

LESSON: CodeBot Check-In Project		Time: 45 minutes
Overview:  This is an easy coding lesson that can be done near the beginning of the school year to introduce coding and the CodeBot. The check-in program can be used for students' overall mental health or for how they are doing with the daily lesson.  This lesson will enable students to indicate their mental health, or their productive struggle, by turning on CodeBot's LEDs. It can be a quick way to "check-in" with your students to see how they are doing, and a safe way for students to share their mental health. A check-in can be done at the beginning of class, at the end of class, or anytime during class.		Coding Objectives:  I can import a library. I can code a button press. I can increment a variable and stay within a range. I can turn on and off LEDs using binary and decimal values. I can use an infinite loop. I can break out of a loop.
2-CS-03 Systematically identify and fix problems with computing devices and their components.  2-AP-12 Design and iteratively develop programs that combine control structures, including nested loops and compound conditionals.  2-AP-19 Document programs in order to make them easier to follow, test and debug.	Grades 9-10 CS Standards:  3A-CS-03 Develop guidelines that convey systematic troubleshooting strategies that others can use to identify and fix errors.  3A-AP-13 Create prototypes that use algorithms to solve computational problems by leveraging prior student knowledge and personal interests.  3A-AP-16 Design and iteratively develop computational artifacts for practical intent, personal expression, or to address a societal issue by using events to initiate instructions.  3A-AP-21 Evaluate and refine computational artifacts to make them more usable and accessible.	Grades 11-12 CS Standards:  3B-AP-16 Demonstrate code reuse by creating programming solutions using libraries and APIs.  3B-AP-17 Plan and develop programs for broad audiences using a software life cycle process.
Preparation:      Download slides     Be familiar with the final code     Read through the teaching guide	In the folder:      CodeBot Check-in project slides     CodeBot Check-in final code	Agenda:      Warm-up (5-10 minutes)     Complete program using slides (30 minutes)     Optional: Wrap-up (5 minutes)

# **Teacher Notes:**

- This lesson is designed as a class project, with students creating their own programs. As a class, you should make decisions on the moods to check for and the number of LEDs for each mood. A recommendation for mood/struggle is provided on the slides and program code.
- Almost all mistakes made by students are typing mistakes. If students get errors when they run their code, first look over the code for spelling, punctuation and indenting.



#### **Extensions:**

- The "while True:" loop can be nested inside another while True loop so students can pick a different mood without having to restart the code.
- The project uses an if statement for 5 emotions or moods. Use more LED combinations to express a level of proficiency (like 0 to 8). Or use all the LEDs for up to 15 levels.

# **Cross-curricular Connections:**

- **LANGUAGE ARTS:** Have students write about their coding experience.
- LANGUAGE ARTS: Have students write about mental health or social-emotional learning.
   Students could also write about their learning styles and how they learn best.
- SEL / MATH: Students can keep track of their daily emotions or how well they are doing with each lesson. They can graph the results, or look for cause and effect.

# **Teaching Guide**

# Warm-up (5-10 minutes)

This warm-up is to discuss mental health with students and let them decide on which emotions they want to share with the teacher, and assign an LED designation for each one. (You can use slide 5 as part of the warm-up.)

# Teaching tip - warm-up

- Talk about feelings and/or mental health, as appropriate for your grade level and students.
- Make a list of emotions on the board.
- Have students pick five emotions they might have at school and want the teacher to know about.
- Tell the students that you will use the CodeX to communicate their mood. Assign each of the emotions a combination of user and line sensor LEDs.
- These instructions are on slide 5.

# Create/Run the Program (30 minutes)

For this project, it is best if each student has his/her own CodeBot. They will create their own program and can use it any time throughout the class period to communicate how they are doing.

# Preaching tip:

This project is not included in CodeSpace. Download and follow the slides. They include step-by-step instructions as well as code snippets to guide students through the program code creation.

You can have students complete the project one of two ways:

- Show the slides on a large screen or monitor and have the class work on each step together. This is a fairly short program, so keeping the class together and letting them help each other is preferred.
- Give the slides to the students and let them work through the instructions at their own pace.

Students should already have an account in CodeSpace.

# Slides 1-2

Students get into CodeSpace to create their program. They can click on the sandbox icon to complete the program. There are no instructions in CodeSpace.

# Slides 3-4

Students become familiar with the buttons and LEDs on the CodeBot.

### Slide 5

The emotions and LED combinations are chosen. If you did the warm-up, you can just review.



#### Slides 6-7

Students log in to CodeSpace and go to the Sandbox. They begin their program by starting a new file and importing the botcore and time library.

# Slide 8: Step 1

Students use a variable to keep track of button presses. The initial value is 0. The variable is defined under the import statements.

# Slide 9: Step 2

Students use an infinite while loop so they can cycle through the combinations.

# Slides 10-13: Step 3

Students program the button press for BTN\_0.

- The code involves a lot of indenting. Have the students be very careful with this. If they use a colon at the end of the while loop and if statement, pressing enter will go to the next line and indenting will be correct.
- There are three slides for this step, so each part of the code is explained.
- This is the time to debug any typing errors. Nothing will happen on the CodeBot yet.

# Slides 14-17: Step 4

First students will map each mood to a value. Then students add code for the first choice (if count == 0).

- Be careful with indenting!
- Run the code to verify the LEDs turn on and the code is error-free.

# Slides 18-19: Step 5

Students add code for the second choice (elif count == 1).

- Be careful with indenting!
- Run the code to verify the LEDs turn on for choice 0 and choice 1.

### Slides 20-21: Step 6

Students notice the LEDs don't turn off when others turn on. Fix this bug.

• Run the code to verify the LEDs turn on and off and the code is error-free.

#### Slides 22-23: Step 7

Students add code for the other three choices.

Run the code to verify the LEDs turn on and off and the code is error-free.

#### Slides 24-25: Step 8

Students add code to break the loop and exit the program.

• Run the code to verify the program works correctly.

## Slides 26-27: Finished!

Example of final code is given. Students can test their code. Whenever you want to check in on your students (at the beginning, during or at the end of a lesson) ask students to run the program and press the button for their mood. They should put the CodeX in clear view of the teacher so you can do a quick scan of the room and see the mood for each student.

# Wrap-up / Optional (5 minutes)

- You can wrap-up this project in a variety of ways, depending on your students and your classroom procedures.
  - Students should practice running the program and selecting the LED combination that matches their mood.
  - Students can fill out a journal entry about their experience or what they learned during the lesson.
  - Students can share with each other or in small groups something they learned, or how they might apply what they learned to a different project.
  - You can discuss when they should use the program, and discuss being sensitive to other students' feelings.