



## Lesson 4: Why Communication is Important

### Arizona Science Standards

7.P3U1.4 - Use non-algebraic mathematics and computational thinking explain Newton's laws of motion.

**Crosscutting Concepts:** Cause and Effect; Scale, Proportion and Quantity, Systems and System Models, Energy and Matter, Structure and Function, Stability and Change.

**Background Information:** For any pair of interacting objects, the **force** exerted by the first object on the second object is equal in strength to the force that the second object exerts on the first but in the opposite direction. The **motion** of an object is determined by the **sum of the forces** acting on it; if the total force on the object is not zero, its motion will change. The greater the **mass** of the object, the greater the force needed to achieve the same change in motion. For any given object, a larger force causes a larger change in motion.

Hello, welcome to Engineers of the Future remote learning. My name is Joseph Davis, I am an engineer with Jacobs Engineering. I am going to be your mentor for today's lesson.

Our program is going to teach you about science, technology, engineering, and math. It is called **STEM learning**.

We will get to the fun project we are going to build together today a

**MARSHMALLOW SLINGSHOT** to learn more about **MOTION** in just a few minutes, but first I want to tell you more about **COMMUNICATION**.

### **What is COMMUNICATION**

It is the process of passing information and understanding from one person to another. It means telling and sharing ideas, opinions, and facts. Every **COMMUNICATION** involves one sender, a message and a recipient.

### **There are 7 benefits of COMMUNICATION**

1. Building trust.
2. Resolving problems.
3. Being clear and direct.
4. Create better relationships
5. Increase engagement.
6. Improve productivity.
7. Promotes team building.

These are several components of **COMMUNICATION**.

1. **Active Listening** - is fully concentrating on what is being said rather than just passively 'hearing' the message of the speaker. You are very engaged in the speaker's message. Becoming an excellent listener will benefit your professional and personal life.
2. **Body Language** – This is where we reveal our true feelings and emotions. Our gestures, facial expressions and posture. This shows we are engaged, interested and approachable.
3. **Clear and Concise** - When you're concise in your communication, you stick to the point and keep it brief. It shows that you know exactly what you are doing and what needs to be done.
4. **Ask Questions** – When you ask the right question you can gather better information and learn more, you can build stronger relationships, manage

people more effectively. When you ask questions you discover new things, you will better remember things and resolve issues.

5. **Tone** – A motivating tone can inspire and inform people. Your teachers use a tone to help you with schoolwork. Maybe your coach motivates you when you play sports. When you are hanging out with your friends your tone is more informal, light or fun. A negative tone can make you mad or not want to do something that is asked of you.

### **Why it is important to WORK TOGETHER in Effective Communications**

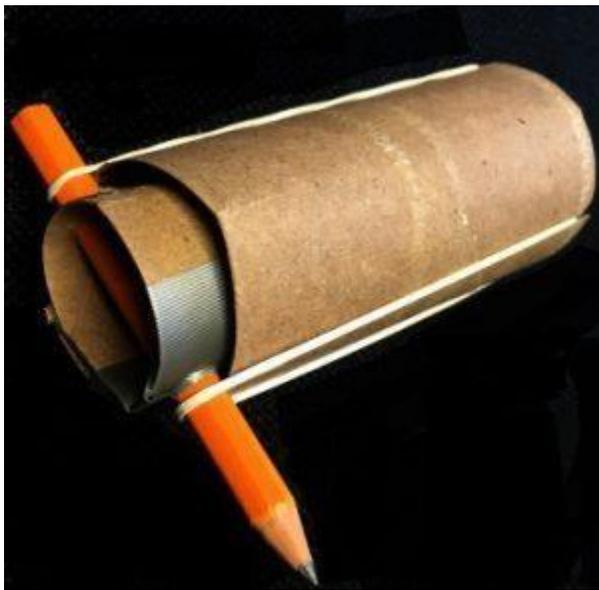
1. **Teamwork** – If you want to work together as a team to accomplish goals you have to communicate effectively. Poor teamwork can lead to problems with the group. That is why it is important to speak clearly and encourage working together.
2. **Communicating with Your Team** – Effective communication lets your team know about changes and that information is shared efficiently. Your team will be well informed about making necessary changes.
3. **Efficient Team Communication** – This means being consistent with your messaging to get things done. You will be able to complete projects quicker and more efficiently. This also allows the team to better understand their roles on the team.
4. **Be Positive Communicating** - Positive communication has the power to convert even negative feelings into positive ones and helps you create a **positive** impression for yourself. Negative communication can stop your team from completing projects. It can lead to hurt feelings and a breakdown in your group.

Now it is time to build our Project: a **MARSHMALLOW SLINGSHOT**

**Credit: Carnegie STEM Girls Program**

The Key Concepts we will learn today: **Potential Energy, Kinetic Energy, Motion.**

**YOUR CHALLENGE:** How far can you launch a marshmallow across the room?



**Materials:**

- 2 toilet paper tubes
- 2 thin rubber bands
- Duct Tape
- Scissors
- Marker
- Marshmallow
- Hole Punch
- Golf Pencil

### **Here's How to build it:**

1. Cut one toilet paper tube in half lengthwise. Squeeze the toilet paper tube together so that it makes a tube about half of its original diameter. Tape it closed so that it doesn't uncurl.
2. With your hole punch, punch two holes at the end of the toilet paper tube about half an inch in from one end. Make sure the holes are opposite from each other. The holes should both be on the same end of the tube, just on opposite sides.
3. Push the golf pencil through the two holes. Be careful not to tear the holes! If you do, you'll need to make new ones.
4. On one end of the other toilet paper tube, draw two short lines (about half an inch long each) straight down from the rim, about as far apart as the width of your pointer finger. Cut each line, making two slits. Do the same thing on the other side of the same rim, opposite the first set.
5. Push one rubber band onto each set of slits. Try not to bend the cardboard! If they bend open, tape them in place with the rubber band wrapped around them.
6. Slide the smaller tube (the plunger) into the larger tube (the grip) so that the small tube's pencil end is sticking out of the end of the big tube that does not have slits. The pencil should be on the opposite end of the rubber bands.
7. Stretch each rubber band and hook it around the end of the pencil.
8. Load a marshmallow into your slingshot. It should be resting on top of the plunger. Holding the outer tube, pull the pencil back to stretch the rubber bands. Release the plunger and watch your marshmallow fly across the room!

## **Thank for watching today's lesson.**

- Thanks for watching today to learn more about COMMUNICATION.
- Hopefully, you had some fun building your MARSHMALLOW SLINGSHOT.
- We will have more mentor lessons on the Engineers of the Future YouTube Channel.
- Bye for now.