LEGO education

WeDo 2.0 Projects

Teacher Guide

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LEGO education WEDO 2.0

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Firetruck

WeDo 2.0 Project

Project at a Glance

In this project, Students will explore different type of gears to help them build and program a model of a firetruck.

Key Words:

Firetruck, gears

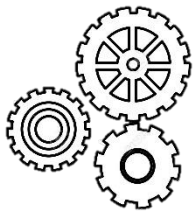
Learning Objectives

By the end of this project, students should be able to:

- Recognize the types of gears.
- Identify the gearing principals.
- Build a firetruck with manually moving gears

Introduction

A gear is a toothed wheel that rotates and makes another part move. You can find gear wheels on your bike, they are linked together with a chain. A "gear train" is when gears are placed directly alongside each other.



- Types of Gear Trains

1. Gear up: a large gear drives a small gear in order to produce more rotations.

2. Gear down: a small gear drives a larger gear in order to produce fewer rotations

- Types of Gears

1. Bevel Gear: A bevel gear is an angled gear that can be placed perpendicular to another gear, changing the axis of the rotation.

2. Rack: A rack is a flat element with teeth that engages a circular gear, in this case often called a pinion. This pair of gears change ordinary rotational motion, as the gear turns into linear motion.

3. Worm: Gear A worm is a continual spiral groove like a screw, which meshes with a gear. The worm is designed to turn a normal gear, but the gear cannot turn the worm, therefore, it functions as a brake.

Connection

1) Show your students the connection photo/video about a gears and a firetruck.
2) Ask your students these question for discussion:

- What can you see in the picture?
- How does the ladder move?
- How does the ladder go up?

Create

Hands-On, Minds-ON: (learn by doing)

Students will build a Firetruck using LEGO bricks in the WeDo 2.0 kit, and observe its characteristics. After that, let them program it as suggested and observe how it's functioning.

Explain the code for the students while they are programming the model.

Share

Ask the students to share, present, and discuss their ideas, models, results of the mission and the engineering based design with the colleagues.

Continue Phase

It's time to take the project to the next level, you can choose a way to enhance the model by changing the code or model structure.

Investigate More

Ask your students to investigate what happens if they remove the rubber band from their model.