CODING CONUNDRUM
Grade Levels: 3rd-8th

Objective:
Students will be introduced to coding functions as they try to "crack the code" to pre-determined puzzles using Google Forms.

Background information:

At the most basic level, coding involves giving instructions to a computer to make something happen. Coding is what makes it possible for us to create computer software, applications (apps) and websites.

An example of computer code in Action is a microwave oven. Most of your interactions with code can be thought of as inputs and outputs:

Input: When you use a microwave, you trigger a series of actions. You might punch in a cooking duration, then press start. Immediately, the code running the microwave uses your inputs (button presses) to complete the task of cooking.

Output: A motor begins to turn the plate inside the microwave. The microwaves are turned on (only if the door is closed!). The timer ticks down and displays that time on the little digital screen. When the time is up, the motor rotating the plate inside the microwave stops. The microwaves turn off. The alarm dings to let you know the process is complete.

Materials:
Download each PDF file by clicking on the title below:

- [Playing Board (7x7 table)](#)
- [Obstacle Puzzle Pieces](#)
- [Puzzle Blueprints (7 puzzles)](#)
- [Master Puzzle Answer Key](#)
- [Worksheet (optional)](#)
- Pencil

For more activities, please visit us at www.alcosan.org/educational-activities

Getting Started:
If printing is available, print out the following:

1. Playing Board/Obstacle Puzzle Pieces

2. Puzzle Blueprints (7 total)

3. Coding Conundrum Worksheet

4. Puzzle Answer Key

If printing is unavailable:
For your playing board, you can use index cards, post-its, cut-out pieces from paper/ cardboard, etc. The only requirement is that it is a 7x7 playing board.
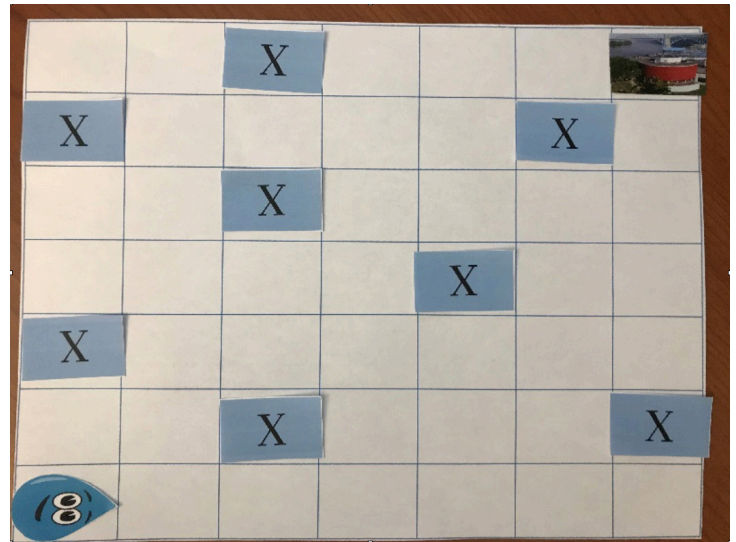
You will need to create your own puzzle pieces: eight Xs, one piece as your start and one piece as your finish. You also can use coins, pop tabs, bottle caps, etc.
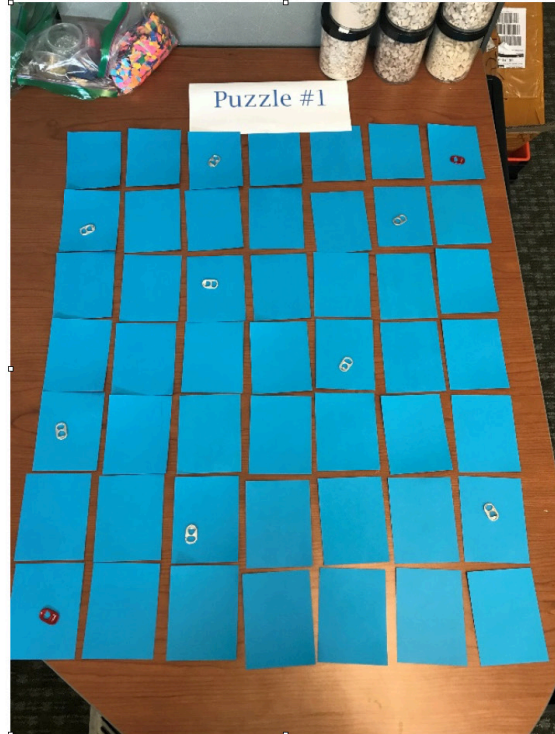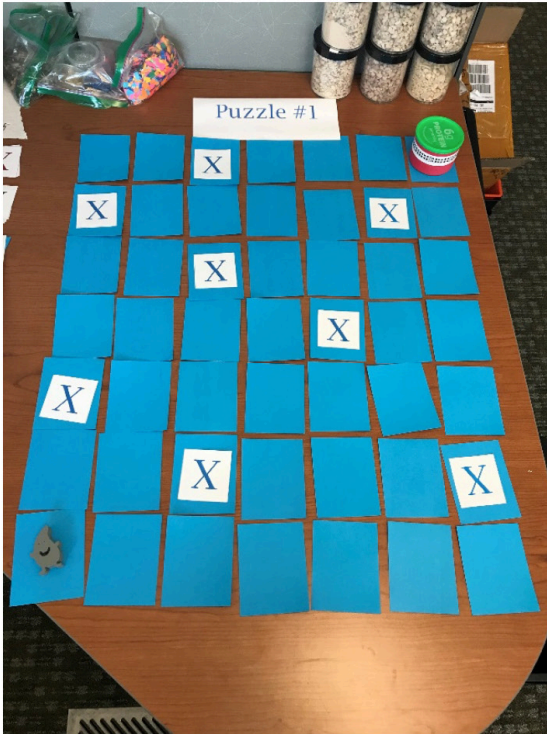
If you have multiple students participating, each should have a role during each puzzle and the roles should rotate:

1. Setting up the playing board

2. Ipad/computer controller

3. Moving start pieces

All members should collaborate when deciding the codes for every puzzle.

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Directions:

1. Lay out your playing board.

2. Students will start with Puzzle 1. Whoever is in charge of setting up the playing board should use the Puzzle 1 Blueprint to set the board.
   a. The water drop will be in its starting position, and your goal is to get it into the wet well by avoiding all of the obstacles.
   b. You may move the water drop as you go, but that is the only thing that you should be moving. Do not move the Xs or the wet well after the initial setup.

3. To crack the code you, will need to enter each move correctly into a Google Form.

   - The answer for each move will have three things: **Move** will always be the first word, the second word will be **Up, Down, Left or Right**, and the third will be the **number** of spaces you want the water drop to move.

     - There is a space in between each word/number and the first letter of each word needs to be capitalized.

     - *Example: If you think the water drop should move up two spaces you will enter:* **Move Up 2**

   - Click **submit**. If you have the correct code, you will be prompted to move on to the next move. If you do not have the correct code, you will get an error message that states, "Try again!" and you will try a different code.

   - When you have cracked the code (when the water drop makes its way to the wet well), you will receive a message telling you that you have successfully cracked the code to that puzzle.

You will be challenged with seven different puzzles. You will need to reorganize the playing board between puzzles in accordance to each puzzle's blueprint.

Each puzzle has a different Google Form, so make sure that the puzzle number of the Google Form matches the puzzle you are trying to solve.

The worksheet can be used to record what moves you have made, but it is not required.

Links for Google Forms:

Puzzle #1: https://docs.google.com/forms/d/e/1FAIpQLSdZ2IGLXFibK7J6ypmkpunOxBmhYFy-ee0UK-1GU6bkJIXzDsg/viewform?vc=0&c=0&w=1

Puzzle #2: https://docs.google.com/forms/d/e/1FAIpQLSfbTmuAru3-X_11yEwVZCzoSBV3klSb9Q-3xt-Jhb6tXgNqFRA/viewform?vc=0&c=0&w=1

Puzzle #3: https://docs.google.com/forms/d/e/1FAIpQLSekWZZ7Ap9z7HrIDmzYcuAzsqq49-qUHwB-Pqri-4Eom7HEEwQ/viewform?vc=0&c=0&w=1

Puzzle #4: https://docs.google.com/forms/d/e/1FAIpQLSe-MV1P7EAHh5ex2BDj3nvjt3pJvbEeAWhwd-QMz2NAEPQSiJg/viewform?vc=0&c=0&w=1

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Puzzle #5: https://docs.google.com/forms/d/e/1FAIpQLSdJJ_jko-D1O8EFCYtTsedkNPfR-t1MWnkhHcT-MRVigbryUbA/viewform?vc=0&c=0&w=1

Puzzle #6: https://docs.google.com/forms/d/e/1FAIpQLSdfUJJ9IeZP-dp4ew1MX02DaxyC1RZIZ7Xk9Bz-zlM0Fe___5xw/viewform?vc=0&c=0&w=1

Puzzle #7: https://docs.google.com/forms/d/e/1FAIpQLSfHcWDSuOaTEoCKqIGKroe63z-lw8AeI71PBZp-MAeA_Yu--cQ/viewform?vc=0&c=0&w=1

*Extension:

If you have finished all seven puzzles and would like to continue playing:

Now that you have experience, and success, in cracking the codes of seven puzzles, you can try to create your own!

One person in the group will use the back of the worksheet to create the puzzle blueprint and movements of the water drop from start to finish. That same person will then set up the playing board according to their puzzle blueprint.

Once the playing board is set, the other two group members will try to crack the code.

Since Google Forms will not be used in this extension, you will say the commands to the puzzle blueprint creator and he or she will respond with correct, or incorrect, until the code is cracked.

Each group member can have a turn creating the puzzle blueprint if they would like!