

**About the Advanced Placement Program<sup>®</sup> (AP<sup>®</sup>)**

The Advanced Placement Program<sup>®</sup> has enabled millions of students to take college-level courses and earn college credit, advanced placement, or both, while still in high school. AP Exams are given each year in May. Students who earn a qualifying score on an AP Exam are typically eligible to receive college credit and/or placement into advanced courses in college. Every aspect of AP course and exam development is the result of collaboration between AP teachers and college faculty. They work together to develop AP courses and exams, set scoring standards, and score the exams. College faculty review every AP teacher's course syllabus.

**AP Statistics Course Overview**

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

**PREREQUISITE**

Students must have taken second-year algebra before enrolling in AP Statistics.

**Use of Graphing Calculators and Computers**

Professional mathematics organizations have strongly endorsed the use of calculators in mathematics instruction and testing. The use of a graphing calculator in AP Statistics is considered an integral part of the course. In addition, schools should make every effort to provide students and teachers easy access to computers to facilitate the teaching and learning of statistics.

**A Few Key Notes...**

Students will also learn the strategy and not just the skills. At various concepts special problems will be assigned to help give students experience using a representative statistics package and writing statistics narratives.

Students can expect to spend a minimum of 6 hours per week outside of class with homework and studying.

All tests are formatted like the Advanced Placement exam. This allows the students to become familiar with what to expect.

Statistics is more of a thinking course where the calculator does the complicated mathematics and the student has to explain the meaning of the statistics in the context of a situation.

Statistics does require a summer assignment.

**Goals of AP Statistics**

Students who are enrolled in AP Statistics are expected to

- Describe patterns and departures from patterns;
- Plan and conduct a study;
- Explore random phenomena using probability and simulation; and
- Estimate population parameters and test hypotheses.

**Topic Outline for AP Statistics****I. Exploring Data**

- Constructing and interpreting graphical displays of distributions of univariate data
- Summarizing and comparing distributions of univariate data
- Exploring bivariate and categorical data

**II. Sampling and Experimentation**

- Planning and conducting surveys and experiments using appropriate methods of data collection
- Generalizability of results and types of conclusions that can be drawn from observational studies, experiments, and surveys

**III. Anticipating Patterns**

- Exploring random phenomena using probability and simulation
- Combining independent random variables
- The normal distribution
- Sampling distributions

**IV. Statistical Inference**

- Estimating population parameters and testing hypotheses
- Tests of significance

## AP Statistics Exam Structure

### AP STATISTICS EXAM: 3 HOURS

#### Assessment Overview

Exam questions are based on the topics and skills addressed in the AP Statistics course. Formulas and tables needed to complete exam questions are provided to students taking the exam. Students are expected to use a graphing calculator with statistical capabilities on the entire exam.

#### Format of Assessment

**Section I:** Multiple Choice | 40 Questions | 1 Hour, 30 Minutes | 50% of Exam Score

- Individual Questions

**Section II:** Free Response | 6 Questions | 1 Hour, 30 Minutes | 50% of Exam Score

- 5 Short-Answer Questions
- 1 Investigative Task

## AP STATISTICS SAMPLE EXAM QUESTIONS

### Sample Multiple-Choice Question

#### DESCRIPTIVE STATISTICS

Variable	N	Mean	Median	trMean	StDev	Se Mean
score	50	1045.7	1024.7	1041.9	221.9	31.4

Variable	Minimum	Maximum	Q1	Q3
score	628.9	1577.1	877.7	1219.5

Some descriptive statistics for a set of test scores are shown above. For this test, a certain student has a standardized score of  $z = -1.2$ . What score did this student receive on the test?

- (A) 266.28
- (B) 779.42
- (C) 1008.02
- (D) 1083.38
- (E) 1311.98

Correct Answer: B

### Sample Free-Response Question: Experimental Design

As dogs age, diminished joint and hip health may lead to joint pain and thus reduce a dog's activity level. Such a reduction in activity can lead to other health concerns such as weight gain and lethargy due to lack of exercise. A study is to be conducted to see which of two dietary supplements, glucosamine or chondroitin, is more effective in promoting joint and hip health and reducing the onset of canine osteoarthritis. Researchers will randomly select a total of 300 dogs from ten different large veterinary practices around the country. All of the dogs are more than 6 years old, and their owners have given consent to participate in the study. Changes in joint and hip health will be evaluated after 6 months of treatment.

- (a) What would be the advantage to adding a control group in the design of this study?
- (b) Assuming a control group is added to the other two groups in the study, explain how you would assign the 300 dogs to these three groups using a completely randomized design.
- (c) Rather than using a completely randomized design, one group of researchers proposes blocking on clinics, and another group of researchers proposes blocking on breed of dog. How would you decide which one of these two variables to use as a blocking variable?