How Do You Use Probability of an Event to Make Predictions?
(Topic #5)

Theoretical and experimental probability can be used to make predictions about future events.

EXAMPLE 1:   **Predict Future Events**

Last year, a DVD store sold 670 action DVDs, 580 comedy DVDs, 450 drama DVDs, and 300 horror DVDs. A media buyer expects to sell 5,000 DVDs this year. Based on these results, how many comedy DVDs should she buy? *Show work below.*

**PRACTICE:** Read each question carefully. *Show your work.*

1.   Yesterday, 50 bakery customers bought muffins and 11 of those customers bought banana muffins. If 100 customers buy muffins tomorrow, how many would you expect to buy a banana muffin?

2.   The frequency table shows the results of a survey of 70 zoo visitors who were asked to name their favorite animal exhibit.

   a)   Suppose 540 people visit the zoo. Predict how many people will choose the monkey exhibit as their favorite.

What is your Favorite Animal Exhibit?

Exhibit	Tally	Frequency
Bears	ꝶꝶ l	6
Elephants	ꝶꝶ ꝶꝶ ꝶꝶ ll	17
Monkeys	ꝶꝶ ꝶꝶ ꝶꝶ ꝶꝶ l	21
Penguins	ꝶꝶ ꝶꝶ lll	13
Snakes	ꝶꝶ ꝶꝶ lll	13
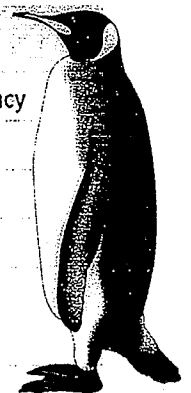
b) Suppose 720 people visit the zoo. Predict how many people will choose the penguin exhibit as their favorite.

3. Alex randomly pulls a colored block from a bag. He records the color and then puts the block back into the bag. The table shows the results of his experiment. If he does the experiment 50 times, predict the number of times he will pull a red block from the bag.

Color	Number of Pulls
Blue	3
Red	4
Yellow	6
Green	7

4. A spinner has a sun, a moon, and a star section. Cameron records her results from her spins in the table below. Based on these results, predict how many times the pointer will land on the moon in 500 spins.

Shape	Number of Spins
Sun	11
Moon	18
Star	31

5. The owner of a deli recorded the number of customers who ordered each of four sandwiches available. If the deli has 50 customers the first hour it is open, predict how many customers will order the turkey sandwich.

Sandwich	Number of Customers
Ham	160
Cheese	100
Turkey	180
Veggie	60

6. Ryan has a bag with marbles. He selects a marble, records the color, and then puts the marble back in the bag. In 25 trials, he selects a green marble 10 times. He selects a blue marble the other times. Base on his results, predict how many times Ryan will select a blue marble in 100 trials.

How Do You Use Probability of an Event to Make Predictions?
(Topic #5)

Theoretical and experimental probability can be used to make predictions about future events.

EXAMPLE 1: Predict Future Events

Last year, a DVD store sold ⟨670⟩ action DVDs, ⟨580⟩ comedy DVDs, ⟨450⟩ drama DVDs, and ⟨300⟩ horror DVDs. A media buyer expects to sell 5,000 DVDs this year. Based on these results, how many __comedy__ DVDs should she buy? *Show work below.* $Total = 2000$

$$\left(\frac{comedy}{total}\right) \quad \frac{580}{2000} = \frac{x}{5000}$$

$$2000x = 580(5000)$$

$$\frac{2000x}{2000} = \frac{2900000}{2000}$$

$$x = 1450$$

PRACTICE: Read each question carefully. *Show your work.*

1. Yesterday, 50 bakery customers bought muffins and 11 of those customers bought banana muffins. If 100 customers buy muffins tomorrow, how many would you expect to buy a banana muffin?

$$\left(\frac{banana}{total}\right) \quad \frac{11}{50} = \frac{x}{100}$$

$$50x = 11(100)$$

$$\frac{50x}{50} = \frac{1100}{50}$$

$$x = 22$$

2. The frequency table shows the results of a survey of 70 zoo visitors who were asked to name their favorite animal exhibit.

   a) Suppose 540 people visit the zoo. Predict how many people will choose the __monkey__ exhibit as their favorite.
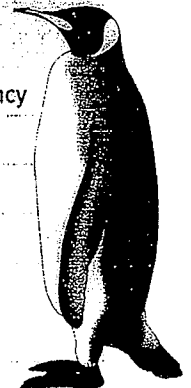
$$\left(\frac{monkey}{total}\right) \quad \frac{21}{70} = \frac{x}{540}$$

$$70x = 21(540)$$

$$\frac{70x}{70} = \frac{11340}{70}$$

$$x = 162$$

What is your Favorite Animal Exhibit?

Exhibit	Tally	Frequency
Bears	ЖІ	6
Elephants	Ж Ж Ж ІІ	17
Monkeys	Ж Ж Ж Ж І	21
Penguins	Ж Ж ІІІ	13
Snakes	Ж Ж ІІІ	13

$TOTAL = 70$

b) Suppose 720 people visit the zoo. Predict how many people will choose the penguin exhibit as their favorite.

$\left(\dfrac{penguin}{total}\right)$ $\dfrac{13}{70} = \dfrac{x}{720}$

$70x = 13(720)$

$\dfrac{70x}{70} = \dfrac{9360}{70}$

$x = 133.7142857$

About 133 people will choose the penguin exhibit as their favorite.

3. Alex randomly pulls a colored block from a bag. He records the color and then puts the block back into the bag. The table shows the results of his experiment. If he does the experiment 50 times, predict the number of times he will pull a red block from the bag.

$\left(\dfrac{red}{total}\right)$ $\dfrac{4}{20} = \dfrac{x}{50}$

$20x = 4(50)$

$\dfrac{20x}{20} = \dfrac{200}{20}$

$x = 10$

Color	Number of Pulls
Blue	3
Red	4
Yellow	6
Green	7

TOTAL = 20

About 10 times Alex will pull a red block from the bag.

4. A spinner has a sun, a moon, and a star section. Cameron records her results from her spins in the table below. Based on these results, predict how many times the pointer will land on the moon in 500 spins.

Shape	Number of Spins
Sun	11
Moon	18
Star	31

TOTAL = 60

$\left(\dfrac{moon}{total}\right)$ $\dfrac{18}{60} = \dfrac{x}{500}$

$60x = 18(500)$

$\dfrac{60x}{60} = \dfrac{9000}{60}$

$x = 150$

About 150 times the pointer will land on the moon in 500 spins.

5. The owner of a deli recorded the number of customers who ordered each of four sandwiches available. If the deli has 50 customers the first hour it is open, predict how many customers will order the turkey sandwich.

Sandwich	Number of Customers
Ham	160
Cheese	100
Turkey	180
Veggie	60

$TOTAL = 500$

$\left(\dfrac{Turkey}{total}\right)$ $\dfrac{180}{500} = \dfrac{x}{50}$

$500x = 180(50)$

$\dfrac{500x}{500} = \dfrac{9000}{500}$

$x = 18$

About 18 customers will order the turkey sandwich.

6. Ryan has a bag with marbles. He selects a marble, records the color, and then puts the marble back in the bag. In 25 trials, he selects a green marble 10 times. He selects a blue marble the other times. Base on his results, predict how many times Ryan will select a blue marble in 100 trials.

$25 - 10 = 15$ blue

$\left(\dfrac{blue}{total}\right)$ $\dfrac{15}{25} = \dfrac{x}{100}$

$25x = 15(100)$

$\dfrac{25x}{25} = \dfrac{1500}{25}$

$x = 60$

About 60 times Ryan will select a blue marble in 100 trials.