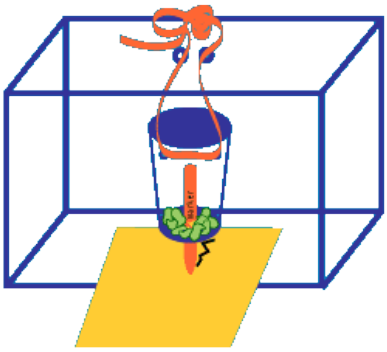
Engineering Experiment:
Make Your Own Seismometer
Project: Models, Weather & Climate Science



Supplies:

- Cardboard Box with Flaps Cut Off (one per group)
- Plastic Cup (one per group)
- Felt Tip Marker (one per group)
- String
- Small Rocks, Marbles, or Bolts (enough to fill one cup per group)
- Paper (long newspaper roll works best)
- Scissors
- Tape or Glue (possibly)

Objective: **Build a seismometer that measures movement (i.e. earthquake movement)**
Time: **30-45 minutes**

What to Do:

1. Place your cardboard box (with the flaps removed) and turn the box so that the open side faces you.
2. Using scissors, poke two holes next to each other in the center of the top of the box.
3. Poke one hole in the center of the bottom of the cup, one hole along the rim of the cup, and another hole exactly opposite that hole.
4. Put the marker through the holes in the center of the bottom of the cup. The writing end should be sticking out of the bottom of the cup. (You might need to tape or use glue to keep the marker in place.)
5. Cut a 45 cm piece* of string and thread it through the two holes along the rim of the cup. (Depending on the size of your box, you might need to vary the length of your string.)
6. Thread the string through the holes in the box so that both ends of the string are equally in the box. Tie the ends on top of the box. See diagram above for example.
7. Fill the cup ¾ full with something that will weigh it down (marbles, rocks, bolts, etc.)
8. Cut a strip of paper that's as long as the box and approximately 5 inches wide.
9. Put one end of the paper under the marker. Remove the marker cap and make sure that it sticks out of the cup far enough so the marker touches/writes on the paper. (You might need to adjust the string/marker.)
10. Have someone shake the box left or right while someone else pulls the paper forward, steadily. You should get a squiggly line on the paper.
11. For more a 'scientific' method, use graph paper in order to quantify how much the marker moved, in what direction, etc.
12. Experiment with many different kinds of "forces" (shaking the box, running or jumping next to it, rolling a ball towards and hitting the box, etc.) Experiment with different structures/surfaces (table, floor, in a car, etc.)

Reflect & Apply:

1. What kinds of forces or surfaces had a greater effect on the movement? What made the marker move more? Move less?
2. Did the marker move in the same direction as the force applied (i.e. which way did the marker move when box moved/struck from the left/right/front/back/etc.)?
3. Why would we need to measure this activity? When would it be useful?

Source: *PBS ZOOM Activity "Make a Seismometer"* www.pbskids.org/zoom/activities/sci

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