

INTRODUCTION TO STATISTICS

How can I become a statistical thinker?

WHAT IS STATISTICS?

It's all about...

DATA

Aug 19-9:39 AM

WHAT IS DATA?

- DATA ARE NUMBERS IN CONTEXT
- THE CONTEXT ALLOWS US TO:
 - ENGAGE BACKGROUND KNOWLEDGE
 - GAIN INSIGHT INTO TOPICS
 - MAKE JUDGEMENTS AND CONCLUSIONS

Aug 19-9:46 AM

Statistical Thinking

- Data Illuminates
 - > Can change attitudes
- Data Beat Anecdotes
 - > Anecdotes can be misleading
- Beware of lurking variables
- Consider the source
- Variation is everywhere
 - > We need a way to deal with this
- Conclusions are not certain

Aug 19-9:49 AM

IN CONCLUSION...

STATISTICS GIVES US A LANGUAGE FOR TALKING ABOUT UNCERTAINTY.

I WILL TEACH YOU THIS LANGUAGE- IT WILL BE A LOT OF READING AND WRITING!

***WE CAN'T ESCAPE VARIATION AND UNCERTAINTY, BUT UNDERSTANDING STATISTICS ENABLES US TO LIVE MORE COMFORTABLY WITH THAT REALITY**

Aug 19-9:54 AM

TIPS FROM 5'S

1. Actually listen when taking guided notes. It's easy to just look for the words you need, but really listen.
2. Do math and every bit of the homework! It's a pain in the butt but it really helps. And when you feel like you got the hang of it, practice some more.
3. Ask questions. Stats can be confusing so ask questions, even if you think they are dumb.
4. Stay persistent. There are so many different types of tests in stats so if you don't get it the first time, just try and look at the problem a different way.
5. Use your resources. Mrs. Butler is here for a reason, use her. Ask questions, come in for tutoring, do test corrections, every little bit helps.
6. Show up for class

Homework- Read Chapters 1-2.

Against All Odds video 1

Aug 22-8:50 PM

Think-Pair-Share

Take a minute or two to discuss your reading from ch.1-2. We will take the reading quiz very soon.

Make sure you have signed up for AP Classroom and turned in your parent letter

Aug 20-9:09 PM

Unit 1: Exploring One-Variable Data

Objectives:

Identify questions to be answered based on one-variable data.

Classify types of variables

What are data?

Data are values along with their context.

Data can be numbers or labels.

Aug 12-8:37 PM

In order to determine the context of data, consider the "W's"

WHO: (who were studying)
Cases people → participants/subjects
 things → experimental units

WHAT (and in what units):
Variables categorical
 quantitative

WHEN:
When the data was collected

WHERE:
location data was collected from

WHY:
purpose for data collection

HOW:

Aug 12-8:37 PM

There are two major ways to treat data:

- A Categorical/Qualitative variable is used to answer questions about how cases fall into categories or groups. A categorical variable may be comprised of word labels, or it may use numbers as labels.

Order #, types of movies, colors

Examples?? Political party

- A quantitative variable is used to answer questions about the quantity of what is being measured or counted. A quantitative variable is comprised of numeric values.

price, quantity, height, gallons, weight, age

Examples??

Aug 12-8:37 PM

way to understand the world
What is a statistic?

estimate of a parameter

Population (everyone) → describe w/ parameter

Sample (portion of pop.) → statistic

Are the numbers 17, 21, 76 data?
no → no context

Data must have Context to be meaningful. The numbers listed above could be test scores, ages of a group of golfers, or the uniform numbers of the starting backfield on the football team. Without Context data cannot be interpreted.

Aug 12-8:37 PM

What is a statistic- Estimate of a population parameter

examples include: mean, median, st. dev. etc.

***This information for a population is called a parameter. This information for a sample is called a statistic.

Aug 18-10:31 AM

Suppose a Consumer Reports article (published in June 2005) on energy bars gave the brand name, flavor, price, number of calories, and grams of protein and fat. Identify the following:

WHO: Energy Bars

WHAT (and in what units):

WHEN:

WHERE:

WHY:

HOW:

CATEGORICAL VARIABLE:

QUANTITATIVE VARIABLE & UNITS:

Aug 12-8:37 PM

A report on the Boston Marathon listed each runner's gender, county, age, and time. Identify the following:

WHO:

WHAT (and in what units):

WHEN:

WHERE:

WHY:

HOW:

CATEGORICAL VARIABLE:

QUANTITATIVE VARIABLE & UNITS:

Aug 12-8:37 PM

Practice

Because of the difficulty of weighing a bear in the woods, researchers caught and measured 54 bears, recording their neck size, length, and sex. They hoped to find a way to estimate weight from the other, more easily determined quantities.

1. The 5 W's:

Who: Bears

What: neck size (Q)

length (Q) sex (C)

When: N.S.

Where: woods

Why: find a way to estimate weight

How:

2. Identify whether each variable is categorical or quantitative, and for any quantitative variable, identify the units in which it was measured (or note that they were not provided).

hi

Aug 14-1:08 AM

One of the reasons that the Monitoring the Future (MTF) project was started was "to study the changes in the beliefs, attitudes, and behavior of young people in the United States." Data are collected from 8th, 10th, and 12th graders each year. To get a representative sample, surveys are given to a randomly selected group of students. In Spring 2004, students were asked about alcohol, illegal drug, and cigarette use. Describe the W's, if the information is given. If the information is not given, state that it is not specified.

WHO:

WHAT (and in what units):

WHEN:

WHERE:

WHY:

HOW:

Aug 18-7:58 PM

Consider the following part of a data set:

| Age (years) | Sex | Only child? | Height (inches) | Weight (pounds) | Credit Hours | GPA | Major |
|-------------|--------|-------------|-----------------|-----------------|--------------|------|----------------|
| 21 | Female | Yes | 67.00 | 140.0 | 16 | 3.60 | animal science |
| 20 | Female | No | 62.00 | 130.0 | 18 | 3.86 | biology |
| 28 | Female | No | 64.00 | 188.0 | 21 | 3.25 | psychology |
| 21 | Male | No | 65.00 | 140.0 | 15 | 2.95 | psychology |
| 24 | Female | No | 67.00 | 130.0 | 20 | 3.00 | anthropology |
| 22 | Male | Yes | 68.00 | 135.0 | 15 | 2.94 | journalism |

List the variables in the data set. Indicate whether each variable is treated as categorical or quantitative in this data set. If the variable is quantitative, state the units.

Against All Odds: Introduction to Stats

<https://www.learner.org/resources/series65.html#>



Aug 18-8:01 PM



Assignment

- 1) Pg. 16-17 #1, 3, 15, 18, 26
- 2) Read pg. 20-24 by Friday and ch. 4 by class on Tuesday! Take notes and highlight your vocabulary!

Aug 13-8:27 PM

Warm-Up

The U.S. Department of Energy conducts weekly surveys of 800 gasoline stations to determine the average price per gallon of regular gasoline. On May 14, 2001, the average price was \$1.713 per gallon.



1. The 5 W's:

Who: 800 Gas stations

What: ^{avg.} Price per gallon (\$) *Quantitative - \$*

When: May 14, 2001

Where: N.S.

Why: Determine avg. pp gallon of regular gasoline

How: Survey

2. Is the data collected quantitative or categorical? What would the units be?

3. Was this data taken from a population or a sample?

Sample

Aug 13-8:19 PM

Aug 12-8:39 PM