Warm-Up

Number	Occurrences
1	26
2	10
3	12
4	9
5	14
6	29

100 total rolls

$\frac{55}{100}$

1. The table shows the results of rolling a die with unequal faces. Find the experimental probability of rolling 1 or 6.
2. Find the experimental probability of rolling a number greater than 3. $\frac{52}{100}$
3. Find the theoretical probability of rolling a 5 $\frac{1}{6}$

7.3

Independent and Dependent Events

Two events are independent if the occurrence of one has no effect on the occurrence of the other.

If A and B are independent events, then the probability that both A and B occur is:

P(A and B)= P(A) · P(B)

This also works with 3 or more events:

P(A and B and C) = P(A) · P(B) · P(C)

1) If you flip a coin 8 times, and the first seven all were "heads", what is the probability that the 8th flip will be heads?

$\frac{1}{2}$

2) What is the probability that you flip a coin and it lands on "heads" 8 times in a row?

$\frac{1}{2}\cdot\frac{1}{2}\cdot\frac{1}{2}\cdot\frac{1}{2}\cdot\frac{1}{2}\cdot\frac{1}{2}\cdot\frac{1}{2}\cdot\frac{1}{2} = \left(\frac{1}{2}\right)^8$

You are playing a game with 2 numbered cubes. Find the probability of rolling a sum of 8 on the first roll and doubles on the second roll.

$\frac{5}{36}\cdot\frac{6}{36}$

Find the probability of rolling an even sum on the first roll and a sum greater than 8 on the second roll.

$\frac{\cancel{18}^{\,1}}{\cancel{36}_{\,2}} \cdot \frac{\cancel{10}^{\,5}}{36} = \frac{5}{36}$

A game machine claims that 1 in every 15 people win. What is the probability that you win ~~twice~~ three in a row?

$\frac{1}{15} \cdot \frac{1}{15} \cdot \frac{1}{15}$

Two events A and B are dependent events if the occurrence of one affects the occurrence of the other.

The probability that B will occur given that A has occurred is called the conditional probability of B given A and is written P(B/A).

If A and B are dependent events, then the probability that both A and B occur is:

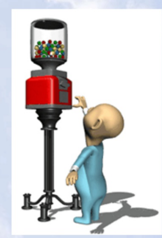
P(A and B)= P(A) · P(B/A)

given

A gumball machine contains 100 gumballs, twenty of each of the colors red, blue, green, white, and yellow.

What is the probability of getting a blue gumball then a white gumball.

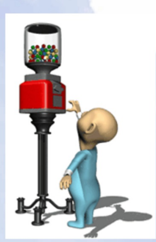
$\frac{\cancel{20}^{\,1}}{\cancel{100}_{\,5}} \cdot \frac{\cancel{20}^{\,4}}{99} = \frac{4}{99}$



A gumball machine contains 100 gumballs, twenty of each of the colors red, blue, green, white, and yellow.

What is the probability of getting a green, then red, then blue gumball.

$\frac{20}{100} \cdot \frac{20}{99} \cdot \frac{20}{98}$



A gumball machine contains 100 gumballs, twenty of each of the colors red, blue, green, white, and yellow.

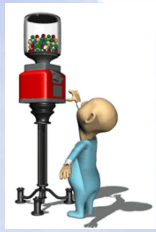
What is the probability of getting a blue, then blue, then blue gumball.

$\frac{20}{100} \cdot \frac{19}{99} \cdot \frac{18}{98}$

A gumball machine contains 100 gumballs, twenty of each of the colors red, blue, green, white, and yellow.

What is the probability of getting a yellow, then another yellow gumball.

$\frac{20}{100} \cdot \frac{19}{99}$



You randomly select 2 cards from a standard 52-card deck. What is the probability that both cards are face cards (king, queen, or jack)?

a) you replace the first card before selecting the 2nd (with replacement)

$\frac{12}{52} \cdot \frac{12}{52}$

b) you do not replace the first card (without replacement)

$\frac{12}{52} \cdot \frac{11}{51}$