SCIENCE NORTH SCIENCE NORD
SUDBURY, ONTARIO, CANADA

Scratch: Push or Pull Game	Grade 3: Forces Causing Movement

Lesson Plan

Coding Tool	*Scratch*
Cross-curricular	Math – Patterning & Algebra

Big Ideas

- There are several types of forces that cause movement.
- Demonstrate an understanding of how forces cause movement and changes in movement.
- Students will use basic coding concepts like cause and effect, critical thinking, and debugging when programming and stacking commands.

Specific Expectations

- ***Science 3.1:*** Identify a force as a push or a pull that causes an object to move.
- ***Science 2.5:*** Use appropriate science and technology vocabulary, including *push* and *pull* in oral and written communication.
- ***Math:*** Describe, extend, and create a variety of numeric patterns and geometric patterns.

Description

Students will remix a Scratch game to identify forces as either a push or a pull. Scratch is a block-based visual programming language for students. Students can drag and combine code blocks to make a range of programs which include stories, animations, and games. You will need to sign up for a free Scratch account for this activity (https://scratch.mit.edu).

Materials

- A box with a rope
- Computers/tablets with Scratch

Computational Thinking Skills

- Sequencing - identifying a series of steps for a task
- Loops – running the same sequence multiple times
- Experimenting and Iterating – developing then trying it out, then building more
- Reusing and remixing – making something by building on existing projects/ideas
- Pattern recognition (finding patterns which can help simplify task)

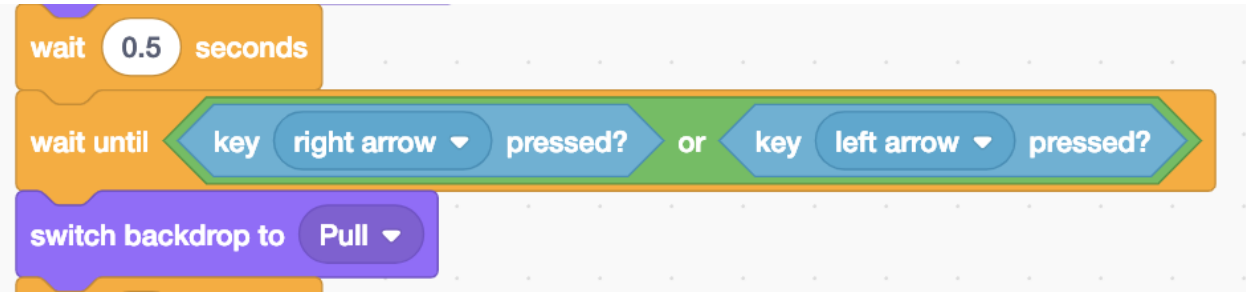
Introduction

- Students will review the idea that a force is a push or a pull.
- Demonstrate the two concepts using a box with a string. Notice how the box moves when you push or pull it.
- Add weight to the box and demonstrate if you require more or less force to push and pull it.

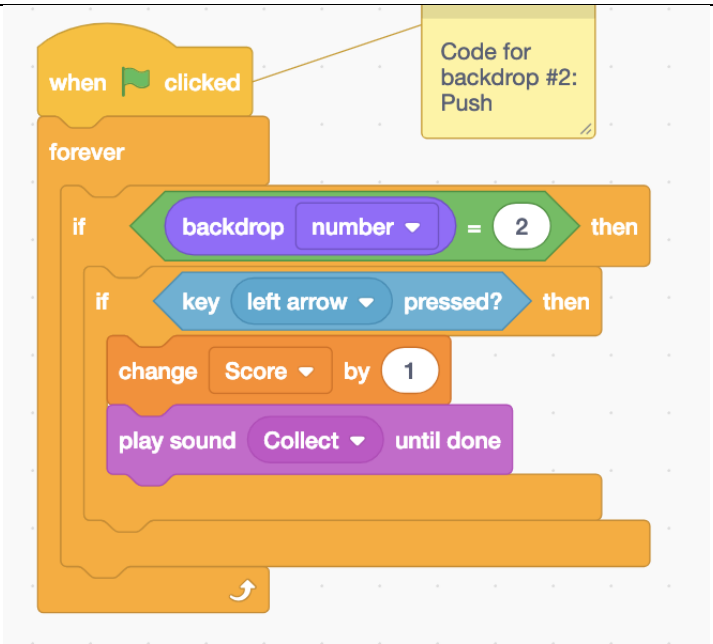
Action

- Students will look at a game on Scratch and remix it to add push and pull concepts.
- In the game, players use the arrow keys to choose if the picture is a push or a pull.
- The game can be found here: https://scratch.mit.edu/projects/290910329/
- In this lesson, students will add to the game by remixing the game.
- To do this, find the project and click the remix button.

- In the game, there are multiple backdrops with different images representing a push or a pull. The first two images are programmed. Students will code the rest of the backdrops (and pushes or pulls).
- To do this, add more lines of code for changing the backdrop.



- They will also have to duplicate the code for choosing and make changes to the backdrop number and the arrow being pressed.



Consolidation/Extension

- When students are done making their game, they can participate in a gallery walk to view the ideas of their peers.

Assessment

- Observations
- Checklist (attached)