

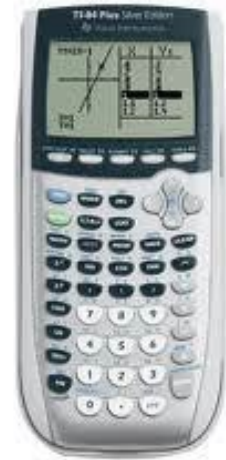


Eastlake High

School AP

Statistics

Summer Packet



Displaying and Describing Data

Note: Due to our late start date relative to other states and the EHS bell schedule, we have less seat time than most schools. Therefore, I'm asking you to work on Chapter 1 over the summer.

Please take this packet seriously! There will be a test on this information during the second week of the year. Because you want to have the information fresh in your mind, but don't want to procrastinate, I would suggest starting the data collection for your project (see page 2) immediately but start the rest at the beginning of August. I would also review the material the week before school starts. Make sure you understand this material and if not, ask questions!

You will turn in the work for the Summer Packet on the first day of school. If you have questions, contact Mr. Emerson at gemerson@lwsd.org

Our First Project: Getting to Know You

To get to know you better, I would like you to collect some data this summer about yourself. This project will be assigned the first week of classes. **DO NOT DO THE PROJECT IN THE SUMMER!** You are merely collecting the data. This data should tell me something important about who you are. You will choose two variables to track—one categorical and one quantitative. Many times, students do not choose data that makes sense in the context of this project, so I've provided you with ideas that work. **READ THE TEXT IN THE BOX CAREFULLY!!**

Examples of data that work:

- Categorical (should be able to display with a bar graph or pie chart):
 - How many books you've read of each of several genres (eg I read 7 anime books, 4 romance novels, etc)
 - How many times you listened to each of several different artists (eg I listened to Taylor Swift 483 times this summer, Beyonce 12 times, etc)
 - How many pieces of different kinds of art you've created (eg I did 4 acrylic paintings, 3 charcoal drawings, etc)
 - How many times you visited various countries (eg I've been to Spain twice, Canada 4 times, etc)
- Quantitative (should be able to display with a boxplot, histogram, or similar and have a meaningful average):
 - The number of pushups you do each day (eg I did 50 pushups on 3 days, 25 pushups on 8 days, etc.)
 - The Rotten Tomatoes ratings for the movies you watched (eg I watched 3 movies with ratings of 79, 1 with a rating of 91, etc)
 - The number of hours spent on your phone each day (eg I spent 22 hours on my phone on 3 days, 19 hours on my phone on 2 days, etc)

NOTE: IF THE BEST DISPLAY FOR YOUR DATA IS A TIMEPLOT OR SCATTERPLOT, YOU'RE NOT TAKING ONE-VARIABLE DATA AND YOU NEED TO THINK OF SOMETHING ELSE!

What is AP STATISTICS?

Course Description

AP Statistics is a college level course in statistics. Credit or placement at most universities can be earned through a score of 3 or higher on the Advanced Placement Statistics Exam offered in May. Course topics include: graphical and numerical summaries of data sets, techniques for establishing confidence intervals and testing hypothesized parameter values. In addition, students learn to perform surveys and conduct and analyze experiments involving one or two variables. Students will need a Graphing Calculator which includes a statistics packet which coordinates with the existing curriculum (TI 83+ or TI 84+).

Outline: The four major topics as outlined by the College Board are carefully followed:

1. Exploring Data: Observing patterns and departures from patterns
2. Planning a Study: Deciding what and how to measure
3. Anticipating Patterns: Producing models using probability and simulation
4. Statistical Inference: Confirming models

This course requires students to analyze data, make connections and draw conclusions using statistics. Students in the class are organized into small groups to facilitate exploration, discovery and discussion. Students will learn to use technology to explore data and create multiple representations from which they can draw conclusions.

Specific technology used in this class includes: TI-83 or TI-84 graphing calculators, Excel spreadsheet software, and Fathom Statistical software. Students will communicate their understanding of statistics in writing through projects, quizzes, exams and papers.

Learning Targets for Chapter 1

1. I can identify the individuals and the variables in a set of data.
2. I can classify a variable as categorical or quantitative.
3. I can make a bar graph or a pie chart to represent the distribution of a categorical variable.
4. I can identify what makes some graphs deceptive.
5. I can calculate the marginal and conditional distributions from a two-way table.
6. I can describe the relationship between two categorical variables.
7. I can create side-by-side and segmented bar graphs to display the relationship between two categorical variables.
8. I can create a dotplot or a stemplot to display a small set of quantitative data. I can create a histogram or boxplot by hand or using my calculator.
9. I can describe the distribution of a set of quantitative variables using SOCS.
10. I can calculate measures of center (mean, median) and spread (standard deviation, IQR) by hand or using my graphing calculator.
11. I can interpret measures of center and spread in the context of a real-world situation.
12. I can use the $1.5 \times \text{IQR}$ rule to identify outliers.
13. I know when to use the mean vs. the median and the standard deviation vs. the IQR.
14. I can use appropriate graphs and numerical summaries to compare distributions of quantitative data.
15. I can identify major trends in time plots and understand that they are NOT univariate (so I should never use SOCS to describe them!).

[Please fill out this survey to let us know how you did with the learning targets!](#)

Deliverables: What will I submit to my AP Statistics teacher the first week of classes to earn credit for the summer packet assignment?

1. Handwritten or typed notes from the instructional video links which are hand chosen to meet the learning targets listed above.
2. A complete list of vocabulary words defined. Visuals can also be helpful for new learners. Feel free to print out the vocab sheets on the next few pages or simply record the terms and definitions on a separate sheet of paper.
3. Complete the assigned problems listed on the last page of this packet on separate sheets of paper, title each page for the specific section and number your problems. Do not forget to check your answers using the keys provided within the inline textbook!

Read Chapter 1 of the online textbook starting on page 40 and take notes. Use the videos linked on the next page to help you answer any questions.

Video Links

[Types of variables](#)

[Pie charts and bargraphs](#)

[Misleading graphs](#)

[Marginal and Conditional Distributions](#)

[Mosaic Plots](#)

[Segmented Bar Graphs](#)

[Dotplots](#)

[Making a stem and leaf plot \(plus how to sort your data\)](#)

[Shape, center and spread](#)

[Entering and displaying data on your calculator](#)

[Histograms](#) (in general)

[1-Variable Statistics](#)

[1-Variable Statistics from a Frequency Table](#)

[Creating a Histogram from a Frequency Table](#)

[Finding outliers](#)

[Box and whiskers plots](#) (you can use Zoom 9 to get a good window instead of changing it by hand!)

[Understanding standard deviation](#) (kinda long, but this guy is pretty entertaining...)

[Example of standard deviation by hand](#)

[Timeplots](#)

Vocabulary

AP Statistics is a **VERY** vocab-intensive class! If you do not pay careful attention to the definitions and understand the meanings of the key terms, you will not be successful! Often, the terms in question are similar, so paying attention to detail will be critical. I advise keeping a running glossary for yourself throughout the year. Please define the following key terms from Chapter 1:

Individuals/Experimental units:

Variable:

Categorical variable:

Quantitative variable:

Distribution of a variable:

These terms are specific to one-variable, quantitative variables

Left-skewed/Right-skewed:

Unimodal:

Bimodal:

Vocab, continued

Standard Deviation (write the formula and explain its meaning—very important!):

Variance (this won't feel important now, but it is!):

Frequency:

Relative Frequency:

Cumulative Relative Frequency Distribution:

Two-way Table:

Marginal Distribution:

Conditional Distribution:

Joint relative frequency:

Association:

Time Plot (*this is NOT in the textbook, but does show up on the exam often enough that I want you to know it):

Notes from Chapter 1

Write down anything you think is important to remember from this chapter. You should also write down any questions you have here.

Problems to Try

[Here is a link to the textbook](#)

The text we need starts on page 40. Answers start on page 1480.

Introduction: Do questions 1 – 9 (odd)

Section 1.1: #13 – 35 (odd)

Section 1.2: #45, 51, 55, 59, 63, 65, 69, 77

Section 1.3: #87 – 97 (odd, skip 93), 101 – 115 (odd, skip 107), 121

[Please take this survey so that we can get to know you](#)

DON'T FORGET THE LEARNING TARGET SURVEY!