3) Hi this is Asmita! I am a Student Success Coach and will be explaining some practice problems from the MA121 Introduction to Statistics course. Today we will review an assigned problem from Unit 2. In the “Homework Assessment” you were asked to solve this problem:

A box contains 8 red, 8 yellow, and 8 green marbles. Construct a sample space for the experiment of randomly drawing out, with replacement, two marbles in succession and noting the color each time.

To approach this problem, use a tree diagram to find sample space (total number of outcomes):

1) Find out the number of possibilities for selection of the first marble (first branch of tree)
2) Find out the number of possibilities for selection of the second marble (second branch of tree)
3) Draw the tree diagram
4) Write the number of outcomes in the final nodes of the tree

**Step 1:** Find out the number of possibilities for the selection of the first marble:

In a box, there are only three types of marbles - red, yellow, and green. Selection of marbles is “with replacement,” meaning that the first marble is put back before the second marble is drawn. Hence, there are three possibilities for the selection of first marble, that is, red (r), yellow (y), or green (g).

**Step 2:** Find out the number of possibilities for selection of the second marble:

Similarly, there are three possibilities for the second marble (red (r), yellow (y), or green (g)).

**Step 3:** Draw the tree diagram:

Tree diagram is as follows:
Step 4: Write the number of outcomes in the final nodes of the tree:

The sample space is reading from the top to the bottom of the final nodes in the tree.

Sample space is $S = \{ \text{rr, ry, rg, yr, yy, yg, gr, gy, gg} \}$

Conclusion:

The sample space for the experiment of randomly drawing out, with replacement, two marbles in succession is $S = \{ \text{rr, ry, rg, yr, yy, yg, gr, gy, gg} \}$.

Please let me know if you have any question on this problem, or on this topic generally. I will be here in the forum for the next hour.