In this activity, we will learn about random number generation. We will then use it to create a simple simulation to draw samples from a population in order to estimate the population proportion.

**Starter World:** Begin by opening a new Alice world. Place a penguin into the world and size it to take up most of the screen.

**Random Color Method:** Create a Penguin method and call it `randomColor`. To begin with we are going to assume the population proportion of males in a colony of penguins is 25%. Choose `world` in the object tree and then click on the `function` tab. Cursor down until you see `random`.

Drag the `choose true` command into the `randomColor` method. Then enter .25 (25%) into the drop down. We are going to make male penguins blue and female penguins pink.

Drag an `If/Else` statement into the `randomColor` method and then drag the `choose true` command into the `if` field. Drag a `Do together` command into both the `If` and `Else` fields. In the `If Do together` set the penguin’s color to blue and have the penguin say, “I am a male.” In the `Else Do together` set the color to pink and have the penguin say, “I am a female.”

Play your world. If your world worked, use the `Restart` button to run your world 20 times. Keep a tally of how many males and females were in the sample and compute the sample proportion of males from your results.

Sample Proportion: ____________
How does the sample proportion compare to the true population proportion of 0.25?

**Simulations**

You just created a simple way to simulate sampling from a population to determine the population proportion. However, it is cumbersome to have to repeatedly run the Alice world to obtain a sample of size 20.

**Challenge**: Your task is to use looping and counters to modify this world to take a sample of size \( n \) and count and report the *sample proportion*. When you think you have accomplished this, call me over to check your world.

- Proper use of looping technique
- Proper use of counters
- Accurate computation and reporting of sample proportion