Date _____

1.3 Roll the Bones

Focus: theoretical probability, experimental probability, number sense

Chapter 1

Warm Up

1. Write 3 equivalent fractions for $\frac{1}{4}$.

2. Write each fraction as a decimal.

$\frac{1}{4}$ = $\frac{1}{5}$ =

3. Write each fraction in lowest terms.

$\frac{4}{12}$ = $\frac{6}{18}$ =

4. There are 15 students in a class. Five are girls. Write the fraction of the class that is girls in lowest terms.

5. The bar graph shows attendance at a movie theatre for 1 week.

a) How many people saw the movie on Wednesday?

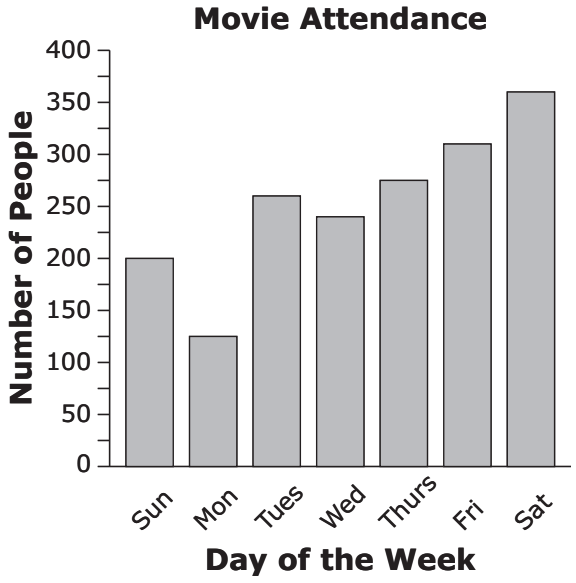
_____

b) How many people saw the movie on Friday?

_____

c) How many people saw the movie last week?

_____



Rolling Dice

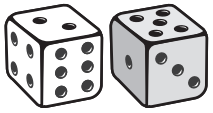
1. Suppose you roll 2 dice.

a) What is the smallest total you can get? _____

b) What is the greatest total you can get? _____

c) How many different totals are possible? _____

d) If you roll a pair of dice 50 times, predict the number of times that the total will be 7. _____



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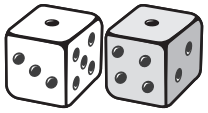
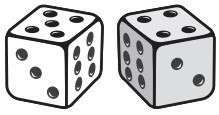
2. a) Roll 2 dice *exactly* 50 times. Add the 2 numbers showing. Record the number of times each total occurs.



Sum of the Dice	Tally	Total Times Rolled
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		



b) Create a bar graph showing your results.

- Include a title.
- Title the *y*-axis, Total.
- Title the *x*-axis, Sum of the Dice.
- Choose an appropriate scale for the *y*-axis.

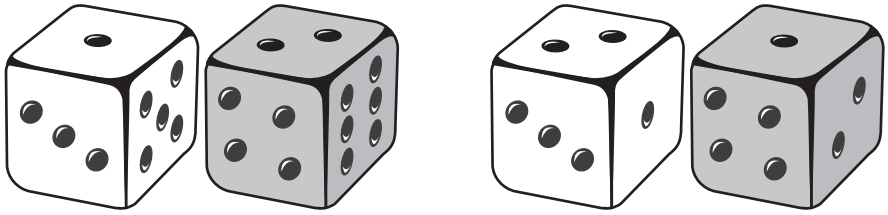
c) Did you roll each of the sums an equal number of times? YES _____ NO _____

d) Suggest some reasons for your answer.

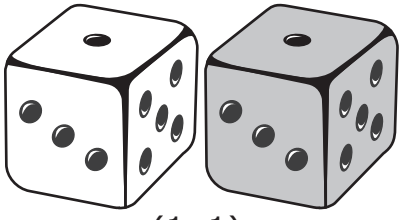
_____

_____

- There is only 1 way to roll a 2 with 2 dice. You need a 1 on each die.
- There are 2 ways to roll a 3. You can have a 1 on the first die and a 2 on the other. Or, you can have a 2 on the first die and a 1 on the other.



3. a) Determine all the possible combinations for rolling 2 dice. Example:



(1, 1)

Sum of the Dice	Possible Combinations	Number of Combinations
2	(1, 1)	1
3	(1, 2) (_____, _____)	2
4		
5		
6		
7		
8		
9		
10		
11		
12		
	Total Number of Combinations	

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b) Create a bar graph showing the Sum of the Dice versus Number of Combinations.
- Include a title.
- Title the *y*-axis, Number of Combinations.
- Title the *x*-axis, Sum of the Dice.
- Choose an appropriate scale for the *y*-axis.

c) Which sum has the highest theoretical probability of being rolled? _____

d) Does your answer to part c) match your experimental results? YES _____ NO _____

e) Why do you think this is the case?

_____

_____

_____

4. When you roll 2 dice, list all of the combinations that make a sum of 7 or greater.

_____

_____

_____

5. a) Complete the table.

- Write the fractions in lowest terms.
- Round each percent to the nearest whole number.

Sum of the Dice	Number of Combinations	Fraction of the Total Number of Combinations	Percent of the Total Number of Combinations
2	1	$\frac{1}{36}$	2.777 = 3%
3	2		
4			
5			
6			
7			
8			
9			
10			
11			
12			
Total			

Tech Tip:
Suppose that you made 5 rolls. You rolled 2 twice. Use your calculator to show $\frac{2}{5}$ as a percent. If your calculator has a [%] key, enter 2 [÷] 5 [%] 2 is 40% of 5.

b) List the pairs of sums that have the same theoretical probability of occurring.

_____

c) The likelihood of rolling a total of 3 with 2 dice is the same as the *total* of the likelihood of rolling 2 other combinations. What are those 2 combinations?

_____ and _____

d) As a percent, what is the chance of rolling 2 dice and obtaining a total of 7 or greater? _____

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6. a) Add all of the class's results from #2a) and record the data in the appropriate row of the tally column. Calculate the percent of the total for each sum.

Sum of the Dice	Class Tally	Percent of Total
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
	Total For Class Results	

b) Graph the results.
- Include a title.
- Title the *y*-axis, Percent of Total.
- Title the *x*-axis, Sum of the Dice.

☑ Check Your Understanding

1. Which graph is closer in shape to the graph in #3?

The graph in #2 or the graph in #6? _____

2. Why do you think this is so?

_____

_____