Probability with Ozobots

Do Now: Go to https://justflipacoin.com/. You will flip the coin 10 times. BEFORE you flip, write down on a piece of paper your prediction for the amount of heads and tails.

What is probability?

- Probability is the likeliness of something happening.
- When you flip a coin, there is no way to know what side it will land on. We use probability to figure out the likelihood of which side it will land on.
- There are two sides to a coin: **Heads** and **Tails.** Therefore, there are **two** different potential outcomes.

$$\text{Probability of something happening} = \frac{\text{How many ways you can get your result}}{\text{Total number of potential outcomes}}$$

A coin has two sides, and therefore has two outcomes: Heads and Tails. Therefore, the probability of landing on a heads is

$$\frac{\text{1 (Only one side of the coin is heads)}}{\text{2 (Total potential outcomes)}}$$

$$\frac{1}{2} = .5 = 50\%$$

There is a 50% chance it will land on heads

Now let's try the same thing with standard dice.

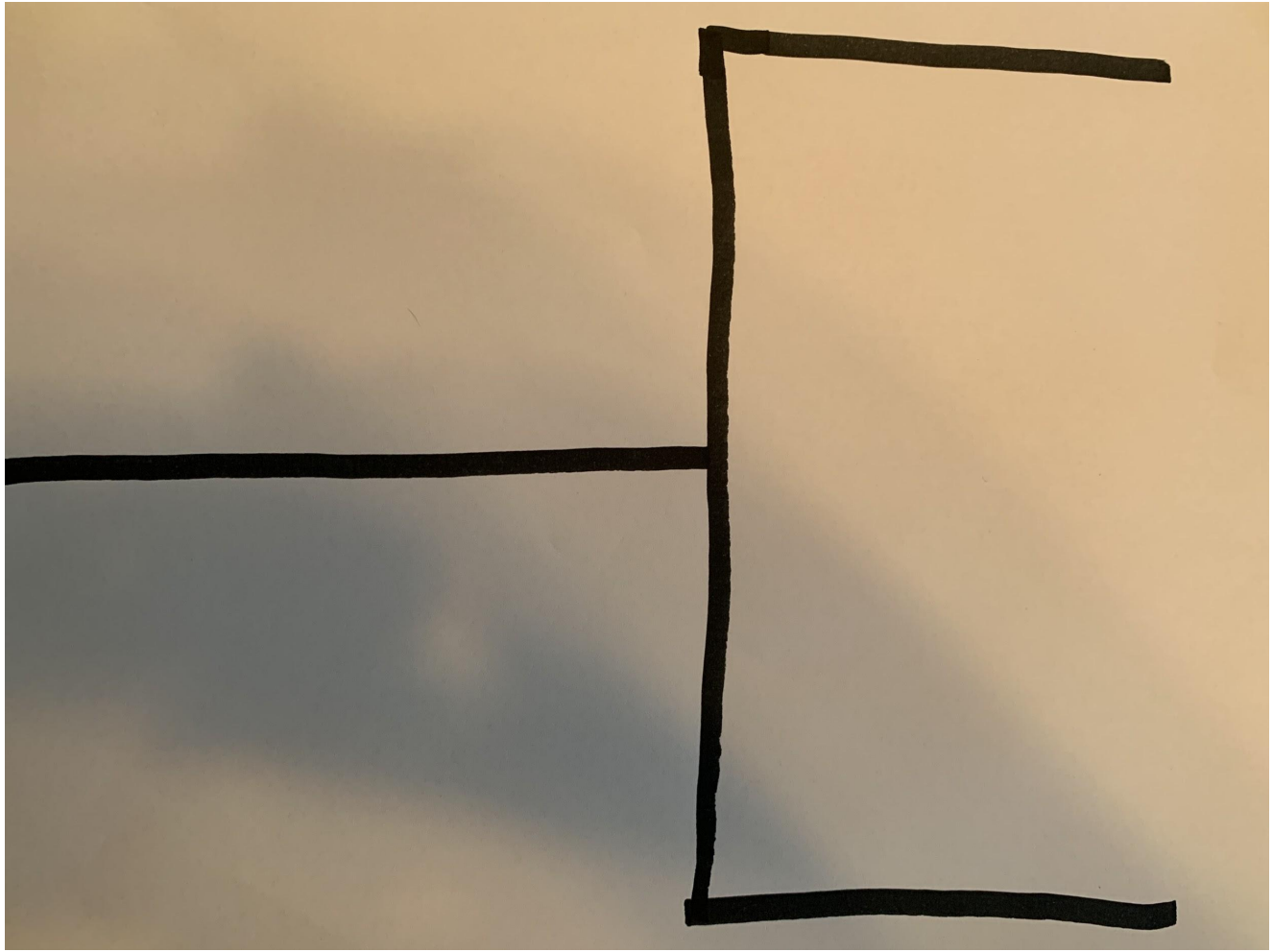
1. What is the probability of one die landing on a 4?
2. What is the probability of it landing on an odd number?
3. Challenge: If you throw two dice, what is the probability of both landing on 1?

Determining Probability with Ozobots

Ozobots can be programmed to move in specific directions based on color codes. However, if there are multiple ways for it to go and you don't tell the Ozobot what to do, the robot will **choose a path at random.**

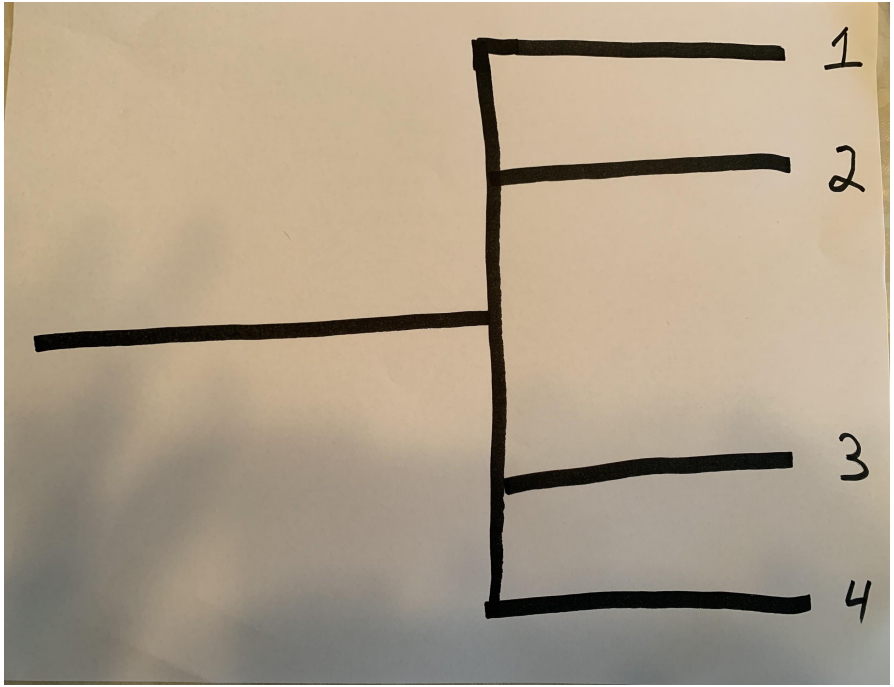
Directions: Grab a piece of paper and a black marker. Draw the diagram on the next slide.

Do you think the Ozobot will take the upper or lower path? Write the probability of each path, as well as your predictions. Run it 10 times and record the results.



Now let’s make it more challenging. Add two more path’s to go and number them 1-4 (see the picture below for reference).

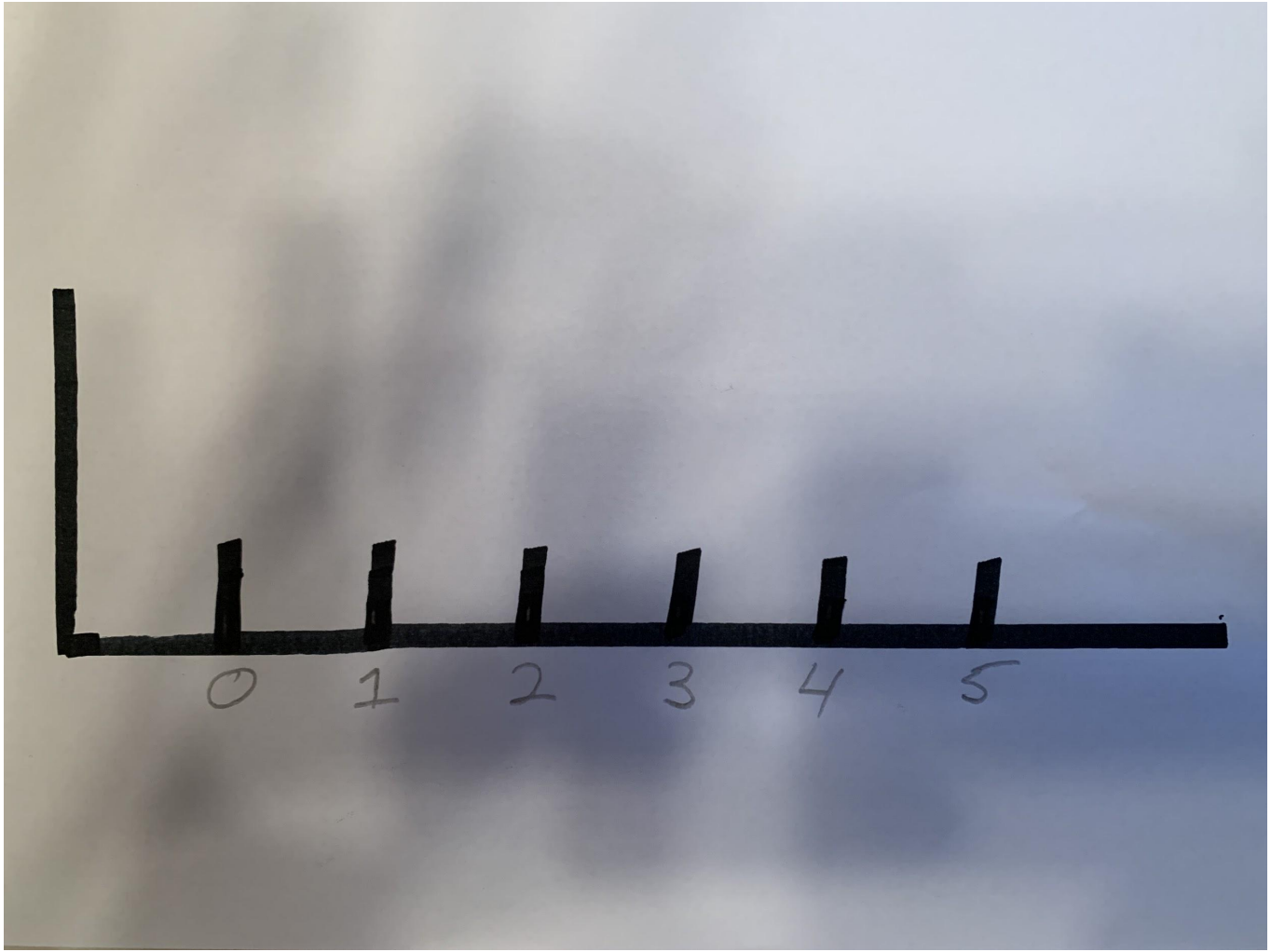
Predict which way you think the Ozobot will go. Run the experiment 10 times and see how it matches up with your results.



Still too easy? Let's try something harder!

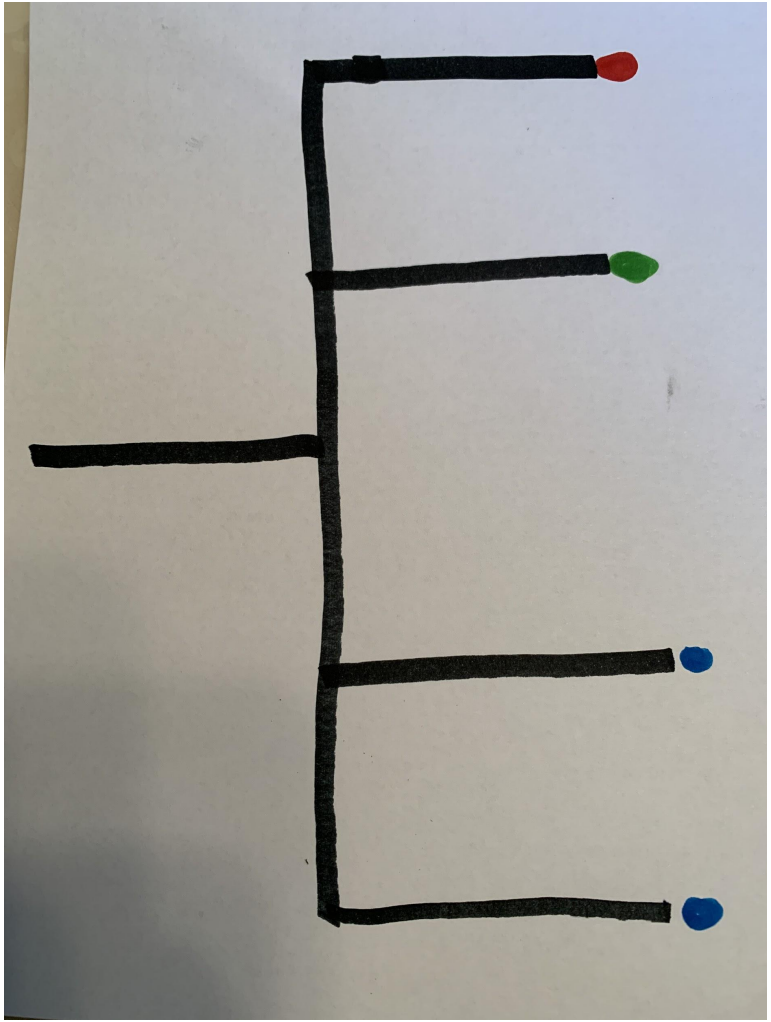
Directions: Create a number line from 0-5 as seen on the picture on the next slide. Draw a black line straight down so it creates a right angle with the beginning of the line. Before you run the test, make your predictions. Then, run the test 10 times.

Question: What is the probability the Ozobot lands on the 0? What is the probability it lands on the 5?


0 1 2 3 4 5

Extension Activity

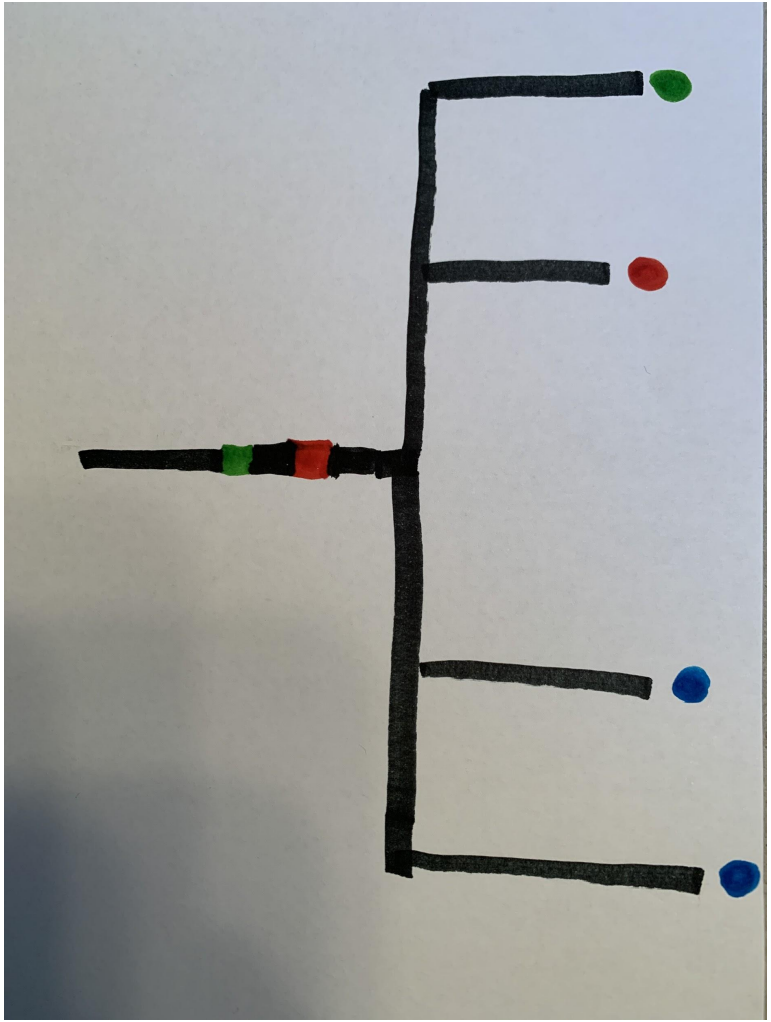
For each diagram, determine the probability the Ozobot will land on each color. Use this Color Code sheet as a reference.



Blue = _____ %

Green = _____ %

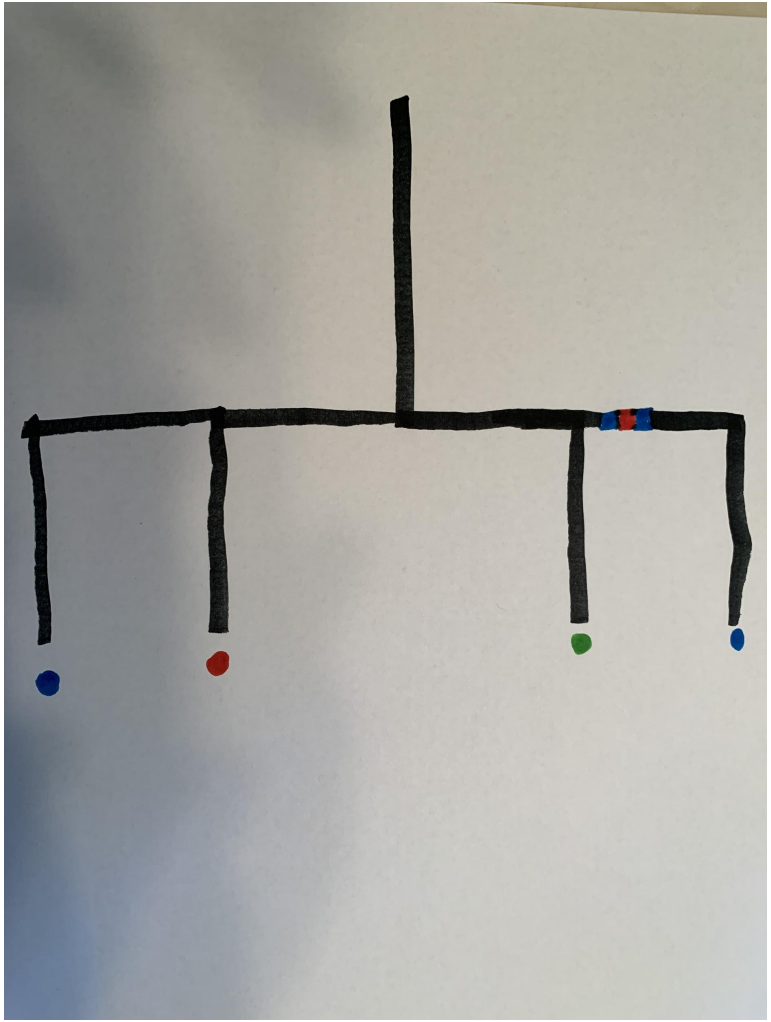
Red = _____ %



Blue = _____ %

Green = _____ %

Red = _____ %



Blue = _____ %

Green = _____ %

Red = _____ %