

Robot Activities

Examples for

Numeracy Learning

Sample activity with Dash on a mission

Unplugged: Sequences and Algorithms

Victorian Early Years Learning and Development Framework (VEYLDF) Practice Principles focus:

- Integrated teaching and learning approaches
- Reflective practice
- High expectations for every child

Materials:

- 1 Dash robot per group
- construction paper cut into quarters
- copies of the Arrows
- textas
- sticky notes/paper for drawing

Group Size (suggested):

3–4 children per group

Overview

Children will become introduced to and define the terms sequencing and algorithms. Children will learn how coding relates to their real lives.

Ask, “*What is a recipe?*” (Sample response: “A recipe is a set of directions for how to make something.”)

Ask, “*Who has ever used a recipe to make something? Or who has seen a member of your family use a recipe to cook with?*”

Say, “*Writing a code is like writing a recipe and following a code is similar to following a recipe. When we write a recipe for a computer to follow, it’s called an algorithm.*”

Coding Level: A

Learning Objectives:

Children will:

- Define sequences and algorithms.
- Relate coding to their lives at home and school.
- Children will design an algorithm navigating Dash through a maze to find 'X'.

Curriculum Mapping

Outcome 4: Children are confident and involved learners

Children resource their own learning through connecting with people, place, technologies and natural and processed materials.

Outcome 5: Children are Effective Communicators

Children begin to understand how symbols and pattern systems work.

Direct Instruction

Introduction

Start with a discussion about:

Say, *“An algorithm is a fancy way to say, ‘directions.’”*

Say, *“When we use algorithms, we give directions to the computer.”*

Say, *“We have to be careful with algorithms because computers can only follow the instructions we give.*

If we give bad instructions, the computer follows the bad instructions.”

Can you write an algorithm to follow to make orange juice?

- What happens if the instructions are not correct?
- What happens when your algorithm is not specific enough.

Quick Check

What is an algorithm?

Sample response:

“An algorithm is a set of instructions written for a computer to follow.”

How do you use algorithms in your life?

Sample response:

“I use algorithms every time I give someone else directions. I also use algorithms when I follow someone else’s directions.”

Guided Practice

1 Talk about algorithms and sequences

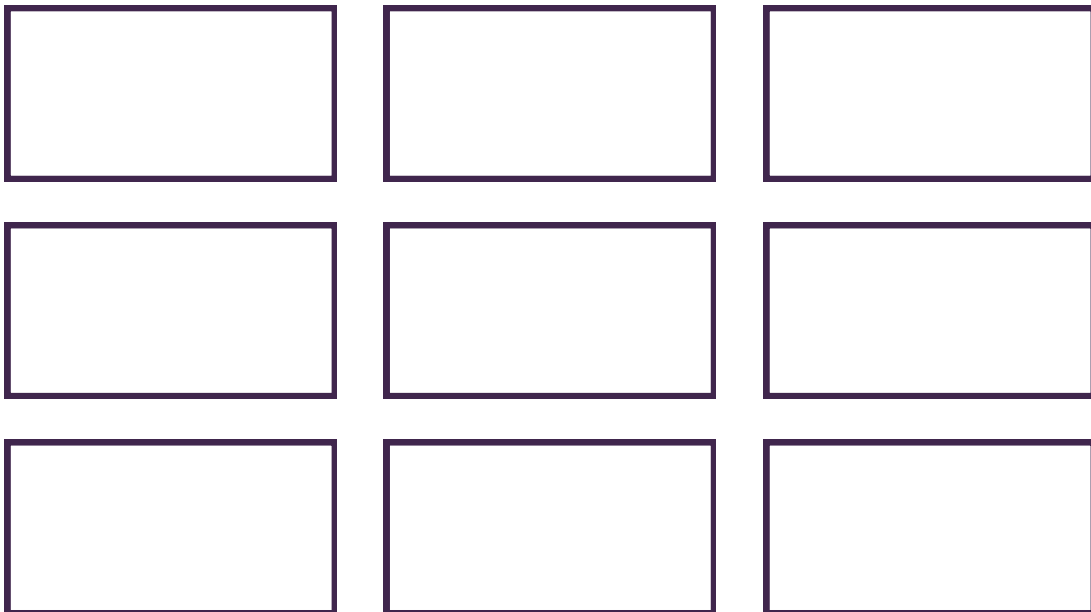
- **Say**, “How can the children use an algorithm to transfer Dash from Point A to Point B?”
- **Ask**, “What would happen if the children used the arrows to make a sequence, but put them in a different order?”

Sample response: “Then Dash might not find the way to get to the fruit.”

- **Say**, “It’s important to make sure the instructions in our algorithm are in the right order or it might not work.”

- ## 2
- Say**, “We are going to create an algorithm that helps Dash find XX.” [these can be items that children draw on their story maps/grids]

- ## 3
- Ask the Children to sit in a circle on the floor. Place 9 pieces of paper on the floor in the shape of a rectangle (see the below diagram). Place Dash on a piece of paper. (It doesn’t matter where the robot is placed.)
- Use the Arrows to make a sequence.**



4 to direct Dash to an item on their grid.

- Once the algorithm has been written, have a child move Dash through the squares, following the arrow sequence.
- **Ask**, “Was our algorithm correct? How do you know?”

Sample response: “Our algorithm was not correct because Dash did not find XX.”

5 Now take all the arrows that were used in the previous algorithm and mix them up. Place them in a random order in a line on the floor.

- Have Dash start in the same place as before and ask a child to move Dash in the direction of the arrows.
- Did Dash end up in the same location? Why or why not?

Sample response: “Dash did not end up in the same place because the sequence of the arrows was incorrect.”

6 Move Dash to different locations on the paper grid and follow the same procedures to create and solve a different algorithm.

7 Say, “Now it’s your turn to create your own algorithms.”

Independent Practice

- Have children work on the following activities in groups.
- When children work together while coding, they’re able to help each other identify mistakes and develop creative solutions!

Quick Check

- What happens when the sequence of the arrows is wrong?

Sample response: “Dash cannot find XX if the sequence is incorrect.”

- How is an algorithm like a recipe?

Sample response: “An algorithm is like a recipe because an algorithm gives instructions and so does a recipe.”

Wrap Up

Follow-Up Questions/Discussion

What were the challenges with this activity?

Sample response: *"I thought it was hard to figure out which direction Dash needed to move. Sometimes we chose the wrong direction."*

Remember how recipes are like algorithms? What happens when the recipe is written in the wrong sequence?

Sample response: *"Our finished product probably wouldn't taste very good."*

