FST Name _____

6-3 Counting Strings with Replacement Date _____ **A#5**

Goal: Use the Multiplication Counting Principle with replacement

Warm Up:

a. Write down all the three-letter combinations that begin with D using the letters A, B, C, D and E only once.

b. Many Star Wars droids are named beginning with a letter and then a single-digit number (e.g., R2-D2, C-3PO). How many different name prefixes are there?

Questions

The Multiplication Counting Principle

You have three pairs of pants and 5 shirts. We will make a tree diagram to see how many possible outfits you can have. How would this change if you include three pairs of shoes?

Multiplication Counting Principle

Let A and B be any finite sets. The number of ways to choose one element from A and then one element from B is $N(A) \bullet N(B)$.

Example 1: A lottery game played in some states (of people who can't do math) involves picking 3 digits from 0 to 9 in order. Describe a sample space for this experiment and determine the number of elements in the sample space.

Questions	**Strings** When elements in a set must be ordered, the list is called a _____. The number of elements (or symbols) in a string is called the _____ of the string. Example 2: a. On a multiple choice test, there are 22 questions with five choices each. How many possible completed answer sheets are there? b. If you guess randomly on each question, what is the probability of answers all 22 questions correctly? Example 3: How would the answers in Ex 2 change if there are only 8 questions? Example 4: In a certain state, license plates have two letters followed by 4 digits from 0 to 9. How many license plates are possible? Example 5: One state allowed either letters (A-Z) or digits (0-9) for all seven characters. How many possible plate numbers are there? If four new characters (heart, hand, plus, star) are introduced, how many more options are there?

Questions

Independent Events

Independent events can be described as events which the probability of A does not affect the probability of B. For example, choose cards and replacing them after each pick.

Definition of Independent Events

Events A and B are **independent events** if and only if $P(A \cap B) = P(A) \bullet P(B)$.

Example 6: The spinner shown is used in a game. If a person spins an even number and then a multiple of 3, they win a TI-85. What are the chances of winning?

Example 7: What is the probability that both spins will sum to greater than 8?

Summary: