Toxic Popcorn Design Challenge

Student Worksheet:
Toxic Popcorn Design Challenge

◆ Scenario

A can of highly toxic popcorn has contaminated a circle of approximately 4 feet in diameter. The toxic area extends to the ceiling. If the toxic popcorn is not transferred to a safe container for decontamination, then it will contaminate and destroy the entire city. The popcorn is estimated to have a safe life of exactly 60 minutes before it explodes. It's up to us to save the city!

◆ Design Challenge

Inside the circle you will find two containers. One (unsafe container) is half full of the toxic popcorn. The other (safe) container is available for decontamination. Find a way to safely transfer the toxic popcorn from the unsafe container to the safe container, using only the materials provided to you**.**

◆ Criteria

1. No one may cross the plane of the circle with any part of the body.
2. The popcorn and containers cannot cross the plane of the circle. Only the ropes & tire tube may cross.
3. No spills are allowed, or the popcorn will explode.

◆ Constraints

1. You may use only the materials provided.
2. The popcorn must be transferred within 60 minutes or there will be a disaster.

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Student Worksheet (continued):

Team members:_____

- **Planning Stage**

Meet as a team and discuss the problem you need to solve. Then develop and agree on a process for solving the challenge. You'll need to determine what materials you want to use.

Draw your design below, and be sure to indicate the description and number of parts you plan to use.

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Student Worksheet (continued):

◆ Construction Phase
Choose your best product design and your best process design. Build your design. During construction you may decide you need additional materials or that your design needs to change. This is ok – just make a new sketch and revise your materials list.

◆ Testing Phase
Each team will test their design and process. If your design and process were unsuccessful, redesign and test again. Continue until you are happy with your solution. Be sure to watch the tests of the other teams and observe how their different designs worked.

Sketch your Final PRODUCT (make sure to label your sketch):

Sketch your final PROCESS (make sure to label your sketch):

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Student Worksheet (continued):

LIST the STEPS of your PROCESS (be as detailed as possible)

- Evaluation Phase

Evaluate your teams' results, complete the evaluation worksheet, and present your findings to the class.

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Student Worksheet (continued):

Use this worksheet to evaluate your team's results in the Toxic Popcorn Design Challenge Lesson:

1. Did your solution save the city?

2. What went well?

3. What didn’t go well?

4. What is your favorite step in the engineering design process and why?

5. What is your favorite element of your design and why?

6. If you had time to redesign again, what changes would you make?