

AP Statistics Summer Assignment

The following assignment should be done over the summer. Some material may seem like a review, while other aspects may be new. **DO NOT LEAVE THIS UNTIL THE WEEK BEFORE SCHOOL!** It will take too long!

THIS ASSIGNMENT IS DUE THE FIRST DAY OF SCHOOL!

Part 1: ***The Joy of Stats*** with Professor Hans Rosling

The creator of the following video, Professor Hans Rosling, states on the site: “Gapminder is a non-profit foundation based in Stockholm. Our goal is to replace devastating myths with a fact-based worldview. Our method is to make data easy to understand...” Rosling uses innovative methods to present and display data and statistics.

Your assignment is to watch the video and **answer the questions below**.
(Feel free to watch more of the videos, most are short and interesting.)

Go to the website <http://www.gapminder.org/videos/> and watch the video *The Joy of Stats*.

- 1) What was the mean number of correct answers given by Swedish students to the questions:
‘Which country has the highest child mortality rate?’
- 2) In displaying data on global health, what does the size of a country’s bubble indicate?
- 3) What are two benefits of public statistics?
- 4) The word ‘statistics’ is derived from what word?
- 5) The first systematic collection of statistics is what document?
- 6) Along with average, when reporting data, what other value is important?
- 7) Which distribution models the number of buses that appear in a given hour?
- 8) Who used a polar area graph to display data?
- 9) What analytical method explores meaning and relationships within data?
- 10) What is a zettabyte?
- 11) Other than the internet, identify 3 technologies used to gather massive amounts of data.
- 12) How many bananas were eaten worldwide in the time it took to watch the video?

Part 2: Vocabulary

These terms are used throughout the year, and by learning these definitions over the summer, we will have more time in class to cover all the necessary material before the AP exam.

Define the following terms (see below for the website). When asked, provide a sketch or UNIQUE example for the word (it should not be the one from the website). Take your time to complete this assignment, as many of these words may be a review of concepts you've learned in previous math courses and you will need to know them!

- a) Go to www.stat Trek.com
- b) Click on "AP Statistics" and then "AP Tutorial"
- c) The left side of the screen lists out general topics. Under each general topic are subtopics. You will use the "Exploring Data" general topic, and "The basics" and "Charts and graphs" subtopics.
- d) Read through the descriptions for each term. There is an optional video to watch as well for each topic.

DEFINITION	EXAMPLE/FORMULA/SKETCH
Categorical variables (qualitative variables)	
Quantitative variables	
Discrete variables	
Continuous variables	
Univariate data	

Bivariate data	
Population	
Sample	
Median	
Mean	
Outlier	
Parameter	
Statistic	

Range	
Z-score (standard score)	
Center	
Spread	
Variance	
Standard deviation	
Symmetric distribution	
Unimodal distribution	

Bimodal distribution	
Skewedness/Skewed Distribution	<i>Skew left:</i> <i>Skew right:</i>
Uniform Distribution	
Gaps in a distribution	
Dotplot	
Bar chart/Graph	
Histogram	
Difference between bar chart and histogram	

Stemplot	
Boxplot	
Quartiles	
Interquartile range	
Four ways to describe data sets	
Types of graphs that can be used for comparing data	

Part 3: Practice Problems

Determine if the variables listed below are quantitative or categorical.

1. Time it takes to get to school
2. Number of people under 18 living in a household
3. Hair color
4. Temperature of a cup of coffee
5. Teacher salaries
6. Gender
7. Smoking
8. Height
9. Amount of oil spilled
10. Age of Oscar winners
11. Type of depression medication
12. Jellybean flavors
13. Country of origin
14. Type of meat
15. Number of shoes owned

A statistic is a number calculated from data. Quantitative data has many different statistics that can be calculated. Determine the following statistics from the data below on the number of homeruns Derek Jeter hit in each season of his career, from 1995-2014.

0	10	10	19	24
15	21	18	10	23
19	14	12	11	18
10	6	15	1	4

16. Mean

17. Minimum

18. Maximum

19. Median

20. Q_1

21. Q_3

22. Range

23. IQR

24. Draw a boxplot of the data.

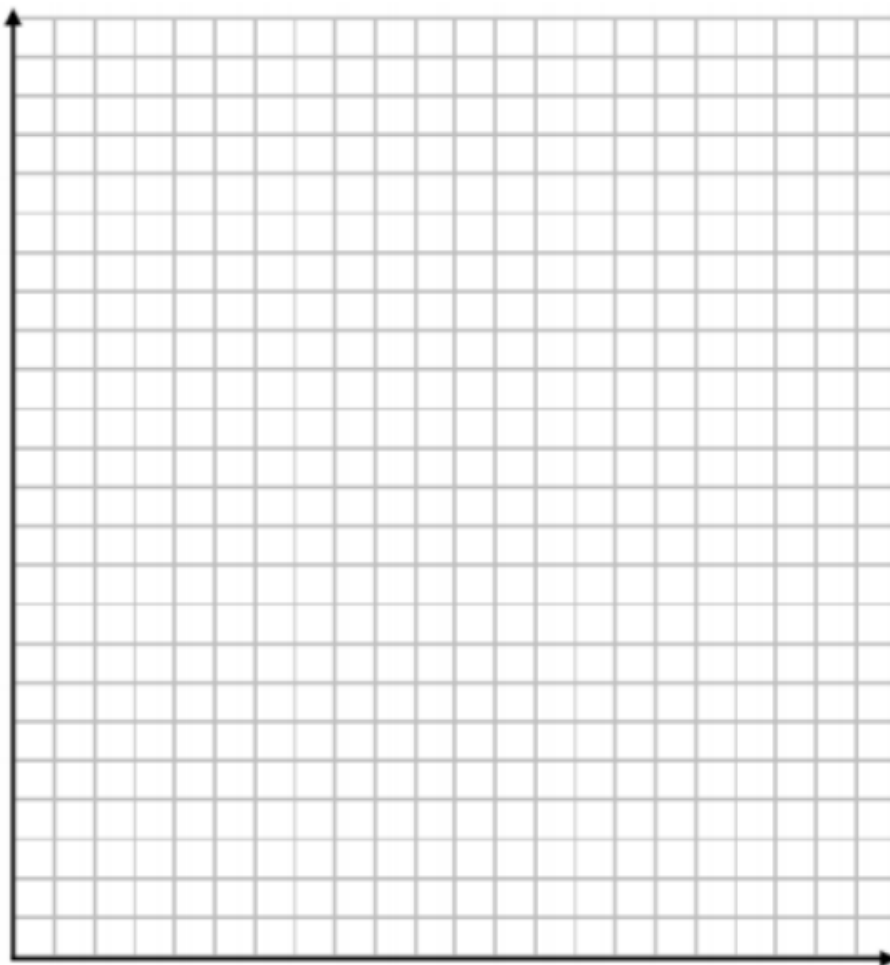


Histograms are a way to display groups of quantitative data into "bars." They must have the same width and scale and are touching because the number line is continuous. To make a histogram, first decide on an appropriate bar width and count how many observations are in each. There is a chart started below.

27. The table below gives the percentages of residents aged 65 or older in each of the 50 states.

State	Percent	State	Percent	State	Percent
Alabama	13.1	Louisiana	11.5	Ohio	13.4
Alaska	5.5	Maine	14.1	Oklahoma	13.4
Arizona	13.2	Maryland	11.5	Oregon	13.2
Arkansas	14.3	Massachusetts	14.0	Pennsylvania	15.9
California	11.1	Michigan	12.5	Rhode Island	15.6
Colorado	10.1	Minnesota	12.3	South Carolina	12.2
Connecticut	14.3	Mississippi	12.2	South Dakota	14.3
Delaware	13.0	Missouri	13.7	Tennessee	12.5
Florida	18.3	Montana	13.3	Texas	10.1
Georgia	9.9	Nebraska	13.8	Utah	8.8
Hawaii	13.3	Nevada	11.5	Vermont	12.3
Idaho	11.3	New Hampshire	12.0	Virginia	11.3
Illinois	12.4	New Jersey	13.6	Washington	11.5
Indiana	12.5	New Mexico	11.4	West Virginia	15.2
Iowa	15.1	New York	13.3	Wisconsin	13.2
Kansas	13.5	North Carolina	12.5	Wyoming	11.5
Kentucky	12.5	North Dakota	14.4		

Complete the frequency chart, then construct a histogram to display these data.



Bar Width	Frequency
$5 \leq x < 6$	1
$6 \leq x < 7$	0
$7 \leq x < 8$	0
$8 \leq x < 9$	1
$9 \leq x < 10$	1

Algebra Practice

This is a formula that is used often in AP Statistics, where z is what is known as the z -score, but we get to that later in the year.

$$Z = \frac{x - \mu}{\sigma}$$

28. If $z = 2.5$, $x = 102$, and $\mu = 100$, find σ . Show work.

29. If $z = -3.35$, $x = 60$, and $\sigma = 4$, find μ . Show work.

30. If $\mu = 7$, $x = 10$, and $\sigma = 0.6$, find z . Show work.

It is expected that you have an understanding of linear functions.

31. The USDA reported in 1990 that each person in the US consumed an average of 133 pounds of natural sweeteners. They also claim that this amount has decreased by about 0.6 pounds each year.

a) Write a linear equation that relates years since 1990 to the average consumption of natural sweeteners. Define your variables.

b) What is the slope and what is the y -intercept?

c) Predict the average consumption of sweeteners per person for the year 2025.