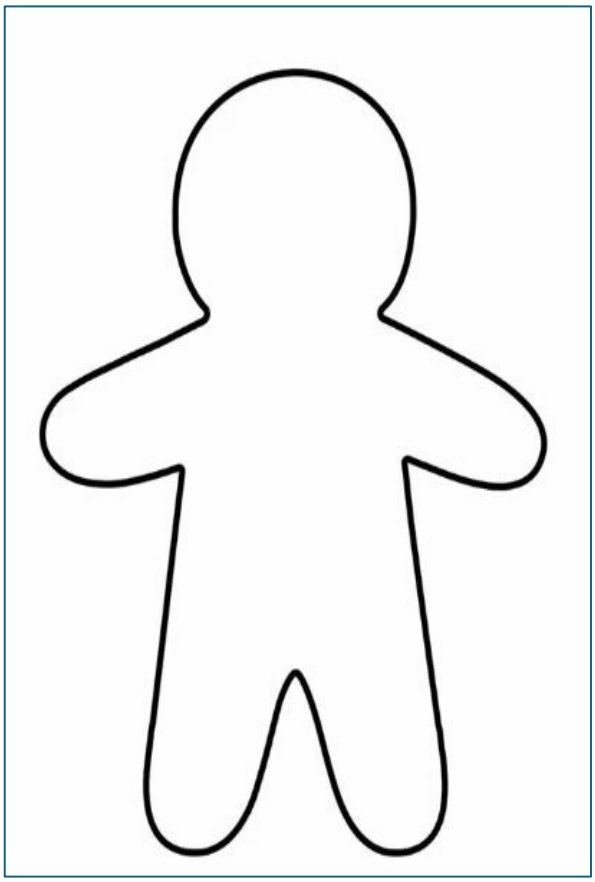
Task – Can you make the paper person stand up?
Find out which material creates the best charge to lift the tissue paper person up.

Prediction – Scientists make predictions (guesses) before they do tests. It doesn't matter if those predictions don't match the results as this can be an important discovery too.
Which material do you think will make the rod lift the paper best?

_____

Now let's find out if your guess is right, but we need to make the test fair.
Colour in yellow the **one** thing you will deliberately change between each test.
Colour in green the things you need to try and keep the same for each test.

Number of pieces of paper in the pile	The material used to charge the rod	The size, shape and material of the rod that is being charged up
The size and shape of the paper pieces	**What material moves the most paper pieces?**	The number and length of scrapes across the rod
The height of the rod above the paper pieces	The location of the paper pieces on the table	The pressure of the scrapes on the rod (same person)



Step 1 - In groups, make your paper person

- Trace this outline onto your tissue paper
- Cut out your paper person
- Place a small piece of tape on the feet
- Stick the paper person to the table

Step 2 - Testing the materials

- Put 15 small pieces of paper in a pile.
- Charge your plastic rod by rubbing it with the sheepskin.
- Put the rod near your paper and see how many pieces move.
- Repeat with cotton, polar, fleece, satin and one material of your own choice. This could be your T-shirt, a jumper or tea towel.

Step 3 - Now lift your paper person

- Using the material combination that worked the best, try and lift your paper person using the charged rod.

Results

Material used to charge the rod	Sheepskin	Cotton	Polar Fleece	Satin	Other material of your choice
Number of pieces of paper that moved					

Conclusion

The material that moved the most paper was _____

This *supported/didn't support* my prediction.

Cross out the incorrect term

What next?

You now know the best material combination to lift your paper person with, but does the paper it's made from make a difference?

What are some different paper types you could test? _____

_____

Task 2 - Try and pick up or move other things using static charge.

Charge the rod with your chosen material and see what else you can move.

Can you lift a piece of A4 paper?	Can you move a thin stream of water?
Can you move hair?	List other objects you can move with the charged rod.

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Extension Activity - Try it yourself

Balloon Investigation

Did you know you can charge a balloon by rubbing it on your hair?

Test this out and see what you can move with your charged balloon.

Blow up a balloon, rub it gently on your head and then…	**Prediction – what do you think is going to happen?** (Answer this **before** testing it)	**Result – what happened when you tested it?** (What did you see in the test?)
Put the charged balloon just above your hair		
Gently place the charged balloon against a wall and slowly let it go		
Hold the charged balloon over cut up cardboard		
Hold the charged balloon over cut up tissue paper		
Lay an empty drink can down and hold the charged balloon near the can		