Name_____Date_____

Theoretical and Experimental Probability
Explore – Answer Key

Directions: Roll two dice, find the sum, and complete the table. Then, compile the data on the tally chart on the following page. Finally, answer the questions below.

Answers may vary. Possible answers are below.

Sum Game

Trial	Die #1	Die #2	Sum
1	2	1	3
2	4	2	6
3	3	3	6
4	1	4	5
5	6	5	11
6	5	6	11
7	2	2	4
8	4	3	7
9	3	4	7
10	1	5	6
11	6	6	12
12	5	1	6
13	2	3	5
14	4	4	8
15	3	5	8
16	1	6	7
17	6	1	7
18	5	2	7
19	2	4	6
20	4	5	9

Sum Game – Tally Chart

Sum	Tally
1	
2	
3	I
4	I
5	I I
6	ⅠⅠⅠⅠⅠ
7	ⅠⅠⅠⅠⅠ
8	I I
9	I
10	
11	I I
12	I

Debriefing Questions:

1. List all possible sum values from the Sum Game:

   2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12

2. Why did some sums appear more often than others during the Sum Game?

   Some sums have more possibilities. For example, to roll a sum of 6, you could roll a 1 and 5, a 2 and 4, or two 3s.

3. For the sum of 7, what possible dice combinations are there?

   1 and 6, 2 and 5, 3 and 4

Class Data

Sum	Theoretical Probability (What SHOULD Happen)	Experimental Probability (What DID Happen)
1	$\dfrac{0}{36}$	
2	$\dfrac{1}{36}$	
3	$\dfrac{2}{36}$	
4	$\dfrac{3}{36}$	
5	$\dfrac{4}{36}$	
6	$\dfrac{5}{36}$	
7	$\dfrac{6}{36}$	
8	$\dfrac{5}{36}$	
9	$\dfrac{4}{36}$	
10	$\dfrac{3}{36}$	
11	$\dfrac{2}{36}$	
12	$\dfrac{1}{36}$	

4. According to the theoretical probability, which sum should occur the most often? How do you know?

   The sum of 7 has the greatest probability since $\dfrac{6}{36}$ is the greatest fraction in the list.

5. According to the class data, which sum occurred the most often? How does this compare with the prediction from theoretical probability?

   Answers will vary, but the class data should yield a 6, 7, or 8 most often.