# Unit 7 Bi-variate Hypothesis Tests

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

## Enduring Understandings

Bivariate quantitative data can be tested using linear regression hypothesis testing procedures

Bivariate qualitative data can be tested for association or independence using Chi Square tests

A contingency table is a way of organizing bivariate qualitative data

Chi square curve is a right skewed non-normal curve

## Essential Questions

How can qualitative data be tested to draw inferential conclusions that are supported numerically?

What are differences between correlation and association when drawing conclusions about data?

When is data usable for linear regression hypothesis testing?

What assumptions must be met in order to use chi square testing and what if the assumptions are not met?

## Content

Red Hot Topics:

Properties of a chi square curve

Goodness of fit test

Test for association

Expected versus observed

Chi Square test statistic

Linear Regression Test


Vocabulary:

Contingency table

Expected value

Association

Marginal distribution

Residual

Correlation coefficient

Coefficient of Determination

Variance




## Skills

Calculate expected values for a multiple proportion study.


Perform a Chi Square Goodness of Fit test and interpret results.


Create contingency table from data collected.


Calculate expected for each cell and the Chi Square test statistic.


Perform the Chi Square test for Association or Independence.

Calculate residuals for linear data.

Find and interpret the correlation coefficient and coefficient of determination.

Conduct a linear regression hypothesis test on the slope of a regression line and interpret results in context.

## Resources

## Standards

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|---|---|
| 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. |