

Name _____

Partner Name _____

Towering Toothpick Disaster (50 points)

Objective:

The student will design and build a three story tower that will withstand vibrations from a simulated earthquake.

Materials:

- Craft Sticks
- Wood Splints
- Toothpicks
- Glue
- Cotton Swabs (to apply glue)
- Meter Stick
- Glue Dish
- Wax Paper (to prevent glue from running onto table top)

Guidelines: (28 points)

1. A plan is drawn and approved by the instructor before construction. (4 pts)
2. The tower consists of 200 or less craft sticks, wood splints and toothpicks. (4 pts)
3. The tower is 45 cm tall. (4)
4. The tower has 3 stories. (4)
5. Each story is 15 cm tall. (4)
6. Each story has a floor. (4)
7. The tower has a roof. (2)
8. The tower does not have solid walls (instead, the structures should be more like scaffolding)
9. The tower base is 22.5 x 22.5 cm. (2)

After the Earthquake: (8 points)

(8 points) The tower's strength was incredible! The tower had little or no damage during the simulated earthquake.

(6 points): Only minor damage occurred due to the earthquake

(4 points): Half the structure held up after the earthquake

(2 points): An attempt was made to build a structure but it crumbled.

(0 points): The project was very incomplete or not done.

Analysis and Conclusions: (14 points)

1. Which aspect of your tower's design was the most successful? Explain.

2. Which aspect of your tower's design was the least successful? Explain.

3. How would you redesign your tower to make it perform better?

4. Should buildings, bridges and other structures be designed differently in earthquake prone areas? Explain.

Go to: <http://pubs.usgs.gov/fs/2006/3016/> and click on the pdf. file

1. According to FEMA, what has estimated future annual earthquake losses in the United States at _____ a year.
2. What state is the most earthquake prone state in the U.S.? _____
3. In the United States, there are an average of six magnitude ____ or greater and ____ magnitude 5 or greater earthquakes each year.
4. What are the priorities of the USGS in relation to earthquakes: (should be 6):
 - a.
 - b.
 - c.
 - d.
 - e.
 - f.
5. List a practical reason that engineers continue to design taller and taller buildings, even though those buildings may be built in earthquake prone areas?
6. Research two examples of how architects try to limit sway due to earthquakes or wind?