Lesson 5-3

Experimental Probability of Compound Events

TEKS 7.6B, 7.6A, 7.6C, 7.6I, 7.1.F

Q: How do you find the experimental probability of a compound event?

A: Write a _____ of the number of ways the event _____ in an experiment to the _____ number of times the experiment was performed.

vocab

① _____ event that includes 2 or more simple events

Q: How can you find the experimental probability of getting heads when you flip 2 coins?
What is the probability of heads for each coin? _____ _____
coin 1 coin 2

Simple event #1 Flipping a coin Heads or Tails

Simple event #2 Rolling a dice 1, 2, 3, 4, 5, 6

Coin	Dice	
H	1, 2, 3, 4, 5, 6	H1 H2 H3 H4 H5 H6
T	1, 2, 3, 4, 5, 6	T1 T2 T3 T4 T5 T6

12 total possible outcomes

1:12 equal probability ↑ theoretical probability

A food trailer serves chicken and records the order size and sides on their orders, as shown in the table. What is the experimental probability that the next order is for 3 pieces with cole slaw?

	Green Salad	Macaroni & Cheese	French Fries	Cole Slaw
2 pieces	33	22	52	35
3 pieces	13	55	65	55

STEP 1 Find the total number of trials, or orders.

$33 + 22 + 52 + 35 + 13 + 55 + 65 + 55 = 330$

STEP 2 Find the number of orders that are for 3 pieces with cole slaw: 55.

STEP 3 Find the experimental probability.

$P(\text{3 piece + slaw}) = \frac{\text{number of 3 piece + slaw}}{\text{total number of orders}}$

$= \frac{55}{330}$ Substitute the values.

$= \frac{1}{6}$ Simplify.

The experimental probability that the next order is for 3 pieces of chicken with cole slaw is $\frac{1}{6}$.

Lesson 5-3

Experimental Probability of Compound Events

TEKS 7.6B, 7.6A, 7.6C, 7.6I, 7.1.F

Q: How do you find the experimental probability of a compound event?

A: Write a ratio of the number of ways the event happens in an experiment to the total number of times the experiment was performed.

vocab

(1) Compound event event that includes 2 or more simple events

Q: How can you find the experimental probability of getting heads when you flip 2 coins?
What is the probability of heads for each coin? 2 (coin 1) 2 (coin 2)

Simple event #1 Flipping a coin Heads or Tails

Simple event #2 Rolling a dice 1, 2, 3, 4, 5, 6

Coin	Dice	
H	1, 2, 3, 4, 5, 6	H1 H2 H3 H4 H5 H6
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Name _____ Date _____ Class _____

LESSON 5-3

Experimental Probability of Compound Events

Success for English Learners

Problem

A **compound event** includes 2 or more simple events.

Compound Event → **Event 1:** flip a coin
Compound Event → **Event 2**: toss a cube

} both **must** happen to create a compound event

A coin is flipped **and** a number cube is tossed 50 times.

compound event number of **trials**

The results are shown in the table below.

2 possible outcomes from the coin

This is an outcome for the number cube *and* the coin. The outcome was **Heads *and* 2** a total of **3 times** out of 50.

6 possible outcomes from the number cube

	1	2	3	4	5	6
Heads	4	3	6	4	4	5
Tails	3	5	2	5	3	6

1. What is the experimental probability that the next outcome will be Tails *and* 4?

   a. Look in the table to find the number for Tails *and* 4. 5

   b. Write that number over the total number of trials: $\frac{5}{50} = \frac{1}{10}$

2. What is the experimental probability that the next outcome will **not** be Heads?

   a. Look in the table to find all the outcomes for heads. Add the numbers to find the total.

   $4+3+6+4+4+5=26$

   b. In a fraction, write that number over the total number of trials.

   $\frac{26}{50} = \frac{13}{25}$

   c. Subtract that fraction from 1 to find the outcomes for "**not** heads."

   $1-\frac{13}{25} = \frac{25}{25} - \frac{13}{25} = \frac{12}{25}$

Name _____ Date _____ Class _____

LESSON 5-3

Experimental Probability of Compound Events

Reading Strategy: Make a Table

Making a table is often a good way to organize information.

If you are doing an experiment where you flip a coin and toss a number cube, recording the results in a list can be difficult to tabulate later. A table is much easier to read.

Tables work well for experiments that include one or two events.

> Ezekiel tosses a coin and rolls a number cube that has sides labeled 1 to 6. He does this 8 times. Using tick marks, he recorded his results in the table below.

	1	2	3	4	5	6
Heads			//	/		/
Tails			/		//	/

Complete.

1. Jalayne tosses a coin and spins a spinner divided into three equal sections (1, 2, and 3). She does this 20 times. The results of Jalayne's 20 trials are shown below. Make a table to display her results.

1H	3H	3T	2H	2T	1T	2H	1H	3H	1T
3H	2T	1T	3H	1H	2T	3T	3H	1T	3T

Section	Heads	Tails
1	3	4
2	2	3
3	5	3

Use the data in your table to find each experimental probability.

2. The next trial will have the outcome Tails and 3. $\frac{3}{20}$
3. The next trial will have the outcome Heads and 2. $\frac{1}{10}$
4. The next trial will have the outcome **not** Heads and **not** 2. $\frac{9}{10}$
5. The next trial will have the outcome **not** Tails. $\frac{1}{2}$

Name _____ Date _____ Class _____

LESSON 5-3

Experimental Probability of Compound Events

Practice and Problem Solving: D

Solve each problem. The first one is done for you.

1. Peter tossed a dime and a quarter at the same time. He did this 100 times. The results are shown in the table.

		Quarter	
		Heads	**Tails**
Dime	**Heads**	18	30
	Tails	32	20

What is the experimental probability that the next time he tosses the coins he will get a tails on the dime and a heads on the quarter?

a. What is the number of favorable events? **32**

b. What is the total number of trials? **18 + 30 + 32 + 20 = 100**

c. What is the experimental probability that the next time Peter tosses both coins he will get a tails on the dime and a heads on the quarter?

$$\frac{32}{100} = \frac{8}{25}$$

2. Aimee tossed a coin and spun a spinner that is divided into 3 equal sections. She did this 50 times. The results are shown in the table.

		Spinner		
		1	**2**	**3**
Coin	**Heads**	4	7	8
	Tails	12	8	11

What is the experimental probability that the next time Aimee tosses the coin and spins the spinner she will get a Tails and a 2? $\frac{8}{50} = \frac{4}{25}$

3. The Reliable Car dealership sells cars and trucks. The cars and trucks come in red, white, and silver. Damon made this table to show the cars and trucks that are on the lot today.

	Red	**White**	**Silver**
Car	45	41	46
Truck	21	24	23

What is the experimental probability that the next vehicle that comes on the lot will be a red car? $\frac{45}{200} = \frac{9}{40}$

Name _____ Date _____ Class _____

LESSON 5-3

Experimental Probability of Compound Events

Practice and Problem Solving: A/B

Solve.

1. A coin was tossed and a spinner with three equal sections numbered 1 to 3 was spun. The results are shown in the table.

	Heads	Tails
1	53	65
2	49	71
3	54	62

What is the experimental probability that the next toss and spin will result in 3 and Tails?

_____

2. A receptionist recorded the number of people who took an elevator up from his floor and the number who took an elevator down. He also noted the number of men and women. The table shows the results.

	Elevator Up	Elevator Down
Men	36	43
Women	39	42

What is the experimental probability that the next person will be a woman taking the elevator up?

_____

3. Sandwich shop customers can choose the bread and meat they want. The table shows the sandwiches that were sold on a given day.

	White Bread	Wheat Bread
Ham	22	24
Turkey	21	22
Tuna	25	23

What is the experimental probability that the next sandwich sold will be tuna on wheat bread?

_____

4. A store sells a coat in three sizes: small, medium, and large. The coat comes in red, navy, and tan. Sales numbers are shown in the table.

	Small	Medium	Large
Red	18	21	19
Navy	24	22	20
Tan	19	25	22

What is the experimental probability that the next coat sold is **not** a large navy?

_____