

Name: _____

Date: _____

Taking a Chance: Compound Probability

Essential Question: How can we predict the likelihood of multiple events happening together, and how does the outcome of one event influence the probability of another?

Part 1: Independent Events

1. **Definition:** In your own words, explain what it means for two events to be independent.

2. Coin Toss and Die Roll:

- What is the probability of flipping tails on a coin?
- What is the probability of rolling an even number on a die?
- What is the probability of flipping tails AND rolling an even number?

3. Spinner and Card Draw:

- A spinner has 4 equal sections: red, blue, green, and yellow. What is the probability of spinning blue?
- What is the probability of drawing a Queen from a standard deck of cards?
- What is the probability of spinning blue AND drawing a Queen?

4. Real-World Example:

- Imagine you have a bag with 3 red marbles and 5 blue marbles. You draw one marble, replace it, and then draw another. What is the probability of drawing a red marble, then a blue marble?

Part 2: Dependent Events

1. **Definition:** In your own words, explain what it means for two events to be dependent.

2. **Marble Mayhem:**

- A bag contains 4 green marbles and 6 purple marbles. What is the probability of drawing a green marble?
- If you draw a green marble and DON'T replace it, what is the probability of drawing another green marble?
- What is the probability of drawing a green marble, then another green marble without replacing the first?

3. **Card Confusion:**

- What is the probability of drawing an Ace from a standard deck of cards?
- If you draw an Ace and DON'T replace it, what is the probability of drawing another Ace?
- What is the probability of drawing an Ace, then another Ace without replacing the first?

4. **Real-World Example:**

- You have a box with 5 chocolate chip cookies and 3 oatmeal raisin cookies. You randomly eat one cookie, then another. What is the probability of eating a chocolate chip cookie, then an oatmeal raisin cookie?

Part 3: Challenge Problems

1. **Three Events:** You flip a coin three times. What is the probability of getting heads, then tails, then heads?
2. **Independent or Dependent?** Determine if the following events are independent or dependent. Explain your reasoning.
 - Rolling a die and then spinning a spinner.
 - Choosing a sock from a drawer, then choosing another sock without putting the first one back.
 - Flipping a coin and then drawing a card from a deck.
3. **Create Your Own:** Write your own compound probability problem involving either independent or dependent events. Then, solve it!