

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