

**Ontario Math Curriculum Expectations 2020
Coding Strand .. Grade 5**

Ontario Mathematics March 2022, EXPECTATIONS for CODING

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

RS are Reproducible Sheets

Grade 5 Coding Expectations

- 5.C3.1 Coding Skills** .. Solve problems & create computational representations of mathematical situations by writing/executing code including code that involves conditions & other control structures.
- 5.C3.2 Coding Skills** .. Read/alter existing code, including code that involves conditional statements and other control structures 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 #10 from grade 1 curriculum 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 **Duplicate 1RS.10,11,12** pg29 to 33

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

- Goal:** Blue-Bot brings STEM - Science, Technology, Engineering, Math - Foundational Skills and communication into the classroom and builds 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

Prepared by Neufeld Learning Systems Inc.

March 2022

**Ontario Math Curriculum Expectations 2020
Coding Strand .. Grade 5**

SPECIFIC ACTIVITIES: SEQUENTIAL EVENTS

RS are Reproducible Sheets

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 #6: Shape Up on Blue-Bot

Duplicate 3RS.6

pg 77

Activity #7: Shape Up by Logo Code

Duplicate 3RS.7

pg 78

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, Count, 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 #3a: Squares ... Again #2 NESTED

Duplicate 4RS.4

pg 104

Part B: Think Triangle

Activity #1: Introduce the Triangle

Duplicate 4RS.7

pg 108

Activity #3: Triangles...Again & Again #2 NESTED

Duplicate 4RS.9

pg 112

Part C: Art Class

Activity #1: Turn & Repeat a Square .. NESTED

pg 114

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

**Ontario Math Curriculum Expectations 2020
Coding Strand .. Grade 5**

Part E: Closed Shapes

Activity #1: Investigate Closed Shapes pg 126

Activity #4: Given code, Design Regular Polygon **Duplicate 4RS.18** pg 130

Grade 5 Coding Expectations continued

RS are Reproducible Sheets

Chapter 5 of Resource - "First Steps in Coding to Learn" Neufeld - Build New Learning

Overview: Introduction to "Procedures" - a more efficient way of programming

Concepts: A "procedure" is a set of commands used to perform a specific task.

A "procedure" introduces a control structure leading to conditional statements

SPECIFIC ACTIVITIES: PROCEDURES leading to efficient CONTROL STRUCTURES

Part A: TURTLE'S FIRST DAY IN SCHOOL

Activity #1: Introduce the First Lesson pg 134

Your Second Task **Duplicate 5RS.1** pg 135

Activity #2: The Second Lesson pg 140

Your Second Task **Duplicate 5RS.2** pg 141

Activity #3: The Cross pg 145

Activity #4: The Daisy pg 147

Idea #1 pg 147

Idea #2 pg 148

Part B: HOMEWORK on the FIRST DAY

pg 150

Activity #1: Preliminaries to ... SQUARES Everywhere pg 150

Activity #1: SQUARES Everywhere **Duplicate 5RS.3** pg 151

Activity #2: TRIANGLES Everywhere **Duplicate 5RS.4** pg 152

Activity #3: RECTANGLES Everywhere **Duplicate 5RS.5** pg 154

Activity #4: TRIANGLES Around a SQUARE pg 155

Activity #5: The WREATH pg 155

Part C: LESSONS ON DAY 2 IN SCHOOL

pg 156

Activity #1: Investigate Plans pg 156

Plan #1, #2, #3, #4 pg 156, 157

Part D: HOMEWORK ON DAY 2

pg 158

Activity #1: Building Square to Flag to Ferris **Duplicate 5RS.6** pg 158

Activity #2: Build RectanglePinwheelSpread **Duplicate 5RS.7** pg 159

Activity #3: Build Square to Panes to Condo **Duplicate 5RS.8** pg 160

Activity #4: Build Tri to Para to Trap to Wow **Duplicate 5RS.9** pg 161

Activity #5: PetalBlossomLeavesDaisyGarden **Duplicate 5RS.10** pg 162