

The Basics of Coding

Explore what makes robots and humans different with a fun exercise that lets students “code” their robot.

Objective

Students will use algorithmic thinking to create instructions for an everyday task, solve problems with new solutions, and analyze different outcomes.

Time

Part A: 30 minutes

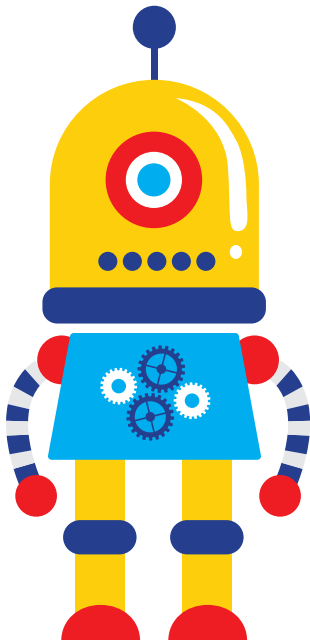
Part B: 60 minutes prep time
30 minutes performance time

Materials

- Code Your Robot activity sheet
- Act It Out! activity sheet

ELA Connections

Read an excerpt from the Amelia Bedelia series to demonstrate how she follows commands very literally. Point out that she, like a robot, does not infer.



PART A

1 Lead a discussion about robots. What sets robots apart from other machines? From humans? Explain that robots are programmed to perform tasks using code.

2 Prompt students to explain the terms *programmed* (told to follow instructions) and *code* (the set of instructions to follow) in their own words.

3 Create code together that a robot might follow in one of your classroom routines. For example, to fill in a worksheet, the robot would a) place a sheet of paper flat on their desk, b) pick up a pencil, c) place the pencil tip onto the paper, d) move their hand to begin writing the first letter of their name, etc.

4 Point out that robots cannot make assumptions or infer meaning like humans can. Therefore, instructions must be clear, ordered, and complete. Point to places in your class-generated code in which a robot might encounter an error and “crash.” (E.g., if you don’t tell the robot to place a sheet of paper on the desk first, he’ll end up writing directly on the desk!) Work to *debug* (identify and remove errors from) your code.

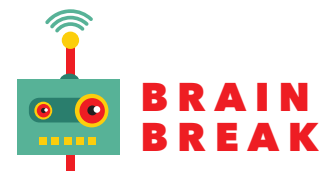
5 Return to the concept of debugging. Facilitate a discussion about making mistakes as an essential part of learning—and not something that students should feel ashamed about. Identifying and fixing those mistakes is an important skill.

6 Distribute the Code Your Robot activity sheet. Pair up students and have them take turns writing and debugging code for their robot partner.

PART B

1 Hand out the Act It Out! activity sheet. Direct students to work in small groups to create and practice a skit.

2 Have groups perform their skits. Ask audience members to identify which parts of the “code” caused the robot to follow directions incorrectly.



Pretend your whiteboard is a touchscreen, and every time you tap it with your finger (in coding lingo that’s called an “event”), students respond by doing one jumping jack.

Name _____

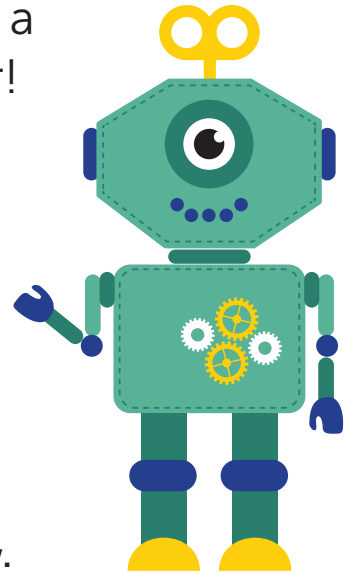
CODE YOUR ROBOT

Program your robot partner to complete a task. Test the code and debug it together!

CIRCLE THE TASK YOU WANT YOUR PARTNER TO COMPLETE

- Sit down at their desk
- Take a book from a shelf
- Put a piece of paper into a binder or folder
- Move to the front of the room
- Take their lunch out of their backpack

Use a pencil to write the code for your robot to follow.



Now test it out. Remember that if something seems wrong, you should go back and tweak your coding instructions.

Name _____



ACT IT OUT!

Create and perform a skit about a robot who makes funny mistakes because it is programmed wrong.

CIRCLE ONE TOPIC FOR YOUR SKIT

- It's the first day of school and the robot doesn't know anyone in class.
- Everyone is playing soccer at recess and the robot wants to join the game.
- The robot feels lonely because it doesn't have anyone to eat lunch with.

Our Robot Skit

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OK, it's re-code time! Flip the page over and write a debugged program so that your robot can perform its tasks the correct way.