## Probability – Worksheet2

### **1st Activity**

To perform the activity’s experiment follow the link <https://www.tinkercad.com/things/20Rl7DEfjux> click “**Tinker This**” and then click “**Start Simulation**” to simulate the circuit.

**A.** As you can see in the right picture, there is an electronic circuit with an arduino platform, two colour LEDs, three resistors and a button. If you start the simulation, then every time you press the button, green or red light LED flashes for a second.

Push the button 20 times. Each time you push the button, note in the table below, **R** if the red LED flashed or **G** if the green LED flashed.

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Trial** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** | **11** | **12** | **13** | **14** | **15** | **16** | **17** | **18** | **19** | **20** |
| **LED Colour** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

**B.** Without pushing the button, write down on the table below your prediction about the LED colour that will flash at the 21st, 22nd, 23rd, 24th and 25th trial.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **trial** | **21st** | **22nd** | **23rd** | **24th** | **25th** |
| **Prediction** |  |  |  |  |  |
| **Result of trial** |  |  |  |  |  |

**C.** Push the A button for the 21st, 22nd, 23rd, 24th and 25th time. Write at the above table the results. Has your prediction been confirmed?

**D.** In which manner the first activity of the previous lesson (deterministic experiment) differs from this one (luck experiment)?

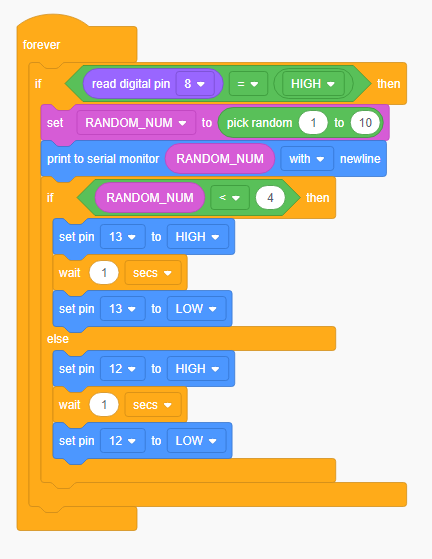
**E.** Give an estimation of the probability that the RED led will come on the next time you press the A button.

**F.** Compare your estimation with the estimations of your classmates. What do you notice?

**G.** How could you find a better estimation of the probability that the RED led will flash the next time you push the A button? Use the data of your classmates.

**H.** If the probability that the RED led will light up the next time is 30%, how close was your estimation?

### **2nd Activity**

To perform the activity’s experiment follow the link <https://www.tinkercad.com/things/20Rl7DEfjux> click “**Tinker This**” and then click “**Code**” to see the block code.

**A.**Which numbers are picked randomly?

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**B.** Which numbers are used to flash RED led? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**C.** Which numbers are used to flash GREEN led? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**D.** Has the RED led the same probability to flash with the GREEN led?\_\_\_\_\_\_\_\_\_

If not, then why? \_\_\_\_\_\_\_\_\_\_\_

**E.** Can you change the block code in order to make the **probability** of each LED **equal**?

**F.** Click on “**Start Simulation**” to check your code! Push the A button 20 times. Each time you push the button, note in the table below, **R** if the red LED flashed or **G** if the green LED flashed.

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Trial** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** | **11** | **12** | **13** | **14** | **15** | **16** | **17** | **18** | **19** | **20** |
| **LED Colour** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

**G.** What’s the probability of each LED now?