

Unit 2: Putting it all Together

Mission 9: Game Spinner

Intro and Discussion Points:

In this project, you'll make a Game Spinner that can:

- Choose the next person to tell a story in a group of friends
- Navigate every turn in a Crazy Compass game
- Decide which pizza slice to eat next
- Provide an element for a game you create!

Your game spinner will show a spinning arrow on the LCD display when you press Button A or B, and then slow down and stop in one of 8 random directions.



CodeX Lesson Plans

UNIT 2 : Putting it all Together

MISSION 9: Game Spinner

DAYS: 3

UNIT GOALS: Students will synthesize skills to create more complex programs.

ADDITIONAL MATERIALS:

- none

VOCABULARY:

- Index
- Loop
- Logic operators

FOCUS CSTA STANDARDS: 1B-AP-10, 2-AP-11, 2-AP-14, 2-AP-16, 2-AP-19, 3A-AP-14, 3A-AP-17, 3A-AP-18

LEARNING TARGETS:

- I can apply properties and uses of an index to a new program.
- I can define and call a function.
- I can utilize multiple variables to a new program and describe their purposes.
- I can utilize loops to make my code more efficient.
- I can create simulations using computer hardware and software.

SUCCESS CRITERIA:

- Display an Arrow in a random direction
- Detect an input- button A or B - to trigger the Arrow spin
- Animate an Arrow spinning around
- Make the Arrow gradually slow rather than stopping abruptly

KEY CONCEPTS:

- Logical operators like 'and', 'or', and 'not' allow your code to test for multiple conditions.
- Define functions to break complex code into smaller, easy to use (and re-use) pieces.
 - Divide and Conquer
- Detect instantaneous button presses by 'polling' for `button.is_pressed()` inside an infinite loop. This is a common pattern!
- Animation! Make your own animated sequences with loops and index variables.
- Loop for a determined number of iterations: `while index < N`
- First steps to simulation code. Add simple physics effect of gradual friction slowdown.
- Overflow your first array! Survive going past the end of a list, and learn what to do about it.

DISCUSS REAL WORLD APPLICATIONS:

After completion of this project, it's a great time to have a group of students gather in a circle to play with what they've wrought. Disconnect the CodeX and run it on batteries. Put it on the floor or a table in the middle of the group, so the random-arrow selects a student each time the button is pressed. Maybe the chosen one gets to name something different they could build using the CodeX and the code they've learned!

Fast button inputs, animation, and simulation! Those are essential ingredients for lots of interesting applications:

- Video games
- Flight Simulators
- Virtual Reality

ASSESSMENT STRATEGIES:

7.5 Checkpoint - Spend time reviewing "conditions."

Remix suggestions (set aside 0.5-1 period to complete):

- Change the direction the Arrow spins: go counter-clockwise! Will you do this by counting the index backwards, 7 to 0? or will you make a new list of Arrows instead of using the built-in `ALL_ARROWS`?
- Make the spin direction depend on which button is pressed.
- Add sound - maybe a click or beep each time the Arrow moves.
 - Check out the `music.pitch()` function (toolbox).

TEACHER NOTES: Always refer to [Appendix A](#) if you get stuck. It has the "Answer Keys" for you.