2. RANDOM NUMBER CUBE

Objectives

- Using basic probability concepts, determine the probability of events related to a number cube.

- Understand that the probability of a chance event is a number between 0 and 1 that expresses the likelihood of the event occurring.

- Replicate and use existing code to create a new program.

Materials and Equipment
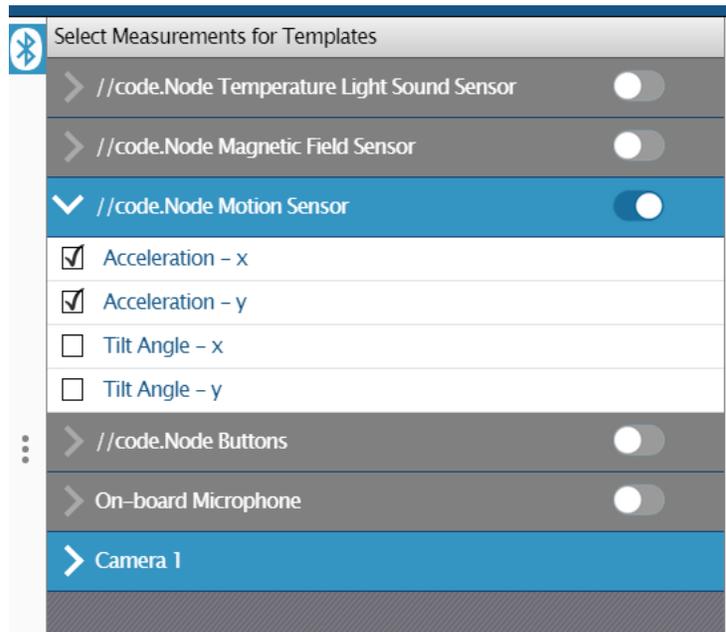
- Data collection system
- //code.Node

Safety

Follow your normal classroom safety procedures.
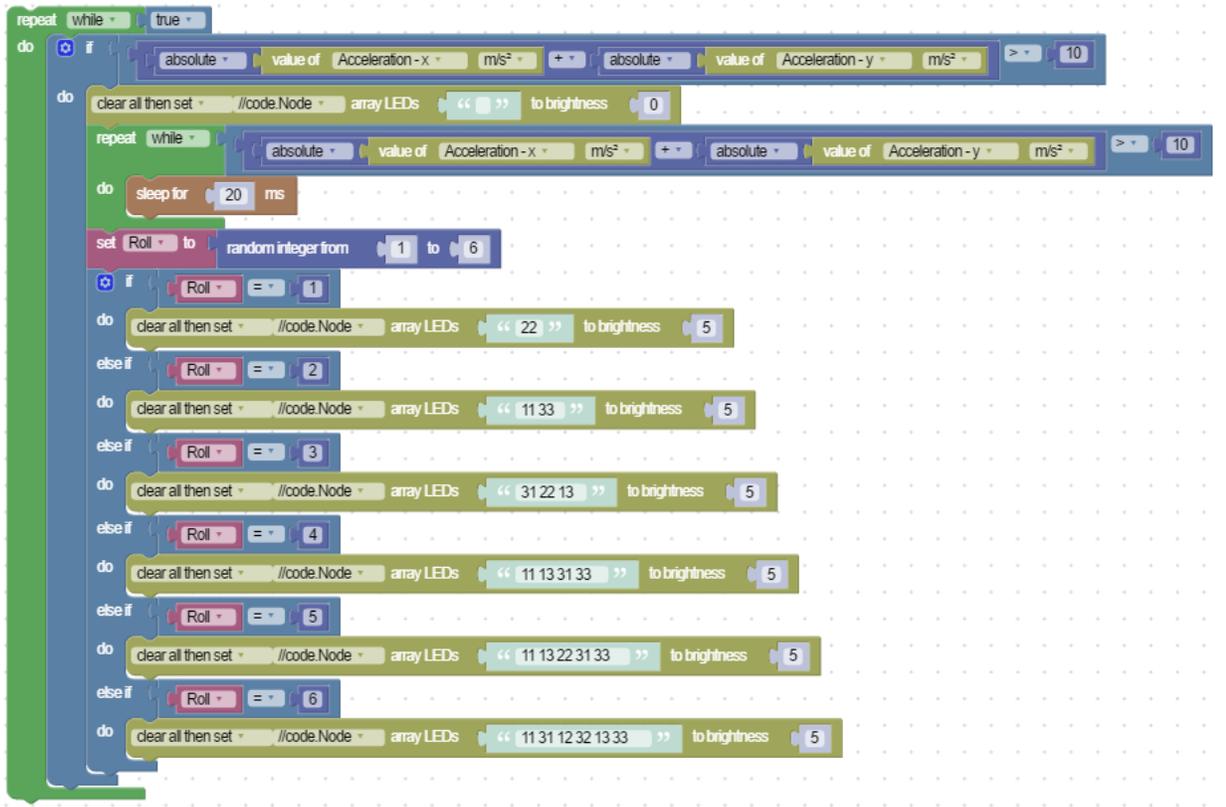
Procedure

Part 1 – Random Number Cube

1. Select Sensor Data in SPARKvue.

2. Connect your //code.Node to your device.

3. Select Motion Sensor and check both acceleration x and y. Turn off all other sensors.

4. Select the Digits display under Templates.

5. Click on the Code icon [icon].

6. Replicate the following code using the blocks found on the left-hand side of the screen.

7. If your code was correct, when you shake the //code.Node than stop and lie flat, the LED array will show you a result of 1 to 6 illuminated like a number cube.

Part 2 – Probability and Likelihood of a Chance Event

Rashad rolls a fair number cube. Each side is numbered 1 to 6. Find the probability that Rashad rolls the following. Represent your answer as a ratio.

For example, what is the probability of rolling a 6? The answer is 1/6 which is equal to 0.167

1. Probability of rolling a 4 _____

2. Probability of rolling a 7 _____

3. Probability of rolling a number other than 5 _____

4. Probability of rolling an even number _____

Probability of a chance event is a number between 0 to 1 that expresses the likelihood of the event occurring. Larger numbers indicate a greater likelihood. A probability near 0 indicates an unlikely event and a probability around 1/2 indicates an event that is neither unlikely nor likely. A probability near 1 indicates a likely event.

A probability, based on its position between 0 to 1 can be placed into the following categories:

- Impossible, unlikely, equally likely, likely, and certain

5. What is the likelihood of rolling a 4? Why?

6. What is the likely hood of rolling a 7? Why?

7. What is the likelihood of rolling a number other than 5? Why?

8. What is the likelihood of rolling an even number? Why?

Part 3 – Absolute Value

Absolute value describes the distance of a number on the number line from 0 without considering which direction from zero the number lies. The absolute value of a number is never negative. The absolute value of 6 is 6. The absolute value of -2 is 2.

1. In your random number cube program, you used absolute value math blocks. Why was it necessary to use these?

2. The absolute value of an unknown number is 9.5. Where could the number be located on a number line? Explain your answer.