Lesson: Crab Cruisin' with Micro:bit

Verizon Innovative Learning Lab Program

Name: _____ Date: _____ Class Period: _____

Instructions: Let's play a Board Game with several new Micro:bit tools. Along the way, we'll identify the Variables, Conditional Statements and Random Numbers in the Block Code. Then you'll make your own Board Game design!

Part A: Experiment with the Micro:bit by Playing the Crab Cruisin' Board Game

1. **Code:** Download this file and upload it in https://makecode.microbit.org/ by choosing "Import" from the dashboard. You can also drag and drop the file to a Micro:bit plugged into your computer. (If the link doesn't work, try accessing the code here)

2. **Play the Crab Cruisin' Board Game**: A group of crabs is trying to make their way across the ocean on a piece of rope. On that journey they encounter several types of challenges. The board is located on page 2 of this worksheet.

   Here are the **rules for the board game**.

   a. To begin, each player places their token in the Start circle.
      i. Your token represents you in the game. It can be a coin, a pen cap, or a folded sticky note, whatever. You choose.
   b. The players take turns in the order of youngest to oldest.
   c. When a player moves their token to the Finish box, they win!
   d. A player's turn starts with shaking the Micro:bit to "Roll the Dice," then moving their token that number of spaces on the Game Board, and completing the challenge shown on the space they land on.
   e. If a player is successful with the challenge, they take another turn! If not, the next player takes a turn.
   f. CHALLENGES:
      i. **Rock Paper Scissors (RPS)**: The player must beat the Micro:bit in one round of RPS. The player shows their choice before hitting the button. Rock beats scissors, scissors beats paper, paper beats rock. On a tie, try again.
      ii. **Temperature**: The player gets **one try** to get the Micro:bit Thermometer to read the given number on the space your token landed on.
         - To raise the temperature reading, try breathing warm air ("hah") on the Micro:bit or holding it close to a warm computer fan.
         - To lower the temperature reading, try blowing briskly ("hoo!") or holding the Micro:bit close to a cool fan.
      iii. **Compass**: The Player has **one try** to point the head of the Micro:bit in the direction written on the space you landed on. It may help to look out a window and remember that the "sun rises in the east and sets in the west."

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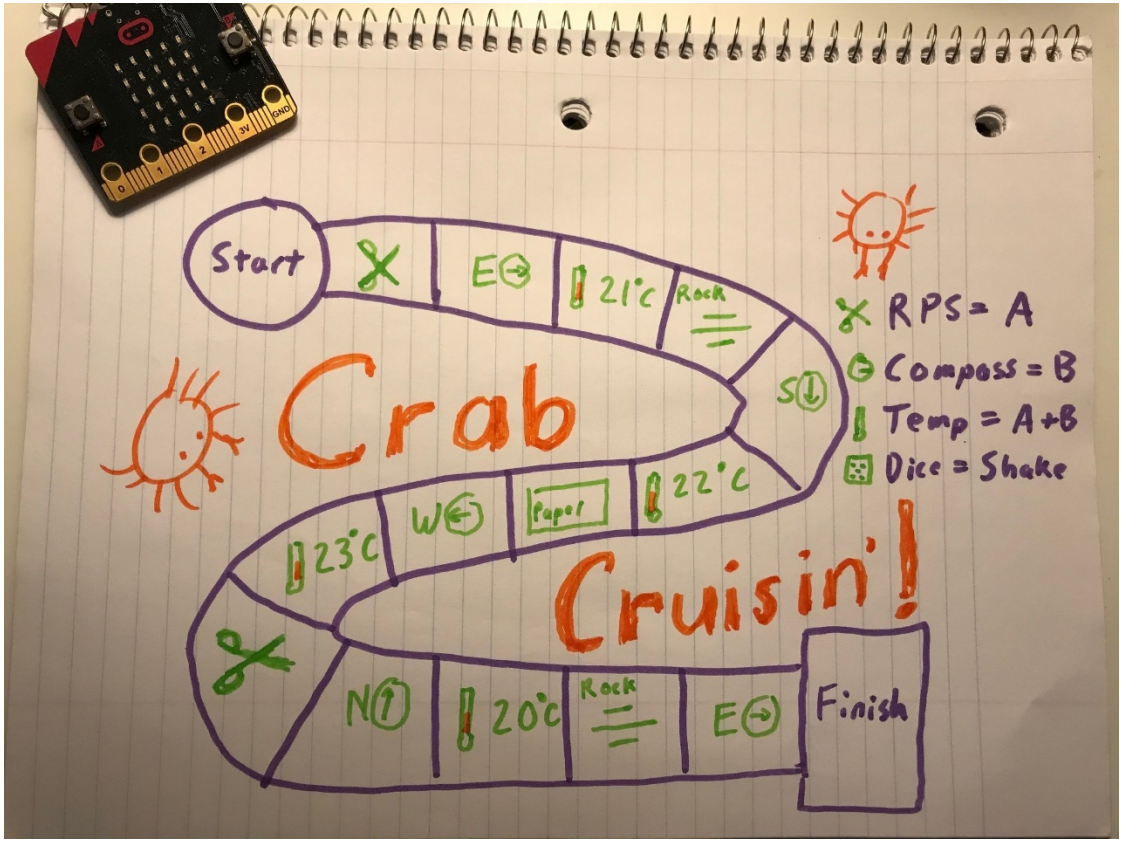

3. **Pseudo-Code**: Write a description for each of these big groups of code. What does each generally do?

Screenshots of Code	Description of What the Code Does

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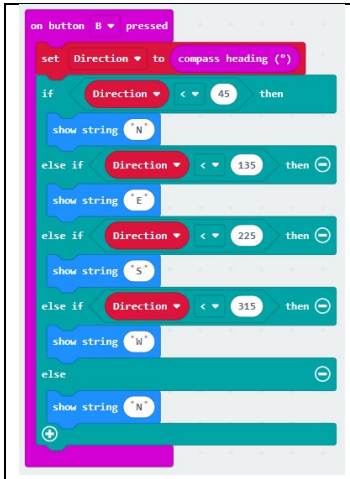
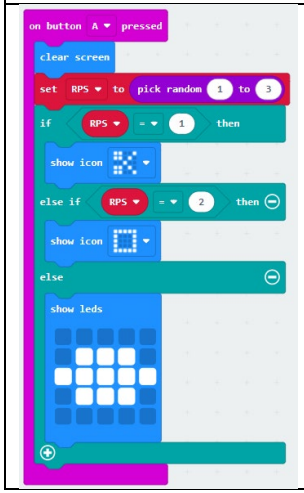
	Example: When B is pressed, the Compass tool tells what direction you're generally pointing.
	

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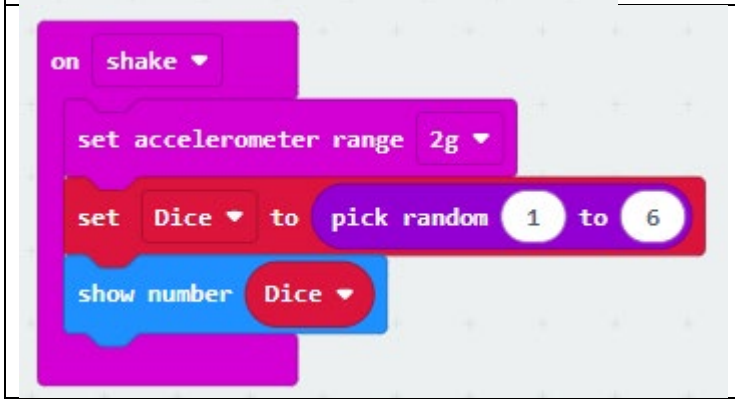

Part B: Make your own Board Game.

Based on what you learned, create your own ocean-themed board game.

- Start with the program you've been given but make at least two changes. The program must include:
  - At least 4 events (such as "On shake" or "on button A pressed")
  - At least two variables (such as "dice" or "temp")
  - At least two conditional statements ("if" statements)

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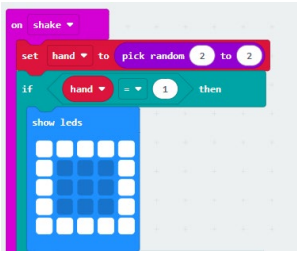
- At least 1 random number

1. **Change the Code.** Choose at least two of the following ways to change the code:
   a. **Complete a new tutorial below and then write it into our game code.**

i. Example, what if a “Love Meter” (see tutorial) used the Temperature to calculate compatibility? Temperature divided by 30 degrees Celsius times 100 = Compatibility. As the temperature rises, the compatibility rises.

ii.

i. Remember how Samson’s Micro:bit always shows rock? How can you prank other players? 😊



2. **Story Board**: Draw a few quick sketches that explain how your game will work. Example: player points Micro:bit to north and presses button to see if she is right.

Example	Sketch 1	Sketch 2	Sketch 3

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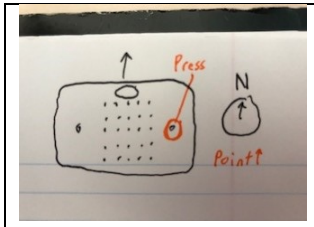 When you land on a compass space, point to North and Press B.			

3. **Draw a Game Board:** Draw the official Board for your game. What does each square tell the player to do?
    a. You can draw on a print of this worksheet or on notebook paper (plan to upload a picture of it from your phone), or you can use Canvas Chrome sketch app or Google Drawings (screen shot and paste onto your worksheet).

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4. **Rules:** Write the rules of your game. Explain the goal of your game and when you should press each button.

   Game Title:

   How to Start:

   What happens when a player lands on any specific challenges?

   - **Challenge 1**: Example: If the space shows the Compass direction N, try to point the Micro:bit toward north and press the button. If the Micro:bit says "N," then you're correct--roll again!
   - **Challenge 2**:
   - **Challenge 3**:

   How do you win the game?

5. **Reflection Question:**
   a. How are Variables & Conditional statements important for coding a game?

   b. Give examples of what Variables and Conditional allow a game to do.

   c. If you could design any game, what would you want it to do?

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6. **Submit:** Put your name at the top of this worksheet, save it with your name in the file name, and submit this to your teacher. Be sure to include:
    a. Pictures of your Storyboard
    b. Pictures of your Game Board