SCIENCE NORTH SCIENCE NORD
SUDBURY, ONTARIO, CANADA

Lifecycle Lego Maze	Grade 2: Growth & Changes in Animals

Lesson Plan

Coding Tool	Play-based
Cross-curricular	Language: Procedural Writing

Big Ideas

- Animals have distinct characteristics.
- Humans are animals.

Overall Expectations

2. investigate similarities and differences in the characteristics of various animals

3. demonstrate an understanding that animals grow and change and have distinct characteristics.

Specific Expectations

2.3 investigate the life cycle of a variety of animals, using a variety of methods and resources

2.4 observe and compare changes in the appearance and activity of animals as they go through a complete life cycle

2.7 use appropriate science and technology vocabulary, including life cycle, migration, adaptation, body coverings, and classify, in oral and written communication

3.1 identify and describe major physical characteristics of different types of animals

Description

Using Lego, Duplo or other building blocks, students will be challenged to practice coding without the use of a computer. They will explore the life cycle of different animals and have the opportunity to demonstrate their understanding of the various stages.

Materials

- Lego, Duplo or other building blocks
- A grid proportional to the blocks
- Pictures of animals in different stages of the life cycle
- Coding pieces (attached)
- Materials for the *Be Specific* activity, depending on what task you choose

Computational Thinking Skills

- Problem Solving
- Algorithmic Thinking

Introduction

Task: *Be Specific* - Acting as a robot, you will attempt to complete a simple task, based on instructions given to you by the class. The goal of this activity is to encourage students to be specific when providing instructions. As the robot, your role is to take their instructions as literal as you can. One at a time, students will provide you with the next instruction to complete your task.
Example: Tying your shoes. If a student says, "Put the shoe on your foot", you would place the shoe on top of your foot. A student may then say, "Put your foot into the shoe", you may choose to do so upside down or on the wrong foot. Students will gradually realize that they need to be specific and will likely give instructions in a trial and error way until completion of the task.

Debrief: Possible Discussion Questions:

- What did you learn during this activity?
- How did you overcome problems during this task?
- Why is it important to be specific while coding?

Action

Task: *Lego Maze Coding:* Students will learn to code without using a technological device. They will also demonstrate how animals grow and change using the life cycle of a specific animal.

- Starting with a grid as the base, students create a maze using whatever types of blocks are available. Lego or Duplo work well, but any building blocks are fine too.
- Assign your students with an animal that changes through different stages in its life cycle. Choose animals that the class is familiar with to help ensure success, or challenge your students with new animals and have them research the various stages first. Students indicate where the beginning of the maze is and place a stage in the life cycle there. All other stages should be placed at various points around the maze. Each stage of the life cycle will need to be represented with a specific place around the maze.
- Create or choose a playing piece that will travel around the maze. The purpose is to have the playing piece move around the maze visiting each stage of the life cycle in order and then return back to the start.
- Students will determine how this is possible and plan out the journey using the coding command strips. This mimics how many coding programs operate on a basic level. Ensure there are many strips available for each student, so their paths are not limited.

Place the first command at the top of a designated "coding space" and other codes in order underneath.

- When students believe they have completed the path, have a different student follow the codes while moving the piece around the maze. Provide feedback on any problems and allow students to alter and fix their codes.

***Extension**:* Instead of creating the path for their own maze, students can create a maze and then have someone else create the path. One partner makes a maze and then the other partner codes for it.

***Extension* or *Early Finishers**:* After the maze and coding is complete, students can practice procedural writing and describe the path that the marker takes through the maze and also about the different stages in the life cycle.

***Extension**:* Have students decorate or create the maze to resemble the habitats of the animal. Use certain colour blocks or add extra items in order for the maze to look more like the animal's habitat.

Consolidation/Extension

Encourage students to walk around and look at other mazes. If time allows, they can follow the code and move the marker piece around the maze.

Discuss with your partner: Two things that your partner did well and one thing they could improve on.

As a class discuss:

- How was this similar to coding on a device?
- How was this different to coding on a device?
- What did you learn about coding through this hands on activity?
- How will it help you code in the future?

Assessment

Test the accuracy of the codes by moving the piece through the maze. Ensure that there are stops at each part in the life cycle and that it returns back to the start. Ensure students are being specific in their write-ups as they learned to do during the introduction activity.

Additional Resources

Lego Coding Pieces - The coding command strips required for this activity are attached as a separate file. Ensure there are a lot for students to access.

Maze Example - An example of what students may create: