

# Earthquakes

Investigation Data Sheet



## How Does A Seismograph Record Earthquake Data?

Scientists who study earthquakes are known as seismologists. They measure the size and energy of earthquakes using the Richter scale. A seismograph is the name of the instrument that measures the Earth's movements and determines the scale of the earthquake. Although seismologists cannot yet accurately predict earthquakes, they have identified indicators of impending earthquakes, such as the frequency and measurement of aftershocks.

### Objective

Determine how a seismograph records an earthquake on paper and how such a recording can be read by building a simple model of a seismograph and putting it through simulated earthquakes.

### Materials

- a metric ruler
- adding machine paper
- scissors
- a pencil
- a shoe box prepared with a slit in one end, just large enough for the ruler to pass through and two 6 cm-wide slits on the sides, near the opposite end
- a felt-tip pen
- masking tape
- a rubber band

**Safety Notice:** All applicable laboratory safety rules must be followed. Students should not perform any experimental activity without the teacher's supervision and express permission. Students must follow safety guidelines and wear appropriate protective gear.

### Procedure

1. Stand the shoe box on end, with the small slit at the top and the two other slits at the bottom.
2. Using your ruler, measure out and carefully cut a 75 cm-long strip of adding machine paper.
3. Thread the strip of paper in through the right side slit and out through the left side slit.
4. Pull it through so that about five centimeters of the paper hangs out the left side slit.

5. Using your rubber band, attach one of your pencils to the ruler, near one end.
6. Slide the other end of the ruler down through the slit at the top of the box and lower the ruler until the pencil stops it from descending.
7. Securely tape your felt-tip marker to the ruler inside the box. (By adjusting the position of the pencil attached to the ruler, you can adjust the height of the felt-tip pen.)
8. Remove the cap of the felt-tip pen and position the pen so that the tip lightly touches the adding machine paper.
9. Now your seismograph is ready. All you need is an earthquake. But, first, while you hold the box steady, have your partner slowly pull the adding machine paper across the bottom of the box from right to left for about five centimeters. This shows you the kind of line the seismograph draws when there is no earthquake.
10. Now you'll simulate an earthquake. While your partner again pulls the paper from right to left, shake the shoe box backward and forward very lightly for a few seconds. Repeat the test while shaking the box a little harder. Write down your observations for each test in the data table.

### Conclusions

- What kind of line is drawn on the moving paper when there is no earthquake — when the box didn't shake?

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- How does a simulated earthquake affect the line the marker draws on the moving paper?

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- How does the model seismograph record the strength of each earthquake? Does the size of the zigzags have anything to do with quake strength?

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Simulation	line drawn
No earthquake	
Mild earthquake	
Severe earthquake	