

Ontario Mathematics March 2022, EXPECTATIONS for CODING

Resource - "First Steps in Coding to Learn"(2022 Neufeld Learning Systems Inc.)

RS are Reproducible Sheets

Grade 4 Coding Expectations

- 4.C3.1 Coding Skills** .. Solve problems and create computational representations of math situations by writing & executing code including code that involves sequential, concurrent repeating & nested events.
- 4.C3.2 Coding Skills** .. Read and alter existing code, including code that involves sequential, concurrent, repeating and nested events and describe how changes to the code affect the outcomes.

In Preparation for Upcoming Lessons, discuss following from Resource with Students/Teachers/Parents.

- 1. FORWARD** - Set up a special learning environment for all.
- 2. PREFACE - The Role of Robots** to facilitate a special learning environment - learn by teaching.
- 3. PREFACE - The Role of Journaling** is an essential way to express understanding.

Chapter 1 of Resource - "First Steps in Coding to Learn" Neufeld - First Steps to Coding

Goal: Provide screen free, interactive experiences where students learn the importance of providing understandable, sequential directions -- the foundation of coding.

Overview: We will consider the role of and the coding of robots.
Exercises will have students organize events sequentially.
Communication skills will be emphasized.
Exercises will introduce concepts in distance and turning.

Concepts: Communication, cooperative learning and sequencing
Decomposition - breaking down problems into steps
Accurate measurements of distances and turns

SPECIFIC ACTIVITIES: SEQUENTIAL EVENTS

Part A: Coding - First Steps

Select one appropriate activity from Activities #1 to #9 in Gr 1 pg 2 to 11

Part C: Code for a Degree Turn

Activity #1: Introduce the DEGREE TURN CODE Duplicate 1RS.8 pg 21

Exercise 3 for the DEGREE TURN CODE pg 24

Exercise 4 for the DEGREE TURN CODE Duplicate 1RS.9 pg 25

Activity #3: Command the Paper Robot pg 27

Activity #4: Design When Given a Code pg 28

Navigation - choose from .. Town Maze, Logan, Bike pg 29 to 33

Chapter 2 of Resource - "First Steps in Coding to Learn" Neufeld - Code a Floor Robot - Blue-Bot

Goal: Blue-Bot brings STEM - Science, Technology, Engineering, Math - Foundational Skills

Overview: Apply the robot's keys to enter code into Blue-Bot.
Apply estimation to determine distances & turns.

Concepts: Investigate results of code.
Given code, predict results or outcomes.
Given results, an action or outcome, one can predict code.
Sequencing, directionality, problem-solving, counting, estimation

SPECIFIC ACTIVITIES: SEQUENTIAL EVENTS

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Part A: Code Blue-Bot with Blue-Bot's Keys

Select 2 Activities from page 37 to 47

From 2RS.1 to 2RS.9 pg 37 to 47

Part C: Code Blue-Bot by Tablet or Computer

Information, Preparation

pg 54/55

Investigation Activity

pg 56

Prediction Activity #1

Duplicate 2RS.10 pg 57

Prediction Activity #2: REPEAT

Duplicate 2RS.11 pg 58

MATH THEATRE:a special activity for gr 3 to 5

pg 63

Chapter 3 of Resource - "First Steps in Coding to Learn" Neufeld - Interactive Coding

Overview: Introducing the LOGO Learning Environment.

Concepts: Apply clear and concise learning skills.

Sequencing, Directionality, Problem-solving, Counting, Estimation, Repeating

SPECIFIC ACTIVITIES: SEQUENTIAL EVENTS, REPEATING EVENTS

Introduction to LOGO Learning Environment; Acquiring LOGO

pg 66 to 68

The LOGO Screen

pg 70

Activity #1: Explanation

pg 71

Activity #1: Investigate, Predict, Journal

Duplicate 3RS.1 pg 72

Activity #2: Investigate, Predict, Journal

Duplicate 3RS.2 pg 73

Select from Activities 3 to 5

Select from RS pg 74 to 76

Activity #6: Shape Up on Blue-Bot

Duplicate 3RS.6 pg 77

Activity #7: Shape Up by Logo Code

Duplicate 3RS.7 pg 78

Activity #9: REPEAT, Wait, Color, Setwidth

Duplicate 3RS.9 pg 80

Activity #10: Predict and Reinforce.. REPEAT

Duplicate 3RS.10 pg 82

Activity #12: The Turn

Duplicate 1RS.8 pg 85

Investigate TURNS with LOGO on Computer

pg 87

Activity #13: Turn - Turn - Turn

pg 90

Select from Tasks within 7 Mazes

Select from RS pg 91 to 95

Chapter 4 of Resource, "First Steps in Coding to Learn" Neufeld - Of Shapes and Patterns

Overview: Work through Patterns based on Squares, Triangles, Rectangles and Beyond

Concepts: Changing Code into a more Efficient Code

Sequencing, Directionality, Problem-solving, Counting, Estimation, Repeating, Nesting

SPECIFIC ACTIVITIES: SEQUENTIAL EVENTS, REPEATING EVENTS, NESTING

Part A: Think Square

Activity #1: Introduce the Square

Duplicate 4RS.1 pg 98 to 99

Activity #2a: Squares ... Again and Again #1

Duplicate 4RS.2 pg 100

Activity #2b: Squares ... Again with Blue-Bot #1

Duplicate 4RS.3 pg 102

Activity #3a: Squares ... Again #2 NESTED

Duplicate 4RS.4 pg 104

Activity #3b: Squares ... Again #2 Blue-bot

Duplicate 4RS.5 pg 105

Activity #4: Squares ... Again and Again #3

Duplicate 4RS.6 pg 106

Grade 4 Coding Expectations continued

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Part B: Think Triangle

Activity #1: Introduce the Triangle	Duplicate 4RS.7	pg 108
Activity #2: Triangles ... Again and Again #1	Duplicate 4RS.8	pg 110,111
Activity #3: Triangles..Again & Again #2 NESTED	Duplicate 4RS.9	pg 112
Activity #4: Triangles ... Again and Again	Duplicate 4RS.10	pg 113

Part C: Art Class

Activity #1: Turn & Repeat a Square .. NESTED		pg 114
Activity #2: Turn & Repeat a Triangle .. NESTED		pg 117

Part D: Think Rectangle

Activity #1: Introduce the Rectangle		pg 120
Activity #2: Rectangles ... Again and Again #1	Duplicate 4RS.11	pg 121
Activity #3: Rectangles ... Again #1 & Blue-Bot	Duplicate 4RS.12	pg 122
Activity #4: Rectangles ... Again and Again#2	Duplicate 4RS.13	pg 123
Activity #5: Rectangles ... Again with Blue-Bot	Duplicate 4RS.14	pg 124
Activity #6: Rectangles ... Again and Again #3	Duplicate 4RS.15	pg 125

Part E: Closed Shapes

Activity #1: Investigate Closed Shapes		pg 126
Activity #2: Walks Around Closed Shapes #1	Duplicate 4RS.16	pg 127,128
Activity #4: Given code, Design Regular Polygon	Duplicate 4RS.18	pg 130