Unit 4: Does It Move?

Foundational Fluencies: Does It Move?

Unit Overview

Primary Unit Objective:

Introduce students to one of the primary tasks of engineering: making things move.

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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:

In this unit, students explore the physics of movement. They learn about force, gravity, pushes, and pulls. Students learn that when they make things move, they are acting as engineers.

Alignment to STEM Standards:

Unit 4 focuses on a specific engineering problem - making things move - and explores different ways to create movement in a design. The unit also expands student's skills using ROK Blocks by introducing the use of additional engineering materials. The table below outlines the Student Learning Objectives (SLO) for Unit 4 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 objects that move.	Developing possible solutions	Developing & using models	Structure & function	Combine different shapes to make an object or design
SLO 2: Explore a specific problem engineers often face (making things move).	Defining/engineering problems	Asking questions & defining problems	Structure & function	
SLO 3: Understand that pushes/pulls on objects can have different strengths and that bigger pushes/pulls can cause bigger changes in the object.	Pushes/pulls on objects have different strengths	Designing solutions	- Scale, proportion, & functionality - Cause & effect	
SLO 4: Match 3-dimensional objects to 2-dimensional pictures.				Recognize 3D objects in 2D pictures
SLO 5: Compare and contrast vehicle types and how different vehicles do work by moving.		Planning & carrying out investigations	Scale, proportion, & quantity	

Unit 4 Lesson Overview:

Lesson 1: Pushes & Pulls (30 - 40 min.)
In this lesson, students will build a tractor and explore how different forces, like pushes and pulls, can be used to move objects.

Lesson 2: Exploring Gravity (30 min.)
In this lesson, students will build a helicopter and explore the concept of gravity.

Lesson 3: Make Your Castle Strong (30 - 40 min.)
In this lesson, students will build a castle wall that includes a door. Students will explore how to use different engineering materials to make the castle door open and close.

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

- Curve
- Direction
- Drag
- Estimate
- Force
- Gravity
- Helicopter
- Movement
- Pivot
- Push
- Pull
- Rotate
- Transport
- Vehicle
- Wheel
- Work

Classroom Organizational Tips

All the lessons in Unit 4 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

"Motion: Push and Pull, Fast and Slow" by Darlene Stille and Sheree Boyd

"Pushes and Pulls" by Helen Gregory

"Push and Pull" by Charlotte Guillain