

KIBO the Singer – 1 hour

Arts and music connection; self-expression; sequencing

Overview: In this lesson, students will dress KIBO up in a performer's outfit and teach KIBO to sing a favorite song! With KIBO's Sound Record/Playback Module, children will use their sequencing skills to program KIBO to play back their song in the correct order. This lesson is meant for children with prior KIBO experience.

Learning Goals: Students will:

- Engage with **sequencing** to create an **algorithm** to carry out steps in the correct order.
- Create a program to **express an idea**.
- Understand that **output** parts allow robots to express with light, sound, and movement.

Materials/Resources:

- One KIBO 21 kit or higher per 2-4 students (or, alternatively any KIBO kit along with one Sound Record/Playback Module add-on per kit).
- A variety of craft and recycled materials for building and decorating.
- Recordings of favorite children's songs
- **Optional:** musical instruments



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: "Today we will all become programmers and musicians. We will be programming our KIBO robots to sing our favorite songs! Just like the order of sounds and lyrics matter in the songs we sing, the order (or sequence), of the blocks in our programs will also matter."

Introduce and demonstrate the **Sound Record/Playback Module**. To use the module, attach it to KIBO's body and make sure KIBO's power



is on (press the triangle-shaped button on KIBO's body). Then record sounds by holding down one of the three small round buttons on the Sound Record / Playback Module (the blue LED will glow while KIBO is recording). Play back the sounds by including the matching PLAY block (SQUARE, CIRCLE, or TRIANGLE) in your program.

Allow the children, as a group, to record a sound onto each of the three buttons. Then test and share this program to play all three sounds in sequence.



Connect: Musical Exploration. Spend time listening and singing along to a variety of children's songs. In addition to singing, include musical instruments (shakers, tambourines, etc.) if desired. This could be a wonderful way to collaborate with a music or singing teacher at your school! By the end of this session, each group should have chosen one song to focus on for their KIBO project.



Small-Group Work: Teaching KIBO to sing! "Now that you have selected a song, you will program KIBO to perform part of the song using the Sound Record/Playback Module and blocks." Remind students how the recording process works using a simple song like "Twinkle, Twinkle Little Star" that children in the class are familiar with. Demonstrate recording one line of the song on each of the three buttons. (Each button can hold about 10 seconds of sound.)

Once the sounds have been recorded, it's time to program. Remember that sequence and order matters! If the first line of the song was recorded with the triangle button, then the PLAY TRIANGLE block will need to come before the PLAY SQUARE block, and so on.

Now, kids are ready to record their songs on their own! Encourage them to explore the length of time they can record sounds and how to incorporate other programming blocks into their musical performance while keeping the flow of their songs.

Students also decorate their KIBO singer using arts and crafts materials. If you have KIBO art platforms, allow students to use the stationary or rotating platforms in their constructions.

Finally, include time to test and revise the programs and creations. Whenever appropriate, call a brief "technology circle" to allow students to share difficulties and ideas.



Reflect: Sharing our songs. It is now time for a musical recital with KIBO! Groups should come up one at a time and share the title of the song, the program they used, and then allow their robots to sing. Children can choose to sing and dance along with their KIBOs!

Standards Addressed

Music: Singing, Performance skills, active listening

CSTA K-12 Computer Science Standards: 1A-AP-08, 1A-AP-10, 1B-AP-11