

Feed The Robot	Kindergarten, Demonstrating Literacy and Mathematics Behaviours & Problem Solving and Innovating
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<h2 style="margin: 0;">Lesson Plan</h2>	
<p><b>Description</b>          A lesson about the importance of algorithms (giving sequenced instructions) as an introduction to coding. Students and teachers will participate in play-based learning in pairs, with one person being the “programmer” and one being the “robot”.</p>	
<p><b>Learning Outcomes</b></p> <ul style="list-style-type: none"> <li>● Learners will describe which cards can be used, and the order to use them in, to successfully “feed the robot”.</li> <li>● Learners will explain which programming instructions help the “robot” to eat (examples: “The robot needs to pick up the food before it lifts its hand,” and “The food needs to have the wrapper removed before the robot can eat it.”).</li> <li>● Learners will use pictograph cards to help give instructions to program the robot.</li> </ul>	<p><b>Specific Expectations</b></p> <p>1.4 sustain interactions in different contexts, representing, example “Assembly Line Cooking,” give directions for other children to follow to assemble their snack.</p> <p>1.6 use language (verbal and non-verbal communication) to communicate their thinking, to reflect, and to solve problems</p> <p>4.1 use a variety of strategies to solve problems, including problems arising in social situations</p> <p>13.1 state problems and pose questions in different contexts and for different reasons</p> <p>13.2 make predictions and observations before and during investigations</p> <p>13.4 communicate results and findings from individual and group investigations</p> <p>17.2 communicate an understanding of basic spatial relationships in their conversations and play, in their predictions and visualizations, and during transitions and routines</p> <p>24.2 state problems and pose questions</p>
<p><b>Materials Needed</b></p> <ul style="list-style-type: none"> <li>● Instruction cards             <ul style="list-style-type: none"> <li>○ these can be cut out for maximum flexibility within the activity, or left in page format for students to point at when giving instructions</li> </ul> </li> <li>● Play food or real food (depending on teacher’s comfort, the learners in the class, and classroom allergies)             <ul style="list-style-type: none"> <li>○ play food can be plastic, wood, picture cards, cardboard shapes, or student-created drawings on paper</li> </ul> </li> </ul>	

## Introduction

### Whole Group Introduction

- Group discussion about “How do we eat? What are some of the movements that we need to do to eat our food?” (e.g. using hands, forks, spoons, moving arms, opening containers, unwrapping food, using bowls and plates, dipping food into sauces, opening mouth, chewing, etc.).
- What instructions would learners give to another person to help them eat food? When learners share an idea that matches a card, their teacher shares the card with the class:
  - open hand / stretch out fingers.
  - close hand / close fingers / hold object.
  - push / reach out away from body.
  - pull / move hand closer to body.
  - lift hand up.
  - put hand down.
  - turn hand toward body.
  - flip hand over.
    - Get the students to practise making each movement with their hands.
- The next prompt: “What is a robot?” Discuss the responses the students share.
  - A robot is a machine that can follow instructions to do jobs.
  - The instructions need to be clear, with no mistakes. The robot cannot think, it can only do what it is told to do.
- Share that students will be working together to “feed the robot”. Remind them that the programmer **ONLY** touches the cards, and the robot **ONLY** follows instructions.
  - Have a student volunteer to be the programmer, while the adult is the robot.
  - Get them to set up three instruction cards.
  - Be the robot and follow the instruction cards very literally (i.e.: if they did not tell you to pick up the food, do not pick up the food, if they say put your hand flat on the food, put your hand flat on the food). This part can be quite funny, and that is okay!
  - Let the student make changes and add another card.
  - Be the robot and act out the new instructions.
  - Discuss with students how well the instructions worked.
  - The robot has successfully been fed if the food card is next to the mouth of the robot!
    - Note: if using real food from student snacks, this would also include putting the food in the mouth and chewing.

**Action**

**Small Group Coding - Setup and Materials**

After introducing the activity to the whole group, set up an area where they can take turns being the programmer and the robot. The area should have the instruction cards printed out (hand positions, directions, foods), on full pages or cut into cards, and some form of “food” for the robot. The educator can also play one of the roles, especially when students are learning how to program this way for the first time.

*All codes are good codes! Even code that has mistakes lets us learn what works and what does not work. Being silly and creative with the cards can show an understanding of code just as much as being successful.*

**Consolidation/Extension**

Whole Group Consolidation:

- Which cards did you use the most?
- Are there any cards you did not use?
- Describe the best way the robot got food into its mouth.
- How many tries did it take to feed the robot? How would you change your instructions next time?

Simplify/solo activity:

- Use a plush animal as the person being ‘fed’. The student can act as both the programmer and the robot arm.
- Use a set of tongs to make the hand “more robotic” and to help with fine motor skills.

Add complexity:

- Have the students be as specific as possible when using the programming cards. Some will notice that the robot not only needs to close the hand but turn it before lifting to the mouth.

**Accommodations/Modifications**

For beginning coders, limit the number of cards available. The suggested cards are open hand, closed hand, up arrow, and down arrow, with one food card.

For early readers and writers, use the cards with words, and encourage them to record their codes on paper.

**Assessment**

Educators can take anecdotal evidence from conversations with students, listening to discussions between students, and observations during ‘programming’ (see Specific Expectations).

## Additional Resources

### Video Resources from slide show:

Algorithm AI <https://www.youtube.com/watch?v=cvk5vIgZAZw&t=6s>

The Algorithm and Data Literacy Project

English [https://youtu.be/46AcviSU9Rg?si=D-xS4k3aXvev\\_9uz](https://youtu.be/46AcviSU9Rg?si=D-xS4k3aXvev_9uz)

French: <https://youtu.be/2oegxbYUFAs?si=2nuGDxFvtykv7X58>

### Additional coding activities:

Science North Coding activities <https://schools.sciencenorth.ca/kindergarten>

Canada Learning Code <https://www.canadalearningcode.ca/canada-learning-code-week>

Code.org <https://studio.code.org/catalog>

Scratch.mit.edu <https://scratch.mit.edu/educators#resources>