Unit 3: Using Inputs and Outputs

Mission 10: Reaction Tester

Intro and Discussion Points:
In this project, students will create a game that measures the time between the display lighting up and a button being pressed.

After the measurement is complete, this time will be scrolled across the display until a button is pressed to restart the game.

Who has the fastest reaction time? ***With a little coding, you're about to find out!***

*Note - this would be a great time to collaborate with science teachers!

CodeX Lesson Plans

UNIT 3: Using Inputs and Outputs	**MISSION 10: Reaction Tester**	**# DAYS:** 3
UNIT GOALS: Students will use the CodeX sensors to create programs with real-world applications.	**ADDITIONAL MATERIALS:** ● none	**VOCABULARY:** ● Loop ● Parameter

FOCUS CSTA STANDARDS: 1B-AP-10, 3A-AP-17, 3A-IC-26

LEARNING TARGETS:

- I can write a function to make code more efficient and readable.
- I can utilize multiple variables to a new program and describe their purposes.
- I can utilize loops to make my code more efficient.

SUCCESS CRITERIA:

- ❑ Give the player a 3-2-1 countdown.
- ❑ Program a random delay so the player can't "guess" the timing.
- ❑ Show a Target Image on the LCD display.
- ❑ Measure the time until a button press occurs.
- ❑ Scroll the reaction time across the display.
- ❑ Wait for a button press, then restart the game.

KEY CONCEPTS:

- Computers are driven by internal clocks. Use the `running_time()` function to determine how long the CodeX's clock has been running.
- Functions can have named parameters, like `loop=True` and `wait=False`.
- The DRY concept. Never write the same code twice!

DISCUSS REAL WORLD APPLICATIONS:

Computers measure time in all types of applications.

- Football play clocks, and stop watches for other sports.
- Electronic Drum Machines
- Microwave Oven timers
- Alarm clocks

ASSESSMENT STRATEGIES:

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

- Level-Up with TWO different Images - "A" and "B".
  - Require player to hit the matching button for score!
  - Psychologists call this "discriminated reaction time". How is it different?
- Try using a Sound rather than an Image. Really getting your neuroscientist research on!
  - Is Ear-Hand reaction faster or slower than Eye-hand reaction time??

TEACHER NOTES:

Always refer to **Answer Keys by Mission** if you get stuck. All coding solutions are available, in alphabetical order.