

Oil Spill Solutions

Materials

- Student Evaluation Sheet (attached)
- Water basin or sink for testing
- "Oil" (use ½ cup vegetable oil mixed with cocoa powder for more realistic oil)
- Rubber bands, paper towels, string, toothpicks, cotton balls, plastic wrap, popsicle sticks, balloons, grass, cork, suction tube/cooking baster, spoon, other items.

Instructions

1. **Preparation Phase-** Gather all the materials you plan to use, and consider how you will use them and what steps might need to be taken. You may need to ask for additional materials during this phase as you consider how much oil you have to clean-up!

Write down your plan:

2. **Testing Phase-** Each team will have a chance to test their containment and clean-up systems on a similar "oil spill." Be sure to watch all the methods and observe the different approaches your classmates have "engineered." See which procedures worked best. It may be that certain parts of a procedure worked better than others. Use the grid below to determine your points.

Water is completely clear of all oil	About a quarter of the oil remains	About half of the oil remains	About three quarters of the oil remains	No change, water is as oily as at the beginning of the challenge
0	1	2	3	4

*Students want low scores in this case.

3. **Evaluation-** Evaluate your team's results, complete the evaluation worksheet, and present your findings to the class.

Resources:

<http://tryengineering.org/lesson-plans/oil-spill-solutions>

Student Evaluation Sheet - Team Members: _____

1. Did you succeed in removing all the oil from the "oil spill?" What was the score your team achieved? (using the grid from the Testing Phase)
2. If your system failed, what do you think went wrong?
3. Describe a system another student team created that you thought worked well. What did they do differently?
4. How did your decisions on engineering trade-offs differ from that team? What goals or priorities for your system did you put above others?
5. Did you decide to revise your plan while actually doing the containment or clean-up? Why? How did you implement changes?
6. Why might a team of environmental engineers change their planned approach to an oil spill clean-up once they arrived on the site? Do you think it is common that professionals change their plans while on the job?
7. If you had to do it all over again, how would your team have improved your containment system? Why? What other materials do you think would have helped speed up your containment?
8. If you had to do it all over again, how would your team have improved your clean-up system? Why? What other materials do you think would have helped speed up your clean-up?
9. Do you think that experience with prior oil spills would make a team of engineers more able to address the next unexpected one?
10. Now that you have learned about the different trade-offs engineers must factor into a product or system, if you were designing a new rail-based oil transportation system, what considerations would you have to balance in your new design (consider costs, environmental issues, public health, speed of transport)?