

Lesson 5: A New Language

Powerful Ideas of Computer Science	Hardware/Software, Representation, Algorithms, Debugging
Powerful Ideas of Literacy	Tools of Communication and Language, Sequencing
PTD	Communication, Choices of Conduct
Palette of Virtues	Curiosity, Open-Mindedness
Children will be able to...	<ul style="list-style-type: none"> • Scan KIBO blocks. • Identify and use the KIBO Begin and End Blocks. • Identify and use KIBO Motion Blocks. • Identify the role of the programmer in programming a robot.
Vocabulary	<ul style="list-style-type: none"> • Programmer: a person who writes instructions for computers to tell them what to do
Teacher Preparation	<ul style="list-style-type: none"> <input type="checkbox"/> Read lesson plan. <input type="checkbox"/> Print out KIBO Blocks. <input type="checkbox"/> Refer to the following video to learn more about how to scan KIBO's programming blocks. <input type="checkbox"/> Gather KIBO Scanner Job Card.

Warm Up

- **Robot Parts Song** (*Suggested Time: 5 minutes*)
 - Review the [Robot Parts Song](#) as a class.

(To the tune of "Dry Bones")
The wheels are connected to the motors.
The motors are connected to the body.
The engineers give it a program.
So move, robot, move!

Opening Tech Circle

- **What Is a Program** (*Suggested Time: 5 minutes*)
 - After reviewing the song, have children focus on the final line: “the engineers give it a program.”
 - Ask children: *What does this line mean?*
 - Remind children about the previous lesson’s discussion of human and robot languages.
 - Ask children to give an example of a question, a sentence, and an instruction in languages.
 - Tell children that in computer languages, computers only use instructions, which are also known in computer languages as programs. This is why computer languages are also known as programming languages, and people who give these instructions to computers and robots are known as **programmers**.

Unplugged Time

- **Programmer Says** (*Suggested Time: 10 minutes*)
 - In order to program the KIBO robot, children first need to learn KIBO’s language: the programming blocks! This activity is played like the traditional “Simon Says” game, in which children repeat an action if Simon says to do something. Before playing the game, hold up each large [KIBO Block](#) and have children guess what the block does (use only the Begin, End, and blue Motion Blocks for now).
 - Have the class stand up. Hold up one big KIBO icon at a time and say, “Programmer says to _____”. Go through each individual instruction a few times until the class seems to get it. Once children are familiar with each instruction, ask for volunteers to be the Programmer who gives the class full programs to run through (e.g., Begin, Forward, Spin, End).
 - Just like in the real “Simon Says” game, the Programmer can try to be tricky! For example, if the Programmer forgets to give a Begin or End instruction, should the class still move? Just like Simon Says, if the Programmer forgets to say, “Programmer says to _____”, then children should not perform the action!

KIBO Time

Structure Challenge

- **Scanning** (*Suggested Time: 5 minutes*)
 - Explain to children that scanning is how KIBO reads and understands language.
 - Demonstrate scanning the barcodes on the blocks using the KIBO body’s embedded barcode scanner. Ask the children: *What do you see during scanning? What do you hear during scanning?*

Expressive Explorations

- **Free Play** (*Suggested Time: 15 minutes*)
 - Take out KIBOs and blocks and have children engage in free play creating and scanning three block programs (Begin, Motion, End).
 - Also take this time to introduce the [KIBO Scanner Job Card](#).
 - Encourage children to use different strategies to scan.
 - Strategies can include disconnecting and separating the blocks to ensure each block is individually scanned, lifting KIBO between scanning each block, or working

collaboratively with a partner (one person holds the robot to scan, and the other person checks to make sure each block is scanned properly).

- Use your chime or call to action every few minutes to signal the switching of job cards, so that every child has the opportunity to be the “Scanner.”
- By the end of this activity, children should feel comfortable assembling and scanning programs with KIBO.

Closing Tech Circle

- **Reflection Circle** (*Suggested Time: 5 minutes*)
 - Ask the children: *What do you see and hear when scanning works? What do you see and hear when scanning does not work?*
 - Have each group share one strategy they tried that worked for scanning.