

# Pequannock Township School District

## Curriculum Syllabus

### AP Statistics

#### Course Description:

AP Statistics is the high school equivalent of a one semester, introductory, non-calculus-based college statistics course. The AP Statistics course introduces students to the major concepts and tools for collecting, analyzing, and drawing conclusions from data. There are four themes evident in the content, skills, and assessment in the AP Statistics course: exploring data, sampling and experimentation, probability and simulation, and statistical inference. Students use technology, investigations, problem solving, and writing as they build conceptual understanding.

#### Course Proficiencies:

\* Most content in this course surpasses the expectations of the NJSL

#### Course Skills

1. Selecting Statistical Methods: Select methods for collecting and/or analyzing data for statistical inference.
2. Data Analysis: Describe patterns, trends, associations, and relationships in data.
3. Using Probability and Simulation: Explore random phenomena.
4. Statistical Argumentation: Develop an explanation or justify a conclusion using evidence from data, definitions, or statistical inference.

#### Statistics Big Ideas (From College Board)

1. Variation and Distribution
2. Patterns and Uncertainty
3. Data-Based Predictions, Decisions, and Conclusions

#### Standards for Mathematical Practice

1. Make sense of problems and persevere in solving them. *SMP1*
2. Reason abstractly and quantitatively. *SMP2*
3. Construct viable arguments and critique the reasoning of others. *SMP3*
4. Model with mathematics. *SMP4*
5. Use appropriate tools strategically. *SMP5*
6. Attend to precision. *SMP6*
7. Look for and make use of structure. *SMP7*
8. Look for and express regularity in repeated reasoning. *SMP8*

# Scope and Sequence

## **Unit 1: Exploring Data and Variable Relationships (Marking Period 1)**

An exploratory analysis of data makes use of both graphical and numerical analysis techniques to study patterns and departures from patterns. Emphasis should be placed on interpreting information from graphical and numerical displays and summaries. Students must learn to talk about data in real-world contexts. Variability may seem to suggest certain conclusions about the data distribution, but not all variation is meaningful. Students will also explore data in two-variable categorical or quantitative data sets.

## **Unit 2: Sampling & Experiments (Marking Period 1-2)**

Depending on how data are collected, we may or may not be able to generalize findings or establish evidence of causal relationships. Data must be collected according to a well-developed plan if valid information is to be obtained. The plan should include clarifying the questions and deciding on an appropriate method of data collection and analysis. When data are collected using well-designed experiments, statistically significant differences between or among experimental treatment groups are evidence that the treatments caused the effects.

## **Unit 3: Probability & Sampling Distributions (Marking Period 2-3)**

Probability is used to anticipate what the distribution of data should look like under a given model. Random phenomena can be collected and patterns described by a distribution. Simulations help us to model situations for which many outcomes are possible. The probability required for statistical inference is oriented toward using probability distributions to describe data. This unit builds on understanding of simulated or empirical data distributions and fundamental principles of probability to represent, interpret, and calculate parameters for theoretical probability distributions for discrete random variables. This unit also applies probabilistic reasoning to sampling, introducing students to sampling distributions of statistics they will use when performing inference.

## **Unit 4: Statistical Inference (Marking Period 3-4)**

Statistical inference guides the selection of appropriate models. Models and data interact in statistical work: models are used to draw conclusions from data, while the data are allowed to criticize and even falsify the model through inferential and diagnostic methods. Inference from data can be thought of as the process of selecting a reasonable model, including a statement in probability language, or how confident one can be about the selection. Students begin by learning inference procedures for one

proportion and then examine inference methods for a difference between two proportions. Students will then analyze data to make inferences about population means.

## Assessments

Evaluation of student achievement in this course will be based on the following:

- a. Tests & Quizzes
- b. Classwork
- c. Projects
- d. Sample AP problems

## Curriculum Resources

### Anchor Programs/Teacher Materials

Textbook:

Stats: [Modeling the World](#)

AP Statistics webpage: <https://apcentral.collegeboard.org/pdf/ap-statistics-course-and-exam-description.pdf?course=ap-statistics>

## Home and School Connection

The following are suggestions and/or resources that will help parents support their students:

- Khan Academy: [www.khanacademy.com](http://www.khanacademy.com)
- AP Statistics College Board website: <https://apcentral.collegeboard.org/courses/ap-statistics?course=ap-statistics>
- Teacher Google Classroom