

ROBOT SAYS

INSTRUCTIONS AND PROGRAMMING



6–9 years



20–30 min



6–30 participants

Movement and role-play activity

OVERVIEW

Children guide a “robot” through a simple task by giving clear, step-by-step instructions. When the robot misunderstands vague directions or follows instructions too literally, participants discover why computers and machines need precise information—and why human instructions influence what technology does.

LEARNING OBJECTIVES

Participants will:

- understand that computers and robots follow instructions
- recognize that complex tasks must often be divided into smaller steps
- practise giving clear and logical instructions
- observe how unclear instructions can produce unexpected results
- understand that machines do not automatically interpret situations as humans do



MATERIALS

- Several everyday objects, such as a cup, ball, book, pencil or building block
- A chair or table
- Masking tape, string or paper to mark a starting point and destination
- Optional obstacle objects, such as cushions, empty boxes or paper markers
- Optional robot badge or simple robot headband

PREPARATION

Create a simple activity area with:

- a marked starting position
- one object for the robot to collect
- a clearly marked destination where the object should be placed
- enough open space for the robot to move safely

For example, place a ball on a chair and an empty box approximately three metres away. The robot's task is to pick up the ball and put it into the box.

Remove sharp objects and other potential hazards. If the group is large, prepare two or three activity areas so that smaller groups can participate simultaneously.

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INTRODUCTION

Ask the participants:

- What can robots do?
- How does a robot know what to do?
- Can a robot understand what we want without being told?

Explain:

Robots and computers need instructions. A sequence of instructions for completing a task is sometimes called an algorithm. Today, one person will become a robot, and the rest of the group will give the robot instructions.

Tell the children that the robot will follow each instruction exactly. It will not guess what they meant or add missing information.

INSTRUCTIONS

1) CHOOSE THE ROBOT

Invite one participant to be the robot. For younger or more hesitant groups, the facilitator can play the robot during the first round. Position the robot at the marked starting point.

2) PRESENT THE TASK

Give the group a simple goal: Guide the robot to the ball, ask it to pick up the ball, and help it place the ball inside the box. The robot may only move when it receives an instruction.

3) TEST THE FIRST INSTRUCTIONS

Encourage the group to begin. They may initially give instructions such as:

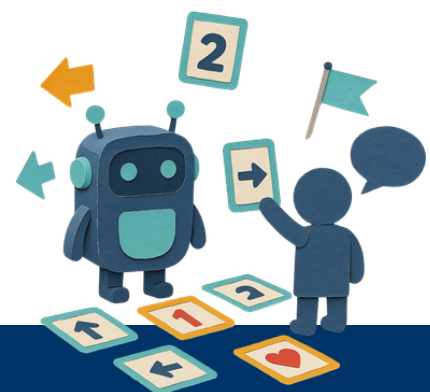
“Go over there.”
 “Get the ball.”
 “Put it in the box.”

The robot should respond literally or demonstrate that the instruction is unclear.

For example:

- For “Go over there,” the robot may turn in the wrong direction.
- For “Get the ball,” it may stop because it has not been told how to reach it.
- For “Pick it up,” it may try to pick up the chair instead of the ball.
- For “Put it there,” it may not know where “there” is.

Keep the misunderstandings playful, but do not deliberately make a correct instruction fail.



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INSTRUCTIONS

4) IMPROVE THE INSTRUCTIONS

Ask participants to divide the task into smaller and more precise steps.

Depending on their age, these might include:

1. Turn to the right.
2. Take three steps forward.
3. Stop in front of the chair.
4. Bend down.
5. Reach toward the red ball.
6. Pick up the ball with one hand.
7. Stand up.
8. Turn toward the box.
9. Take four steps forward.
10. Place the ball inside the box.

Allow the children to correct or revise an instruction if the robot does something unexpected.

5) TRY A SECOND ROUND

Choose another robot and change the task slightly. For example:

- Move a book from a chair to a table.
- Build a tower using three blocks.
- Draw a circle on a sheet of paper.
- Carry a cup from one marked place to another.
- Move around one safe obstacle before collecting an object.

Ask a different participant to give each instruction so that several children contribute to the sequence.

DISCUSSION AND REFLECTION

Bring the group together and ask:

- Which instructions worked well?
- Which instructions confused the robot?
- What made an instruction clear?
- Why did the robot sometimes do something we did not expect?
- Was the mistake made by the robot, the instruction, or both?
- How did you improve the instructions?
- Do you think a real robot always understands what a person means?
- What might happen if a machine receives the wrong instruction?

Conclude with the key idea: Machines can perform useful tasks, but what they do depends on their instructions, the information they receive, and what they have been designed or trained to do. Humans therefore have an important responsibility when creating and using technology.

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CONNECTION TO ARTIFICIAL INTELLIGENCE

Traditional computer programs and robots follow instructions written by people. AI systems can also learn patterns from examples and respond in ways that are not programmed one step at a time. However, they still depend on human-designed goals, rules, and training data.

Like the robot in the activity, an AI system may produce an unexpected result when:

- an instruction is unclear
- important information is missing
- the system interprets words differently from the user
- it encounters a situation it has not learned how to handle

The activity provides a simple foundation for later discussions about programming, prompting, training data and responsible AI use.

EASIER VARIATION

For children aged six or for groups with limited space, keep the robot seated at a table. Participants guide it through a simple task such as:

- drawing a face
- arranging three coloured blocks
- opening a book to a particular page
- placing objects in a specific order

The facilitator can offer instruction cards with pictures representing actions such as turn, move, stop, pick up and put down.

MORE CHALLENGING VARIATION

For children aged eight or nine, introduce additional rules:

- The robot only understands five commands: forward, turn left, turn right, pick up and put down.
- Participants must plan the full instruction sequence before the robot begins.
- Once the robot starts, the sequence cannot be changed.
- If the task fails, the group must identify the faulty instruction, revise it and try again.

This introduces the idea of debugging: finding and correcting a problem in a set of instructions.

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FACILITATOR NOTES

- Keep the robot's misunderstandings humorous but reasonable.
- The aim is to demonstrate ambiguity, not frustrate the group.
- Do not blindfold participants. The robot needs to see the activity area to move safely.
- Use walking only; running should not be permitted.
- Make sure every participant has an opportunity to suggest an instruction.
- Accept different successful solutions. There may be several ways to complete the same task.
- For multilingual groups, demonstrate important commands physically before beginning.
- Emphasize that unexpected results are useful: they help us identify what needs to be clarified or corrected.

KEY WORDS

ROBOT

A machine designed to perform physical tasks.

INSTRUCTION

Information telling a person or machine what to do.

ALGORITHM

A sequence of steps used to complete a task or solve a problem.

PROGRAM

A set of instructions that tells a computer or machine what to do.

DEBUGGING

Finding and correcting a problem in a set of instructions.

