Answers

1. a) Explain your opinion. b) 19 c) 20 d) 9

2. $16.\overline{6}\%$

3. a) \$25 b) \$2.50/pound

Formative

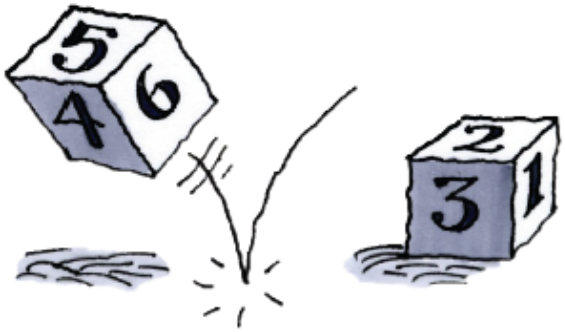
4. a) 0 b) -127

5. a) $1\frac{1}{9}$ b) 8

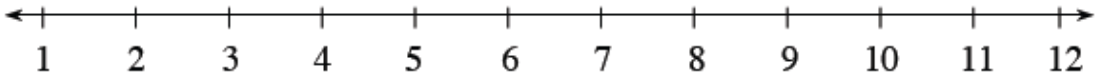
Summative

TEN O's

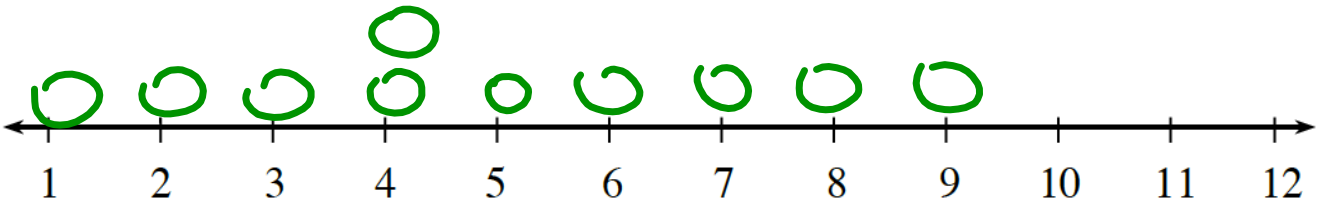
In this game, you will create a strategy to play a board game based on your predictions of likely outcomes. You will place ten O's on a number line. Then your teacher will roll two number cubes and add the resulting numbers. As your teacher rolls the number cubes and calls out each sum, you will cross out an O over the number called. The goal of the game is to be the first person to cross out all ten of your O's.



Talk with your team about the possible outcomes of this game. Then draw a number line like the one below on your own paper. Place a total of ten O's on your number line. Each O should be placed above a number. You should distribute them based on what results you think your teacher will get. More than one O can be placed above a number.



Follow your teacher's instructions to play the game.



Gerald's strategy for the Ten O's game was to place an O on each number from 1 to 10. He was frustrated that his strategy of placing his ten O's was not working, so he decided to analyze the game.

Gerald began by trying to create a table to list all of the possible combinations of rolls. He made the table at right.

Did he list them all? If so, how can you be sure that they are all there? If not, give examples of a few that he has missed.

Cube 1	Cube 2
1	1
2	2
3	3
4	4
5	5
6	6
1	2
2	3
3	4
4	5
5	6
1	3
2	4
3	5
4	6
1	4
2	5
3	6
1	5
2	6
1	6
3	2
6	1

Many more..difficult to know when we have the entire list.

56. Gerald decided that this method was taking too long, that it was too confusing, and that he made too many mistakes. Even if he listed all of the combinations correctly, he still had to find the sums and then find the theoretical probabilities for each one. Inspired by multiplication tables, he decided to try to make sense of the problem by organizing the possibilities in a **probability table** like the one shown at right.

+	1	2	3	4	5	6
1	2	3	4	5	6	7
2	3	4	5	6	7	8
3	4	5	6	7	8	9
4	5	6	7	8	9	10
5	6	7	8	9	10	11
6	7	8	9	10	11	12

a. How does Gerald's table represent the two events in this situation? What should go in each of the empty cells? Discuss this with your team and then complete Gerald's table on your own paper.

b. How many total possible number combinations are there for rolling the two cubes? Is each combination listed equally likely? That is, is the probability of getting two 1's the same as that of getting two 2's or a 3 and a 1?

36 possible outcomes.

c. How many ways are there to get each sum? Are there any numbers on the game board that are not possible to achieve?

d. What is the theoretical probability for getting each sum listed on the Ten O's game board?

One way to get 2, two ways to get 3, three ways to get 4, four ways to get 5, five ways to get 6, six ways to get 7, five ways to get 8, four ways to get 9, three ways to get 10, two ways to get 11, one way to get 12. The sum of 1 is not possible.

e. Now work with your team to determine a better strategy for Gerald to place his ten O's on the game board that you think will help him to win this game. Explain your strategy and your reasoning.

Strategies vary, but should place more O's over sums with higher probabilities such as 5 through 9.

5-57. Gloria and Jenny each have only one O left on their game board. Gloria's O is at 6, and Jenny's is at 8. Which student is more likely to win on the next roll? Explain.

They are equally likely because there are the same number of ways to get as to get .