USDA NIFA
United States Department of Agriculture
National Institute of Food and Agriculture
https://nifa.usda.gov/program/4-h-positive-youth-development
National Aeronautics and Space Administration
EXPEDITIONARY SKILLS FOR LIFE
A FEDERAL PARTNERSHIP FOR STEM EDUCATION

LESSON PLAN: TEAMWORK ACTIVITY 1.10

ROCKET POWER CHALLENGE I

LESSON DETAILS

AGE/GRADE LEVEL
Elementary School

LEARNER OUTCOMES
Youth will identify ways to effectively communicate with members of a team, recognize there are many different solutions to solving problems, and define teamwork.

SUCCESS INDICATORS
Youth will encourage each other in team activities, be able to accomplish a task with limited resources, and demonstrate cooperation.

LIFE SKILLS
Critical thinking and innovation, collaboration, social skills

NATIONAL STANDARDS
CCSS.ELA-Literacy.CCRA.SL.1
Prepare for and participate effectively in a range of conversations and collaborations with diverse partners, building on others' ideas and expressing their own clearly and persuasively.

21st Century Learning and Innovation Skills: Learning and innovation skills increasingly are being recognized as the skills that separate students who are prepared for increasingly complex life and work environments in the 21st century, and those who are not. A focus on creativity, critical thinking, communication and collaboration is essential to prepare students for the future.

PREP TIME
15 minutes for room set up

ACTIVITY TIME
60 minutes

MATERIALS LIST
- 1 lb. dry spaghetti
- 10 oz. small marshmallows
- 20 oz. gum drops
- yard stick or tape measure
- countdown clock or other timing device

More supplies may be needed depending upon the size of the group

HANDOUTS
- Learner Assessment Questions

SUGGESTED SPACE
Indoors, one table or other flat surface for each team

SUGGESTED GROUP SIZE
4 youth per team, any number of teams can be involved.

INTRODUCTION INFORMATION
Share after the second part of the activity has been completed. Use the introduction information as a lead in to the discussion question.

REFERENCES
Doing It Together
www.uaex.edu/publications/pdf/4HCD1.pdf

Building Your Programs 20 Minutes at a Time — Leadership and Reflection Activities You Can Use !
www.extension.umn.edu/youth/research/quality/docs/building-your-programs-book-one.pdf

5 Ways Youth Can Be Good Team Members
http://msue.anr.msu.edu/news/five_ways_youth_can_be_good_team_members

NASA Teamwork
https://science.nasa.gov/science-news/science-at-nasa/2005/10jan_teammeup

INTRODUCTION

Teamwork is a group of individuals who use the strengths of each team member to work cooperatively towards a shared goal.

Teamwork is a way of working together which cares for each person as the tasks are being accomplished. The teamwork process has two basic components: belonging and accomplishing.

- Belonging: Each person must feel welcome and important to the team.
- Accomplishing: Each person must have opportunity to contribute to the work of the team.

Belonging is the beginning of motivation for teamwork and the source of commitment to accomplish the necessary tasks. Team building begins with the open and supportive relationships among team members.

Team members share the tasks which enable them to carry out their plans. A team builds on the strengths of each of its members. Teamwork does not make fewer tasks, it redistributes tasks so that all who belong may be equally involved. .

Communication is the lifeblood of the team. Communication begins with caring and continues with listening, with being sure that the concerns of each person are heard. Communication is transmitted through clear verbal and non-verbal messages and adequate well timed information. Communication is verified through feedback (by checking to be sure that what was heard was the message which was originally intended). Communication must occur for a team to achieve its goals.

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ROCKET POWER CHALLENGE I, CONTINUED

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ACTIVITY INSTRUCTIONS

INTRODUCTION ACTIVITY (10 MINUTES)

Ask and discuss with youth:

1. What do you think of when I say the word team? Do you know what teamwork is? Why is it important for people to work together?
2. Brainstorm the characteristics of a good team member.
   Be Reliable
   Communicate
   Be an Active Listener
   Cooperate
   Commit
3. Have you ever heard of NASA? (Explain what NASA is and does) Do people at NASA have to use teamwork? Why or why not?

ACTIVTY PART 1: NO ASSIGNED ROLES (10 MINUTES)

Youth will be working on a team to complete an engineering activity. Their challenge is to build a rocket model. NASA uses models in the process of building rockets.

Directions

1. Assign youth into groups of 4 with each group at their own table or other level surface.
2. Hand out supplies. Give each team 12 pieces of spaghetti, 10 marshmallows and 10 gumdrops. Tell the youth not to touch or eat the supplies.
3. Tell the youth they will have to work together and build a model of a rocket.
4. The goal is to make the rocket as tall as possible, and it has to stand on its own. When they're done building, it should not tip over.
5. Have the youth briefly discuss and make a plan of what their rocket may look like and how they might use the limited supplies they have been given. No other supplies may be used.
6. Tell the youth they have 5 minutes to build their rocket. Display a countdown clock if possible.
7. Allow the teams to begin to build.

ACTIVTY PART 2: NO ASSIGNED ROLES (10 MINUTES)

Directions

1. Within their teams, allow each team member 15 seconds to share. Have each member answer one of the following questions:

   What is going well?

   What is not working?

   What could we do better?

   Are we working as a team? Why or why not?
2. Allow each team a chance to move about the room as a group for 1 minute to view the other teams' projects to get ideas.
3. Give teams 5 minutes to finish their rocket model. Remind them to think about what they heard from their teammates and what they viewed from the other teams' models.
4. When time is up, have the youth step away from their table and have each team showcase their final model design. Use the yardstick to measure the final rocket model height. Use class applause to celebrate all of the teams' efforts!

DISCUSSION QUESTIONS (10 MINUTES)

1. Ask the youth to give a quick nonverbal feedback response of the activity with thumbs up, thumbs side-ways, or thumbs down. Ask for verbal sharing of why they chose to rate the activity the way they did.
2. What did you learn about teamwork?
3. What was one thing your team did well?
4. What was one thing your team could do better next time?
5. Did your team try more than one way to complete the challenge?
6. Why do scientists and engineers at NASA have to use teamwork?

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ROCKET POWER CHALLENGE I, CONTINUED

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DEBRIEF ACTIVITY: WHAT'S MY REFLECTION QUESTION? (10 MINUTES)

MATERIALS LIST

Reflection question notecards (see questions below).

1. Hand each youth a card face down so that they cannot see the question.
2. Ask them to hold their card up to their forehead with the question visible to all but themselves.
3. Instruct youth to move around to individuals answering the question the other person is holding. Remind them not to read the question out loud.
4. Each youth should hear answers from a minimum of 3 people before guessing what their reflection question is. After most or all have discovered their reflection question, ask a few to share the responses they received and how those answers helped them determine what their question was.

Sample Reflection Questions

What are some ways you like to learn?
What have you learned about making decisions?
How did others help you?
Why was this an important/useful thing to do?
What surprised you about this activity?
What was most challenging?

APPLY CHALLENGE: HUMAN KNOT (10 MINUTES)

1. Divide the group into teams of 6 to 10 youth. Have each team stand in a tight circle.
2. Ask the youth to reach their right hand into the middle of the circle and grasp the hand of someone that is not directly next to them.
3. Then tell the youth to reach their left hand into the middle of the circle and grasp the hand of someone else that is not directly next to them.
4. After they are all holding hands, ask the teams to try to untangle the knot (while still holding hands).

SAFETY NOTE

Teams should be closely monitored to ensure that the untangling process is done safely. Remind youth not to pull anyone over and to be careful not to accidently step on or kick anyone.

Discuss:

1. Can anyone share a feeling they had during the activity? (i.e. happy because it was fun, frustrated because you could not get untangled, mad because people would not listen, proud because you were able to untangle the knot, etc.)
2. How did this activity require teamwork? What could your team have done better?
3. How can you use teamwork during your daily lives at school, at home, in extra-curricular activities, etc.?

FUN FACTS

- There is no set number of people in an astronaut candidate class; NASA selects candidates on an as-needed basis.
- Lonnie Johnson, the man who invented the Super Soaker was a NASA engineeer. He also helped develop the Stealth Bomber.

DID YOU KNOW

NASA will send you a text message whenever the International Space Station (ISS) passes over your location. https://spotthestation.nasa.gov/signup.cfm

INSTRUCTOR'S NOTES

EXPEDITIONARY SKILLS FOR LIFE

ACTIVITY 1.10: LEARNER ASSESSMENT

These questions are about things you learned during this activity. Please check the circle that best describes you.

Q1 I can identify three different ways to communicate with someone.

- ○ Not at all like me
- ○ A little like me
- ○ Somewhat like me
- ○ A lot like me

Q2 I can find more than one ay to solve a problem.

- ○ Not at all like me
- ○ A little like me
- ○ Somewhat like me
- ○ A lot like me

Q3 I know how to work as part of a team.

- ○ Not at all like me
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