



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: ACTIVITY 1.1 PIPELINE

LESSON DETAILS

AGE/GRADE LEVEL

Elementary School

LEARNER OUTCOMES

Youth will recognize and acknowledge the importance of each team member's contributions and actions in the team. Youth will use communication in a positive way to contribute collaboratively to a team goal.

SUCCESS INDICATORS

Youth will recognize and accept suggestions of others regarding methods of solving the team challenge. Youth will contribute ideas and accept adaptation of their ideas. One or more youth will assume a leadership role, facilitating the group decision and maintaining the cohesiveness of the team.

LIFE SKILLS

Relationship building, communication, collaboration, flexibility, adaptability, leadership

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/COMMUNICATION AND COLLABORATION/Communicate clearly, collaborate with others

21st Century: Learning and Innovation Skills/CRITICAL THINKING AND PROBLEM SOLVING/reason effectively, use systems thinking, makes judgements and decisions, solve problems

PREP TIME

10 minutes

ACTIVITY TIME

60 minutes

MATERIALS LIST

- Lengths of half pipe - 1" pvc pipe cut in 12 to 18 inch lengths, then cut in half lengthwise. (16 half pipe pieces may be cut from on 10' length of pvc pipe costing less than \$5 at most home improvement stores)
- Marbles and/or other small balls such as ping pong balls or golf balls
- A small container (can, bucket, jar, bowl, etc.) to serve as the end goal to deposit the marble

SUGGESTED SPACE

Indoors or outdoors, open space adequate for the group to move around and establish a path to achieve their team goal.

SUGGESTED GROUP SIZE

This activity will be best with groups of 10 to 12 participants. To accommodate larger groups, split participants into multiple groups, groups could be as small as 5 or 6 and should not be any larger than 15.

REFERENCES

Teamwork & Teamplay by Jim Cain and Barry Jolliff, 1998 (pgs 128, 129).

Activity also on line at <http://www.wilderdom.com/games/descriptions/Pipeline.html>

INTRODUCTION

We've all heard that "two heads are better than one." When it comes to problem-solving, having multiple viewpoints can be a big advantage. Everyone has something important to share, and each person has different strengths - some in understanding the problem, some thinking of solutions, some in evaluating or figuring out which solution might be best for that specific problem, and some in carrying out the solution.

There are four basic steps in problem solving:

1. Define the problem.
2. Identify multiple solutions.
3. Evaluate and select a solution.
4. Perform the solution.

Making sure that everyone has a chance to share their strengths in the problem solving process requires good communication. To be successful when working as a team to solve a problem, follow these easy communication tips.

- Make sure everyone understands the problem to be solved.
- Allow everyone a chance to share ideas.
- Be open to new ideas.
- Be respectful of others and their ideas.
- Make sure everyone understands their role in performing the solution.
- Encourage and support each other.

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EXPEDITIONARY SKILLS FOR LIFE

PIPELINE, CONTINUED

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ACTIVITY INSTRUCTION

ACTIVITY: PIPELINE (20 MINUTES)

Determine a starting point and an ending point that are 30 to 40 feet apart. The start and end points do not need to be in a straight line. Determine how easy or difficult to make the task by selecting from the “rules” below (or create your own) to set the difficulty level appropriate for your group.

Explain that the youth will have to work together as a team to get the marble from the starting line to the ending line. Each youth should be given one half pipe. The group (or each team if using multiple small groups) receives one marble. Review the rules and remind youth about the four steps to solving a problem as a team. Provide 5 minutes for the team to plan how this will accomplish this goal.

Rules:

- You may not touch the marble.
- The marble may only touch the half pipe.
- If the marble falls or someone touches it, the entire team must return to the start line and begin again.
- Every youth on the team must participate.

Additional “rules” you may want to choose from to make the activity more difficult.

- Youth must take turns in a certain order.
- Youth may only use one hand to hold the half pipe.
- The half pipe tubes may not touch each other.

Variations:

- Once a team has successfully accomplished their goal once, have them use a different ball. If the team used a marble first, next give them a ping pong ball. The different weight and size of ball will change the speed the ball moves and how quickly it responds to changes in the slope of the half pipes. This is a good follow up to the first accomplishment to see if the team will apply what they have learned about communication and adaptability with each other to accomplish a similar yet different experience.

- Suggest a time frame to accomplish the task. A fairly short time frame may result in less collaboration and poorer communication prompting frustration. An extended time frame will allow for more discussion among the team leading to more positive team relationships.
- Set parameters that every team member must participate although provide fewer half pipes so team members must share – pass them off between team members – or find another way for all team members to be involved.
- Set a course that requires the marble or ball to start lower than the end point. If indoors, possibly even going upstairs or if outdoors, going uphill.

DEBRIEF ACTIVITY (20 MINUTES)

Discuss:

1. Did everyone get to contribute ideas?
2. Did one person take on the role of the leader? Why or why not?
3. How did you plan your action?
4. What didn’t work?
5. Did you change your plan?
6. If you did this activity again, what would you do differently?

7.

APPLIED CHALLENGE (20 MINUTES)

Teams can be formal or informal, but in all teams each person has an important role to contribute. Have the youth brainstorm the various teams they are part of. Examples: sports teams, family dinner preparation, choir, etc. Record this list in a place where everyone can see it.

1. Have each youth select one team they are on and write down the name of the team and the goal of that team.
2. Then have the youth write a description of their role on that team. Alternatively, youth could draw a picture of them performing their role.

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ACTIVITY 1.1: LEARNER ASSESSMENT

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

Q1 I can share my ideas with others.

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

Q2 I can explain what role I have on a team..

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

Q3 I know that what I contribute to a team is important.

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



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