

7th Grade TEKS Readiness Focus

TEKS 7.6I *determine* experimental and theoretical probabilities related to simple and compound events using data and sample spaces.

Activity Directions:

Items Needed: **Probability** activity, scissors, glue, number cubes, nickels, quarters, spinners, paper clips to make spinner


1. Distribute the probability activity to partner groups.
2. Students should cut apart sample space cards and frequency table cards found at the end of the activity. Students should glue to the correct scenario. (See below.)
3. Then, each student in the partner group will conduct the experiment independently and record his/her data in two formats: in a sample space and in a frequency table. Students should compare the experimental results to the theoretical probabilities.
4. Have students practice questions coded to TEKS 7.6I.

Partner 1: _____ Partner 2: _____

Theoretical and Experimental Probability

Four experiments are described below. Find the sample space and frequency table that identify the theoretical probability in each situation. Glue to the template. Then, each partner should conduct the described experiment and record his/her results in a sample space and frequency table. Compare the theoretical probability and experimental results.


Experiment 1: Roll a fair number cube 6 times.



THEORETICAL Probability – The EXPECTED Results		EXPERIMENTAL Probability – The ACTUAL Results			
		Partner 1 Results		Partner 2 Results	
1	2	1	4	6	
2	3				6
3	4				2
4	5				6
5	6				2
6					6

Outcome	Frequency	Outcome	Frequency	Outcome	Frequency
1	1	1	1	1	0
2	1	2	0	2	1
3	1	3	1	3	0
4	1	4	2	4	0
5	1	5	1	5	2
6	1	6	1	6	2


Experiment 2: Flip a nickel and a quarter eight times.



THEORETICAL Probability – The EXPECTED Results		EXPERIMENTAL Probability – The ACTUAL Results					
		Partner 1 Results		Partner 2 Results			
HH	HT	Example: HH	TT	HT	TT		
TH	TT	HT	HH	HT	TH		
				HH	HH	HT	TH

Outcome	Frequency	Outcome	Frequency	Outcome	Frequency
HH	1	HH	2	HH	3
HT	1	HT	3	HT	2
TH	1	TH	1	TH	1
TT	1	TT	2	TT	2

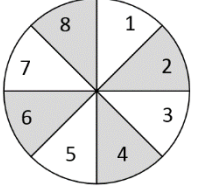
Experiment 3: Flip a quarter and roll a number cube twelve times.



THEORETICAL Probability – The EXPECTED Results		EXPERIMENTAL Probability – The ACTUAL Results			
		Partner 1 Results		Partner 2 Results	
H1 H2 H3 H4 H5	H6 T1 T2 T3 T4	T1 H4 H2 T5 H3 H2	T4 T3 H3 T4 H1 H6	H3 H2 T5 T1 H6 T4	T2 T4 T4 H5 T2 H6

Outcome	Times	Outcome	Times	Outcome	Times	Outcome	Times
H1	1	T1	1	H1	1	T1	1
H2	1	T2	1	H2	2	T2	0
H3	1	T3	1	H3	2	T3	1
H4	1	T4	1	H4	1	T4	2
H5	1	T5	1	H5	0	T5	1
H6	1	T6	1	H6	1	T6	0

Experiment 4: Spin the spinner 8 times. Use a paper clip to make the spinner. (See below.)



THEORETICAL Probability – The EXPECTED Results		EXPERIMENTAL Probability – The ACTUAL Results			
		Partner 1 Results		Partner 2 Results	
1	2	Example: 7	5	1	8
3	4				4
5	6				7
7	8				3
					1

Outcome	Frequency	Outcome	Frequency	Outcome	Frequency
1	1	1	2	1	1
2	1	2	0	2	1
3	1	3	1	3	2
4	1	4	0	4	4
5	1	5	2	5	0
6	1	6	1	6	1
7	1	7	1	7	1
8	1	8	1	8	1

TEKS 7.6i *determine* experimental and theoretical probabilities related to simple and compound events using data and sample spaces.

1. Alex spun a spinner forty times and recorded his results.

Spinner Number	1	2	3	4	5	6	7	8	9
Frequency	3	5	4	6	6	4	5	4	3

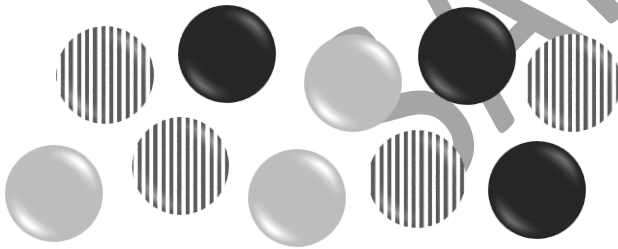
Based on Alex's results, what is the probability that the spinner will land on number 4 on the next spin?

- A. 45%
- B. 30%
- C. 15%
- D. 3%

2. Fred has a white number cube and a black number cube. The faces of the cubes are numbered 1 through 6. Fred will roll each cube one time. What is the probability that the white cube will land on an odd number, and the black cube will land on a number less than 5?

- F. $\frac{1}{3}$
- G. $\frac{1}{36}$
- H. $\frac{1}{6}$
- J. $\frac{1}{9}$

3. James is selecting a marble. His choices are shown below.



James chooses a marble at random and then replaces it. He then selects a second marble at random. What is the probability that James selects a striped marble both times?

- A. $\frac{2}{5}$
- B. $\frac{8}{100}$
- C. $\frac{4}{5}$
- D. $\frac{4}{25}$

4. Maya tosses three quarters. What is the probability that all three coins will land heads up?



- F. $\frac{1}{2}$
- G. $\frac{1}{3}$
- H. $\frac{1}{4}$
- J. $\frac{1}{8}$

5. Sandra and Marcy are playing a game by rolling two number cubes with faces numbered 1 through 6. Sandra gets a point when the product of the two numbers on the cubes is an odd number, and Marcy gets a point when the product of the numbers is less than six. The table below shows all possible products for the numbers on the cubes.

Product of Two Number Cubes

		Cube 1					
		1	2	3	4	5	6
Cube 2	1	1	2	3	4	5	6
	2	2	4	6	8	10	12
	3	3	6	9	12	15	18
	4	4	8	12	16	20	24
	5	5	10	15	20	25	30
	6	6	12	18	24	30	36

Which player is most likely to get a point on the first roll?

- A. Sandra is more likely to get a point, because $\frac{18}{36} > \frac{10}{36}$.
- B. Marcy is more likely to get a point, because $\frac{10}{36} > \frac{9}{36}$.
- C. Sandra is more likely to get a point, because $\frac{9}{36} > \frac{8}{36}$.
- D. The girls are equally likely to get a point, because $\frac{10}{36} = \frac{10}{36}$.

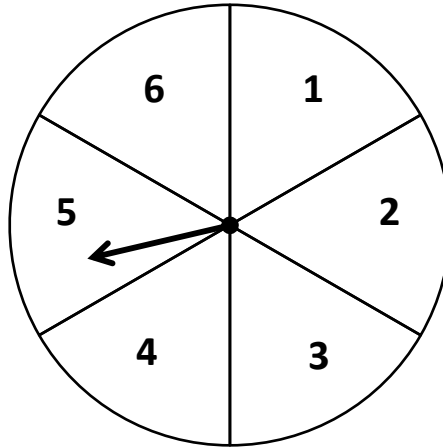
6. The probability of getting a yellow gumball from a gumball machine is $\frac{1}{12}$. The probability of getting a yellow piece of candy from a piñata is $\frac{1}{6}$. If a gumball is gathered from the gumball machine and a piece of candy is pulled from the piñata, what is the probability that both will be yellow?

- F. $\frac{1}{9}$
- G. $\frac{35}{48}$
- H. $\frac{1}{72}$
- J. $\frac{1}{18}$

7. The theoretical probability of landing on heads when a coin is flipped equals $\frac{1}{2}$. Bethany flipped a fair coin 10 times, and the coin landed on heads 4 of those times. What is the difference in the theoretical probability and the experimental probability in this situation?

- A. $\frac{3}{8}$
- B. $\frac{1}{10}$
- C. $\frac{1}{3}$
- D. $\frac{2}{5}$

8. A game spinner is shown below.



Manuel spun the spinner 8 times, and the results are shown below.

Spin 1	Spin 2	Spin 3	Spin 4	Spin 5	Spin 6	Spin 7	Spin 8
4	1	3	5	6	6	1	4

What is the difference between the theoretical probability of spinning a number greater than 4 and the experimental probability of spinning a number greater than 4?

F. $\frac{1}{24}$

G. $\frac{9}{24}$

H. $\frac{1}{3}$

J. $\frac{1}{2}$

9. Annie will choose one headband, one necklace, and one pair of earrings to wear with her prom dress.

- She has 3 white, 1 red, and 1 blue headband.
- She has 2 gold and 2 silver necklaces.
- Annie has 1 pair of gold earrings, 1 pair of silver earrings, and 1 pair of pearl earrings.

What is the probability Annie will choose a blue headband, a silver necklace, and a silver pair of earrings to wear with her prom dress?

A. $\frac{1}{10}$

C. $\frac{1}{30}$

B. $\frac{3}{10}$

D. $\frac{3}{50}$

10. Sergio has a bag containing 8 red, 6 blue, 9 green, 5 yellow, and 2 black marbles that are all the same size and shape. What is the probability of randomly choosing a black marble on the first pick, replacing the marble, and then randomly choosing a red marble on the second pick?

F. $\frac{1}{15}$

G. $\frac{4}{225}$

H. $\frac{4}{30}$

J. $\frac{4}{15}$