AP Statistics
Vocabulary Ch. 1- 2

Chapter 1
Data
Individuals
Categorical Variables
Data Analysis
Frequency Table
Relative Frequency Table
Pie Chart
Bar Graph
Two-way Table
Marginal Distributions
Conditional Distributions
Dot Plot
Stemplot
Histogram
SOCS
Symmetric
Skewed Left
Skewed Right
Mean
Median
Variability
Quartiles
Interquartile Range (IQR)
1.5(IQR) Rule
5-number summary
Boxplot
Range
Variance
Standard Deviation
Mosaic Plot

Chapter 2
Percentile
Cumulative relative frequency graph
Ogive
Standardized Score (z-score)
transforming data
density curve
median of a density curve
mean of a density curve
Normal curves
Normal Distributions
68-95-99.7 rule
Standard normal distribution
Standard normal table
Normal probability plot

AP Statistics Vocabulary Ch. 3 – 4

Chapter 3

Scatterplots
Explanatory Variable
Response Variables
Direction (positive, negative, no linear association)
Form (linear, curved, cluster, other)
Strength
Outliers
Correlation (r)
Regression line
Predict y from a given x
Interpret y-intercept in context
Interpret slope in context
Extrapolation
Least-squares regression line
Residuals
Residual plot
Standard deviation of the residuals
Coefficient of determination (r^2)
High leverage point
Outlier
Influential point
CORRELATION **DOES NOT IMPLY** CAUSATION!!!!
Transforming to achieve linearity
Power model
Exponential Model

Chapter 4

Population vs. Sample
Census
Sample Survey
Inference
Convenience Sample
Voluntary Response Sample
Bias
Random sampling
Random Numbers and the Random Digit Table
Simple Random Sample (SRS)
Strata
Stratified Random Sample
Cluster Sample
Undercoverage
Nonresponse
Response Bias
Question wording
Observational Study
Experiment
Confounding
Treatment
Systematic Random Sampling
Subject
Experimental Unit
Explanatory Variable (Factor)
Response Variable
Principles of Experimental Design
Comparison
Random Assignment
Control
Replication
Completely Randomized Design
Placebo Effect
Single-Blind
Double-Blind
Statistically Significant
Block
Randomized Block Design
Matched Pairs Design
Inference about a Population
Inference about Cause and Effect
Lack of Realism
Establishing Causation
Ethics of Collecting Data

Note: Be very careful to distinguish the **vocabulary of sampling methods** from the **vocabulary of experimental design.**
Many of these terms can seem to be interchangeable but THEY ARE NOT!!!

AP Statistics
Vocabulary Ch. 5 & 6

Chapter 5

Randomness
Probability
Simulation
Law of Large Numbers
Probability model
Sample Space
Probability rules
Event
Probability notation
Disjoint events
Independent Events
Two-way table
Tree diagram
Venn diagram
Conditional probability
General addition rule
General multiplication rule
Intersection
Union

Chapter 6

Random Variable
Mean of a Random Variable
Standard deviation of a Random Variable
Variance of a Random Variable
Expected Value
Random Variable notation
Rules for multiplying Random Variables by a constant
Rules for adding or subtracting a constant to Random Variables
Normal Distribution as a Probability Distribution
Adding or Subtracting Random Variables
Discrete Random Variable
Continuous Random Variable
Independent Random Variables
Interpret the mean of a Random Variable
Interpret the standard deviation of a Random Variable
Probability distribution
Effects of a Linear Transformation on a Random Variable
Mean of the sum or difference of two Random Variables
Variance of the sum or difference of two Random Variables
Combining Normal Random Variables
Binomial Distribution
The Binomial Setting
Binomial Random Variables
Binomial Probabilities
Binomial Coefficient
Binomial Probability Formula
Factorial
Mean of a Binomial Distribution
Standard deviation of a Binomial distribution
10% Condition
Normal approximation to the Binomial distribution
Large Counts condition

AP Statistics
Vocabulary Ch. 7 & 8

Chapter 7

Parameter
Statistic
Population distribution
Distribution of sample data
Sampling distribution
Unbiased estimator
Biased estimator
Variability
Sampling distribution of $\hat{p}$

Mean $\mu_{\hat{p}} = p$

Standard deviation $\sigma_{\hat{p}} = \sqrt{\frac{p(1-p)}{n}}$

10% condition
Normal approximation $np \geq 10$ and $n(1-p) \geq 10$
Sampling distribution of $\bar{x}$

Mean $\mu_{\bar{x}} = \mu$

Standard deviation $\sigma_{\bar{x}} = \frac{\sigma}{\sqrt{n}}$

Central Limit Theorem

Chapter 8

Point estimator
Point estimate
C% confidence interval
Confidence Level
"We are C% confident that the interval ___ to___ captures the (parameter in context)
Margin of error
Margin of error effected by confidence level and sample size
Conditions for CI for proportions: Random, 10% if sampling without replacement, Large count ($n\hat{p}$ *and* $n(1-\hat{p})$ both greater than 10)

Confidence interval for proportion $\hat{p} \pm z^* \sqrt{\frac{\hat{p}(1-\hat{p})}{n}}$

State, Plan, Do, Conclude

Margin of Error $\geq z^* \sqrt{\frac{\hat{p}(1-\hat{p})}{n}}$

Standard error for sample proportion $\sqrt{\frac{\hat{p}(1-\hat{p})}{n}}$

Sampling distribution of difference of sample proportions: $p_1 - p_2$

Conditions for confidence interval procedures about difference in population proportions:

For large count use: $n_1\hat{p}_1$, $n_1(1-\hat{p}_1)$, $n_2\hat{p}_2$, $n_2(1-\hat{p}_2)$ need to be at least 10.

Standard error of the statistic $\sqrt{\frac{\hat{p}_1(1-\hat{p}_1)}{n_1}+\frac{\hat{p}_2(1-\hat{p}_2)}{n_2}}$

Two-sample z interval for difference in population proportions:

$$\hat{p}_1 - \hat{p}_2 \pm z^* \sqrt{\frac{\hat{p}_1(1-\hat{p}_1)}{n_1}+\frac{\hat{p}_2(1-\hat{p}_2)}{n_2}}$$

AP Statistics
Vocabulary Ch. 9 – 10

Chapter 9

Significance test
Hypotheses
Null hypothesis
Alternative hypothesis
P-Value
Statistically significant
Significance level
One-sided alternative hypothesis
Two-sided alternative hypothesis
Type I Error
Type II Error
Power of the test (What increases/decreases power?)
Test statistic
Four-step process for significance tests

One-sample z test for a proportion: $z = \dfrac{(\hat{p} - p_o)}{\sqrt{\dfrac{p_o(1-p_o)}{n}}}$

Conditions for performing a significance test about a population proportion:

For large count use np_o, $n(1-p_o)$ need to be at least 10.

Two-sided tests and confidence intervals
Interpreting Type I and Type II errors in context

Conditions for significance test procedures about difference in population proportions:

For large count use: $n_1\hat{p}_c$, $n_1(1-\hat{p}_c)$, $n_2\hat{p}_c$, $n_2(1-\hat{p}_c)$ need to be at least 10.

Combined sample proportion. $\hat{p}_c = \dfrac{X_1 + X_2}{n_1 + n_2}$

Two-sample z test for difference in population proportions: $z = \dfrac{(\hat{p}_1 - \hat{p}_2) - 0}{\sqrt{\dfrac{\hat{p}_c(1-\hat{p}_c)}{n_1} + \dfrac{\hat{p}_c(1-\hat{p}_c)}{n_2}}}$

Chapter 10

Confidence interval for mean $\bar{x} \pm t^* \frac{s}{\sqrt{n}}$

t-distribution
degrees of freedom (n-1)

standard error $SE_{\bar{x}} = \frac{s}{\sqrt{n}}$

Conditions for CI for means: Random, 10% if sampling without replacement, Large Count (normal population, n>30 (CLT) or sample is approx. normal)

If looking for sample size for specific margin of error use z* since we don't know sample size

Margin of Error ≥ 

Sampling distribution of difference of sample means: $\bar{x}_1 - \bar{x}_2$

Conditions for confidence interval procedures about difference in population means.

Standard error of the statistic $\sqrt{\frac{s_1^2}{n_1} + \frac{s_2^2}{n_2}}$

Two sample t-interval for the difference between two means: $(\bar{x}_1 - \bar{x}_2) \pm t^* \sqrt{\frac{s_1^2}{n_1} + \frac{s_2^2}{n_2}}$

Degrees of freedom for two-sample t-interval

Paired data vs. 2 sample data

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Vocabulary Ch. 11 - 12

Chapter 11

One-sample t test for a mean: $t = \dfrac{(\bar{x} - \mu_o)}{\dfrac{s_x}{\sqrt{n}}}$

Conditions for performing a significance test about a population mean

Conditions for significance test procedures about difference in population means.

Two sample t-test for the difference between two means: $t = \dfrac{(\bar{x}_1 - \bar{x}_2) - (\mu_1 - \mu_2)}{\sqrt{\dfrac{s_1^2}{n_1} + \dfrac{s_2^2}{n_2}}}$

Degrees of freedom for two-sample t test

Paired data vs. 2 sample data

Chapter 12

One-way table
Chi-square goodness of fit test
Observed count
Expected count
Chi-square statistic
Conditions – Random, 10%, Large Count
Chi-square distribution
Components
Degrees of freedom
Two-way table
Chi-square test for homogeneity
Chi-square test for association/independence

Chapter 12.3

Sample regression line
Population regression line
Conditions –LINER (linear, independent, normal, equal standard deviation, random)
t-interval for the slope
standard error of the slope
t-test for the slope
degrees of freedom (n-2)