Unit 6 Hypothesis Testing for Two Samples

Content Area: **Mathematics**
Course(s): **AP Statistics**
Time Period: **March**
Length: **6 weeks**
Status: **Published**

Enduring Understandings

Hypothesis testing for two samples involves the difference between the means or proportions

Identifying and labeling each population allows for more accurate and less confusing conclusions

Procedures vary for samples that are dependent as opposed to independent

Matched pair tests are an important analysis tool when analyzing results of an experiment

Essential Questions

How can hypothesis testing be used to find out if a difference between two samples is greater than a given value?

What are differences between pooled and non-pooled and does it matter which is used to test data?

When is it appropriate to use a matched pair t-test instead of a two sample t-test?

Can the probability value be utilized to determine the strength of the test?

Content

Red Hot Topics:

Two sample t-test

Two proportions z-test

Matched pair t-test

Independent/dependent samples

Vocabulary:

Independent samples

Paired samples

Paired test statistic

Pooled vs. Non-pooled

Skills

Identify and label two groups to be tested.

Create appropriate null and alternate hypotheses.

Conduct two sample t-test for pooled or non-pooled data.

Distinguish between independent and dependent samples.

Perform matched pair t-test and interpret results.

Construct confidence interval for matched pair results.

Identify and analyze the cautions and limitations of hypothesis testing.

Use paragraph method of conducting hypothesis tests.

Resources

Standards

CCSS.Math.Content.HSS-ID	Interpreting Categorical and Quantitative Data
CCSS.Math.Content.HSS-ID.A	Summarize, represent, and interpret data on a single count or measurement variable
CCSS.Math.Content.HSS-ID.A.1	Represent data with plots on the real number line (dot plots, histograms, and box plots).
CCSS.Math.Content.HSS-ID.A.2	Use statistics appropriate to the shape of the data distribution to compare center (median, mean) and spread (interquartile range, standard deviation) of two or more different data sets.
CCSS.Math.Content.HSS-ID.A.3	Interpret differences in shape, center, and spread in the context of the data sets, accounting for possible effects of extreme data points (outliers).
CCSS.Math.Content.HSS-ID.A.4	Use the mean and standard deviation of a data set to fit it to a normal distribution and to estimate population percentages. Recognize that there are data sets for which such a procedure is not appropriate. Use calculators, spreadsheets, and tables to estimate areas under the normal curve.
CCSS.Math.Content.HSS-ID.B	Summarize, represent, and interpret data on two categorical and quantitative variables
CCSS.Math.Content.HSS-ID.B.5	Summarize categorical data for two categories in two-way frequency tables. Interpret relative frequencies in the context of the data (including joint, marginal, and conditional relative frequencies). Recognize possible associations and trends in the data.
CCSS.Math.Content.HSS-ID.B.6	Represent data on two quantitative variables on a scatter plot, and describe how the variables are related.
CCSS.Math.Content.HSS-ID.B.6.a	Fit a function to the data; use functions fitted to data to solve problems in the context of the data.
CCSS.Math.Content.HSS-ID.B.6.b	Informally assess the fit of a function by plotting and analyzing residuals.
CCSS.Math.Content.HSS-ID.B.6.c	Fit a linear function for a scatter plot that suggests a linear association.
CCSS.Math.Content.HSS-ID.C	Interpret linear models
CCSS.Math.Content.HSS-ID.C.7	Interpret the slope (rate of change) and the intercept (constant term) of a linear model in the context of the data.
CCSS.Math.Content.HSS-ID.C.8	Compute (using technology) and interpret the correlation coefficient of a linear fit.
CCSS.Math.Content.HSS-ID.C.9	Distinguish between correlation and causation.