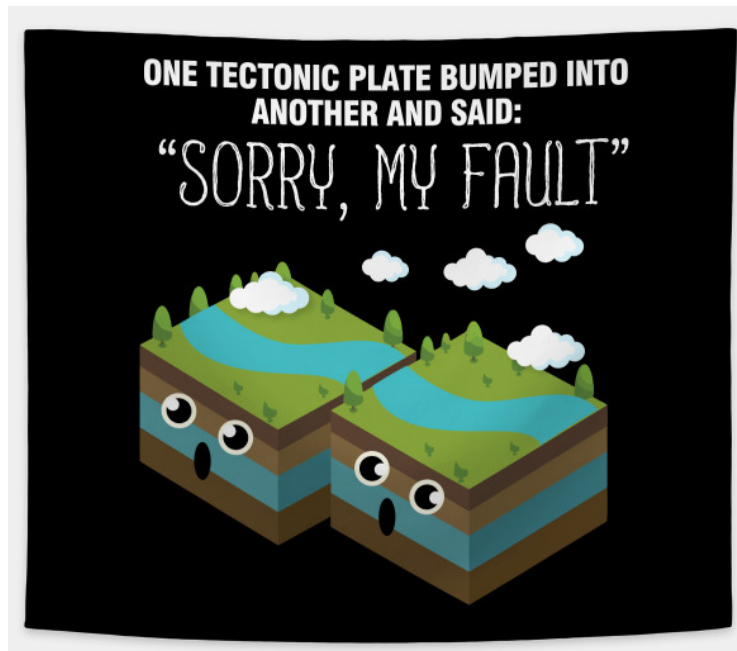




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DIY Seismograph

Activity Rundown:



In this activity, we'll be learning how to build a simple seismograph and how it measures the shaking of the earth during an earthquake!

You will need:

- + Medium-sized cardboard box
- + Paper or plastic cup
- + String
- + Marker
- + Scissors
- + Paper or a very long printed receipt from a store
- + Tape
- + Coins, marbles, small rocks, or other small, heavy objects to use as weights

Let's do it!

1. Cut the lid or flaps off the cardboard box. Stand the box up on one of the smaller sides.



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2. Poke two holes opposite each other near the rim of the cup.
3. Tie a piece of string, slightly longer than the length of the box, to each hole.
4. Poke two holes in the top of the box, making sure they are the same distance apart as the holes in the cup.
5. Push the two pieces of string through the holes and tie them together on the top of the box, so the cup hangs down inside the box. The bottom of the cup should be about an inch above the bottom of the box.



6. Poke a hole in the center of the bottom of the cup. Remove the cap from the marker, and push the marker through the hole, so its tip just barely touches the bottom of the box.
7. Fill the cup with coins or other small weights, making sure the marker stays vertical.



8. Fold a piece of paper in half lengthwise, then fold it in half lengthwise again. Unfold the paper and cut along the folds to form four equal-sized strips. Tape the strips of paper together end to end, to form one long strip. If you have a long printed receipt, you can skip this step.



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9. Cut two slits on opposite sides of the cardboard box, as close as possible to the bottom edge. The slits should be wide enough to pass the paper strip through one side, across the middle of the box, and out the other side.
10. Make sure the marker is centered on the paper strip. You might need to poke different holes in the top of the box and re-hang the cup if necessary.
11. Now you are finally ready to use your seismograph! Stabilize the box with your hands as your helper slowly starts to pull the paper strip through the box from one side to the other side.
12. Now, shake the box back and forth (perpendicular to the paper strip, keeping the bottom of the box in contact with the table) as your helper continues to pull the paper strip through, doing their best to pull at a constant speed. How does the line on the paper strip change?
13. Pause your shaking for a few seconds (as your helper continues to pull the paper), then try shaking the box harder.
14. Pause for a few more seconds, then shake the box very gently.
15. Pull the paper strip all the way out of the box and look at the line.



Background:

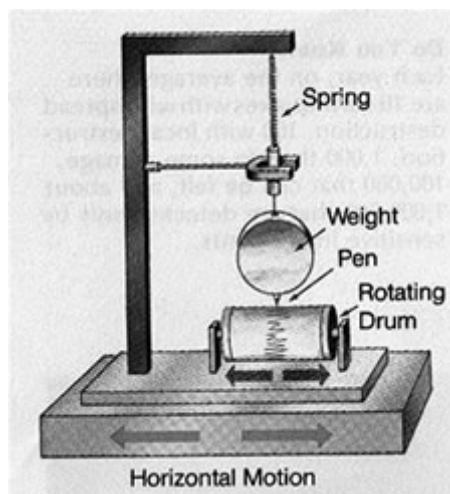
- **A seismograph is an instrument used to detect and record earthquakes.** Generally, it consists of a mass attached to a fixed base.



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- During an earthquake, the base moves and the mass does not. The motion of the base with respect to the mass is commonly transformed into an electrical voltage. The electrical voltage is recorded on paper, magnetic tape, or another recording medium. This record is proportional to the motion of the seismometer mass relative to the earth, but it can be mathematically converted to a record of the absolute motion of the ground.
- **Seismograph** generally refers to the seismometer and its recording device as a single machine.



- **Earthquakes** are the shaking, rolling or sudden shock of the Earth's surface. They are the Earth's natural means of releasing stress.
- More than a million earthquakes rattle the world each year!
- There are about 20 **plates** along the surface of the earth that move continuously and slowly past each other. When the plates squeeze or stretch, huge rocks form at their edges and the rocks shift with great force, causing an earthquake.
- As the plates move they put forces on themselves and each other. When the force is large enough, the crust is forced to break. When the break occurs, the stress is released as energy which moves through the Earth in the form of waves, which we feel and call an earthquake.
- A **fault** is an area of stress in the earth where broken rocks slide past each other, causing a crack in the Earth's surface.

Resources:

<https://www.scienceworld.ca/resource/make-your-own-seismograph/>



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Reach out!

We would love to hear from you about all the amazing STEM projects you are doing at home! Show us your finished products on any of the following social media platforms by tagging us or by using the following hashtags. We hope these projects have brought some excitement to your day during these difficult times.

Let us know how we did! Please [click here](#) to fill out a short survey on how well we did and what you would like to see more of in the future. Thank you!

Twitter: **@MyMindsInMotion**

Facebook: **@mindsinmotion2014 & @ucactiveliving**

Instagram: **@ucalgaryactive**

Please use the following hashtags!

#ucalgarycamps #ucalgarytogether