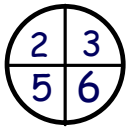
6th grade FM: How do we find the probability of compound events?

1. Jimmy is playing a game with his friend John. The following spinner gets spun twice. Jimmy wins if the sum is even and John wins if the sum is odd. Is this a fair game?



$P(\text{even}) = \frac{8}{16} = \frac{1}{2}$

$P(\text{odd}) = \frac{8}{16} = \frac{1}{2}$

	2	3	5	6
2	4	5	7	8
3	5	6	8	9
5	7	8	10	11
6	8	9	11	12

This will be a fair game because they each have the same probability of winning.

2. Aaron decides to pull some marbles out of a bag. He pulled out 3 green, 4 red, 6 blue, and 2 yellow. What is the probability that Aaron will pull out a red marble next? Is this theoretical or experimental?

has / in a bag.

3 g
4 r
6 b
+ 2 y
15 total

$P(\text{red}) = \frac{4}{15}$ Experimental

The Counting Principle: Multiply your choices to get the total # of outcomes.

You want to know how many outfits you can make. You have a red, a blue, and a green shirt. You have a pair of jeans and a pair of khaki pants. You have blue and black shoes. How many outfits could you make?

shirt Pants shoes
Red, Jeans, Blue
Red, Jeans, Black
Red, khaki, Black
Red, khaki, Blue

Blue, Jeans, Blue
Blue, Jeans, Black
Blue, khaki, Blue
Blue, khaki, Black

Green, Jeans, Blue
Green, Jeans, Black
Green, khaki, Blue.
Green, khaki, Black

12 outfits

$3 \cdot 2 \cdot 2 = 12$ outfits

3 shirt choices · 2 pants choices · 2 shoe choices

I like to go to Dairy Queen to buy blizzards. I have 4 choices of fruits, 3 types of cookies, and 4 toppings to choose from. If I pick a fruit, cookie, and topping, how many options of blizzards would I have?

$$\frac{4}{\text{fruit}} \cdot \frac{3}{\text{cookie}} \cdot \frac{4}{\text{toppings}} = \frac{48}{\text{Blizzard options}}$$

I would have 48 Blizzard options

Compound Probability

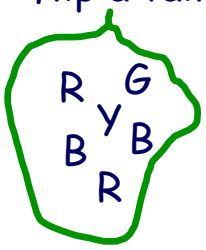
$$P(A,B) = P(A) \times P(B)$$] Formula

Ex 1: Suzzie wants to spin the following spinner and roll a die. What is the probability that Suzzie will spin a C and roll an even number?

$$P(C, \text{even}) = P(C) \cdot P(E)$$
$$= \frac{1}{4} \cdot \frac{3}{6}$$
$$= \frac{1}{8}$$

Suzzie has a $\frac{1}{8}$ chance of getting a C and even.

Ex 2: Mark wants to pick a marble out of a bag and flip a coin. What is the probability that he will pick out a blue marble and flip a tail?



$P(\text{Blue, Tail}) = P(B) \cdot P(T)$

$= \frac{2}{6} \cdot \frac{1}{2}$

$= \frac{1}{6}$

Mark has a $\frac{1}{6}$ chance of getting a blue marble and a flipping a tail.

Ex 3: Shawn's teacher decides to pull names out of a hat. She decides she is going to pull a name and put it back in the hat and pull another one. There are 22 kids in the class. What is the probability that she picks Sarah's name and then Jason's name out of the hat?

$P(\text{Sarah, Jason}) = P(S) \cdot P(J)$

$= \frac{1}{22} \cdot \frac{1}{22}$

$= \frac{1}{484}$

Probability Packets 2A and 2B