3. AUTOMATIC NIGHTLIGHT

A nightlight is a small device that provides enough light for you to see around your room or can illuminate your way to the bathroom in the dark of night. When light is reflected from objects, it enters our eyes and allows those objects to be seen. Without light, there would be no sight.

White light is not a single color, it is made up of a mixture of colors. The color of visible light is referred to as its frequency.

Amplitude of a light’s wave tells us the intensity or brightness of the light relative to other light waves. It is a measure of how much energy the wave carries.

Objectives

- Using your knowledge of light behavior, create a program that functions like a nightlight.
- Investigate how to create different colors (frequency) and brightness (amplitude) of the RGB light.
- 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 – Modeling a Nightlight

1. Select Sensor Data in SPARKvue.
2. Connect your //code.Node to your device.
3. Select only Brightness under Measurements and disable all other controls.
4. Select the Digits display under Templates.

5. Set the //code.Node on the desk facing up. Press the Start tab and record the measurement of the brightness here _______%.

6. Click on the Code icon.

7. Replicate the following code using the blocks found on the left-hand side of the screen. In the example below, 1 is chosen within the value of brightness block. Here you will enter a number below what you measured in step 5.

8. If your code was correct, when you cover the light sensor with your finger, or turn off the lights in your classroom, the RGB light should come on. When you remove your finger from the light sensor it should turn back on.

**Part 2 – Modify Your Program**

1. Now that you have been able to create an automatic nightlight, can you now modify your program so that the RGB light is purple?

2. Continue to investigate by adjusting the brightness (range from 0 - 10) of the RGB LED.
Questions and Analysis

1. Before you created your code, you were asked to record the brightness of the room. Why do you think this was important to do?

2. What part of your program did you modify so the RGB light turned purple?

3. What other observations did you have when you adjusted the brightness of the various RGB LEDs?