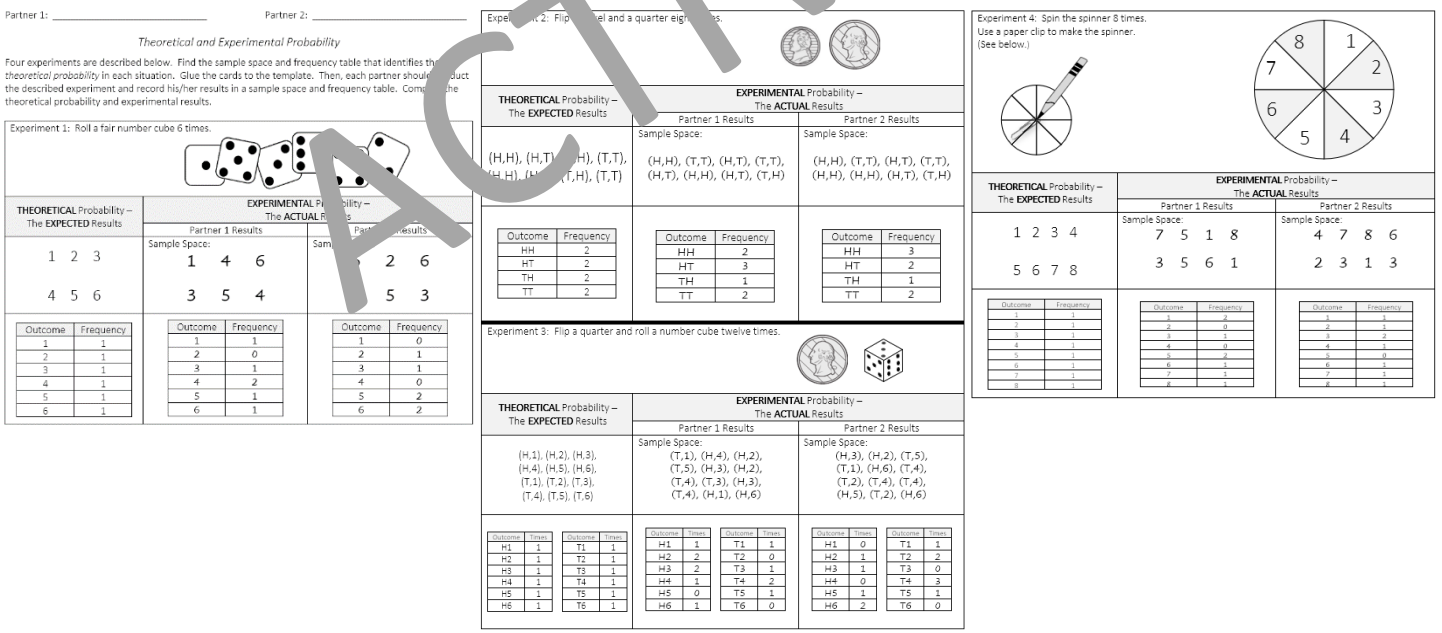
7th Grade TEKS Readiness Focus

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 the cards to the correct scenario. (An example of a completed activity is shown 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 aligned 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 identifies the *theoretical probability* in each situation. Glue the cards 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 3 4 5 6	Sample Space: 1 4 6 3 5 4	Sample Space: 2 6 5 3

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

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

Outcome	Frequency
1	0
2	1
3	1
4	0
5	2
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
(H,H), (H,T), (H,H), (T,T), (H,H), (H,T), (T,H), (T,T)	Sample Space: (H,H), (T,T), (H,T), (T,T), (H,T), (H,H), (H,T), (T,H)	Sample Space: (H,H), (T,T), (H,T), (T,T), (H,H), (H,H), (H,T), (T,H)

Outcome	Frequency
HH	2
HT	2
TH	2
TT	2

Outcome	Frequency
HH	2
HT	3
TH	1
TT	2

Outcome	Frequency
HH	3
HT	2
TH	1
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
(H,1), (H,2), (H,3), (H,4), (H,5), (H,6), (T,1), (T,2), (T,3), (T,4), (T,5), (T,6)	Sample Space: (T,1), (H,4), (H,2), (T,5), (H,3), (H,2), (T,4), (T,3), (H,3), (T,4), (H,1), (H,6)	Sample Space: (H,3), (H,2), (T,5), (T,1), (H,6), (T,4), (T,2), (T,4), (T,4), (H,5), (T,2), (H,6)

Outcome	Times
H1	1
H2	1
H3	1
H4	1
H5	1
H6	1

Outcome	Times
T1	1
T2	1
T3	1
T4	1
T5	1
T6	1

Outcome	Times
H1	1
H2	2
H3	2
H4	1
H5	0
H6	1

Outcome	Times
T1	1
T2	0
T3	1
T4	2
T5	1
T6	0

Outcome	Times
H1	0
H2	1
H3	1
H4	0
H5	1
H6	2

Outcome	Times
T1	1
T2	2
T3	0
T4	3
T5	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 3 4 5 6 7 8	Sample Space: 7 5 1 8 3 5 6 1	Sample Space: 4 7 8 6 2 3 1 3

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

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

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

Name _____ Date _____

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

TEKS 7.6I Mini-Assessment

1. A number cube with faces labeled 1-6 was rolled 40 times. Each time the number cube was rolled, the number showing on the top face was recorded. The table shows the results.

Results

Number on Top Face of Cube	1	2	3	4	5	6
Frequency	6	5	8	6	8	7

Based on these results, what is the experimental probability that the next time the cube is rolled it will land with 3 or 4 showing on the top face?

Ⓐ $\frac{7}{20}$

Ⓑ $\frac{7}{40}$

Ⓒ $\frac{1}{5}$

Ⓓ $\frac{3}{20}$

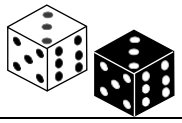
2. Fred has a white number cube and a black number cube. The faces of the cubes are numbered 1 through 6. Fred will roll each cube one time. What is the theoretical probability that the white cube will land on an odd number, and the black cube will land on a number less than 5?

Ⓐ $\frac{1}{36}$

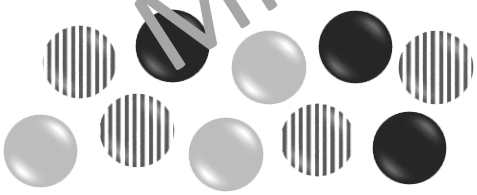
Ⓑ $\frac{1}{6}$

Ⓒ $\frac{1}{3}$

Ⓓ $\frac{1}{2}$



3. James has ten marbles. He will randomly select 2 marbles from the group one at a time, without replacement.



What is the probability that James will select a striped marble both times?

Ⓐ $\frac{4}{25}$

Ⓑ $\frac{3}{25}$

Ⓒ $\frac{2}{5}$

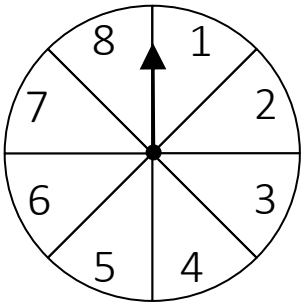
Ⓓ $\frac{2}{15}$

4. Maya will toss two quarters.

What is the probability in decimal form that both coins will land heads up?

Enter your answer in the space provided.

5. A spinner with 8 equal sections is shown.



What is the probability in decimal form of spinning a 1, 5, or 7?

Enter your answer in the space provided.

6. A bag contains colored tiles.

- 7 tiles are red
- 9 tiles are green
- 4 tiles are blue

A tile will be selected at random from the bag. What is the probability that the tile selected will NOT be blue?

Ⓐ $\frac{7}{20}$

Ⓑ $\frac{4}{5}$

Ⓒ $\frac{1}{5}$

Ⓓ $\frac{3}{4}$

7. Kelvin has two number cubes. The faces of each number cube are numbered 1 to 6. Kelvin rolled the number cubes and recorded the number showing on the top face of each number cube. The results are shown below.

2, 1	5, 6	1, 2	4, 5	6, 4	3, 1
2, 3	6, 4	3, 5	1, 1	5, 6	2, 5
1, 5	4, 1	5, 6	3, 6	6, 4	4, 2
4, 4	6, 1	2, 3	5, 2	1, 5	3, 3

Based on these results, which statements are true?

Select TWO correct answers.

- ☐ The probability of the next roll landing on a 5 on one number cube and landing on a 3 on the other number cube is $\frac{1}{24}$.
- ☐ The probability of the next roll landing on a 2 on one number cube and landing on a 3 on the other number cube is $\frac{1}{6}$.
- ☐ The probability of the next roll landing on a 4 on both number cubes is $\frac{1}{36}$.
- ☐ The probability of the next roll landing on an even number on both number cubes is $\frac{5}{24}$.
- ☐ The probability of the next roll landing on numbers less than 4 on both number cubes is $\frac{1}{4}$.

8. Mr. Lanz has a bag of coins. The bag contains –

- 5 quarters
- 1 dime
- 3 nickels
- 6 pennies

Mr. Lanz will randomly select 2 coins from the bag one at a time without replacement. What is the probability he will select a penny first and then a quarter?

Ⓐ $\frac{2}{15}$

Ⓑ $\frac{11}{15}$

Ⓒ $\frac{1}{7}$

Ⓓ $\frac{11}{29}$

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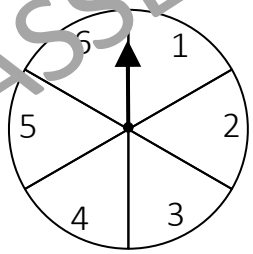
9. A game spinner divided into 6 equal sections is shown.



Manuel spun the spinner 6 times, and his results are shown in the table.

Spin Results

Spin 1	Spin 2	Spin 3	Spin 4	Spin 5	Spin 6
5	3	1	3	4	2

Based on these results, what is the experimental probability that the next time Manuel spins the game spinner it will land on number 6?

Enter your answer in the space provided.

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.
- 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?

Ⓐ Sandra is more likely to get a point, because $\frac{18}{36} > \frac{10}{36}$.

Ⓑ Marcy is more likely to get a point, because $\frac{10}{36} > \frac{9}{36}$.

Ⓒ Sandra is more likely to get a point, because $\frac{9}{36} > \frac{8}{36}$.

Ⓓ The girls are equally likely to get a point, because $\frac{10}{36} = \frac{10}{36}$.