

## EWHS Course Scope & Sequence

<b>Course Title</b>	<b>AP Statistics</b>				
<b>Course Overview</b>	<p>Students learn how to explore data, design studies, use probability, and make conclusions through statistical inference. The course is organized into units covering topics like distributions, relationships between variables, sampling methods, and hypothesis testing. Emphasis is placed on real-world applications, critical thinking, and clearly explaining results.</p>				
<b>Unit Component</b>	<b>Unit 1</b>	<b>Unit 2</b>	<b>Unit 3</b>	<b>Unit 4</b>	<b>Unit 5</b>
<b>Title</b>	Exploring One-Variable Data	Exploring Two-Variable Data	Collecting Data	Probability, Random Variables, and Probability Distributions	Sampling Distributions
<b>Guiding or Essential Questions</b> <i>(if applicable)</i>	<p>How can we represent and summarize data to reveal patterns?            What does variation tell us about a dataset?            How do measures of center and spread shape our interpretation?            When is a distribution considered “normal,” and why does that matter?            How do outliers influence conclusions?</p>	<p>How can we describe and quantify relationships between variables?            What does correlation measure—and what are its limits?            When is a linear model appropriate?            How do residuals help evaluate a model?            Why doesn't association imply causation?</p>	<p>How can we design studies that produce trustworthy data?            What is the role of randomization in sampling and experiments?            How do bias and confounding affect results?            When can we generalize findings to a population?            When can we claim cause-and-effect?</p>	<p>How do we model and quantify uncertainty?            What do probability rules tell us about real-world events?            How can simulations approximate probability?            What is a random variable, and how does it model outcomes?            How do probability distributions describe behavior over time?</p>	<p>Why do sample statistics vary from sample to sample?            What is a sampling distribution?            Why is the Central Limit Theorem so powerful?            What makes an estimator unbiased or reliable?            How does sample size affect variability?</p>

<p style="text-align: center;"><b>Topic</b></p> <p>This should be the overarching theme or big idea. Brief overview of the unit.</p>	<p>Students investigate how to describe distributions of a single variable using graphical displays and summary statistics. Emphasis is on understanding variation, identifying patterns (shape, center, spread), and using models like the normal distribution.</p>	<p>Students analyze relationships between two variables using scatterplots, correlation, and regression. They learn how to model associations and use those models for prediction while recognizing limitations.</p>	<p>This unit focuses on designing studies (sampling and experiments). Students learn how randomization and proper design reduce bias and allow for valid generalizations and causal conclusions.</p>	<p>Students develop probability rules and models to describe randomness. They explore random variables and probability distributions as tools for predicting long-run behavior.</p>	<p>Students study how statistics behave across repeated samples and are introduced to the Central Limit Theorem, which underpins statistical inference.</p>
<p style="text-align: center;"><b>Length</b></p> <p style="text-align: center;"><i>(in weeks)</i></p>	3 weeks	3 weeks	2 weeks	4 weeks	3 weeks

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<b>Course Title</b>					
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<b>Unit Component</b>	<b>Unit 6</b>	<b>Unit 7</b>	<b>Unit 8</b>	<b>Unit 9</b>	
<b>Title</b>	Inference for Categorical Data: Proportions	Inference for Quantitative Data: Means	Inference for Categorical Data: Chi-Square	Inference for Quantitative Data: Slopes	

<p><b>Guiding or Essential Questions</b></p> <p><i>(if applicable)</i></p>	<p>How can we estimate a population proportion using a sample?          What does a confidence interval actually communicate?          How do we test claims about proportions?          What is a p-value, and how should it be interpreted?          What types of errors can occur in inference?</p>	<p>How do we estimate and test population means?          Why do we use t-distributions instead of normal distributions?          How do we compare two groups statistically?          What conditions must be met for valid inference?          How do variability and sample size impact results?</p>	<p>How do we compare observed data to expected outcomes?          When should we use a chi-square test?          How can we determine if variables are independent?          What does a significant result tell us (and not tell us)?          How do we interpret results in context?</p>	<p>How do we determine if a relationship is statistically meaningful?          What does the slope represent in context?          How can we estimate and test the true slope?          What conditions are required for regression inference?          How do sampling variability and randomness affect conclusions?</p>	
<p><b>Topic</b></p> <p>This should be the overarching theme or big idea. Brief overview of the unit.</p>	<p>Students begin formal statistical inference by constructing confidence intervals and conducting hypothesis tests for proportions. They interpret results in context and justify conclusions.</p>	<p>Students extend inference to means using t-distributions and procedures for one- and two-sample problems, deepening their understanding of statistical reasoning.</p>	<p>Students use chi-square procedures to test relationships between categorical variables or how well data fits expected distributions.</p>	<p>Students perform inference for regression slopes, determining whether relationships between variables are statistically significant and useful for prediction.</p>	
<p><b>Length</b></p> <p><i>(in weeks)</i></p>	<p>4 weeks</p>	<p>3 weeks</p>	<p>2 weeks</p>	<p>2 weeks</p>	