



## Toxic Waste Crisis: Practicing Team Work

### Overview

In this team-building activity, students will work in groups to problem-solve and avert a toxic waste disaster.

### Grades

9-12

### Activity Type

Group—either a single group or two groups in competition

### Materials

- 1 roll of masking tape
- 4 large coffee cans, 2 labeled “Toxic” and filled with coffee beans; 2 empty labeled “Safe”
- 4 bicycle tire inner tubes (deflated)
- 10 pieces of rope, each 3 feet long

### Duration

45 minutes

### Preparation

- Use the masking tape to create 2 circles on the ground, each at least 8 ft in diameter. These circles represent each team’s toxic waste radiation zone. The larger the radiation zone, the more difficult the activity
- Place a full coffee can in the center of each circle. The coffee beans represent toxic waste
- Place the an empty coffee can approximately 10 feet outside of each toxic waste circle
- Place 2 bicycle tire inner tubes and 5 pieces of rope outside of each circle

### Procedure

1. Divide the group into two teams (ideally, teams will be between 6-9 people).
2. Explain the following scenario to the group:

A container of unstable and highly toxic waste has contaminated an area approximately 8 feet in diameter. The contaminated area extends to the ceiling. If the toxic material is not transferred to a safe, the material will contaminate and destroy the population of the city. The material has a safe life of exactly 30 minutes before it will explode. Obviously, there is insufficient time to alert authorities and evacuate the city. Therefore, the lives of thousands of people are in your hands! Your objective is to safely transfer the toxic material from the unsafe container to the safe container before it explodes
3. Next, explain to participants that there are certain rules they must abide by:
  - You may use only the materials provided to you: 5 pieces of rope and a rubber strap (the bicycle inner tube)
  - No participant may cross the plane of the contaminated circle with any part of the body. If this occurs, that person is immediately incapacitated, and another participant must take them to the hospital. Both participants are no longer available to help with the transfer operation.
  - To avoid enlarging the area of contamination, the unsafe (red) container must stay inside the center of the contaminated area, as delineated by the smaller circle. If it moves outside the inner circle, half of your team will immediately become incapacitated, and the remainder must return the toxin to the center within 3 minutes
  - If the toxin is spilled outside of the containers, it will explode.



- The safe (green) container may be moved anywhere inside or outside the contaminated circle.
  - If transfer is not complete, and the green container sealed, within 30 minutes, the toxin will explode.
4. Once students have completed the activity, debrief by discussing:
- What was the initial reaction of the group?
  - Was your group successful?
    - If so, what do you attribute to your success?
    - If you were unsuccessful, why? What could you have done differently to ensure success?
  - How did the group come up with its best ideas?
  - What would an outside observer have seen as the strengths of your group? The areas for improvement?
  - Was there any spillage? Injuries?
    - If so, how did your team deal with the loss of team members?
    - What errors led to spillage or injuries? What could you have done differently to avoid spillage or injuries?
  - Did anyone emerge as a leader in your group? Explain.
  - What lessons did your group learn from this exercise that can be used in the future?

### **Facilitator Notes**

- Toxic Waste is not an easy exercise and most groups will benefit from some coaching along the way.
- The solution involves using the ropes to manipulate the inner tube, then guiding the inner tube with the ropes to sit around and grab the toxic waste bucket. With everyone pulling on their rope and with good coordination and care, the toxic waste bucket can be lifted, moved and tipped into the empty neutralizing bucket.
- If someone breaches the toxic waste zone, indicated by the circle, enforce an appropriate penalty (e.g., loss of limbs, illustrated by placing a hand behind the back) or function (e.g., blindfolds if a head enters the zone) that lasts for the rest of the game. If a whole person enters the zone, they die and must then sit out for the rest of the activity. Students who are “out” can be given the instructions to monitor participants and take notes on what they see happen among the teams.
- If the group struggles in figuring out what to do, freeze the action and help them discuss their difficulties, guiding them to some ideas to try.
- If the group spills the waste entirely, make a big deal about catastrophic failure (everyone dies), invite them to discuss what went wrong and how they can do better, then refill the container and let them have another go.
- Ideas for varying the level difficulty of the activity:
  - Adjust timeframe
  - Adjust distance between the buckets
  - Include obstacles between the buckets
  - Include red herring objects in available equipment