

Unit 5 Intro to Hypothesis Testing

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

Enduring Understandings

Hypothesis testing uses sample data to decide between two competing claims about a population characteristic

There is a possibility of making a Type I or Type II error when conducting a hypothesis test

Tests can be performed using the critical value approach or the p- value approach

The level of significance is the total area in the rejection region

Essential Questions

Which hypothesis test is appropriate for a particular data set?

What makes results “statistically significant” and how are they determined so?

When is interpreting results inconclusive and potentially dangerous?

How can one data set be used to draw opposing conclusions?

Content

Red Hot Topics

Null and alternate hypotheses

Step procedure

Interpreting results in words/context

Errors in Hypothesis testing

Vocabulary:

Null hypothesis

Alternate Hypothesis

Type I Type II Error

Test statistic

Critical value

Level of significance

p-value

Rejection region

Power of the test

Degrees of freedom

Margin of Error

Skills

Determine the null and alternate hypotheses for a given scenario.

Differentiate the difference between one tailed and two tailed test and draw curve.

Identify and interpret Type I and Type II errors in context of problem.

Follow procedure and conduct hypothesis test on one sample mean.

Identify and utilize the p-value approach as well as critical value approach.

Analyze results of test in context of the problem.

Perform hypothesis tests on one sample proportion.

Establish and interpret the power of the test

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.

