Unit 2: I Am An Engineer

Foundational Fluencies: I Am An Engineer

Unit Overview

Primary Unit Objective:

Introduce what it means to be an engineer

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Recommended Grade Level:

PreK - 1st

Mobile STEM Lab Required:

ROK Blocks (1 per group of 4 students)

of Lessons Included:

4

Developing STEM Identity:

Some students grow up knowing an engineer. Most do not. Or, the engineers they know are different from them in gender, race, or other demographic characteristics. This unit demonstrates to students that we all use engineering every day, and extends their engineering skills working with Kid Spark engineering materials.

Alignment to STEM Standards:

Unit 2 builds on skills and capacities introduced in Unit 1, with a focus on problem-solving, patterns, visual-spatial reasoning, and symmetry. The table below outlines the Student Learning Objectives (SLO) for Unit 2 and their alignment to the Next Generation Science Standards (NGSS) and the Common Core State Standards in Math.

Unit Learning Objectives	NGSS DCI	NGSS SEP	NGSS CCC	CCSS-MA
SLO 1: Manipulate ROK Blocks to build increasingly complicated structures.	Developing possible solutions	Developing & using models	Structure & function	Combine different shapes to make an object or design
SLO 2: Explore what engineering is and what engineers do.	Defining/engineering problems	Asking questions & defining problems		Reason abstractly & quantitatively
SLO 3: Compare and contrast size and shape of blocks.		Designing solutions	Scale, proportion, & functionality	Describe & compare measurable attributes
SLO 4: Match 3-dimensional objects to 2-dimensional pictures.				Recognize 3D objects in 2D pictures
SLO 5: Create and analyze patterns.		Analyzing & interpreting data	Patterns	Expand understanding of simple & repeating patterns
SLO 6: Recognize symmetry.			Patterns	Begin to use relational language of right & left

Unit 2 Lesson Overview:

Lesson 1: What Is An Engineer? (30 - 40 min.)
In this lesson, students will learn about engineers and what they do. Students will create measurement tools to help their instructor solve a challenge.

Lesson 2: Patterns & Pyramids (30 - 40 min.)
In this lesson, students learn how to think like an engineer. Students will explore patterns and symmetry as they build different structures and designs.

Lesson 3: What's In The Lab? (30 - 40 min.)
In this lesson, students will explore the engineering materials that are included in the ROK Blocks Mobile STEM Lab and become familiar with the name and function of each component.

Lesson 4: Free Build (30 - 40 min.)
In this lesson, students are free to create something of their own design. Students can use the skills they have learned throughout previous lessons to build and improve a custom design.

Target Vocabulary

Build
Engineer
Equivalent
Design
Left
Inventory
Make
Measure
Pattern
Persistence
Problem
Pyramid
Right
Solve
Symmetry
Symmetrical
Tool
Vehicle

Classroom Organizational Tips

All the lessons in Unit 2 can be taught to the whole class (with or without older student facilitators) or in teacher-facilitated small groups. The lessons are designed to be implemented with small groups of students seated around a shared table. At times it is helpful to have students work in pairs, sharing their observations with their partner. When students use a ROK Blocks Lab, there should be no more than 4 students using each lab.

GET ENGAGED!
Visit our community page at **KidSparkEducation.org/Community** for new project ideas, lesson insights, and to see how other educators are using KidSpark materials and resources in their classrooms.

Recommended Children's Literature

"What Do You Do With A Problem?" by Kobi Yamada

"Is it Symmetrical?" by Nancy Allen

"Otto and the New Girl" by Nan Walker and Amy Wummer

"Seeing Symmetry" by Loreen Leedy

"What is Symmetry in Nature" by Bobbie Kalman