



Let's Talk About Volcanoes.

**STEM Education worksheet provided by
Dundee Science Centre.**

These worksheets work in conjunction with our **Let's Talk About** video series that can be found on our Instagram @dundeesciencecentre.

They are designed to engage and educate on interesting science topics to support the curriculum for learners of all levels.



Create Your Own Mini Volcano

You will need

- Vinegar
- Bicarbonate of soda (not baking powder)
- Dish soap
- Volcano vessel - a cup will do, but you could also make your own volcano model!
- Tablespoon
- Jug
- Red or orange food colouring - **Optional**
- A tray to prevent mess - **Optional**

Instructions

Step 1: Place your cup or volcano vessel either outside or in a tray to prevent mess. Fill your cup $\frac{1}{3}$ of the way full with vinegar.

Step 2: Add 3 drops of food colouring and a tablespoon of dish soap to the cup of vinegar.

Step 3: In a jug add 100ml of water and 3 tablespoons of bicarbonate of soda. Mix well.

Step 4: While mixing very quickly tip the jug with the bicarb mix into your cup and watch your volcanic eruption.

Make Your Own Seismograph

One of the main tools used by **geologists** - scientists who study volcanoes, earthquakes, and the Earth's structure - is called a **seismograph**. When a volcano erupts or an earthquake occurs, it causes vibrations in the ground. A seismograph is a sensitive instrument that detects these vibrations and records them, even when they are too small for people to feel. Interestingly, you can build a simple version of a seismograph yourself to better understand how it works.

You will need

- Cardboard box
- Paper cup
- Stones, coins, or something similar and heavy
- Felt-tip pen
- Paper (long, thin strips if possible)
- String

Instructions

Step 1: Cut off the top of the cardboard box to see inside, and stand it up on a side.



Step 2: Poke two holes near the rim of the cup on opposite sides and two holes the same distance apart on the top of the box.



Step 3: Make a hole in the bottom of the cup big enough for the felt-tip pen to squeeze through.



Step 4: Hang the cup in the box using two equal-length pieces of string - the bottom of the cup should be about 3 cm above the bottom of the box, and the tip of the pen just touching the bottom of the box.



Step 5: Fill the cup with stones or coins to give it some weight.

Step 6: Take a thin strip of paper and lay it under the pen.





Using Your Seismograph

If we rest our seismograph on a table, as we begin shaking the table, the box will shake too. By adding weight to our cup, we increase the cup's mass, which increases the cup's ability to resist motion.

We can describe this ability to resist motion as **inertia**. When the box begins to shake, the cup will remain mostly stationary, due to having greater inertia. Since the paper is attached to the moving box, the paper moves back and forth beneath the stationary cup and pen, causing the pen to trace a line that records the box's motion.

See it in action!

- Ask someone to slowly slide the paper underneath the pen while you gently shake the box, as if simulating a small earthquake. Observe the pattern that forms.
- Next, try sliding the paper without shaking the box. Do you notice a difference in the pattern compared to when the box is moving?

Experiment with different directions of movement. Does the pattern change depending on whether the box is shaken side to side, forwards and backwards, or up and down?

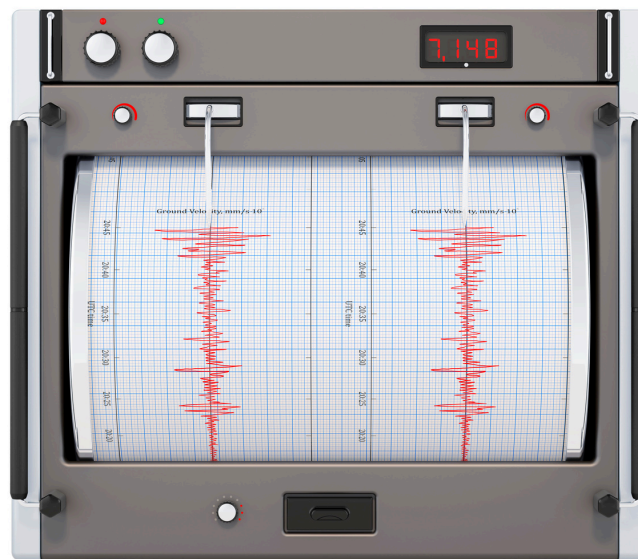


Using Your Seismograph

You can also test how sensitive your seismograph is.

- Have someone steadily move the paper while you create small vibrations - try tapping the table or jumping nearby. Can your seismograph detect these movements?

Although modern seismographs are controlled and recorded digitally, your homemade version works in a very similar way to early scientific instruments. The main difference is that older professional models included a mechanism to move the paper continuously at a steady rate.





Volcano Word Search

S	L	A	V	A	P	U	E	A	L
U	J	T	Y	E	A	R	T	H	A
B	M	U	C	R	U	S	T	E	U
M	A	G	C	U	S	I	D	A	L
A	G	Q	E	P	O	S	H	T	I
R	M	A	G	T	H	E	H	P	E
I	A	T	F	I	R	A	S	O	A
N	W	A	V	O	L	C	A	N	O
E	Z	Q	C	N	I	K	S	Y	T

LAVA
MAGMA
CRUST
ERUPTION

CORE
ASH
VOLCANO
EARTH

HEAT
SUBMARINE