Musical Bots: Sphero Indi Edition

Lesson Plan | *Grades 1–3*

MIM
MUSICAL INSTRUMENT MUSEUM

Click here or scan the QR code to view the Arizona Academic Standards aligned with this lesson.

Key Vocabulary

- **Algorithm:** a step-by-step method for solving a problem or completing a task
- **Code:** individual instructions written in a specific programming language that a computer, machine, or robot can understand
- **Coding:** the task of writing instructions for a computer, machine, or robot
- **Loop:** a section of code that repeats
- **Note:** a distinct musical pitch
- **Robot:** a machine that does tasks without the help of a person, but only after a person has built and coded it to complete those tasks

Materials

- Paper
- A writing utensil
- A class set of Sphero Indi robots
- Tablets with internet access and the Sphero Edu Jr. app
- Color coding tiles (**Note:** Extra tiles are available on the Sphero website.)

Objectives

Students will be able to program a Sphero Indi robot to play a short song or a section of a song and test their program using colored tiles and the Sphero Edu Jr. app as their programming language.

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DAY 1

ENGAGE [5–10 minutes]

Play the video of **MIM's orchestrion** and **the clip of a jazz orchestra performance**. Discuss who or what in each video is instructing the instruments to play.

EXPLORE [20 minutes]

Teach your students how to play the Programmer/Robot game using the make-believe programming language MEOWF. Meow: move forward 1 step; Woof: turn left; Quack: turn right; Chirp: turn around.

EXPLAIN [5 minutes]

Model for your students the basic structure and operations of the Sphero Indi robot.

ELABORATE [20 minutes]

Assign students into groups of two or three. Have each group code their Sphero Indi robot to sing a four-note scale in ascending order. Then have the group arrange the same-colored tiles in a square to allow the robot to loop the notes in the scale.

EVALUATE [10 minutes]

Collect the student worksheets and give a participation grade for understanding and completing the first activity.

DAY 2

ENGAGE [5–10 minutes]

Play the **video** of a robot conducting the South Korea's national orchestra.

Discuss: Do you think it would be easier or harder to follow directions from a robot than from a human? Why?

EXPLORE [20 minutes]

Have your students play another round of the Programmer/Robot game.

EXPLAIN [5 minutes]

Review with your students what they did and learned in the previous lesson. Then test with your students the steps in coding the Sphero Indi robot to "sing" the first line of "Old MacDonald Had a Farm."

ELABORATE [20 minutes]

Have students form in their chosen groups (or in new groups), compose an original song with the tiles, and work together to code their Sphero Indi robot to perform it.

EVALUATE [10 minutes]

Have each group's robot perform its song.

Find the digital version of this lesson plan at **MIM.org**.