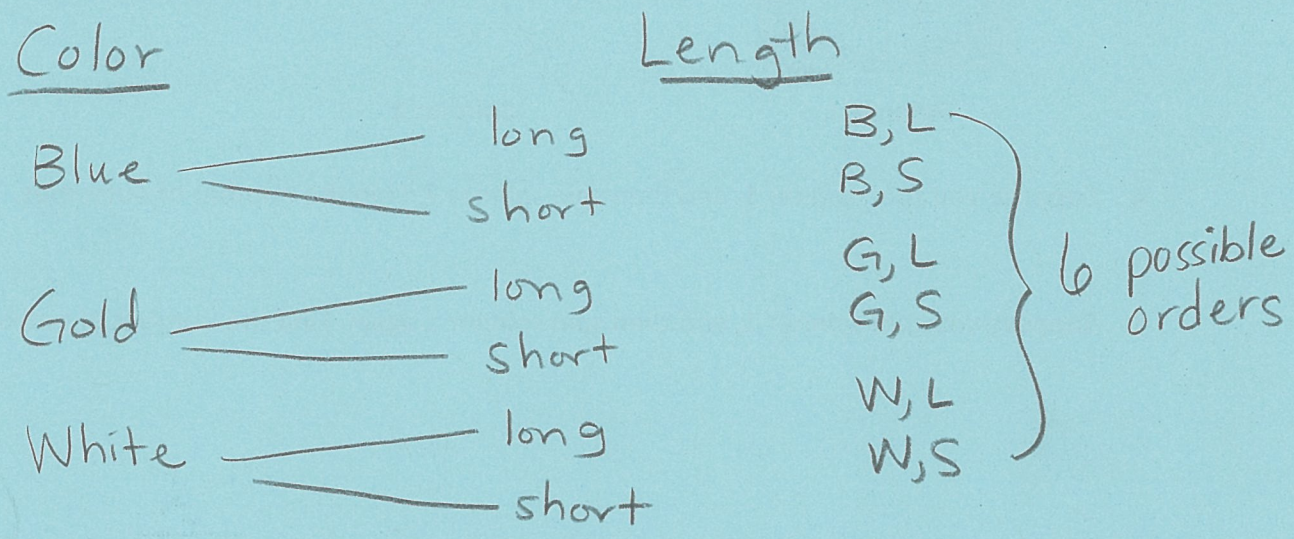
Name [redacted] Period _____

10.8A – Tree Diagrams and Counting Principle

For problems #1 and 2 make a tree diagram and list all the outcomes.

1. You are ordering practice T-shirts for your soccer team. You can get the T-shirts in one of the three school colors (blue, gold, or white) and you can get long-sleeve or short-sleeve T-shirts. How many T-shirts are possible?



2. Jar A contains 3 marbles (one blue, one red, and one green), jar B contains 2 marbles (one purple and one yellow), and jar C contains 2 marbles (one orange and one white). How many outcomes are possible if you choose on marble from each jar?

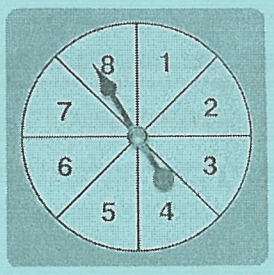
For problems #3-9 solve using the counting principle. Show your work.

3. You are given a random 4-digit personal identification number (PIN) for your bank card. How many 4 digit PINs are possible if the numbers cannot be repeated?

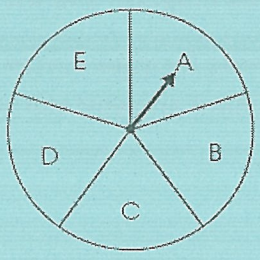
Could be any # 0-9 → $10 \times 9 \times 8 \times 7 = 5040$ (1st digit, 2nd digit, 3rd digit, 4th digit) ← only 9 choices because we can't have the same number as the first digit

Solve using the counting principle. Show your work.

In Exercise 4 and 5, use the spinners shown.



Spinner 1



Spinner 2

4. Suppose you spin spinner 1, and then spin spinner 2. Find the number of outcomes.

5. Suppose you spin spinner 1, and then spin spinner 1 again. Find the number of outcomes.

6. In Minnesota, the standard configuration of a license plate is 3 digits followed by 3 letters. How many license plates can be made if the letters and digits can be repeated?

$\frac{10}{\text{Digit}} \times \frac{10}{\text{Digit}} \times \frac{10}{\text{Digit}} \times \frac{26}{\text{Letter}} \times \frac{26}{\text{Letter}} \times \frac{26}{\text{Letter}} = 17,576,000$

7. How many license plates can be made if the letters and digits cannot be repeated?

8. You roll a number cube 5 times. How many outcomes are possible?

$\frac{6}{\text{1st roll}} \times \frac{6}{\text{2nd roll}} \times \frac{6}{\text{3rd roll}} \times \frac{6}{\text{4th roll}} \times \frac{6}{\text{5th roll}} = 7776$

9. Radio station call letters, such as WROC, KFAN and KDWB, consist of 4 letters. The call letters need to begin with either a W or a K. How many different call letters are possible if the letters can be repeated?