Professional Learning – Coding Series



Land Acknowledgement

Anishinaabe Territory

Robinson-Huron Treaty

Located on the traditional lands of

Atikameksheng Anishnawbek





schools.sciencenorth.ca/virtual-learning-packages







JUST FOR TEACHERS

TEACHERS

TEACHERS WORKSHOPS EDUCATOR RESOURCES SCIENCE AT HOME TEACHERS ACCESS PASS SUBSCRIBE TO SCIENCE-ATIONAL NEWS!

TEACHERS WORKSHOPS



Science North has developed a series of dynamic teacher workshops that will bring the Ontario Science and Technology Curriculum to life. Each workshop is designed to give teachers the confidence and resources they need to investigate and explore the scientific concepts involved. These workshops involve teachers in fun, hands-on activities that are easily reproduced for the classroom at little or no cost.

COVID UPDATE

<u>schools.sciencenorth</u> <u>.ca/just-teachers</u>



education.sciencenorth.ca





Workshop Goals

Science North is dedicated to getting **students excited** and **thinking about science**. We aim to provide teachers with **innovative**, **hands-on activities** and **creative learning tools** that make learning more meaningful and fun.

Motivate students:

- Connect to their interests.
- *Highlight relevance of material.*
- Use real-world examples.
- Choose challenging activities.
- Boost confidence.

Promote active learning:

- Use a group or individual activity.
- Challenge them to solve a problem.



Let's Get Moving – Gr 1/2

Part 1 – January 11, 2020

- Walk the Robot
 - Lesson Plan
 - Slides
- Unplugged Coding Activity
 - Lesson Plan
 - Shape and Maze Handout
 - Shape and Maze Answer Key

Part 2 – January 12, 2020

- Coding Math Activity
 - Lesson Plan
 - Slides
 - Coding Handout
 - ScratchJr



Math curriculum expectations

Algebra C3. Coding

Overall Expectations

C3. Solve problems and create computational representations of mathematical situations using coding concepts and skills

Specific Expectations

C3.1 solve problems and create computational representations of mathematical situations by writing and executing code, including code that involves sequential events

Spatial Sense E1. Geometric and Spatial Reasoning

Overall Expectations

E1. Describe and represent shape, location and movement by applying geometric properties and spatial relationships in order to navigate the world around them

Specific Expectations

E1.1 sort and identify two-dimensional shapes by comparing number of sides, side lengths, angles and number of lines of symmetry

E1.5 describe the relative positions of several objects and the movements needed to get from one object to another



Algorithms







Navigating the world around us







Walk the robot







This is our robot.

It moves in the grid 1 square at a time. It can move Up, Down, Right and Left.







What steps will it need to take to get to the power station?





What steps will it need to take to get to the power station?

Right 1 square, Up 1 square

OR

Up 1 square, Right 1 square











Right 1 square, Right 1 square



- OR
- Right 2 squares









Help the robot get around the trees so it can plug in.



The robot only has power to move 5 steps. Which path should it take to reach the plug?

Let's give the robot a crayon that will draw the path as it walks.

How can it draw the smallest square possible?

How can it draw a rectangle that is taller than it is wide?

How can it draw a rectangle that is taller than it is wide?

Unplugged Activity

- Shapes and Mazes Handout with Answer Key
- 5 tasks total
 - Largest square
 - Rectangle that is wider than it is tall
 - Ant maze
 - Beaver maze
 - Treasure map

Let's Get Moving

Grade 1 and 2

Shapes and Mazes Handout

1. What steps will the robot take to walk in the largest square possible?

Coding Math Activity - ScratchJr

Tablets and Devices https://www.scratchjr.org/

Desktops

https://jfo8000.github.io/ScratchJr-Desktop/

Coding Math Activity - ScratchJr

Movement Tasks Large Rectangle Large Square Visible Rectangle

- Task 1:
- Start a new project
- Turn on the grid
- Choose a sprite

 Use the background editor to draw a rectangle around the perimeter of the stage

• Now we can see the rectangle to follow

- Count the squares
- Drag the code blocks
- Coding Complete!

- Task 2:
- Start a new project
- Turn on the grid
- Choose a sprite

- Use the background editor to draw the largest square in the stage
- You'll have to count the squares since the grid isn't numbered in this tool

- Use the background editor to draw the largest square in the stage
- Drag and drop the code blocks
- Coding Complete!

- Task 3:
- Start a new project
- Turn on the grid
- Choose a big sprite

- Test how far the sprite can go while staying visible in each of the four corners
- Bottom left

- Test how far the sprite can go while staying visible in each of the four corners
- Bottom right

• Test how far the sprite can go while staying visible in each of the four corners

• Top right

• Test how far the sprite can go while staying visible in each of the four corners

• Top left

• Test how far the sprite can go while staying visible in each of the four corners

• Top left

- Along the width (left/right):
 - Left position = 3
 - Right position = 18
 - Sprite takes 15 steps
- Along the height (up/down):
 - Top position = 12
 - Bottom position = 4
 - Sprite takes 8 steps

Thank You!!

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