

The Real Meal Deal

Reporting Category	Probability and Statistics
Topic	Computing the number of outcomes, using the Fundamental (Basic) Counting Principle
Primary SOL	7.10 The student will determine the probability of compound events, using the Fundamental (Basic) Counting Principle.
Related SOL	7.9

Materials

- Chart paper
- Markers
- The Real Meal Deal activity sheet (attached)
- Calculators

Vocabulary

probability, outcome, sample space, impossible event, certain event, equally likely, tree diagram, simple event, independent event, dependent event (earlier grades)
compound event, Fundamental (Basic) Counting Principle (7.10)
theoretical probability, experimental probability, Law of Large Numbers (7.9)

Student/Teacher Actions (what students and teachers should be doing to facilitate learning)

1. Have students work in small groups to find all the possible outcomes of one of the following scenarios (or create your own). Have students work with markers on chart paper so their work can be displayed.
 - Scenario A: John can take three classes a day. For first period, he can choose math or English. For second period, he can choose history, science, or computer concepts. For third period, he can choose art, music, or drama. How many different schedules of three classes are possible?
 - Scenario B: In the sub shop you can choose your bread, meat, and condiments. The bread choices are white, wheat, or rye. The meat choices are ham, turkey, roast beef, or bologna. The condiment choices are mayonnaise or mustard. You may choose only one bread, one meat, and one condiment. How many different sandwiches can be ordered?
 - Scenario C: Trying to decide what to wear to school, you look in your closet and see shirts, pants, and shoes. For shirts you see short sleeves and long sleeves. For pants you see jeans and shorts. For shoes you see athletic shoes, sandals, and hiking boots. How many outfits can you choose from?
2. Have students present their work to the class. Discuss vocabulary terms like outcomes, sample space, and tree diagrams as they come up in student work. Ask students to think of a more efficient way to find the total number of outcomes when given a set of choices. Discuss the Fundamental (Basic) Counting Principle—a computational procedure to

determine the number of possible outcomes of several events—and how it can be related to tree diagrams.

3. Distribute The Real Meal Deal activity sheet, and have students complete it.

Assessment

- **Questions**

- What is the difference between a compound event and a simple event?
- What is the Fundamental (Basic) Counting Principle, and how can it help you to determine the probability of an event?

- **Journal/Writing Prompts**

- Describe what connections can be made between the Fundamental (Basic) Counting Principle and tree diagrams.
- Explain the Fundamental (Basic) Counting Principle to someone who has never heard of it.

- **Other**

- Have students design their own scenario and questions requiring the use of the Fundamental (Basic) Counting Principle.
- Give students the probability of getting a favorite meal (such as $1/24$) from a cafeteria that serves one appetizer, one entrée, and one dessert. Have students determine the number of choices for each (appetizer, entrée, and dessert) the cafeteria must serve to establish the given probability.

Extensions and Connections (for all students)

- Have students bring in a menu from a local restaurant and repeat the Real Meal Deal activity.

Strategies for Differentiation

- Limit the menu choices, or create a different menu, reducing the amount of work needed. Frame the menu categories so they are separated.
- Create a frame for tree diagrams as a guide for students to complete.
- Have students record Real Meal combinations on a chart.

The Real Meal Deal

MENU

Sandwiches

Ham and Turkey Club
Roast beef on Rye
Italian Cold Cut Sub

BLT
Sliced BBQ
Hamburger

French Fries: small medium large

Salads

Garden Salad
Chef Salad
Caesar Salad

Dressings

Ranch
French
Creamy Italian

Dessert

Chocolate Chip Cookie
Brownie Sundae

Beverages

Soda: small medium large
Tea: small medium large
Milk: regular low-fat
Coffee: regular decaf

Activity:

1. Determine the number of choices a customer has for the following meals. For each, display the choices with a tree diagram, and check with the Fundamental (Basic) Counting Principle.
 - o soda, sandwich, and fries
 - o salad with dressing and tea
 - o sandwich, dessert, and milk
2. How many possible meals can be served at the Real Meal Restaurant?
3. Make up your own question using the Real Meal Restaurant Menu.