The Maker ROK-Bot

v2.0

STEM Fundamentals: Mechanisms & Movement | Teacher Lesson Plan

Overview:

In this lesson, students will learn how to create different types of robots using the remote-controlled Maker ROK-Bot and various Kid Spark engineering materials.

Click here **to explore the entire Kid Spark Curriculum Library.**

Learning Objectives & NGSS Alignment:

- Use the wireless, ROK-Star controller to operate the Maker ROK-Bot.
- Build three types of robotic systems using the Maker ROK-Bot.
- Use Kid Spark engineering materials to create a custom robot.

Scientific/Engineering Practice - Developing and using models
Crosscutting Concept - Structure and function

Activity Time:

120 Minutes

Note: this lesson can easily be taught over the course of two class periods.

Period 1 - Convergent Learning Activity
Period 2 - Divergent Learning Activity

Targeted Grade Level:

3 - 5

Student Grouping:

Teams of up to 4 students

Additional Lesson Materials:

- Curriculum Packet
- Student Engineering Workbook

Kid Spark Mobile STEM Lab:

Young Engineers **OR**
Engineering Pathways

Pre-Lesson Preparation:

1. Prepare enough lesson materials for each team. (Curriculum Packets, Student Engineering Workbooks)
2. Become familiar with how to use the Maker ROK-Bot, ROK-Star Controller, and Motor Modules. *Curriculum Packet - Pages 1 - 2*
3. Prepare an example solution for the design and engineering challenge. *Curriculum Packet - Page 8*

Convergent Learning Activity:

1. Work with students as they become familiar with the Maker-ROK, ROK-Star Controller, and Motor Modules. *Curriculum Packet - Pages 1 - 2*
2. Instruct each team to assemble at least one of the example builds that demonstrates how the Maker ROK-Bot can be used. *Curriculum Packet – Page 2*

Divergent Learning Activity:

1. Review the Design & Engineering Challenge with teams. *Curriculum Packet - Page 8*
2. Instruct teams to use the Kid Spark Design & Engineering Process to develop a solution to the challenge. *Student Engineering Workbook - Page 2*
3. Instruct teams to fill out the design specification after they have completed their project. *Student Engineering Workbook - Page 3*
4. Review the challenge rubric with teams so they understand how they will be evaluated for the project. *Student Engineering Workbook - Page 4*

5. Consider setting strict time boundaries for the divergent learning activity (see example below). Keep in mind that teams won't always complete a design that works or looks as intended. That's alright! Students can learn a lot by reflecting on their experience and considering what they might have done differently if they had more time or could start the project over.

    a. Review the challenge with teams. (2 minutes)

    b. Teams work through the design and engineering process to create a design. (30 minutes)

    c. Teams complete design specification. (10 minutes)

    d. Teams present designs to class. Each team has 1 minute max to present. (10 minutes)

    e. Lab cleanup. (8 minutes)

Lesson Closure:

1. Project presentations - Instruct each team to share the design they created with the rest of the class.

2. Lab cleanup - After teams have finished their presentations, instruct them to disassemble their designs and pack all engineering materials back into the labs correctly. *Note: each lab should include a laminated inventory and organization guide to help students pack engineering materials back correctly.*

3. Lesson reflection - If time permits, do a quick recap/review of the lesson.

Assessment/Evaluation:

A. Student Engineering Workbook (9 Points)

B. Design & Engineering Challenge (25 Points)