

ROBOT ACTIVITIES EXAMPLES FOR NUMERACY LEARNING:

Sample activity with Dash on a mission

Unplugged - Sequences and Algorithms



Overview/Description

Children will become introduced to and define the terms **sequencing** and **algorithms**.

Children will learn how coding relates to their real lives.

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.

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

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

Group Size (suggested): 3–4 children per group

Time Required: 45–60 minutes

Materials:

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

1. 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.”

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

ACTIVITY: DASH FINDS??

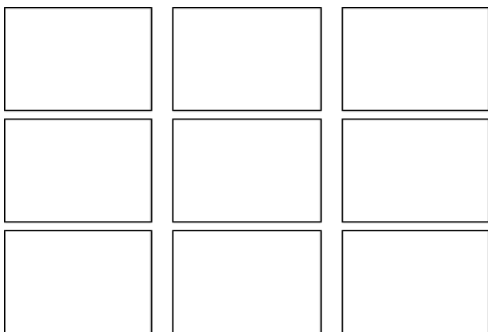
1. Talk about **algorithms** and **sequences**

- 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.”

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.”)

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!

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.”

