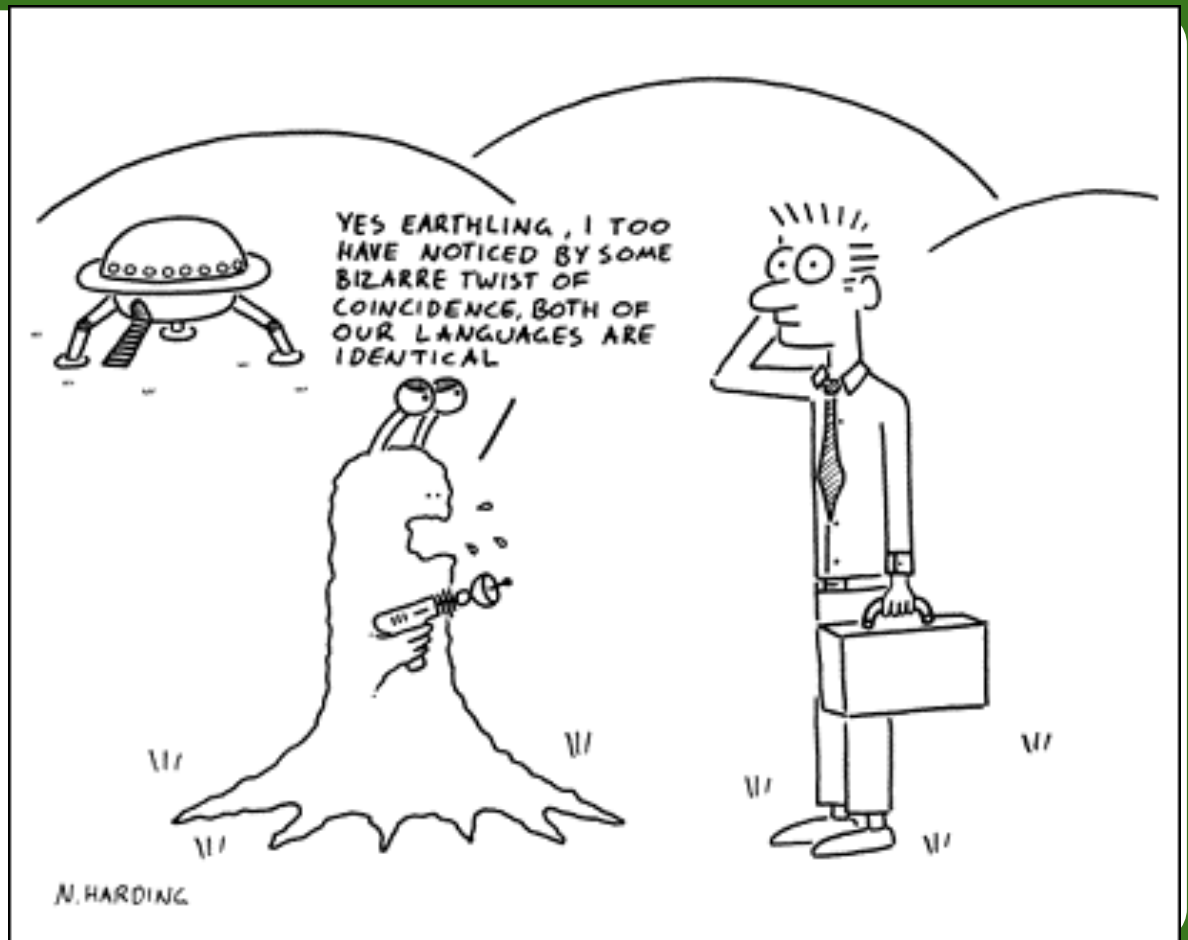# Probability and Statistics

May 28th and 29th, 2013

_____ out of _____

Example statistics:

**95 out of 100 students in New Orleans wear uniforms to school.
Nationally, only 23 out of 100 students wear uniforms.**

**1 out of 4 employees steal from their employer at least once.
1 out of 30 retail workers is arrested for workplace theft.
The median amount stolen is $175, 000.**

http://www.statisticbrain.com/employee-theft-statistics/

Dice

A die has six sides.

Only one result is

possible at a time.

Sample questions:

How many possible outcomes are there?

Is the probability of rolling an even number

a. greater than the probability rolling an odd number.

b. less than the probability of rolling an odd number.

c. equal to the probability of rolling an odd number.

What is the probability of rolling an odd number?

What is the probability of rolling a two?

Cards

There are 52 cards in a deck.

There are four suits: spades, diamonds, hearts, and clubs.

In every suit there are 13 cards.

The probability of pulling any specific card is 1/52 or one out

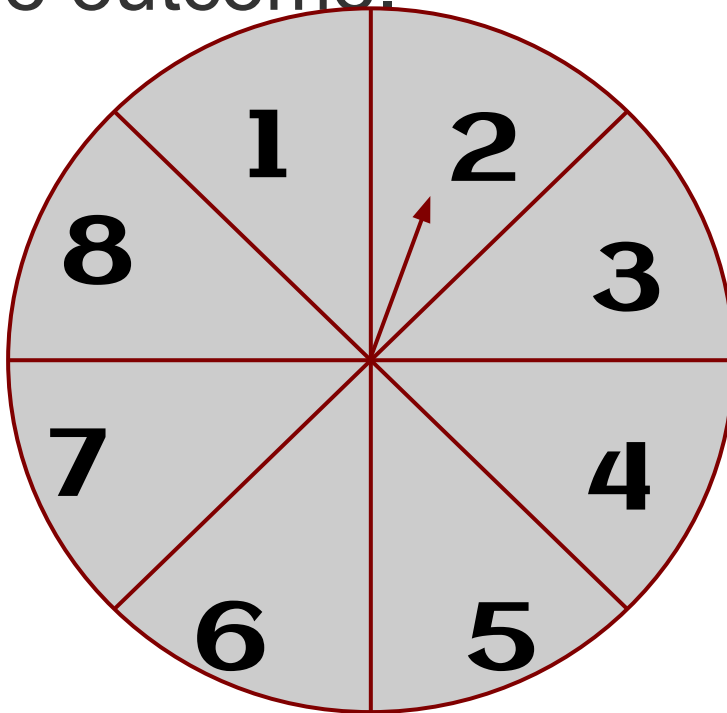of fifty-two. The probability of pulling a specific suit is 13/52 or 1/4.

Sample questions: What is

the probability of pulling a four?

What is the probability of pulling a

red card?

Spinners

When a spinner is used, there is only one possible outcome.

There is a 1/8 chance that the arrow will land on any particular number.

There is a 4/8 or 1/2 chance that the spinner will land on an odd number.

Sample questions:
What is the chance the spinner will land on an even number?

What is the chance that the spinner will land on a number greater than five?

What is the chance the spinner will land on a number less than or equal to six?

Boxes of Stuff:

What is most likely to happen?

certain-likely-unlikely-impossible

In the box there are 4 packets of duck sauce, 1 packet of soy sauce, and 2 packets of hot mustard.

If you were to stick your hand in this box and pull out one of the packets, which of the following statements would be true;

a. you are certain to pull out a pack of duck sauce.

b. It is most likely that you will pull out a packet of hot mustard.

c. It is as equally likely that you will pull out a soy sauce as a duck sauce.

d. It is impossible to pull out a ketchup packet.

Converting Fractions to Percentages

Fractions can be easily converted into percentages.

Fraction problems are division problems in disguise.

Fractions can be expressed as decimals simply by dividing the numerator by the denominator.

And decimals become percents by moving the decimal point to the right twice and adding a % symbol.

For example

3/4 (three out of four) equals 3 divided by 4

3 divided by 4 equals 0.75

0.75 equals 75%
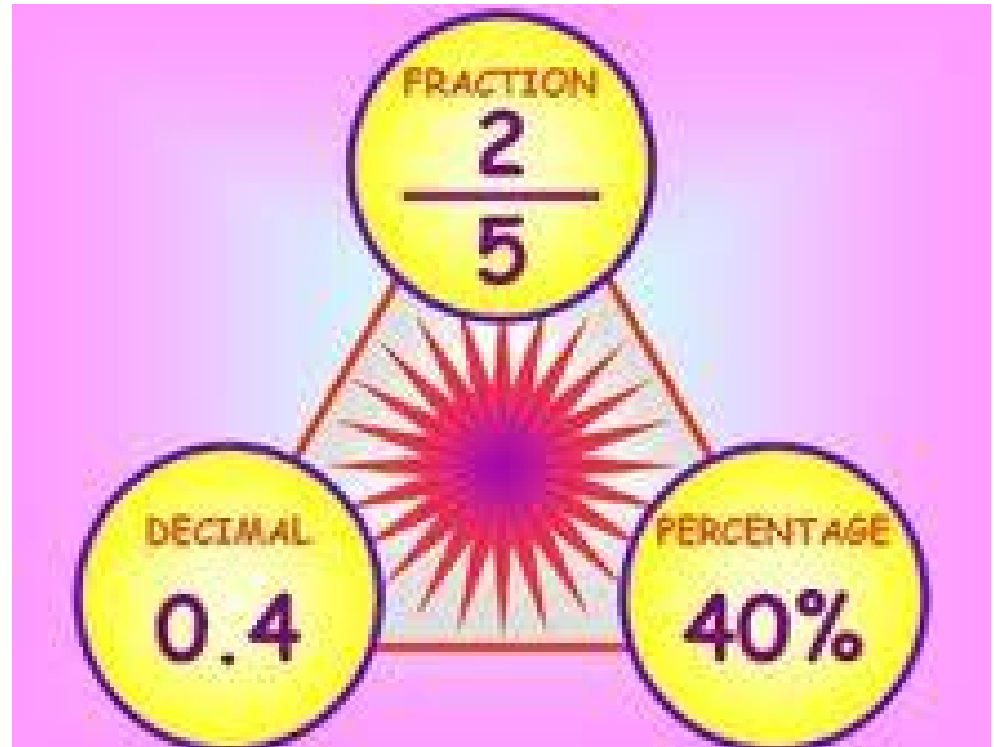
Here are the standard equivalencies you should remember.

1/10 = 0.1 = 10%

1/4 = 0.25 = 25%

1/2 = 0.5 = 50%

3/4 = 0.75 = 75%

1/100 = 0.01 = 1 %

Statistical analysis: Average, Mode, Median, and Range

http://www.youtube.com/watch?v=erwqUNkVNL4

Mean and average are the same thing.

add- count- divide

Mode

arrange-count

Median

arrange-find the middle

Range

arrange-subtract
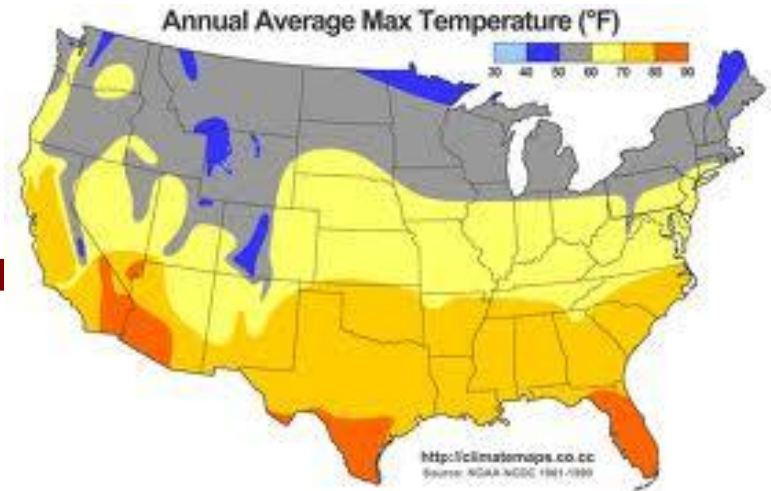
Average/mean

add-count-divide

$$\frac{(\text{sum of all numbers in the set})}{(\text{number of items in the set})}$$

For example: Lebron James scored the following number of points in the last five games:

24, 27, 32, 18, 24.

His average is 24+27+32+18+24 divided by 5= 125 divided by 5 = 25 points per game.

Mode

arrange-count

The mode is the most often occurring number in a set. There can be no mode or more than one mode.

For example: Lebron James scored the following number of points in the last five games:

24, 27, 32, 18, 24.

If I rearrange the numbers, I can see that 24 is on the list twice; therefore, it occurs most often.

*18, **24**, **24**, 27, 32*

Median or the middle

arrange-find the middle

If a set has an odd number of items, simply put the numbers in order from least to greatest and then, identify the middle number.

If a set has an even number of items, simply put the numbers in order from least to greatest and identify the middle two numbers. The average of the middle two numbers is the median of a set with an even number of items.

Even vs. odd medians

Find the median of
(23, 4, 6, 67, 10, 12)
First
(4, 6, 10, 12, 23, 67)
Second
(4, 6, **10, 12,** 23, 67)
Third
(10+12= 22)   (22/2=11)
The median is eleven.

Find the median of
(23, 45, 22, 67, 44)
First
(22, 23, 44, 45, 67)
Second
(22, 23, **44,** 45, 67)
The median is 44.

Range

To find the range of a set of numbers, put the numbers in order from least to greatest and then subtract the smallest number from the biggest.

Find the range of the following set of numbers

(34, 12, 3, 8, 94, 69, 34, 65)

 First

(3, 8, 12, 34, 34, 65, 69, 94)

Second

(94-3)= 91 The range is 91.