

## Earthquakes vs Buildings Lesson Plan

### Science Standards Addressed

#### ***CDE Standard 1 – Physical Science***

5<sup>th</sup> Grade: Earth Systems Science: Earth's surface changes constantly through a variety of processes and forces

#### ***Adams 50 Standards***

Level 2: **SC.02.41.01.03** Energy comes in many forms such as light, heat, sound, magnetic, chemical, and electrical

**SC.02.13.01.03** Earth's materials can be compared and classified based on their properties (CAS: 1.3.1) - Pebbles, Sand & Silt (FOSS Kit)

**SC.02.33.01.03** Earth's materials can be broken down and/or combined into different materials such as rocks, minerals, rock cycle, formation of soil, and sand - some of which are usable resources for human activity (CAS: 3.3.1) - Pebbles, Sand & Silt (FOSS Kit)

Level 4: **SC.04.53.02.03** Earth's surface changes constantly through a variety of processes and forces (CAS: 5.3.2) - Earth Movements (DSM)

**SC.04.63.01.03** Complex interrelationships exist between Earth's structure and natural processes that over time are both constructive and destructive (CAS: 6.3.1)

**Objective:** The lesson is aimed at reinforcing the ideas about Earth movements that are introduced in the course of regular class lectures. The students should see the link between the earthquakes they are learning about, and real world design of structures.

### Materials (per group)

- LEGOs – uniform 6x2 blocks, as many as possible
- Earthquakes vs Buildings PowerPoint Presentation (provided on website)
- A cookie sheet filled with jell-o.

### Pre-activity Prep

The jell-o needs to be prepared overnight, but other than that, no preptime is required.

### Procedure:

1. Go through the Power Point presentation, making sure to emphasize the real world impact of earthquakes. Point out to the students that many major cities are located around the Ring of Fire. Major cities often contain very tall buildings, which could be very susceptible to earthquake damage. There are many youtube videos which show the effects of earthquakes on modern cities.
2. Explain some of the old and new technology used by architects to protect buildings. The presentation contains examples of both (step pyramids from Central America and base isolated demonstration buildings).
3. Tell the students that it is now their turn to design a building that will be resistant to earthquake damage. Suggested procedure is below:

1. Ask the students to come up with a design individually, and to draw it out on a piece of paper. Remind the students that they only have blocks to use, so their buildings should not have any curves.
2. Have each group discuss the designs its members have developed, and agree on a consensus design.
3. Once each group has decided on a design, hand out the LEGO blocks, and ask the students to build the design.
4. After the build time is over (5-10 minutes as needed) collect all of the designs and place them on the jell-o. Shake the cookie sheet until there is only one standing. Declare the winner!
5. Review why the design was successful.