

STEM: RED CUP CHALLENGE

NEXT GENERATION SCIENCE STANDARDS

The Next Generation Science Standards (NGSS) are a comprehensive guide for K – 12 STEM science content standards. The Framework lays out the STEM skills young people should have as they move through the K – 12 school system. This STEM Activity Lesson is designed to integrate the Next Generation Science Standards. For more information and to find all of the standards visit: <https://www.nextgenscience.org/>

NGSS FOR THIS ACTIVITY LESSON

Science and Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
Asking Questions and Defining Problems	ETS1.A: Defining and Delimiting Engineering Problems	Influence of Science, Engineering, and Technology on Society and the Natural World
Developing and Using Models	ETS1.B: Developing Possible Solutions	
Engaging in Argument from Evidence	ETS1.C: Optimizing the Design Solution	

*To see the full standard visit: <http://www.nextgenscience.org/topic-arrangement/msengineering-design>

BIG IDEAS

WHAT IS THE RED CUP CHALLENGE?

- This is a STEM challenge that employs the students' fine and gross motor skills to build a tower of red plastic cups – without touching the cups at all! This challenge combines the students' engineering knowledge, motor skills, group leadership, and group dynamics. This challenge should be left wide open for the youth. Provide them with the cups and other supplies, give them the rules (no touching the cups!) and allow them to come up with a strategy for building their tower.

SUPPLIES & PREPARATION

SUPPLIES

- 10 Red Plastic Cups (preferably but any color will work!)
- 2 straws per person on the team
- 1 – 2 feet length of string per person on the team
- 1 cotton ball per person on the team
- 1 rubber band per kid
- 1 Lego figure or game marker per team
- OPTIONAL: blindfold

PREPARATION

- Gather supplies for as many groups there will be
- Put supplies in a bag for each group or have them at designated tables
- Have blindfolds on hand in case you decide to have some of the students blindfolded during later rounds of the challenge

ENGAGE THE STUDENTS

1. One of the best ways to engage students for a new activity is to use a different, fun grouping strategy in order to put them in groups to complete the challenge
2. For this activity use any grouping strategy that your youth enjoy or this one:
 - a. Have all the students stand up and give them space to move around all ot
 - b. Announce that you are going to call out a number and that's how many people you want to be in their group, anyone that does not get in to a group must do the bunny hop (or some other small activity to keep them included and moving)
 - c. Start with any number, for instance “get in groups of 3,” and give them 30 seconds to do so, then have them get in a different sized group, continue this for a few rounds, and finally end on the number of students you would like to be in each group (should make the group evenly divided so that no kid is left out of a group)

EXPLORE & EXPERIMENT: THE CHALLENGE

1. Once students are divided in to groups, provide them with all of the supplies listed at the top of the lesson
2. Do not give them any specific instructions, only that they are to build a pyramid tower with the red plastic cups using the supplies in the bag or on their table
 - a. The only rule is that they CANNOT actually touch the cups with their hands
3. The kids need to work together to come up with a way to move the cups in to a pyramid tower
 - a. Some kids might lift the cups with the straws, others may tie the string to the cups and then lift them, and some may stretch the rubber bands around the cups, tie the string to the rubber band and lift in that way
4. Once a team finishes, have them explain to you how they built their tower

- a. Now, remove one of the supplies or give them a handicap and have them re-think the challenge and how they will now build the pyramid of cups
 - b. For instance, if the team heavily relied on the straws to lift the cups, remove the straws from the group
 - c. Or, if the team had issues communicating with one another, have them be completely quiet or only allow the quietest team member to speak
5. You can keep going with different rounds of the challenge as long as they can still build the tower and are still having fun!
 6. One other fun handicap for any of the groups is to blindfold one or two of the team members but make them responsible for the actual building and everyone else can only tell them what to do

CONNECT & EXTEND

- What was your favorite part of this challenge?
- What was it like to have to make decisions on how to move the cups without touching them?
- What steps did your group take to build the pyramid of cups?
- Did you learn anything about yourself or your group members during this challenge?
- What other situations can you compare this group challenge to?
- What happened if you didn't agree with the rest of your group?
- What would you do differently next time you had to complete this challenge?

REFERENCES

KidsActivitiesStaff. (2016). Red cup STEM challenge for kids. Kids Activities. Retrieved on October 18, 2018, from <https://familymaven.io/kidsactivities/kidsactivities/red-cup-stem-challenge-for-kids-SPHL8sKbQ0OHWNrVI7BwZA/>

The University of Arkansas System Division of Agriculture offers all its Extension and Research programs and services without regard to race, color, sex, gender identity, sexual orientation, national origin, religion, age, disability, marital or veteran status, genetic information, or any other legally protected status, and is an Affirmative Action/Equal Opportunity Employer.