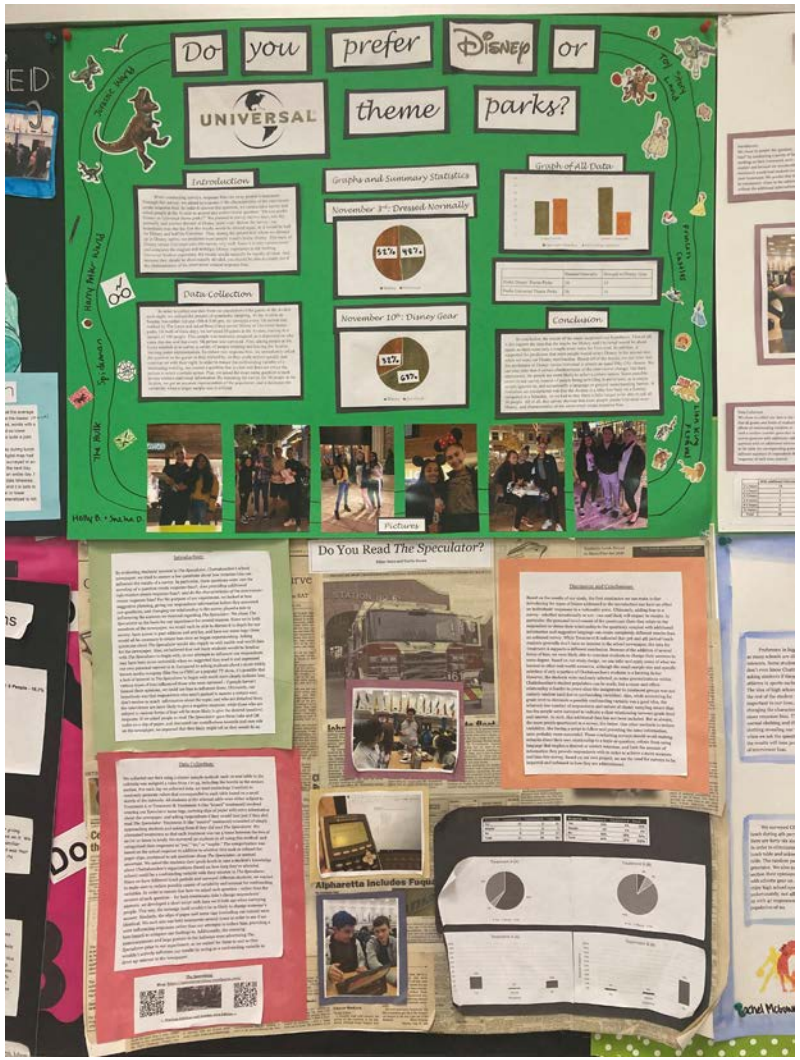
AP Statistics



What the College Board says....

The AP Statistics course is an excellent option for any secondary school student who has successfully completed a second-year course in algebra and who possesses sufficient mathematical maturity and quantitative reasoning ability.

Because second-year algebra is the prerequisite course, AP Statistics usually will be taken in either the junior or senior year. The decisions about whether to take AP Statistics and when to take it depend on a student's plans:

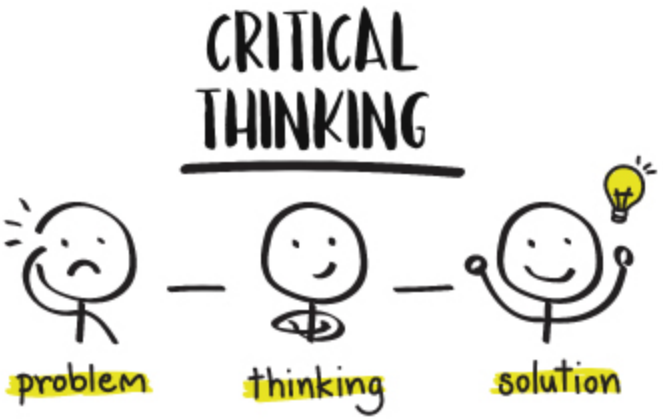
- Students planning to take a science course in their senior year will benefit greatly from taking AP Statistics in their junior year.
- For students who would otherwise take no mathematics in their senior year, AP Statistics allows them to continue to develop their quantitative skills.
- Students who wish to leave open the option of taking calculus in college should include precalculus in their high school program and perhaps take AP Statistics concurrently with precalculus.

Students with the appropriate mathematical background are encouraged to take both AP Statistics and AP Calculus in high school.

What We've Seen....

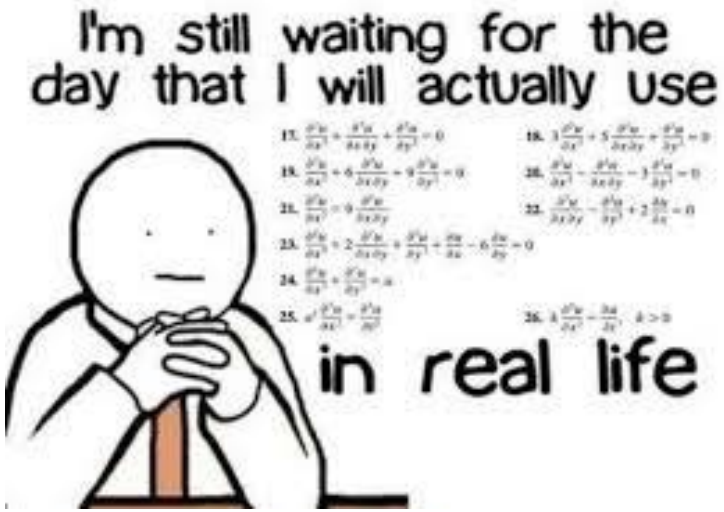
Success in AP Stats depends on:

- oGood math skills (Accel Geometry or Algebra II)
- oWillingness and ability to read/write
- oCritical thinking skills – analyze, interpret, compare
- oInterest in applied math (real world scenarios)



Why AP Statistics?

- ✓Stats helps us in the “information age”
- ✓Stats is required by more college majors than calculus
- ✓Stats doesn’t mean you can’t take calculus
- ✓Stats is not covered well in other courses
- ✓Stats is valued in the “real world”
- ✓Stats is relevant to students……



In today's world...

…we are constantly being bombarded with statistics and statistical information. For example:

Customer Surveys Medical News

Political Polls Economic Predictions

Marketing Information Scanner Data

How can we make sense out of all this data?

How do we differentiate valid from flawed claims?

What is Statistics?!

What is Statistics?

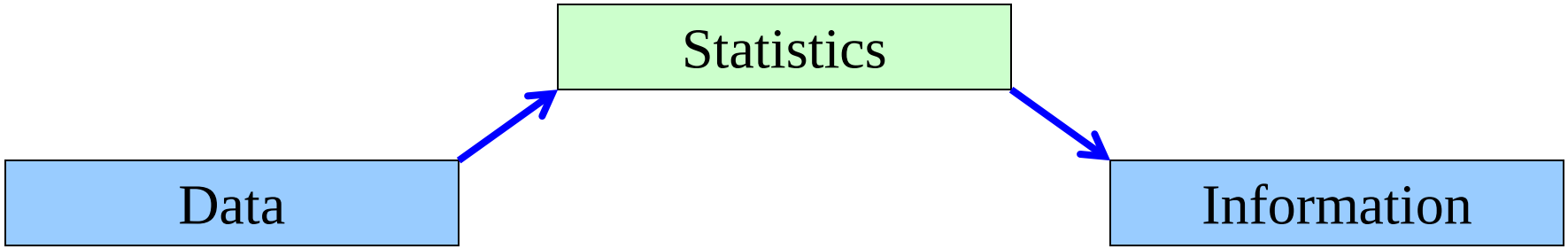
"Statistics is a way to get information from data.

That's it!"

-Gerald Keller

What is Statistics?

"Statistics is a way to get information from data"



Data: Facts, especially numerical facts, collected together for reference or information.

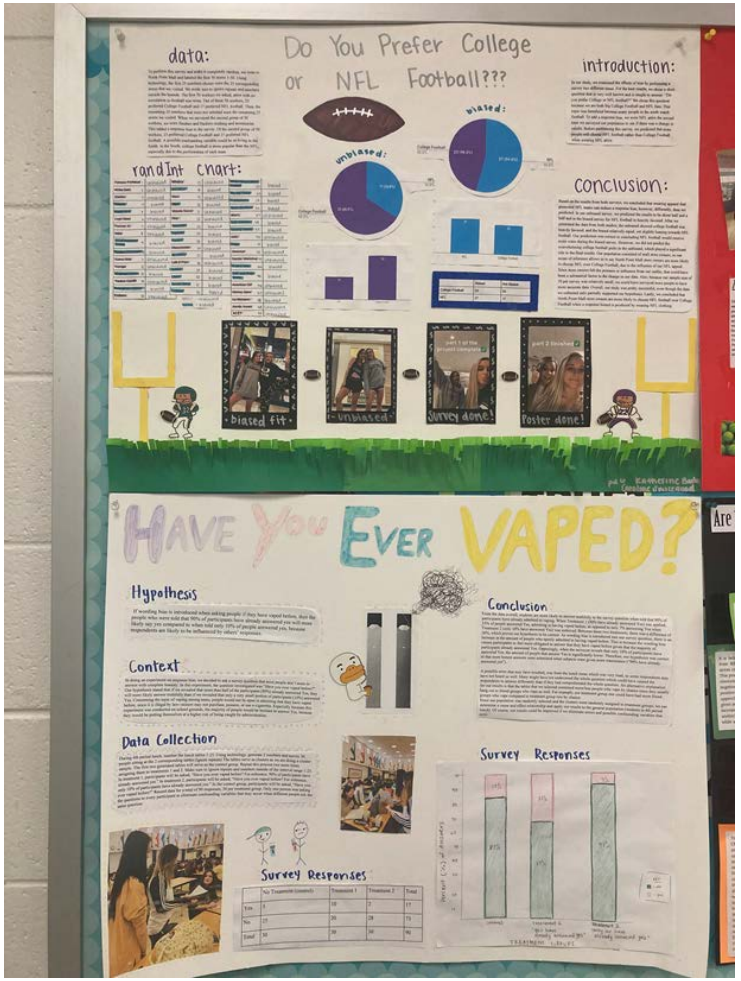
Information: Knowledge communicated concerning some particular fact.

Statistics is a ***tool*** for creating ***new understanding*** from a set of numbers.

Definitions: Oxford English Dictionary

Main Topics

1. Descriptive Statistics
2. Survey & Experimental Design
3. Probability
4. Inferential Statistics



Descriptive Statistics...

…are ***methods*** of organizing, summarizing, and presenting data in a convenient and informative way. These methods include:

Graphical Techniques, and

Numerical Techniques

The actual method used depends on what ***information*** we would like to extract. Are we interested in…

- measure(s) of central location? and/or
- measure(s) of variability (dispersion)?

Descriptive Statistics helps to answer these questions…

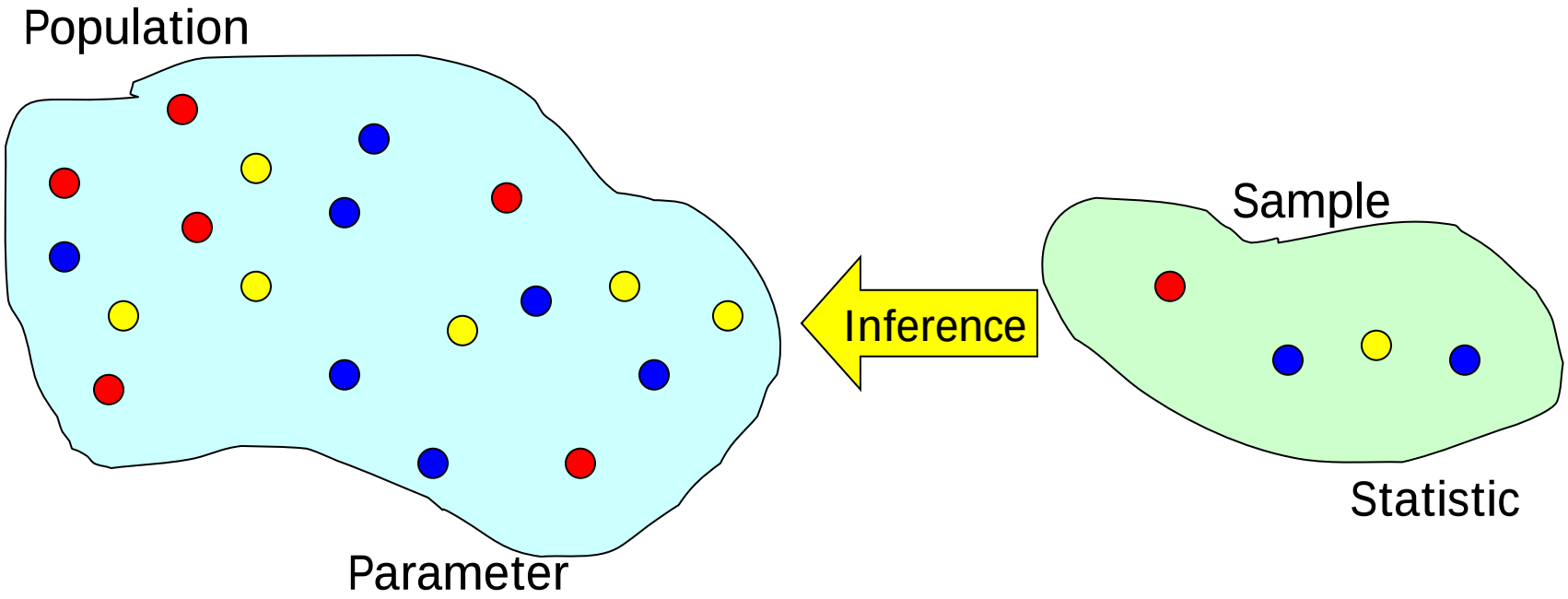
Inferential Statistics...

Descriptive Statistics describe the data set that's being analyzed but doesn't allow us to draw any conclusions or make any interferences about the data. Therefore we need another branch of statistics: ***inferential statistics***.

Inferential statistics is also a set of methods, but it is used to draw conclusions or inferences about characteristics of ***populations*** based on data from a ***sample***.

Statistical Inference...

Statistical inference is the ***process*** of making an estimate, prediction, or decision about a population based on a sample.



What can we ***infer*** about a Population's Parameters based on a Sample's Statistics?

Statistical Inference...

Rationale:

- Large populations make investigating each member impractical and expensive.
- Easier and cheaper to take a sample and make estimates about the population from the sample.

However:

Such conclusions and estimates are not always going to be correct.

For this reason, we build into the statistical inference "measures of reliability", namely **confidence level** and **significance level.**

Confidence & Significance Levels...

Consider a statement from polling data you may hear about in the news:

“This poll is considered accurate within 3.4 percentage points, 19 times out of 20.”

In this case, our confidence level is 95% (19/20 = 0.95), while our significance level is 5%.

Statistical Applications ...

Statistical analysis plays an important role in virtually ***all*** enterprises these days.

Throughout this course, we will see applications of statistics in….. marketing,

medicine,

operations,

human resources,

politics,

and education.