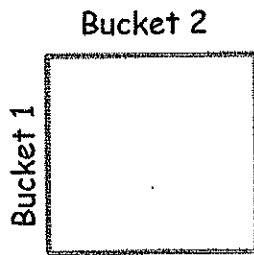
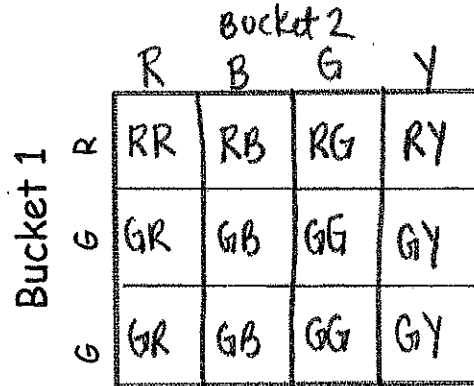


Investigation 4.1 - Drawing area models to find the Sample Space

Miguel draws a square to represent an area of 1 square unit. He will use the square's area to represent a probability of 1. The square represents the sum of all probabilities for all the possible outcomes.



Miguel adds to his diagram to help him find the theoretical probabilities of drawing marbles from Bucket 1.



Explain what Miguel has done so far. Does this look reasonable?
 This does look reasonable. Miguel has divided his area model into 3 sections to represent the 3 colors in bucket 1.

- Use the top edge to represent Bucket 2. How many sections do you need to represent the marbles in Bucket 2? 4. Draw the lines and label the sections you need to represent Bucket 2.
- Now label each of the sections inside the square with two letters to represent the results of choosing two marbles. RR in a section would mean that two red marbles were drawn from the buckets.

What are the probabilities for selecting each pair of marbles in the given order?

a. $P(RR) = \frac{1}{12}$ b. $P(RB) = \frac{1}{12}$

c. $P(RG) = \frac{1}{12}$ d. $P(RY) = \frac{1}{12}$

e. $P(GR) = \frac{2}{12} = \frac{1}{6}$ f. $P(GB) = \frac{2}{12} = \frac{1}{6}$

g. $P(GG) = \frac{2}{12} = \frac{1}{6}$ h. $P(GY) = \frac{2}{12} = \frac{1}{6}$

i. $P(YY) = \frac{0}{12} = 0$

What is the probability of choosing a marble from each bucket and...

a. getting at least one red? $\frac{6}{12} = \frac{1}{2}$

b. getting at least one blue? $\frac{3}{12} = \frac{1}{4}$

c. getting at least one green? $\frac{9}{12} = \frac{3}{4}$

d. getting at least one yellow? $\frac{3}{12} = \frac{1}{4}$

Bucket 1 contains three marbles- 2 red and 1 blue. Bucket 2 contains four marbles- 2 red, 1 blue, and 1 green. Draw an area model to represent the theoretical probabilities of drawing from bucket 1 and bucket 2.

		Bucket 2			
		R	R	B	G
Bucket 1	R	RR	RR	RB	RG
	R	RR	RR	RB	RG
	B	BR	BR	BB	BG

What are the probabilities for selecting each pair of marbles in the given order?

a. $P(RR) = \frac{4}{12} = \frac{1}{3}$

d. $P(BB) = \frac{1}{12}$

b. $P(BR) = \frac{2}{12} = \frac{1}{6}$

e. $P(GB) = \frac{0}{12} = 0$

c. $P(GR) = \frac{0}{12} = 0$

f. $P(RB) = \frac{2}{12} = \frac{1}{6}$

What is the probability of choosing a marble from each bucket and....

a. getting at least one red? $\frac{10}{12} = \frac{5}{6}$

c. getting at least one green? $\frac{3}{12} = \frac{1}{4}$

b. getting at least one blue? $\frac{6}{12} = \frac{1}{2}$

d. getting at least one yellow? $\frac{0}{12} = 0$