

# Solving a Problem? No Problem.

**Objective:** To help students realize the importance of problem solving.

**Materials:**

8" x 11" piece of paper for each team  
Earthquake scenario  
Earthquake story  
Drinking straws (10 for each team)  
Masking tape  
Pans for holding water  
Water  
Pennies  
2-3 pair of scissors per team  
Blindfolds or scrap strips of fabric  
Large stack of scrap paper

**15 to 20 minutes; Earthquake**

- Divide your group into teams of eight.
- Hand out one copy of the story to each group.
- Read the story and have them follow along as you read.
- Have each person pick a role. Whichever role the person chooses, that is the role they will assume in the activity.
- Give each group one piece of paper that represents the light fixture cover.
- Remind them that in order for them not to be affected by the chemical, their feet must not be touching the floor.
- The same group must be off the floor for the same thirty seconds.
- The groups must complete this in a 10 minute time period and ask you to time them when they are ready.

How did your team decide which people would definitely be saved? What techniques did you use to keep people from touching the floor?

**20 to 25 minutes; A Cents of Floating**

- Split the entire group into teams of four.
- Give each team 10 drinking straws and 25 inches of masking tape.

- Tell each group that is all the materials they will be provided. They have 10 minutes to build a raft with these materials.
- When they are finished, they can do an official float, in which they put the raft in one of the pans filled with water. They will put pennies on the raft, one at a time, until it sinks. They can place pennies anywhere on the raft that they want to.
- The team whose raft holds the most pennies before sinking wins.

Remind the groups that they are not allowed to test the raft out until it is time for the official float.

Why did you use the design you chose? Why do you think this design worked or didn't work? Is there another design that may be more successful?

\*Note: This activity can also be done using aluminum foil instead of straws and tape.

### **15 to 20 minutes; Chain Gang**

Divide your group into teams of five. Have them sit down on the floor in a circle or around a table. Give each team a stack of paper, 2-3 pair of scissors and 2-3 long strips of masking tape. Use the blindfolds to tie each team's wrists together. Tie their wrists tight enough that they have to work together to use their hands, but not too tight! Explain that the object of the activity is to work as a team to create the longest chain using paper and masking tape. The chain is just like the ones kids make out of construction paper at Christmas time. Decide on a time limit. 8 to 10 minutes is usually sufficient. Every minute, call out the amount of time they have left. At the end, compare the chains to see which team has the longest.

Instead of tying their wrists together, ask the students to do the same activity, with each team member with one hand behind their back. Half of the people on the team should use the hand that they don't write with. Another option is to make them go through the activity without talking.

What made the activity so difficult? What things could your team have done to make the activity easier?

## **EARTHQUAKE SCENARIO:**

Tour Guide: 23 years old with three young children. Your spouse has died and you are the sole financial and emotional support for the children. You hope to save enough money to go to college and become a lawyer.

Doctor: 50 years old. You have been doing research for the past ten years on a cure for AIDS. You feel that an answer is only a few months away. You have been working on the project without any other research assistant.

High School Math Teacher: 32 years old. You have developed a new system of teaching that makes learning fun and interesting. YOU have just started to put together a training program that can be used by school districts everywhere. The system has shown great advances in student achievement levels.

Corporate Executive: 35 years old. The company employs 10,000 people. You were the key person in starting the company. The company is faced with massive layoffs unless a new product can be found. You believe such a product has been found, but the details have not been worked out yet.

Scientist: 65 years old. You have been working on the space program for 30 years. You are the key individual for the space station project. You have been working on the air recycling system for the space station. Just before leaving for a conference you told the other staff members that an answer had been found. You would tell them your findings right after the United Nations Conference.

Counselor: 25 years old. You have been working with abused children. This is a group of about fifteen severely emotionally disturbed kids. You have made tremendous progress with them. Without your support, the children will probably regress and never make it outside the hospital.

General: 60 years old. You are the head of the United States Armed Forces Central Command. You know all of the national defense plans in case of a war or emergency. You are the only one that the President of the United States has trusted to work out a military compromise with North Korea that so far has averted a war. You are the only person that North Korea will deal with.

Facilitator: You are not part of the group, however, you are there to make sure there are no arguments and ask the questions that need to be asked. You also must address the problems that need to be taken into consideration. Remember, this is a very tense situation, so, the discussion may become very heated!

## **EARTHQUAKE STORY:**

### ***TRAPPED***

You are a part of a group from the United States that is attending a United Nations conference on world problems. The group is touring a biological research facility. While the group is waiting in a completely bare room for some equipment to be brought to them, the building begins to shake and an alarm sounds. The doors to the room shut and lock automatically and your group is trapped. The earthquake causes a storage container in the next room to begin leaking. The storage container holds a liquid biological weapon that was left over from previous military research. When it comes in contact with human skin, it causes permanent blindness, a one year loss of speech, and a three year paralysis from the neck down. The chemical easily passes through clothing, including shoes.

There is enough liquid in the storage container to seep under the door and completely cover the floor of the room that you are in with a thin film of the chemical. It will take about fifteen minutes from the entire floor to be covered. As the liquid begins to spread, the tour guide takes out a pocketknife and pries off the cover of the light fixture. The cover is made of a material that can't be bent or cut by can withstand the effects of the chemical. The only problem is that the light cover is very small. Your group must figure out how many people you can protect by having them stand on the light cover. The chemical is dangerous for only a short period of time. If you can keep the people in your group from touching the floor for a period of thirty seconds, they will be safe. Anyone who touches the floor after the liquid has reached them, they will become blind, mute, and paralyzed. How many of your group can you protect? If not everyone, then which one will you protect? What strategy will you use to get people on the light cover?