STEAM: Science, Technology, Engineering, Art, and Math
Workshop Lesson Plan for Elementary School Students
Grades K-5

What’s the Big Idea?
Artists and scientists both use tools and experiment with different materials and processes.

STEAM Tour and Workshop Purpose
During this workshop, students will examine how artists manipulate and depict light and shadow to create artworks; students will consider how shape and line are transformed between 3-dimensions and 2-dimensions.

Essential Questions
Use the following as guiding questions as you lead students through the workshop:
• How is an artist similar to a designer, explorer, or scientist?
• How do artists use light and shadow in creating and imagining new works of art?

Vocabulary
• Sculpture
• Abstract
• Figurative
• Shadow
• Light/light source
• Collaborative

Objectives
Students will …
• make connections between artists and scientists
• observe artists’ uses of light and shadow in selected artworks
• experiment with different materials and light sources to create shadows
• consider the differences between 2-dimensional and 3-dimensional representations of objects
• create a collaborative shadow painting

Materials
• Flashlights (if classroom is too bright, use a large piece of cardboard to block light when using flashlights)
• Cardboard scraps and tubes
• Recyclable and other scrap materials
• Paper clips
• Pipe cleaners
• Large white paper on roll – torn edges ok!
• Q-tips/paintbrushes
• Sharpies
• Art sticks
• Texture plates

Procedures
1. **Introduction (5 minutes):** Today we are going to experiment with light and shadow. When do you usually notice shadows? Did you see any interesting shadows today at school, on the bus, or in the museum? What did you notice about them?

For years, artists have been observing light and shadow and experimenting (like scientists) with ways to manipulate them to create interesting line, shape, and form in 2- and 3-dimensional artworks.

Let’s take a look at a few examples from the High’s collection and investigate the artists’ use of light and shadow!
- How have these artists used light and shadow to create these works of art?
- What color(s) do you see in the shadows?
- Where might the light source be coming from? How can you tell?
- What might be creating the shadows? How can you tell?

2. **Describe the Challenge/Demo (10 minutes):** Introduce the art-making challenge for the day. Students will have 10 minutes to arrange materials, considering line, shape, and form, to create a sculptural arrangement in the center of the table. Sheets of white paper (one for each student) should be placed around the edge of the sculpture. Next, students will take turns shining a flashlight from their spot at the table to create a shadow on each paper. The student across from them will trace the shadow outline with an oil pastel or sharpie. Repeat until each student has held the flashlight and traced. Tracing should take about 5 minutes. Finally, students will spend 20 minutes translating their work to a collaborative, 2-dimensional artwork based on the outline of the shadow.

3. **Build the sculptural component (10 minutes):** Students use materials to build a sculptural component in the center of the table. Prompt students to think about art elements with these questions:
   - What do you think the shadow of your sculpture will look like? Do you have a shape in mind that you want your shadow to look like? How will you create a sculpture that will make that shape?
   - Will the shadows be different from different angles or the same from all angles?
   - For K-2: Define sculpture! What is 2-D versus 3-D, flat versus sculptural? Use larger items for building the sculptural component.

4. **Tracing (5 minutes):** Students each take turns holding the flashlight and tracing the shadow’s outline onto the paper with a black oil pastel or sharpie. Encourage students to experiment with the angle and distance of the flashlight to see how the shadow changes.

5. **Art-making (20 minutes):** Depending on time, this portion of the workshop can be shortened, if needed. Students will use watercolor pencils and moist q-tips to create an artwork on their piece of paper based on the shadow outlines. Encourage students to create abstract artworks or if their shadow outline inspires them, to turn it into a figure, symbol, etc.

6. **Closing and Presentations (5 minutes):** Invite student volunteers to share their artwork with the whole group. What was challenging about this project? What was most exciting/surprising?

7. **Cleanup (5 minutes):** Leave time for students to clean up and return materials to designated containers. Each student takes their paper as their own work of art.