

January 2021

Science: Magical Dancing Snake!

Ages: 7 - 13

Hello everyone. This is Bill from the Okanagan Regional Library System. Welcome to the fun and inventive world of making STEAM projects in your own home. Each month, I will share a fun and interesting project that you can make using materials commonly found in your own home.

Even though we can't be together right now, we can still learn how to make exciting projects each week!

This month's project: Magical Dancing Snakes

Dancing Snakes



How would you like to have a new career as a snake charmer and get a writhing serpent to jump up and down and dance like magic? You will have to make use of an invisible force call static electricity. You can create this force with nothing more complicated than tissue paper and a balloon. And, as you will see, static electricity can do other strange things besides taming paper snakes. It can even bend a stream of water.

Heads Up

When you put your tissue snake on a table or in the bottom of a basket, it's head will normally lie flat. Even light material like this is pulled down by the force of gravity. To lift it up, there must be another force acting on it – one that pulls the snake's head upward, against gravity. That is the force of attraction between electric charges.

Materials Needed:

This recipe will make 6 Black Holes

- Masking Tape
- Balloon
- Coloured Felt Pens
- Scissors
- Large Plate or Bowl
- Tissue Paper
- Basket - Optional



You will need a steady hand to draw and cut out your snake, but otherwise this experiment is as easy as blowing up a balloon. Once you have discovered what static electricity can do to a tissue snake, you can try other things too. The tiny electric charge involved in the experiment is completely safe. However, you should never investigate the electricity in power cables and appliances as this would be very dangerous.

Time: 30 minutes

Steps:

1. Unfold the tissue paper, so that it is just one sheet thick. For the best results, use the thinnest tissue paper that you can find. Lay the paper out flat on a table and put the plate or bowl upside down on top. Draw around the plate or bowl with a pen.



2. Now draw a spiral on the paper, to create an outline of a coiled snake. The center of the spiral will be the head of the snake., while the tail will be the pointed part around the outside.



3. Cut carefully around the circle you drew and continue along the line of the spiral. As you go around, your snake will be revealed. Tissue paper crumples up very easily, so try not to grip it too hard with your fingers.



4. You can decorate your snake, if you like. Perhaps you could draw on some eyes, or make a small tongue by colouring some leftover tissue paper with a red pen, then sticking it on. Tape the snake's tail to the table or to the basket if you are using one.



5. Now it is time to generate static electricity. Blow up the balloon and tie it off. Then rub it quite hard against something wool, such as a blanket, for about a minute. If you don't have anything made of wool, you can rub the balloon on your hair. Hold the charged balloon about 5 centimeters above the snake and then slowly bring it closer. When the balloon is about 2 cm above the snake's head, the snake will be attracted to the balloon, and will rise up towards it.



Take it Further

Jumping Paper People

Make the people dance! You can use a charged balloon to attract small pieces of paper on a table. See how close you have to hold the balloon before the paper jumps up and down.

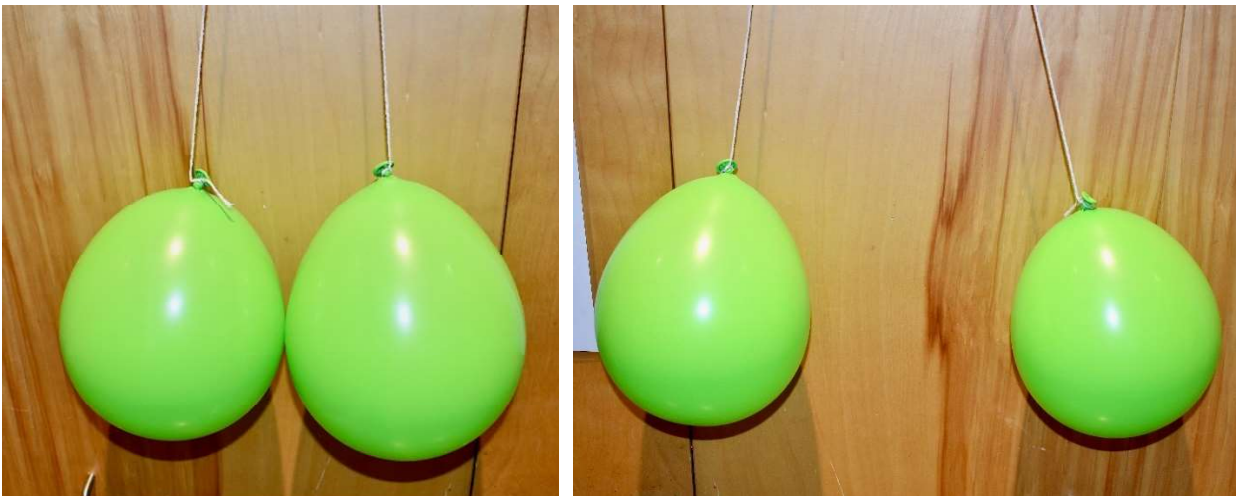
1. Cut out lots of little pieces of tissue paper. You could make fun shapes like these. Lay them on a table.
2. Bring a charged balloon close to the paper pieces. The pieces will jump up and stick to the balloon. Some may even fall off and jump up again.



Pushing Balloons

Hang two uncharged balloons together and nothing much happens. Yet, when the balloons are charged with static electricity, things start to get a little more interesting.

1. Tie string around each of two balloons. Do not charge them yet, but hold both strings between a finger and thumb and let the balloons hang down.
2. Charge both balloons evenly, all over their surfaces. When you dangle them down now, they stay apart, repelled (pushed) by the invisible force of static electricity.



The Science behind your Magical Dancing Snake

Electric charge is carried by tiny particles called protons, which carry a positive (+) charge and electrons, which carry a negative (-) charge. Charges exert forces on each other: charges of the same type push apart, or repel, while opposite charges pull together, or attract. Normally, there are equal numbers of positive and negative charges everywhere. However, when you rub the balloon on wool or your hair it picks up extra electrons, giving the balloon an overall negative charge. This pushes the electrons away in the paper, making the paper's edge positively charged. That is why the paper is attracted to the balloon.

Real World Science – Lightening Storms



Inside a thunder cloud, swirling winds make ice crystals in the cloud rub together, which charges them. The base of the cloud becomes negatively charged, which is attracted to a positively charged ground. This can produce lightening, which takes the shortest route to the ground, often striking trees.

STEAM

This activity includes everything you need for a comprehensive STEAM project.

Science: Understanding how static electricity affects how different objects react with each other.

Technology: Understanding how static electricity changes the polarization of various objects.

Engineering and Art: Making objects for this experiment.

Math: Measuring how close or how far apart static electricity pushes or pulls objects towards or away from each other.