

About Probability and Statistics...

What is probability?

The “probability” that something will happen is the likelihood or relative chance of that event taking place.

Probability can be expressed in terms of a fractional value: 1/10 means that there is one chance in 10 that some event will occur. This fraction can also be expressed as a decimal value between 0.0 and 1.0. When the probability is 0.0 the event can absolutely never happen. When the probability is 1.0 is always happens. When the probability is 0.5, it happens about half the time.

Probability can be expressed in terms of a percentage value: 10 %. (read “ten per cent”) That also means that there is a one chance in 10 that some event will occur.

What are statistics?

Statistics are data collected to describe the probability that certain events will occur. You could collect data about how many people drink milk, juice or something else for lunch. Collect data for a week or so. Then you can predict the number of students that will be drinking milk for the next week.

Solutions...

Step 1: The sum of values on the die.

		Value of Dice #1					
		1	2	3	4	5	6
Val ue of	1	2	3	4	5	6	7
	2	3	4	5	6	7	8
	3	4	5	6	7	8	9
Dic e #2	4	4	6	7	8	9	10
	5	6	7	8	9	10	11
	6	7	8	9	10	11	12

Step 3: Likelihood of total roll value.

Combined value of dice.	Number of different ways to get that combined value	Likelihood if we roll the dice 72 times. (2 times number of possibilities)
2	1	2/72
3	2	4/72
4	3	6/72
5	4	8/72
6	5	10/72
7	6	12/72
8	5	10/72
9	4	8/72
10	3	6/72
11	2	4/72
12	1	2/72

Lunchbox Math Bytes

easy to digest mathematics for your lunchbox

Probability and Statistics

Part 2: Rolling Dice

You will need to pack:

- 1 Pencil
- 2 6-sided game dice

©1997 Meg Noah, Permission to duplicate granted for “not for profit” educational purposes

Probability

Probability

Figuring out the probability of rolling a particular number with 2 dice.

Step 1: Write down all the possible combinations of rolls. Write down the sum of the two dice values for each possible combination.

		Value of Dice #1					
		1	2	3	4	5	6
Value of Dice #2	1						
	2						
	3						
	4						
	5						
	6						

Step 2: Write down the number of possible combinations:

The number of possible outcomes for each dice is 6.

Total Number of Combinations =
Number for Dice #1 * Number For Dice #2

Total Number of Combinations = $6 * 6 = 36$. Notice that this is the number of squares in the table.

Step 3: Write down the number of times each combination occurs in the table. (The center column below.)

Combined value of dice.	Number of different ways to get that combined value	Likelihood if we roll the dice 72 times. (2 times number of possibilities)
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		

Step 4: The probability of a rolling a particular combined value (2 - 12) is the number of different ways to get that value divided by the total number of combinations. For reasonable statistics, we would roll the dice over 1000 times. The probability curve will still be approximated even for 72 rolls which is 2 times the number of different ways to get each value. Multiply the values in the middle column by 2 and write them in the third column.

Step 5: Test the dice by rolling a pair 72 times and filling in a square on the histogram (bar chart). See whether you get values close to the expected number. (Expected value is shaded)

Number of Times Value Was Rolled.

