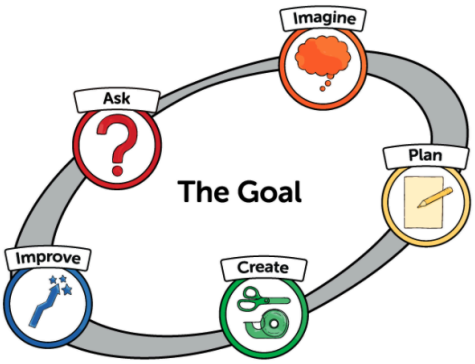
WEEK 6 Lesson 2

Science and Engineering: Engineering Design

Designing the Our Town Project Exhibit: Considering Exhibit Designs

Big Ideas	Every place has many stories. People and places around the world are linked.
S & E **Guiding Question**	How do museums and others exhibit work for audiences to learn about a topic?
Content Objectives	I can learn about ways to exhibit work by asking questions and analyzing the work of others. (SL.1.2.c, 2.K-2-ETS1-3) I can use the engineering design process to create an exhibit that displays artifacts. (2.K-2-ETS1-3, Practice 1)
Language Objective	I can talk with my partners about what I notice in the provided images. (SL.1.2)
Vocabulary	**artifact**: an object made by a human being **exhibit**: an object or a collection of objects displayed in a public space for people to look at **task**: a piece of work to be done
Materials and Preparation	This lesson and those through Week 8 are dedicated to introducing children to the Engineering is Elementary (EiE) Engineering Design Process. During this time children will design their exhibit about the town/school area, incorporating a variety of work and artifacts. The EiE Engineering Design Process was developed by Boston's Museum of Science. Review the EiE website to become familiar with the process (https://www.eie.org/overview/engineering-design-process). The goal for these lessons is to practice most of the steps of the process in preparation for Unit 4, when children will work on an in-depth engineering task.

The following graphic summarizes the Engineering Design Process steps and will be recreated on a chart during the lessons. (A free poster of this graphic can be downloaded from the EiE website: https://info.eie.org/download-free-engineering-design-process-poster-1.)



ASK: What is the problem? How have others approached it? What are the constraints?

IMAGINE: What are some solutions? Brainstorm ideas. Choose the best one.

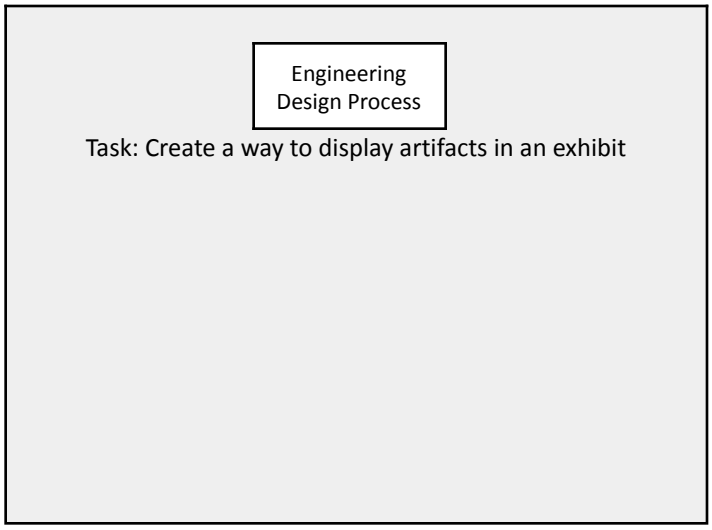
PLAN: Draw a diagram. Make lists of needed materials.

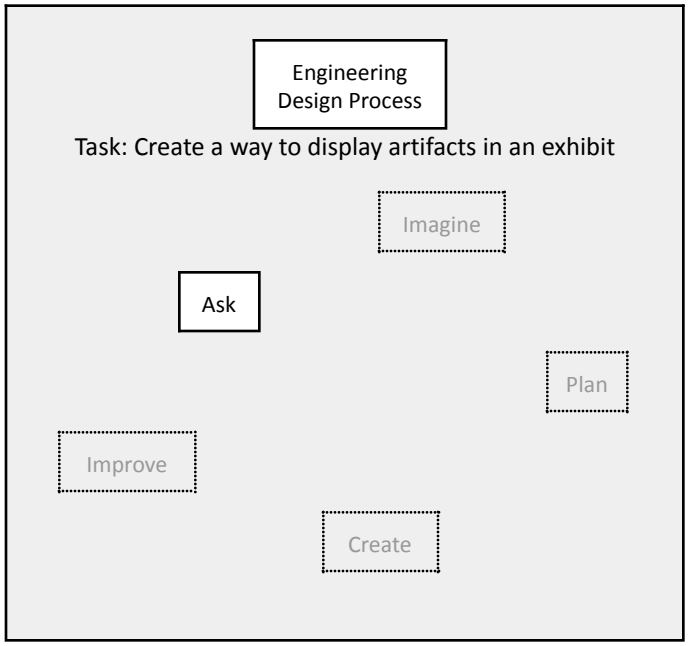
CREATE: Follow the plan and create something. Test it out.

IMPROVE: What works? What doesn't? What could work better? Modify the design to make it better. Test it out.

Children will work in ongoing small groups of three to four.

- Engineering Design Process cards
  Cut the cards apart. Only the title and Ask cards will be used in this lesson. Set the others aside for upcoming lessons.
- glue stick or tape
- chart paper
  Create the following chart by attaching the Engineering Design Process title card at the center top of the chart paper. Below this write, Task: Create a way to display artifacts in an exhibit.



	• Museum Exhibits images, one set for each small group • Science and Engineering packets • writing tools
Opening 10 minutes	*We're going to switch gears for our Science and Engineering lessons. For the next three weeks we will be working on an **exhibit**—a collection of objects displayed in a public space for people to look at. Today we'll just begin gathering information. For our project, we will go through several steps as we work as engineers and designers: we will learn what it takes to create a solution to an engineering or design problem.* *Here is the task: Create a way to display different kinds of **artifacts**—objects made by people—in an exhibit.* *Designers and engineers ask questions about the task first. What do you need to know in order to do this work? Let's gather and record some questions.* Attach the Ask design process card to the chart, leaving room for attaching the other steps and for writing notes related to each. For example:  Children might ask questions about materials, to clarify the task, and/or about the Engineering Design Process. Write questions on the chart next to or below "Ask," and respond to those with immediate answers. Answers to some questions will emerge as children look at images or later, during the

	design process. *Engineers and designers like to look at the way others have completed tasks or solved problems similar to their own. Doing this gives them inspiration and ideas. We did this when we were designing chairs in the fall, remember?* *Working in your small groups, take a look at these images of exhibits in museums around the world. On the chart in your packets, write down the kinds of artifacts you see being displayed. Then, notice and write down how they are being displayed. Are they hanging on a wall, for example, or standing up somehow? Finally, write down the kinds of materials that might have been used to create the displays you see.*
Investigation 13 minutes	Distribute images, Science and Engineering packets, and writing tools. Send children to work in small groups. While children look at images one at a time, noticing and recording elements of various displays, circulate and listen carefully to what they notice and to the questions they ask.
Discussion 6 minutes	Gather the group and facilitate a conversation about what children notice in the images and what they have recorded in their packets. Discuss any answers that have emerged to questions posed earlier, and record any additional questions that have surfaced. Turn children's attention to the self-assessment questions in their packets. In today's work, how did they gather information to answer a question? What was the question?
Closing 1 minute	*Today's work gave us some ideas about designing exhibits. We'll continue with this engineering design process tomorrow!*
Standards and Practices	**SL.1.2.c** Ask for clarification and further explanation as needed about the topics and texts under discussion. **SL.1.2** Participate in collaborative conversations with diverse partners about grade 2 topics and texts with peers and adults in small and larger groups. **2-PS1-1.** Plan and conduct an investigation to describe and classify different kinds of materials by their observable properties.
Ongoing assessment	Reflect on the discussion and on children's work in small groups. What do children notice in the images, and how do they connect

	this to the task? What kinds of questions do children ask? What does this indicate about their thinking? What previous experiences do children draw upon? Children will have had differing prior experiences in museums. Consider what other classroom experiences will help all children connect to the task.

Notes