

Overview:

In this lesson, students will learn about engineers and what they do. Students will create measurement tools to help their instructor solve a challenge.

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Unit Concepts & NGSS Alignment:

- Manipulate ROK Blocks to build increasingly complicated structures
- Explore what engineering is and what engineers do
- Compare and contrast size and shape of objects
- Match 3-dimensional objects to 2-dimensional pictures
- Create and analyze patterns
- Recognize symmetry

Scientific/Engineering Practice - Developing and using models

Crosscutting Concept - Scale, proportion, and quantity

Activity Time:

30 - 40 Minutes

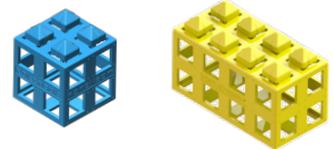
Kid Spark Mobile STEM Lab:

ROK Blocks

Materials Per Team:

Group students in teams of 2.

- 14 Blue ROK Blocks
- 10 Yellow ROK Blocks



Pre-Lesson Preparation:

Prepare a "measuring tool" made with enough Blue ROK Blocks stacked together to be able to measure the shortest dimension of the top of a desk.

Lesson Introduction:

Instructor: "Today we are going to learn what it means to be an Engineer. Engineers are people who solve problems. They often design or make things to help them solve a problem. Think about what the word "problem" means. A problem is something that you need to figure out. Sometimes problems can be frustrating or keep us from doing something we want to do. Most problems are like puzzles that we need to figure out. Tools can help us solve these puzzles."

Core Learning Activity:

1. Explain to students that you would like to have their help in solving a problem. Tell students that you are thinking about rearranging the classroom, but you aren't sure how big a lot of the objects in the room are. Explain how you would like for them to help you create some measuring tools to measure different objects in the room. Tell students, "This is exactly what engineers do. They make things that help solve problems. Let's think like an engineer."
2. Show the class the tool you made using the Blue ROK Blocks (Pre-Lesson Preparation). Explain why you made your measuring tool the way you did. (**Ex.- "I made it straight because most of what I want to measure is straight. I made it long because I want to measure long things, but not too long because it might fall apart."**)
3. Demonstrate measuring your desk or a student desk using your tool. For the unit of measurement, count each block. So, your desk will be "X" number of Blue ROK Blocks wide and "X" number of Blue ROK Blocks long.
4. Group students into teams of (2) and instruct them to create straight measuring tools using the provided ROK Blocks. These measuring tools will be used to measure different objects in the room. Inform students they can use any color, but their tool must be made from only one color.

5. Discuss ideas about creating measuring tools with the class using the following prompts:
 - a. What will your measuring tool look like?
 - b. Will it be long or short?
 - c. Will it be wide or skinny?
 - d. Will it roll around or lie flat?
 - e. What shape will you choose? Why?
6. Prompt students to work together to make measuring tools at least (10) blocks long. As they finish making their tools, ask them to measure their desks, and any other large object in the room (Ex.- white boards, cabinets, tables, chairs). Students can also take turns measuring body parts such as arms or legs and comparing to a partner.
7. As you wrap up the class period, inform students they will be learning more about what engineers do and how they design things to solve problems.

Learning Extensions:

1. Compare the size of classroom objects.
2. Define what is "big" and what is "small."
3. Have students record the measurements they take of various objects in the classroom on the board.