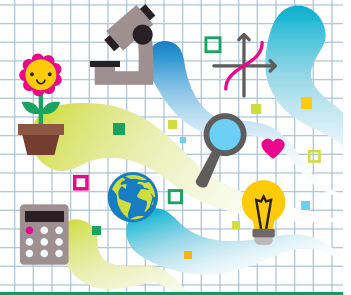# Heads IN, Hearts IN

Marshmallow Launcher

Instructions for Set-Up

Supplies

- ❏ "Guide for Families" handout
- ❏ Clear plastic standup display (optional)
- ❏ "Engineering Process" handout (1 per participant or family)
- ❏ Paper
- ❏ Pencils
- ❏ Regular-sized marshmallows
- ❏ Bowl for marshmallows (optional)
- ❏ Empty cardboard toilet paper rolls or paper towel rolls
- ❏ Scissors
- ❏ Masking tape
- ❏ Scotch tape
- ❏ Plastic cups (3–5 per participant)
- ❏ Eight 12-inch balloons (3–5 per participant)
- ❏ Ruler, measuring tape or yard stick
- ❏ Display table

Activity Preparation

▸ Purchase or locate items on supply list.

▸ Print one copy of the "Guide for Families" handout. Laminate or place in a clear plastic standup display to allow participants to see it more readily.

▸ Print one "Engineering Process" handout per participant or family. Optionally, print and laminate a few to leave on the table.

▸ Using masking tape, mark a "starting line" on the floor.

▸ Set up the display table and arrange needed supplies.

▸

Heads IN, Hearts IN

Marshmallow Launcher
Guide for Families

Learning Objectives

What you need to know:

Engineering is a process used to solve problems by designing, building and testing things. An engineer is a person who uses math and science to create new things, solve problems or make things better.

In engineering, machines can be used to move objects from one place to another. A **launcher** is a machine that throws an object forward.

What you will do and learn:

In this activity, you will practice using the engineering process to build a marshmallow launcher. The goal of this activity is to build a launcher that hurls a marshmallow as far away from you as possible.

Instructions

1. Using the "Engineering Process" handout, start to work through building your marshmallow launcher.

2. Identify the problem: How can you build a launcher that throws a marshmallow forward as far away from you as possible?

3. Brainstorm: Where have you seen other launchers? What features of those launchers help them move objects? How can you build your launcher? How can you put materials together to build a device that will launch a marshmallow?

4. Plan: Make a drawing or sketch of your design. Choose the materials that you wish to use to make your launcher.

5. Build: Build your launcher.

6. Test: Stand with your marshmallow launcher at the starting line. Place a marshmallow in your launcher. Launch the marshmallow. Use the ruler, measuring tape or yardstick to see how far your marshmallow went. Did it launch far? Could it launch farther? Are there changes you would make to your launcher to help the marshmallow move farther away from you?

7. Redesign: Make some changes to your design to improve your marshmallow launcher. Try some of the ideas you came up with during your brainstorming.

8. Repeat steps 6 and 7 as many times as needed.

9. Reflect and Discuss: What materials could be safely moved this way in the real world? How important might accuracy be if you were using this to move things in the real world? Is your launcher accurate? What materials could you use instead of the materials provided today? How would it have been different with different materials? How do you think engineers might use launchers in their work?

Engineering Process Handout

Engineering Process

1 **Identify the problem**

2 **Brainstorm**

3 **Plan**

4 Build → Test → Redesign

5 **Reflect and discuss**
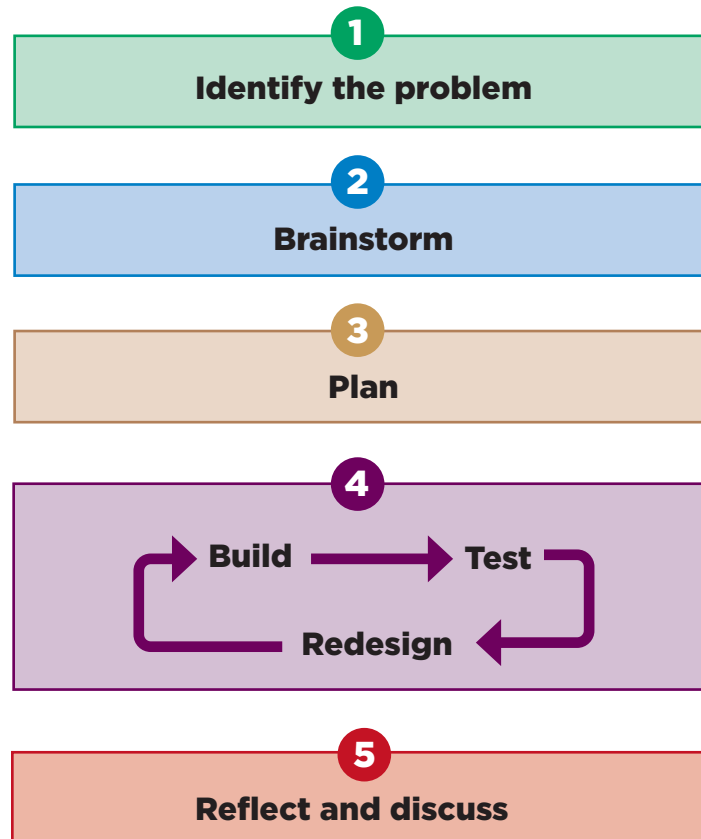
1. **Identify the problem:** Engineering is about identifying problems and designing solutions. As you go through these activities, think of the goal you are trying to achieve.

2. **Brainstorm:** What are the many different ways I could solve this problem? What are the potential advantages and disadvantages of different ideas? What things do I need to think about to make that solution successful?

3. **Plan:** What are the different ways I can solve this problem or make the build? What steps can I take to try out my solution? What do I need to do to prepare my build? What might happen if I choose that solution? During your design phase, you might discover new problems that you need to brainstorm.

4. **Build:** Construct and carry out the design. As you build your design, you might come up with more problems that you need to brainstorm and design new ideas for.

   Test: How does my solution work? Does it solve the problem? Is it effective? Are there additional problems?

   Redesign: How can I improve my design? What can I try to make my solution work better?

5. **Reflect and Discuss:** How did the solution turn out? What could I do differently next time? How would my design be different if I had different materials?