



Bible Story






Midnight Praise with
Paul and Silas

Acts 16:16-40

Castle Callout

Armor Up with Salvation!

Materials:

-  2-liter soda bottle, at least halfway full
-  wooden ruler
-  masking tape
-  felt-tip marker
-  paper

Teacher Tip

For best results, pull the paper in the opposite direction from how the table is shaking.

Experiment 1

Build a Seismograph

I. Preparation

Gather materials and cover the tables. Practice the activity to make sure it works with your materials. If the soda bottle is empty, fill it at least halfway with water.

II. Introduction

Say Something Like: **In today's story, God rescued Paul and Silas from jail, using an earthquake. It was powerful enough to free them from the jail, but not so powerful that they were harmed. Today, scientists use a device called a seismograph to measure how powerful earthquakes are. We are going to make a very simple seismograph with these materials.**

Ask: **What happens during an earthquake?** (the ground moves and shifts, shaking everything on top)

Ask: **Why do you think it is useful for scientists to know how strong an earthquake is?** (to know how much damage to expect, to compare the effects of different earthquakes)

III. Experiment

Have your Knights complete the following directions:

Step 1. Firmly tape the felt-tip pen or marker to the side of the ruler, forming an L-shape.

Step 2. Set the 2-liter bottle on the table. Line up the ruler so that the marker lightly touches the table. Loosely tape the ruler to the side of the bottle.

Step 3. Place a piece of paper under the marker. Test your device by shaking the table lightly. Adjust the position of the ruler until the pen marks on the paper consistently but isn't pressed too tightly to move. Secure the ruler to the side of the bottle more firmly.

Step 4. Invite two Knights to help you test the seismograph. One should shake the table, while the other pulls the paper slowly under the pen. Try shaking very hard and shaking softly. What differences show up on the seismograph?

Step 5. Invite Knights to perform the experiment themselves (divide your group into teams, if needed). Repeat steps as time allows or until each Knight who wants a turn gets one.

IV. Side Quest

- 1) Consider building a shake table (see “Earthquake Engineering” on page 24) and testing your seismograph on the shake table.
- 2) Knights can make smaller seismographs to take home using 16-ounce water bottles, wooden craft sticks, and felt-tip markers.

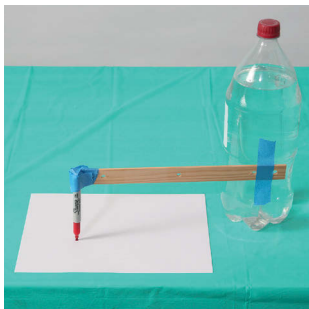
V. How does it work?

This seismograph works because the taped ruler is flexible enough to separate the motion of the pen from the motion of the table. The paper and the table shake together, but the pen stays in roughly the same place. Therefore, it draws lines as the paper moves underneath it. The size of the lines indicates the strength of the shake. The most accurate seismographs can detect earthquakes that are too small for people to feel, which can help predict a dangerous earthquake before it happens.

VI. Bible Tie-in

Paul and Silas didn't run away from jail after the earthquake freed them because they knew the guard would get in trouble if they escaped. But they also knew that the guard's deepest need wasn't physical safety, just like our deepest need isn't physical safety, even during an earthquake. God wants us to know that we are known and loved and that we are invited into a relationship with this God who loves us.

Steps 1



Step 2

