STRAWKETS

OVERVIEW
In this outdoor or indoor activity, learners will make their own rockets that they can build and launch.

LEARNING OBJECTIVES
- Learners will think about actions and reactions.
- Learners will explore the different parts of a rocket.

VOCABULARY
- **NOSE CONE** – the pointed top part of a rocket
- **FUSELAGE** – the cylindrical body of a rocket
- **FINS** – parts of a rocket that help stabilize flight

MATERIALS
- Straws (8 inch)
- Paper
- Tape
- Scissors
- Balloon (optional)

SET-UP
→ Gather all the materials.

LESSON PLAN
1. Open the activity by asking students if they have heard of Sir Isaac Newton. Explain that he is a very important scientist who studied how the world around us worked. He developed the Theory of Gravity as well as the Laws of Motion that explain how things in our world move.
   i. For example: Newton’s Third Law of Motion states that for every action, there is an equal or opposite reaction. It’s that law that explains how rockets work.
      ○ Use a real balloon or have participants imagine a balloon to facilitate the following conversation.
      ○ What is this balloon filled with? Air! Air is made out of lots and lots of tiny molecules and right now they are all packed in the balloon trying to get out. Hold the balloon sideways and ask what direction the air would go if you let go? Now ask what direction the balloon would go. Emphasize that the air would move one direction (the action), while the balloon would move the other direction (reaction).
      ○ Newton’s Third Law of Motion show us how rockets work. When a rocket is getting ready to take off, it ignites a large amount of fuel that burns really hot and really quickly. All the gas that is created by that ignition shoots out of the bottom of the rocket. The action of all the gasses escaping creates the reaction of the rocket blasting off into space.
2. Now that we know how a rocket is able to get into space, let’s look at how rockets are designed. Every rocket has three main parts; a nose cone, a fuselage, and fins. Let’s look at the importance of the design of each.
   i. Nose cone: Ask participants how they would describe the top of the rocket (pointy, sharp, etc.). Rockets are usually pointy on the top. We call this part the nose cone. Why are rockets pointy? In order to get to space, the rocket has to travel through the Earth’s atmosphere. Remember all those air molecules in the balloon? There is air all around us and even though we can’t see it, as we travel through it, it slows us down. If you wave your hand back and forth, you can feel the air. The pointy nose cone helps the rocket cut through the air. If it is flat on the top, the air will slow it down more.
   ii. Fuselage: Ask participants how they would describe the shape of the body (round, cylindrical). We call the body of the rocket the fuselage. The fuselage is shaped like a cylinder so that the air doesn’t slow it down. This usually where the fuel is stored.
   iii. Fins: At the bottom of the rocket, you will find fins. Why do you think rockets have fins? The fins help the rocket fly straight. The important thing about the fins is that they should all be similar size and shape, and they should be evenly placed around the bottom of your rocket.

3. Now it’s time to build your rocket!
   i. Gather all your needed materials.
   ii. Begin with a sheet of 8.5 x 11 paper and cut it horizontally into quarters.
   iii. Put a few pieces of tape along one of the long sides of the sheets of paper with the sticky part facing upwards.
iv. Use a straw to roll up the paper towards the tape. Roll the straw past the tape so the paper sticks onto it. Make sure it isn’t too tight. You want the paper to slide off the straw. You now have your fuselage.

v. After removing the paper tube from the straw, take one end and fold it over into a point. Once you fold it over, tape it down and make the end airtight. This will be your nose cone.

vi. Using the remaining paper not used for the fuselage, design your own fins and tape them to the bottom of your fuselage.

4. Slide the rocket back onto the straw, then blow into the visible end of the straw to launch.

FURTHER EXTENSION

In the Museum
During your visit to The Museum of Flight visit our Apollo and Simonyi Space Galleries to explore and see some real-life rockets!