If You're Happy and You Know It - 1 hour
Expressing Happiness with KIBO (SEL connection)

Overview: "If you're happy and you know it flash your light!" In this robotics lesson that also engages with music and social-emotional learning, students collaboratively create a program for KIBO including output that expresses a feeling of happiness. Students learn that robots have output parts that allow them to send information out into the world.

Learning Goals: After this lesson, students will:

- Understand that output parts allow robots to express information with light, sound, and more.
- Create a robotic program that expresses a feeling using output.
- Understand the function of KIBO's Light Bulb output module.

Materials/Resources:

- One KIBO 15 kit or higher per group of 2 – 4 students.
- Optionally, craft / recycled materials to decorate KIBO.

New to KIBO? Watch the Videos!
If this is your first time using KIBO, we encourage you to check out our short tutorial videos at kinderlabrobotics.com/getting-started.

Lesson Plan

Inspire: Output Parts: Introduce the term **output**. Output means the different things a computer or robot can display or show. For a person, speaking might be considered output; while listening is **input**. For KIBO, the different movements are a kind of output. So are the sounds KIBO makes when it BEEPs or SINGs. And with the light bulb part, light is another kind of output for KIBO. If a robot's sensors are like our senses, then

output is like our ability to speak, smile, and sing. Can students think of other ways that humans or robots might share with output? Make a list of their ideas.

Introduce KIBO with its wheels, motors, and light bulb. While children make their guesses about what this part might do, create a demo program like this:
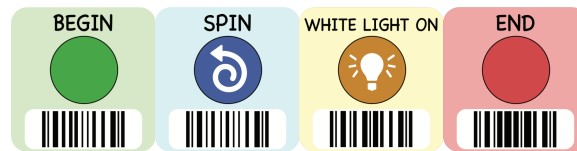
Scan and test the new program, explaining to the students that KIBO "reads" the program by seeing the bar code symbols then acting out the program.

Connect: Dance to "If You're Happy and You Know It". Have the class dance along to "If You're Happy and You Know It." Include a light bulb verse for KIBO!

If you're happy and you know it, light your bulb!
If you're happy and you know it, light your bulb!
If you're happy and you know it and you really want to show it...
If you're happy and you know it, light your bulb!

After the dance, discuss with students the different ways they showed their happiness through movement of their bodies. This expressive movement is also a kind of output.

Small-Group Work: The students will use KIBO's sound and movement abilities, and the light bulb part, to teach KIBO to dance to "If You're Happy and You Know It." Each group's robot should include at least the light bulb, along with two motors and wheels.

Children program their robots to move however they'd like during the lyrics "If You're Happy and You Know it." Students then select one or more LIGHT ON blocks – plus other favorite instructions – to express their happiness.

You can also choose to allow children to decorate their robots with arts and crafts materials to express their happiness visually.

Reflect: What Makes You Happy? Close with a demonstration and discussion circle. Students share their LIGHT ON programs. How do the blocks they chose express happiness? Then ask students to share something that makes them feel happy. How do they show it?

Standards Addressed

CSTA K-12 Computer Science Standards: 1A-AP-10, 1A-CS-02, 1B-AP-10, 1B-CS-01