



Homemade Seismograph

Have you ever experienced an earthquake? Create a model of a seismograph and replicate an earthquake to see how seismologists use this machine to record when and where earthquakes take place and how intense they are.

TEKS:

3.7B Investigate rapid changes in Earth's surface such as volcanic eruptions, earthquakes, and landslides.

How To:

1. Spread out your newspaper or scratch paper on the table.
2. Uncap the marker and tape the end of it to one end of the ruler so it makes a long L-shape and the two are perpendicular. The tip of the marker should be facing away from the ruler.
3. Place the soup can near the scratch paper. Tape the ruler to the side of the soup can so that the tip of the marker is just touching the newspaper.
4. Try gently shaking the table: *What happens on the paper? What happens with smaller versus bigger shakes?*
5. Real seismographs have rolls of paper that rotate slowly as a needle moves with the shaking. Have one person try to slowly move the paper as another person shakes the table. *Can you see seismic (earthquake) waves being recorded?*
6. *If you shake the table horizontally (forwards and backwards) and vertically (up and down), how does that affect the image of the waves on the paper?*
7. If you feel really adventurous, make two seismographs. Place one in a tub of sand or water and the other on the hard table surface. *How does what the seismograph rests upon affect the readings on the scales?*

Materials:

- Marker or felt-tip pen
- Plastic or metal ruler that is flexible
- Masking tape
- Something heavy (a can of soup is perfect!)
- Newspaper or other large scratch paper
- Table with a hard surface

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The STEM Explanation:

Scientists measure seismic waves produced by an earthquake using devices such as a seismograph (or seismometer). An earthquake is caused by a sudden slip on a fault. When the always-moving tectonic plates get stuck due to friction, stress builds up on the edges of the plates until it overcomes the friction, suddenly releasing in an earthquake. An earthquake releases energy in waves that travel through the earth's crust and causes the shaking we feel. A seismograph records these ground vibrations or shaking. With a sensor attached to the ground, a seismograph records the arrival of seismic waves at that point. The height of the largest waves indicates the size of an earthquake. Given the length of the earthquake record and the arrival time of each wave, the distance of the earthquake's focus point, or origin, from the recording point can be determined.

Career Connection:

Seismologists are geoscientists who study earthquakes and related phenomena, including the effects of explosions and the formation of tsunamis. These professionals gather data about shifts in the earth's crust through the use of seismographs and other instruments. While many seismologists are uncertain about the possibility of predicting earthquakes, their research has been instrumental in the development of advancements in tsunami warning systems.

Resources:

- <http://www.calacademy.org/educators/lesson-plans/measuring-earthquakes/>
- http://study.com/articles/Seismologist_Job_Description_Salary_and_Requirements.html
- <http://www.usgs.gov/faq/categories/9827/3343>

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