PROBABILITY

$\text{Prob}(\text{female}) = \frac{8}{14} = \frac{4}{7}$

$\text{Prob}(\text{not white shoes}) = \frac{7}{14} = \frac{1}{2}$

$$\text{Probability} = \frac{\text{ways to succeed}}{\text{total possible outcomes}}$$

$$\text{Odds} = \frac{\text{ways to succeed}}{\text{ways to fails}}$$

$\text{Prob}(\text{snow}) = \frac{2}{9}$ $\frac{\text{suc}}{\text{total}}$

$\text{Odds}(\text{snow}) = \frac{2}{7}$ $\frac{\text{suc}}{\text{fail}}$

$\text{Prob}(\text{good lunch}) = \frac{2}{55}$ $\frac{\text{good}}{\text{total}}$

$\text{Odds}(\text{bad lunch}) = \frac{53}{2}$

Theoretical probability--the probability that should occur based on rules or formulas

Experimental probability--Estimating the probability of an event by performing the activity many times and using the results to estimate the probability

Sample Space--all possible outcomes from an event

Given: 2 coins (Nickel & Quarter) and 3 marbles (2 purple, 1 blue)

Select 1 coin and 2 marbles. List the sample space.

N P_1 P_2 Q P_1 P_2

N P_1 B Q P_1 B

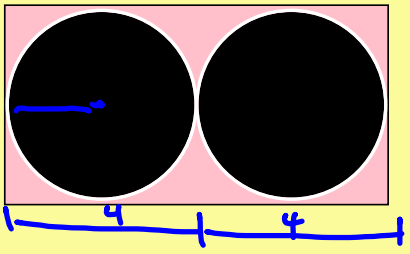
N P_2 B Q P_2 B

What is the probability of selecting a nickel and at least one purple marble?

$\frac{2}{6} = \frac{1}{3}$

Prob(blue) $= \frac{4}{6} = \frac{2}{3}$

Geometric Probability--Estimating the probability using the area of a figure



Total $= \ell \cdot w = 4 \cdot 8 = 32$

$A = \pi r^2 = \pi \cdot 2^2 = 4\pi$

2 circles $= 8\pi$

Pink $= 32 - 8\pi$

Prob (fly lands on pink)

$= \frac{\text{Area of pink}}{\text{Total Area}}$

$= \frac{32 - 8\pi}{32}$

≈ 0.215

March 27, 2024

The Easter bunny brings you an Easter basket filled with 6 peanut butter eggs, 4 caramel eggs, and 2 solid chocolate eggs. Your mother will only allow you to have 3 eggs at a time.

1,2,3 234
124

What is the probability that you select 3 peanut butter eggs?

$$\text{Prob}(3 \text{ peanut butter}) = \frac{\text{ways to get 3 p.b}}{\text{total ways to pick 3 eggs}} = \frac{{}_6C_3}{{}_{12}C_3} = \approx 0.0909 = \frac{1}{11}$$

What are the odds that you select 3 peanut butter eggs?

$$\text{Odds}(3 \text{ p.b.}) = \frac{3 \text{ p.b.}}{2 \text{ ch}, 1 \text{ p.b}, 1 \text{ ch}}$$

Find Prob first!

$$\text{Prob} = \frac{1}{11} \quad \frac{\text{suc}}{\text{total}}$$

$$\text{odds} = \frac{\text{suc}}{\text{fail}} = \frac{1}{10}$$

6 peanut butter
4 caramel
2 chocolate

What is the probability that you select 2 caramel eggs and 1 chocolate egg?

$$\frac{{}_4C_2 \cdot {}_2C_1}{{}_{12}C_3} = \frac{3}{55}$$

$$\text{Odds} = \frac{3}{52}$$

AND = Multiply

If 5 eggs are selected, what is the probability of selecting 3 caramel eggs?

$$\text{Prob}(3 \text{ caramel} + 2 \text{ other}) = \frac{{}_4C_3 \cdot {}_8C_2}{{}_{12}C_5} = \frac{14}{99} \approx 0.141$$