

Lesson 2: KIBO Parts

Powerful Ideas of Computer Science	Hardware/Software
Powerful Ideas of Literacy	Tools of Communication and Language, Alphabet and Letter-Sound Correspondence, Phonological Awareness
PTD	Communication, Choices of Conduct
Palette of Virtues	Curiosity
Children will be able to...	<ul style="list-style-type: none"> ● Assemble the KIBO robot ● Identify the parts of the KIBO robot ● Discuss classroom behaviors for using KIBO
Vocabulary	<ul style="list-style-type: none"> ● Hardware: the physical parts of a computer or robot (e.g., KIBO body) ● Main board: the robot's "brain" that has the programmed instructions that the robot to perform its behaviors ● Motor: the part of a robot that makes it move
Teacher Preparation	<ul style="list-style-type: none"> <input type="checkbox"/> Read lesson plan. <input type="checkbox"/> Refer to the following video to learn more about the parts of KIBO. <input type="checkbox"/> Memorize the lyrics of the Robot Parts Song. Open the link and be ready to play it at the beginning of class. <input type="checkbox"/> Memorize the lyrics of the Clean-Up Song. Open the link and be ready to play it at the end of class. <input type="checkbox"/> Prepare to display the KIBO Kind and Safe Anchor Chart.
Warm Up <ul style="list-style-type: none"> ● Robot Parts Song (<i>Suggested Time: 5 minutes</i>) <ul style="list-style-type: none"> ○ Introduce the Robot Parts Song (sung to the tune of "Dry Bones") and have the class sing along: 	

The wheels are connected to the motors.
The motors are connected to the body.
The engineers give it a program.
So move, robot, move!

- Explain to children that they will be learning about KIBO and its different parts soon!

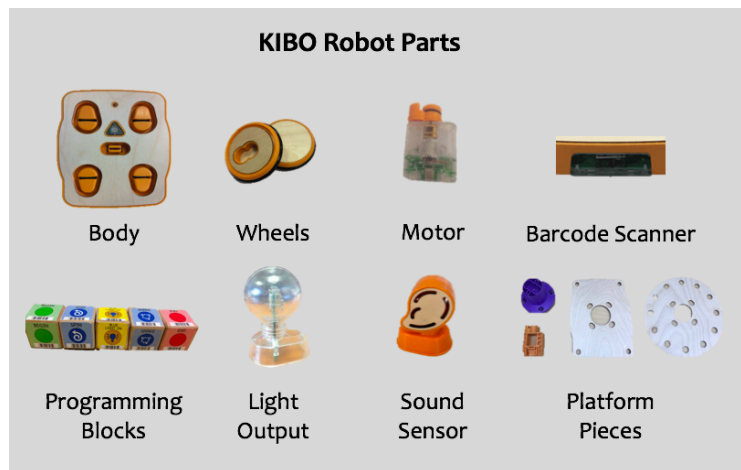
Opening Tech Circle

- **Our Bodies and KIBO's Body** (*Suggested Time: 5 minutes*)
 - Explain to children that today they will be learning how to put together the different parts of the KIBO robot.
 - Show children a KIBO robot body.
 - Ask children what they think will be similar about their bodies and KIBO's body.
 - E.g. both can move and do things, wheels are similar to legs, both can see and hear
 - Ask children what will be different about their body and KIBO's body.
 - E.g. KIBO has many pieces, KIBO has wires and batteries, KIBO has wheels instead of legs, KIBO has to be turned on, KIBO can have a lightbulb

KIBO Time

Structure Challenge

- **Meet KIBO** (*Suggested Time: 15 minutes*)
 - Show children a KIBO robot body.
 - Ask children:
 - *What parts do you see through the clear back of KIBO? What are the main board and wires inside of KIBO for? What do the batteries do?*
 - *What are some human body parts that are similar to KIBO's? For instance, what part of our body tells the rest of it what to do?*
 - Our brain
 - *And what part of KIBO tells the rest of it what to do?*
 - The **main board**
 - *What parts of our body move to make us go forward and what part of KIBO moves to make it go forward?*
 - Our legs make us go forward, and the motor and wheels help KIBO go forward.
 - Using the KIBO parts guide below, introduce the KIBO robot's key parts and their functions.



- Tell children that KIBO is a robot that was created by engineers. A **robot** is a machine that is given instructions by humans to do different physical tasks (e.g., move around, throw a ball, etc.).
- Explain to children that the *Robot Parts Song* helps us understand how to put the KIBO robot together. Demonstrate how to attach the wheels, motors, and art platforms.
 - Point out that when attaching the motors to the KIBO body, both “green dots” are visible from the outside. Otherwise, the motor will spin in the wrong direction.
 - When introducing the motor, tell children that they should not spin the motors with their fingers because that can break the motors.
 - To control KIBO’s motors, we need to give KIBO a program.
- These physical parts of KIBO are part of KIBO’s **hardware** (the physical parts of a robot, like the KIBO body).

Expressive Exploration

- **Exploring KIBO** (*Suggested Time: 10 minutes*)
 - Pass out KIBO bodies, wheels, and motors (or have children take them out of their kits).
 - Have children practice assembling and disassembling the KIBO wheels and motors (the motors should show a green dot when they are attached to the KIBO bodies). If children are working in groups, each group member should take a turn.
 - Take this time to introduce classroom procedures related to KIBO usage. Use a classroom organizational system that works best for you and your classroom. Your system should cover procedures such as:
 - Taking KIBO kits out from storage/central area

- Putting KIBO parts and blocks back into each bin
- Checking for any missing parts
- Calling for children's attention during a KIBO activity
- Listening to others during whole class discussions and technology circles
- Putting KIBOs back into storage/central area

Word Time

- **Kind and Safe with KIBO** (*Suggested time: 5 minutes*)
 - Explain to children that to play with KIBO, there are some class norms to follow about being kind and safe to each other and to KIBO. Take time to review your standard classroom procedures here.
 - Show children the [KIBO Kind and Safe Anchor Chart](#). Guide children through each letter and explain what it stands for:
 - *The first letter of KIBO is K. K is for "Kind words to." We say this when we want to tell someone we like what they are doing. For example, you can say "I'm sending kind words to my children for listening carefully to instructions!"* Ask children to practice sending kind words to a classmate.
 - *The second letter of KIBO is I. I is for "I respect you. You respect me."* When we are working with KIBO, we have to show respect to each other. This can look like taking turns or listening to what someone is saying. Ask children what else respect means and looks like.
 - *The third letter of KIBO is B. B is for "Bodies are safe." When we work with KIBO, we have to keep our bodies safe. That means our physical bodies, but also the KIBO bodies.* Ask children to demonstrate what safe bodies look like and how they should hold objects like KIBO carefully with both hands. Another part of being safe with KIBO's body is not spinning KIBO's motors with our fingers because that can break the motors.
 - *The fourth letter of KIBO is O. O is for "Oops, let's try again!"* Sometimes, we might make a mistake when we're working with KIBO, but that's okay. When that happens, we just say oops and try again. Ask children to think of a time when they made a mistake or did not know how to do something correctly the first time but were able to after spending more time and effort.

Closing Tech Circle

- **Cleaning Up KIBO** (*Suggested Time: 5 minutes*)
 - Clean up KIBO parts.
 - To make cleaning up more fun, here's a [KIBO Clean-Up Song](#) you can introduce to children!

KIBO Clean-Up Song

(To the tune of “Itsy Bitsy Spider”)

We're turning off our KIBOs and putting them away

We had so much fun but we're finished for the day

We're using both our hands and we walk instead of run

We put away our KIBOs and now the song is done!