Stat 1350, Sample Spaces, Fall 2014

Name **KEY**

Instructions: Take two bags (or a bag and a box of cards) from the box of sample spaces brought by your instructor. Complete the following for each bag (or box) you choose.

Bag/Box #1	Bag/Box #2
1. **What kind of item is in this bag/box?**	1. **What kind of item is in this bag/box?**
plastic coins	box of cards
2. **How many total items are in the bag/box?**	2. **How many total items are in the bag/box?**
35	52
3. **Can you categorize the items in the bag/box? If so, explain how.**	3. **Can you categorize the items in the bag/box? If so, explain how.**
H T	spades — 13 clubs — 13 hearts — 13 diamonds — 13
4. **How many items are in each category?**	4. **How many items are in each category?**
flipping a random coin (or group of them) has one result per coin heads/tails	See above.

these values are examples only
student results may vary

5. **If all the individual items in the bag/box are equally likely to be selected from the bag/box, what is the probability of selecting an item from each category?**

$$H - \frac{1}{2} = 50\%$$
$$T - \frac{1}{2} = 50\%$$

$$spades = \frac{13}{52} = \frac{1}{4} = 25\% \Big\} 50\% \text{ black}$$
$$clubs = \frac{13}{52} = \frac{1}{4} = 25\%$$
$$hearts = \frac{13}{52} = \frac{1}{4} = 25\% \Big\} 50\% \text{ red}$$
$$diamonds = \frac{13}{52} = \frac{1}{4} = 25\%$$

6. **Conduct the following experiment: Choose a category whose probability is at least ¼ (25%) or higher. Randomly choose an item from the bag/box, record which category it belongs to (specifically, does it belong to the category you choose or another one?). Put the object back and randomize (i.e. stir the contents, shake or shuffle). Repeat this process until you have 25 sample selections.**

Category 1 H   T Category (Other)

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$$\frac{10}{25} = 40\%$$ $$\frac{15}{25} = 60\%$$

Category 1 black   Category (Other) red
(spades + Clubs)   (hearts + diamonds)

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$$\frac{18}{25} = 72\%$$ $$\frac{7}{25} = 28\%$$

7. **Use the information you collected from your experimental sample and compare it to your probability calculation in #5. Are they about the same or very different?**

Yes, they are within the 20% margin of error

$$\frac{1}{\sqrt{25}} = .20$$

These are (accidentally) quite different. we should not expect a value off by more than 20% most of the time.