



Ball Selection

Worksheet

K-W-L Chart

What I Know	What I Wonder	What I Learnt

New Commands: make a list of all the new Python commands you learn throughout the lesson

Activity 1:

Read the program.

```
1. import random
2.
3.
4. def drawballs(n):
5.     p = 0
6.     for i in range(n):
7.         bag = ["y", "g", "g", "r", "r", "r", "b", "b", "b", "b"]
8.         balls = []
9.         draws = 3
10.        for j in range(draws):
11.            ball = random.choice(bag)
12.            balls.append(ball)
13.        print(balls)
14.        if balls[0] == balls[1] and balls[1] == balls[2]:
15.            p += 1
16.
17.    chance = round(p/n * 100, 2)
18.    print("The probability of all the same colour is", chance, "%")
19.
20.
21. drawballs(1000)
```

Answer:

- Identify the line of code that represents the collection of coloured balls.
- How does the simulation program draw 3 balls from the bag?
- How does the program modify the item of a list?
- How to check whether the selected balls have the same colour or not?
- How to repeat the trials of drawing balls in the program?

Draw a Flowchart for the example program:

**Activity 2:**

Task 1: Add two lines of code to call the 'drawballs()' function. One is to repeat the experiment in 100 trials and the other is in 10,000 trials. Compare the probabilities.

Task 2: Modify the function to solve the problem below:

Pick 4 balls from the bag each time. What is the probability of getting 4 blue balls and the probability of getting the yellow ball among the 4 selected balls?

Task 3: Modify the program to answer the question below:

There are 2 bags. In one bag, there are 3 white balls and 2 blue balls; in another bag, there are 2 red balls, 2 green balls, and only 1 blue ball.

You will pick one ball from each bag and then put it back each time. Repeat the experiment 1,000 times.

What is the probability of getting both blue balls?

Are they independent events or dependent events? Why?

Task 4: Refer to Lesson 9 and create a 'rolldice' function. The program should solve the problems as follows:

Roll 2 dice 1,000 times and calculate the sum of the dice numbers.

(a) What is the probability that the two dice numbers are the same?

(b) What is the probability of the sum being greater than 7?

(c) What are the probabilities of the sum being odd or the sum being even?



Extension:

- It is common practice that functions represent actions
- These actions should complete a specific task and shouldn't be large in size
- Go back to previous lessons and break down the programs into functions that complete specific tasks