SERVICE LEARNING for HAITI

EARTHQUAKE SCIENCE

1. **Overview of Earthquake Science Activity**
   - Supplies:
     - Girl Scout Daisies/Brownies: *Rumble Tumble* story.
     - Girl Scout Juniors/Cadettes/Seniors/Ambassadors: paper, pencil, small toy car
   - Girls will learn what earthquakes are and why they occur.

2. **Activity**
   - **Instructions**:
     - Explain to the girls that they will be learning about Earthquakes

       - **Girl Scout Daisies/Brownies**
         - Read *Rumble Tumble* by Katy Henriksen
         - The book can be found online at http://www.fema.gov/kids/images/rumble.htm

       - **Girl Scout Juniors/Cadettes/Seniors/Ambassadors**
         - Have the girls read the information on the Earthquake Science Fact Sheet as a group.
         - The girls will do the following activity to find out how a seismograph works.
           - Break the girls into pairs.
           - On a table place a small toy car on a piece of paper.
           - One person holds a pencil with the lead lightly resting in the paper.
           - The other person moves the paper back and forth very slowly.
           - What kind of line does the pencil make? Does the car move?
           - Now move the paper so that the car starts to slide around. What kind of line does the pencil make now?

3. **Reflection**
   - **Girl Scout Daisies/Brownies**
     - How did the earthquake make Johnny feel?
     - How would you feel if you were Johnny?
     - How is the earth like a puzzle?
     - Why does the earth “rumble and tumble”?
     - What happens when there is an earthquake under water?

   - **Girl Scout Juniors/Cadettes/Seniors/Ambassadors**
     - Now that we know the science behind earthquakes, lets talk about the effects they have.
     - What major earthquakes have you heard about other than the one in Haiti?
     - What have you heard about the Haiti earthquake?
     - How are the Haitians recovering from the devastation?
     - What are other countries doing to help?
     - What are you doing to help?

Earthquake Science Fact Sheet

1. **What is an earthquake?**
   An *earthquake* is what happens when two blocks of the earth suddenly slip past one another. The surface where they slip is called the *fault* or *fault plane*. Sometimes an earthquake has *foreshocks*. These are smaller earthquakes that happen in the same place as the larger earthquake that follows. Scientists can't tell that an earthquake is a foreshock until the larger earthquake happens. The largest, main earthquake is called the *mainshock*. Mainshocks always have aftershocks that follow. These are smaller earthquakes that occur afterwards in the same place as the mainshock. Depending on the size of the mainshock, aftershocks can continue for weeks, months, and even years after the mainshock!

2. **What causes earthquakes and where do they happen?**
   The earth has four major layers: the *inner core, outer core, mantle,* and *crust*. The crust and the top of the mantle make up a thin skin on the surface of our planet. But this skin is not all in one piece – it is made up of many pieces like a puzzle covering the surface of the earth. Not only that, but these puzzle pieces keep slowly moving around, sliding past one another and bumping into each other. We call these puzzle pieces *tectonic plates*, and the edges of the plates are called the *plate boundaries*. The plate boundaries are made up of many faults, and most of the earthquakes around the world occur on these faults. Since the edges of the plates are rough, they get stuck while the rest of the plate keeps moving. Finally, when the plate has moved far enough, the edges un-stick on one of the faults and there is an earthquake.

3. **How are earthquakes recorded and how is the size of an earthquake measured?**
   Earthquakes are recorded by instruments called *seismographs*. The recording they make is called a *seismogram*. The seismograph has a base that sets firmly in the ground, and a heavy weight that hangs free. When an earthquake causes the ground to shake, the base of the seismograph shakes too, but the hanging weight does not. Instead, the spring or string that it is hanging from absorbs all the movement. The difference in position between the shaking part of the seismograph and the motionless part is what is recorded. The *seismogram* recordings determine how large the earthquake was. A short wiggly line that doesn't wiggle very much means a small earthquake, and a long wiggly line that wiggles a lot means a large earthquake.

4. **Can scientists predict earthquakes? Why or why not?**
   No, and it is unlikely they will ever be able to predict them. Scientists have tried many different ways of predicting earthquakes, but none have been successful. On any particular fault, scientists know there will be another earthquake sometime in the future, but they have no way of telling when it will happen.