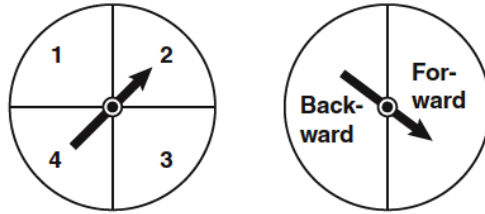


# Tree Diagrams and Counting Principle

## An Actual Regents Question!!

August 2008

- 32 Brianna is using the two spinners shown below to play her new board game. She spins the arrow on each spinner once. Brianna uses the first spinner to determine how many spaces to move. She uses the second spinner to determine whether her move from the first spinner will be forward or backward.



Our goal is to figure out how many different possibilities of moves that we can have. We can do this using one of two different methods.

List the Possibilities

Tree Diagram

Key Definition:

**Sample Space** \_\_\_\_\_

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- 39 A restaurant sells kids' meals consisting of one main course, one side dish, and one drink, as shown in the table below.

**Kids' Meal Choices**

Main Course	Side Dish	Drink
hamburger	French fries	milk
chicken nuggets	applesauce	juice
turkey sandwich		soda

Draw a tree diagram or list the sample space showing all possible kids' meals. How many different kids' meals can a person order?

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However what happens when the tree diagram gets too big? It would take too much time to make a tree diagram to show hundreds of possible arrangements. Instead we use the **Multiplication Counting Principle** shortcut!

Examples:

1. Jen and Barry's ice cream stand has 3 types of cones, 6 flavors of ice cream, and 4 kinds of sprinkles. If a serving consists of a cone, one flavor of ice cream, and one kind of sprinkles, how many different servings are possible?

2. A certain car comes in three body styles with a choice of two engines, a choice of two transmissions, and a choice of six colors. What is the minimum number of cars a dealer must stock to have one car of every possible combination?

3. A password consists of two digits and one letter. How many different passwords can be formed?

Digits to Choose From? \_\_\_\_\_ Letters to Choose From? \_\_\_\_\_

4. An outfit Jennifer wears to school consists of a top, a bottom, and shoes. Possible choices are listed below.

Tops: T-shirt, tank top, blouse, sweater

Bottoms: jeans, skirt

Shoes: flip-flops, sneakers

List the sample space or draw a tree diagram to represent all possible outfits consisting of one type of top, one type of bottom, and one pair of shoes.

Determine how many different outfits contain jeans and flip-flops. \_\_\_\_\_

Determine how many different outfits do *not* include a sweater. \_\_\_\_\_

1. The local ice cream stand offers three flavors of soft ice cream: vanilla, chocolate, and strawberry; two types of cone: sugar and wafer; and three toppings: sprinkles, nuts, and cookie crumbs. Draw a tree diagram or list the sample space of the different choices can she make that have one flavor of ice cream, one type of cone, and one topping.

Dawn will not order vanilla ice cream. How many sundaes will she have to choose from? \_\_\_\_\_

2. Jamestown Builders has a development of new homes. There are four different floor plans, six exterior colors, and an option of either a one- or a two-car garage. How many choices are there for one home?

3. There are 12 tomato plants in a garden. Each plant has 7 branches and each branch has four (4) tomatoes growing on it. If **one-half** of the tomatoes are picked, how many will be picked?

4. A password is created containing one digit, one letter, and one of the following symbols: ! @ # \$ % & \* . How many passwords can be created?