

Rocket Race Field Trip

Post-Visit Classroom Science Talk

Grade level: Pre-K -- 3-4 year olds

Duration: 35 Minutes

Essential Questions

- What shapes can we use to build a rocket?
- What materials can we use to build a rocket?
- How can we build a rocket to protect the astronauts?

Learning Outcomes

- Learn, explore and reflect on three dimensional shapes
- Explore building structures through shapes and materials
- Articulate prediction and problem-solving
- Explore cause and effect
- Explore building an enclosure

Materials

- Model or print out image of a Rocket
- Industrial paper towel tubing (or other sturdy, hollow cylinder tubing)
- Scrap Felt or other soft material to cut to size of tube opening
- Scrap Paper, newspaper or other material
- Scrap Bubble Wrap
- Paper Cone (This can be made ahead of time from a circle)
- Cups or other paper container
- Paper or Styrofoam plate or other stiff material cut to size of tube opening
- Masking tape

- Figurines to enclose (i.e., Astronauts)

Lesson

1. Introduction – [5 minutes]

The teacher will discuss the Rocket Race Field Trip at the National Air and Space Museum

- What do you remember about your visit to the National Air and Space Museum?
- Let's identify shapes. What shapes did we use to build our rockets?
- What does a rocket do? What makes a rocket different from an airplane?

2. Engines and Astronauts [10 minutes]

The teacher will introduce the model rocket or image of a rocket.

- Where are the engines?
- Where do the astronauts sit? Why?

3. Building the Astronaut Capsule [15 minutes]

The teacher will build a rocket with guided instruction from the children. The teacher will facilitate building the rocket by asking questions.

- Where do we place the astronauts – the top or the bottom of the cylinder?
- What happens when I place the astronauts at the top of the cylinder? (the astronauts will fall through the hole)

The teacher will reinforce that the group will need to keep the astronauts from falling down the tube – then the teacher will pull out a piece of felt and paper plate (or other materials, one “soft” and one “hard”) and propose a challenge.

- Which material is soft? Which is hard?

- What will happen to the astronauts with each material? Which one should we use?

Students have the opportunity to hypothesize which material will work and why. The teacher will then guide them through the experiment to find the results. (The “hard” material – or paper plate – will keep the astronauts from falling through the tube)

The teacher tapes the paper plate to the top of the tube. The teacher introduces the cups and other scrap material and astronauts and continue building the rocket as each of the following questions are explored:

- How do we keep the astronauts in place? Where should they sit?
- Outer space can be very cold. How can we use these materials to keep the astronauts warm?
- How do we cover the astronauts? What shape do we use for the top of the rocket?

4. Reflect and Liftoff! [5 minutes]

Once the Rocket has been completed, the teacher will review the shapes; cylinder, cone, and where the engines and astronauts are located. The teacher will review the choices the children made in constructing the rocket. As a group, countdown and lift-off! Children can later decorate their rocket with paper, drawings and other materials to make it their own.

Children may ask how the astronaut can get in and out of the command module; they can then create a door in their model rocket. The model can then be used to deepen children's inquiry. The teacher can offer students other challenges to facilitate their learning about engineering including other enclosures and towers.

Extensions:

- Build a large rocket for dramatic play using cardboard boxes, paper and tape.
- Create a command center with buttons and switches and screens.
- Use recycled materials to create model rockets. Oatmeal cartons, paper towel tubes, potato crisp cans - any cylinder can become the base for a rocket. Create

cones using construction paper. Use colored tape to construct the rocket. Add engines and red and orange tissue paper, cellophane or construction paper for fire.

- Use wooden or foam blocks in the block area to build rockets. Which shapes are best for building tall rockets?

