SCIENCE NORTH SCIENCE NORD
SUDBURY, ONTARIO, CANADA

Ozobot Force Test	Grade 3: Forces Causing Movement

Lesson Plan

Coding Tool	Ozobot
Cross-curricular	Math – Measurement

Big Ideas

- There are several types of forces that cause movement.
- Forces cause objects to speed up, slow down, or change direction through direct contact or through interaction at a distance.
- We can provide the Ozobot with directional commands using coloured line codes, and therefore, students will learn basic coding concepts like cause and effect, critical thinking, and debugging.

Specific Expectations

- ***Science*** **-** Conduct investigations to determine the effects of increasing or decreasing the amount of force applied to an object.
- ***Math*** - Estimate, measure, and record **length**, height, and distance, using standard units (i.e., centimetre, metre, kilometre).

Description

Students will use Ozobots to determine the effects of increasing or decreasing the amount of force applied to an object. The Ozobot is a small, programmable robot that reads and responds to colours on both paper and digital surfaces.

Materials

- Ozobots
- Markers
- Ozobot testing handout
- Material to push
- Ruler

Computational Thinking Skills

- Problem decomposition
- Abstracting
- Data ordering
- Testing and debugging
- Problem-solving

Introduction

- Have students make predictions about how a different amount of force can move an object.
- Record predictions.
- Model - Try pushing a heavy object with all your muscle. Try again but not as hard. Does the object move as far?

Action

- Use the Ozobot handout to complete this activity.
- To complete the activity, students must colour the required colour code so that their Ozobots move at different speeds.
- Students place an object of their choice (ping pong ball, *Lego* block, etc.) on the red line at the start spot.
- Ozobots will hit the objects at different speeds causing them to move.
- Students will measure how far the object moves for the different speeds.
- Using the recording sheet, students can record their measurements.
- Discuss: *How far did the object move when it moved at a fast speed? How far did it go when the speed was slower?*

Consolidation/Extension

- Let's try this activity with objects that are heavier or lighter.
- *Use objects around the classroom to test.*

Additional Resources

- Recording sheet (attached)
- Ozobot Force Sheet (attached)