The Ultimate List of AP Statistics Tips

If you're taking AP Statistics this year, you're probably in the midst of learning the material and constantly studying. But what exactly should you be learning? What can you expect to see on the exam? *How* should you be studying? This ultimate list of 50 AP Statistics tips is here to help answer those questions and more!

The AP Stats exam is a difficult exam. Instead of memorizing formulas and calculations, you must understand how to interpret and manipulate statistical data, as well as make use of higher order thinking skills. In statistics, there is not just a right or wrong answer.

To understand the difficulty of the exam a little better, let's take a look at some statistics of the 2015 AP Statistics exam! In this most recent exam, only 13.2% of test takers earned a score of 5 and only 18.9% of students received a score of 4. (Fun fact: only two students, out of 200,000, achieved a perfect score on this exam!). The most common score was a 3, with 25.2% of test takers earning this score. Finally, 18.9% earned a 2, and a large portion of test takers, 23.8%, earned only a 1. This means that more than half (57.8%) of students who took the 2015 AP Stats exam received a passing score. Passing the AP Statistics exam is definitely an achievable goal!

Now, let's look at some strategies and tips for how to achieve your AP Stats goals.

How to Study for AP Statistics General Exam Tips

1. Know the format of the exam. In order to maximize your score on the AP Stats exam, you need to be familiar with the layout of the exam and how it is scored. Before you even start studying, you should know what you're studying for. The exam is three hours long and consists of two sections:

Section I: Multiple-Choice

– 90 minutes

– 40 questions

Section II: Free-Response

– 90 minutes

It's important to note that each section is worth 50% of your final score, which means that they both have an equal weight. Keep this in mind when [studying for the exam](#).

2. Invest in a good [AP Stats review book](#). While AP Statistics textbooks are essential for learning all the material you need to know, you should also buy a review book. Textbooks can often be lengthy and dry, and it's impossible to remember absolutely everything you read from the text. Review books, on the other hand, are more concise, easier to read, and quicker to flip

through. Most come with diagnostic exams, practice questions, a full-length practice exam, extra tips and hints, and all the statistics information you should absolutely know for the AP exam. Give Barron's, The Princeton Review, or REA's Crash Course a try. It's always a good idea to supplement your textbook with other materials. This can often give you a different view on the same ideas, which makes it more likely that this information will stick in your brain.

3. Do NOT memorize formulas. Don't waste your valuable study time trying to memorize formulas and equations. Since the purpose of the AP Stats exam is to test your ability to analyze, understand, and explain fundamental concepts of statistics, the focus is taken off memorization. You will be given a list of formulas and tables to use during the entire duration of the exam. While you don't need to memorize these formulas, you should still be familiar with them and know how to use them in a variety of ways to solve a variety of problems.

4. Know the calculator policy. You will need to use a graphing calculator with statistical capabilities during the exam and while you're studying for the exam. Remember that you absolutely *cannot* store notes in your calculator, since this is considered cheating on the AP Stats exam. You are only allowed to store programs in your calculator's memory. Be sure to bring extra batteries or a second back-up calculator in case something goes wrong.

5. Check out StatTrek.com. This invaluable site has free statistics tutorials with fast-paced videos, practice questions in the AP format, and examples to help you understand concepts in-depth. There's also a useful Statistics and Probability Dictionary, which illustrates the meaning of key terms you need to know for the AP Stats exam. If you're ever looking for a refreshing way to review statistics concepts, StatTrek.com is the place to go.

6. Become "one" with your calculator. There's no way of getting around it: statistics is a very calculator-heavy course. You will need to know how to perform tests on your calculator, interpret data, and use graphing functionalities. The more you practice using your calculator, the faster you can answer multiple-choice questions on the AP Stats exam. Since you only have a limited time to answer 40 questions on the multiple-choice section, and because you aren't required to show your work on that section, knowing how to use your calculator efficiently is essential. However, don't waste your time punching data and numbers into your calculator during the FRQ section, unless you are absolutely sure you need to do this to answer the question. Overall, you need to be familiar with these functions on your graphing calculator:

– Linear regression equations

– Binomial probability equations

– Summary statistics (mean, median, mode, standard deviation, etc.)

– Histogram plots

– Scatterplots

– Residuals

– Confidence intervals

Keep in mind that your brain is meant to be the primary tool you use on the exam. Your calculator should only be your secondary tool.

7. Practice classifying statistics problems. Determining *what* questions on the AP Stats exam are actually asking you to do can be difficult to master. In order to become more comfortable identifying what a question really wants you to do, try practicing classifying statistics problems. This website offers an interactive way to do just that. It gives you a statistics problem, and you have to choose which category it belongs to, whether it's a hypothesis test for a population proportion or a confidence interval for paired data. The more you practice identifying questions, the easier it will be to pinpoint what you need to do on the exam.

8. Watch AP Statistics video lectures. If you're a visual learner, simply reading a textbook is probably not enough for you to really understand complex concepts. That's where AP Stats video lectures come in! Check out this website, which organizes videos based on chapters and goes in-depth on the key concepts you need to know for the exam. Even if you prefer reading the textbook for information, try watching a video or two. You never know what new insights you can learn from seeing something laid out, and talked through for you, in an organized way.

9. Make flashcards! Perhaps one of the most classic and effective study techniques in the book, you can't go wrong with flashcards. Instead of using e-flashcards, which you can easily find online, write out your own flashcards by hand, with definitions you've written in your own words. Use Quizlet to see which key terms you need to know, but don't just rely on flashcards someone else has written for you. To really understand statistics topics and to cement them in your brain, you need to go through the physical process of hand writing out vocabulary words. Pull out your handwritten flashcards every single day for 10 to 15 minutes at a time.

10. Take practice AP Stats exams. In order to get a feel for the types of questions you can expect to see on the AP exam, the most helpful thing you can do is take practice exams. It's not enough to just simply know the format of the exam and understand the material: you must also know *how* to take the test. The multiple choice questions on the AP Stats exam will probably be more detailed and involved than other exams you've taken, and the free-response questions will be similarly challenging. Check out the CollegeBoard's sample multiple- choice questions and free-response questions from past AP Statistics exams. There, you will find scoring guidelines, sample responses from real test-takers, and detailed explanations of how to answer FRQs. It will be helpful to look at sample responses that earned a high score, versus sample responses that earned a low score. Understand why the high scores are high, and why the low scores are low. Apply this to your own responses.

AP Statistics Multiple-Choice Tips

1. Focus on specific themes covered on the exam. The College Board narrows down the topics covered in the AP Statistics Exam by detailing the four main content areas you should expect to see. Make note of the percentage of each multiple-choice content area on the exam. For example, you might want to spend more time perfecting your statistical inference skills since that

comprises 30% to 40% of the multiple-choice section, and less time working on how to conduct a study since that only makes up about 10% to 15% of the multiple-choice section.

Content Area	Specific Concepts Covered	Percentage of Multiple-Choice Section of Exam
Exploring Data: Describing patterns and departures from patterns	**– Constructing and interpreting graphs of one-variable data** **– Summarizing and comparing distributions of one-variable data** **– Analyzing two-variable and categorical data**	**20-30%**
Sampling and Experimentation: Planning and conducting a study	**– Data collection methods** **– Planning and conducting surveys and experiments** **– Conclusions that can be drawn from observational studies, experiments, and surveys**	**10-15%**
Anticipating Patterns: Exploring random phenomena using probability and simulation	**– Probability** **– Normal distribution** **– Combining independent random variables** **– Sampling distributions**	**20-30%**
Statistical Inference: Estimating population parameters and testing hypotheses	**– Estimation** **– Tests of significance**	**30-40%**

2. Don't underestimate the power of practice! The only way to become confident when answering multiple-choice questions on the AP Statistics exam is to practice, practice, practice. AP exams have very specific types of questions that you need to be familiar with. The questions you'll see are *not* straightforward, simple questions with an obvious answer. You will have to read, reread, and analyze before choosing an answer. Use your review book, the **CollegeBoard's website**, or check out **Albert.io** for a wide variety of practice questions. Make sure to take your multiple-choice practice exams under the time constraint of 90 minutes to get a feel for how to budget your time.

3. Think about what topic is being tested. As you read the multiple-choice questions, ask yourself: "What statistical topic is being addressed? What is the purpose of this question?" If you can get an idea of what the test writers' goals were when including this question on the exam,

you'll have a better chance of (1) understanding exactly what the question is asking, and (2) which answer choices you can eliminate to narrow it down.

4. Don't look at the answers while reading the stem of the question. Try not to read the answer choices before reading the question. It's much more helpful, and less biased, when you cover up the answer choices and read the question first. Before even looking at the choices, think of the possible answer(s) you would give if it were a fill-in-the-blank question. Jot it down, and *then* look at the possible answer choices.

5. Draw pictures to help visualize the situation. You are not required to do anything other than fill in the bubbles on the multiple-choice section of the AP Stats exam. However, if you're having trouble with a certain question, try drawing a small diagram, graph, or scatterplot to illustrate the problem. This can make the solution appear clearer especially if you are a visual learner.

6. Use standard multiple-choice strategies. For any test, it's important to know multiple-choice test taking strategies. On the AP Stats exam, this is especially important since the multiple-choice section is worth 50% of your overall exam score. Keep these strategies in mind if you get stuck:

– Answer EVERY question (there is no penalty for wrong answers)

– Examine each question for an absolute maximum of 2 minutes

– Use other questions as hints

– Beware of "EXCEPT" and "NOT" questions

– Use the process of elimination to make educated guesses

– Be sure to check that your bubbles are filled in correctly

AP Statistics Free Response Portion Tips

1. Know the types of free-response questions. On the AP Statistics exam, there are six free-response questions that you'll have to answer in a total of 90 minutes. The first five questions are shorter, open-ended, and should be answered in around 12 minutes or less. The sixth question, which is a longer investigative task requiring extended reasoning, is designed to be answered in about 30 minutes. The first five open-ended problems are worth 37.5% of your free-response score, and the investigative task is worth 12.5% of your final FRQ score.

2. Understand that responses are graded *holistically*. The answers you give for the six free-response questions will be scored based on the "complete package." Other AP exams use a more analytic approach, where components of an answer are specified in advance and the graders follow a strict rubric to award points based on correct information given. On the AP Stats exam, however, scoring is holistic, meaning graders look at the overall quality of your answer and don't

just search for pre-specified correct answers. This is because AP Stats FRQs are open-ended; there is more than one correct answer.

3. Know the vocabulary of statistics and use it correctly. It is extremely important to not only know your vocabulary terms, but to also use them correctly within the context of the question. Be especially careful when using the word "normal," since it has a specific meaning. "Normal" usually refers to the distribution of a graph, and not the general shape of the graph. Instead, it's better to use terms like "approximately normal," "mound shaped," or "bell-shaped." Do not simply comment on the appearance of graphs. For example, do not say things like "the graph is even" or "the plot is half above and half below." What do you mean by this? Do you mean that it's symmetric? Consistent?

Besides statistical vocabulary, you also need to know your Greek letters: α (alpha), β (beta), μ (mu), χ (chi), π (pi), θ (theta), and σ (sigma).

4. Read the questions carefully and answer them in context. This may seem like a no-brainer, but make sure you read the question closely and answer fully. In order to do this, you need to offer explanations and conclusions in context for every answer. For example, if you are given a confidence interval on the exam, you must interpret the interval in the context of the question.

5. State and check all assumptions. If you are asked to perform a hypothesis test or construct interval estimates on the FRQ section, you need to state and check all assumptions and conditions. It's not enough to just state them; you must also *show* that the assumptions/conditions are met with the information given in the question. Another way to say this is: show your work! For example, instead of just writing "np>10," write "np=150(.32)=48>10." Your goal is to convince the AP graders that you know how to calculate results and connect the assumption to the problem, not just memorize information.

6. It's okay if you can't answer early parts of the question. On the AP Stats FRQ section, many of the problems will be multi-part. This means that you must use solutions you found in earlier parts of the question to answer other parts. But what happens if you just can't get the correct answer for part (a)? Don't worry! All is not lost! If you find yourself in this situation, make up a value to use that makes sense, or explain in detail what you would do if you knew the answer to the first part of the question. You won't necessarily get points for trying, but you could get points for crafting a solution that makes sense and is carefully explained.

7. Do not add "extra fluff." You will be given more space than you need to answer the free-response questions on the AP Stats exam. In fact, most of the best answers are usually the shortest. That being said, you still need to make sure you're answering the question fully, clearly, and explicitly. Do not add flowery language and do not ramble. If you continue to write unnecessary information, you run the risk of contradicting yourself, which will lead to lost points. Your goal is to leave no questions in the AP grader's mind. Keep in mind that while this is not AP Language and Composition, you still need to be confident in your writing and be able to express your thoughts logically and clearly.

8. Be able to construct graphs by hand and interpret data displayed in a variety of ways.
Do not depend on your calculator to make graphs for you. The exam will be written to prevent you from relying on your calculator to construct plots and graphs. For this reason, you need to be comfortable with drawing boxplots, stemplots, histograms, and other graphs completely *by hand*. Remember to label the axes and be aware of the number scale. The AP Stats exam is also likely to include computer outputs, not just graphs and plots, for you to interpret and use in your answer. These outputs will not be complex, but it's still useful to become comfortable with seeing outputs of statistical programs.

9. Refer to graphs explicitly. If you're asked to interpret a graph, be very specific and use statistics vocabulary. Instead of saying something like: "The male times are obviously higher than the female times," say "The median male time is higher than the first quartile of the male times." Show that you know how to apply statistical concepts to describe a graph. You can also mark and add notes to the graph itself; keep in mind that the AP grader will read everything you write.

10. Be aware of the common test taking errors. There are a number of common mistakes that past test-takers have made on the AP Statistics exam. Keep these errors in mind and do your best to not make the same mistakes. These common errors are:

– Confusing skewed right and skewed left

– Confusing symmetric/bell-shaped with approximately normal

– Mixing up categorical data with quantitative data

– Mixing up one-variable data with two-variable data

– Writing down a laundry list of everything you know to answer a question, hoping that at least some part of it is correct

– Confusing random sampling with random allocation

– Mixing up the confidence level with the confidence interval

– Using blocking schemes when it doesn't make sense in the context of the problem

– Simply naming a theorem to answer a question without providing an explanation

11. Understand the common question prompts. You will most likely see at least one of the following types of questions. Be aware of how to answer each of them.

Task	What To Do
"Choose"	**If an FRQ asks you to choose between two things, you must state *why* you chose one, AND**

"Compare"	**why you did *not* choose the other option. It's also extremely important to take a stand. Don't try to say that both are good, or both are bad, or that both have pros and cons. This is not a compare and contrast question. Make a choice.** **If an FRQ asks you to compare, it usually involves one-variable distributions. You will need to compare aspects of this distribution, such as shape, spread, etc. Make sure you compare like things, meaning don't compare a median of one distribution to the first quartile of the other distribution. Compare medians to medians, and first quartiles to first quartiles.**
Refer to a previous answer, for example: "Using your answer to part (a), explain…"	**When an AP Stats FRQ asks you to refer to a previous answer, you must include a reference to this in your answer, either by number or concept. You should also link your answer to the key statistical concept in the original problem.**

12. Know the steps to writing a complete answer for confidence interval problems. On the 2011 AP Statistics Exam, a free-response question asked test-takers to construct and interpret a confidence interval:

Every year, each student in a nationally representative sample is given tests in various subjects. Recently, a random sample of 9,600 twelfth-grade students from the United States were administered a multiple-choice United States history exam. One of the multiple-choice questions is below. (The correct answer is C.)

In 1935 and 1936 the Supreme Court declared that important parts of the New Deal were unconstitutional. President Roosevelt responded by threatening to:

(A) impeach several Supreme Court justices

(B) eliminate the Supreme Court

(C) appoint additional Supreme Court justices who shared his views

(D) override the Supreme Court's decisions by gaining three-fourths majorities in both houses of Congress Of the 9,600 students, 28 percent answered the multiple-choice question correctly.

*(a) Let p be the proportion of all United States twelfth-grade students who would answer the question correctly. **Construct** and **interpret** a 99 percent **confidence interval** for p.*

Assume that students who actually know the correct answer have a 100 percent chance of answering the question correctly, and students who do not know the correct answer to the question guess completely at random from among the four options.

Let k represent the proportion of all United States twelfth-grade students who actually know the correct answer to the question.

In order to answer this type of question, you will need to follow these steps:

1. Identify the population and define the parameters of the population being estimated.

2. Identify the confidence interval procedure that is appropriate for the question by writing the name or formula.

3. State and *verify* any assumptions that need to be met.

4. Calculate the confidence interval. State degrees of freedom if appropriate.

5. Interpret your results in the context of the question.

13. Know the steps to writing a complete answer for significance test problems.

1. State the hypothesis in terms of the population parameters. Use correct symbols and define any subscripts that you use.

2. Identify the test you will perform, either by name or formula.

3. State and *verify* any assumptions that need to be met.

4. Calculate the significance test. Find the p-value and compare it to alpha. State degrees of freedom if appropriate. Reject or fail to reject the null hypothesis.

5. State your conclusion in the context of the question. Be sure to connect your conclusion to the p-value.

14. Understand how to describe a residual plot. If the AP Stats FRQ asks you to describe a residual plot, be sure to comment on:

– The balance of positive and negative residuals

– The size of the residuals as compared to the corresponding y-values

– If the residuals are randomly distributed

15. Know how to describe a scatterplot. When describing a scatterplot, make sure you touch upon the following points:

– Direction, strength, and shape

– Patterns in the data

– Any deviations from the data patterns

Tips From AP Statistics Teachers

1. NEVER write calculator commands on the exam. Do NOT use calculator-speak as part of your answer (avoid *normalcdf* or *1-PropZTest).* Never write directions for calculator button-pushing!

2. It's not what you know; it's what you can PROVE you know. Thanks to Ms. T. at Cannon School for the tips!

3. When asked to describe a one-variable data set, always write about shape, center, and spread. Thanks to Mr. L. from Miramar High School for the tip!

4. Do question 1, then question 6, then the remaining four questions. Read every question before you begin writing so that you can start to prioritize your time. Whatever you do, don't save question 6 (investigative task) until last. Question 6 is a very important part of the exam and you don't want to be rushed, tired, or out of creative juices when you get to it. Thanks to Mrs. B. from Lakeland High School for the tip!

5. Use inference procedures to make a conclusion about data. You cannot just look at the data and give your opinion. You must use confidence intervals, hypothesis tests, etc. to come to a conclusion about data.

6. Don't round off at each step of the problem. If you start rounding off your answers too early, it will create a cumulative rounding error. This can affect the accuracy of your final answer. Thanks to Ms. K. at Union County Vocational-Technical School for the tips!

7. Only use terms and symbols you know. If you're not entirely sure how to use a term or symbol, don't use it! It's better to explain something in your own words than use a term or symbol incorrectly. Thanks to Mr. S. at The Lawrenceville School for the tip!

8. Make sure that you know that only variances are additive, and ONLY if the random variables are INDEPENDENT.

9. Understand the algebraic interpretation of a regression line. Questions that require you to interpret the slope or y-intercept of a regression line are very closely graded.

10. Practice your statistical thinking, processing, and analysis skills! You shouldn't just focus on memorizing computational methods. The AP Statistics exam is more about statistical thinking. Thanks to Mrs. B. from Yeshiva University High School for Girls for the tips!

11. Go back and review your Algebra, Geometry, and Trigonometry skills. Thanks to Ms. P. from Granbury High School for the tip!

12. Know the following content-specific tips.

– Don't mix up correlation coefficient and slope of least-squares regression line.

– Don't confuse a scatter plot with a residual plot.

– Know the difference between *median* and *mean*.

– Be familiar with the concepts of Type I error, Type II error, and Power of a test.

Thanks to Mr. D. from Roy High School for the tips!

Tips From Past AP Statistics Students

1. Read through the AP Statistics Course Description. You can find it on College Board. This course description tells you everything you need to know for the exam, from the topics you should study, to sample multiple-choice questions, and from free-response scoring rubrics to formulas you should have a good understanding of.

2. Make an extra effort to memorize the conditions for different distributions and approximations. One of the most challenging parts of the AP Stats exam is remembering all of the conditions and assumptions for distributions and approximations. If you memorize these, it will be a lot easier for you on the exam:

Type of Test	Assumptions	Conditions
One proportion z-test	– Individuals are independent – Sample is sufficiently large	– Simple random sampling – Population > 10n – np >= 10, nq >= 10

Test		
Two proportion z-test	– Groups are independent	– Simple random sampling
	– Data in each group is independent	– Population >10n for each group
	– Both groups are sufficiently large	– np >= 10, nq >= 10 for each group
One Sample T-test	– Individuals are independent	– Simple random sampling
	– Population is normal	– n > 30; Central Limit Theorem
		– Population > 10n
Two-Sample T-Test	– Groups are independent	– Simple random sampling
	– Individuals are independent	– Both groups are normal; Central Limit Theorem
	– Both populations are normal	– Population > 10n for each group
Matched Pair T-Test	– Data are matched	– Simple random sampling
	– Individuals are independent	– Difference is normal; Central Limit Theorem
	– Population is normal	– All > 10n
Goodness of Fit Chi-Square Test	– Data are counts	– Simple random sampling
	– Data are independent	– All > 10n
	– Sample is sufficiently large	– All expected counts >= 5
Homogeneity Chi-Square Test	– Data are counts	– Simple random sampling
	– Data in groups are independent	– All > 10n

Independence Chi-Square Test	– Samples is sufficiently large	– All expected counts >= 5
	– Data are counts	– Simple random sampling
	– Data are independent	– All > 10n
	– Sample is large	– All expected counts >= 5
Regression Test	– Form of relationship is linear	– Scatterplot looks approximately linear
	– Errors are independent	– No pattern in residuals plot
	– Variability of a errors is constant	– Consistent spread
	– Errors are normal	– Histogram of residuals is approximately normal

3. You *must* read your textbook. Even if you have a great teacher who explains things to you in class, you should still read and reread your textbook. It sounds tedious, but it's extremely helpful to see the same ideas in a different light.

4. Attempt every problem. Partial credit can add up!

5. Do practice problems. The biggest challenge on the AP Stats exam is choosing which statistical technique should be used on each question. To help with this, use your textbook, which should come with practice problems at the end of each section or chapter. Work through several of these after you've read the section. Then, work on test questions from AP Stats review books, like Barron's, in the lead up to the exam. Usually practice exams are a lot harder than the actual exam so you will be well prepared! I did around 10 practice tests before the exam.

6. Visit [Khan Academy](#) for probability and statistics review videos. The videos don't really follow the AP format, but they're useful if you're struggling with a particular concept

7. Form a study group. A great way to learn something, or understand it better, is to explain a concept to someone else. Study groups give you that opportunity. You can also hear your classmates explain things to you in different ways, which might make certain concepts click. Start a study group at the beginning of the year and meet regularly until exam time!

8. Make sure you know when to use certain tests and what conditions to check for each.
You must know when to use a t-test, a z-test, a matched-pairs test, a chi-square test, etc. Make sure you know the different conditions you need to check for these tests as well.

AP Statistics can seem overwhelming at first, and that feeling can sometimes last right up until the day of the exam. That's why having a study plan, as well as a good grasp of what to expect on the exam, is essential to staying calm and confident. Since the AP Stats exam focuses on testing your ability to think critically and statistically, memorizing formulas is not important. You need to know how to confidently perform calculations, understand complex word problems, and apply your knowledge of statistics to solve multi-step problems. Many students wrongly think that statistics is all about math; statistics is actually about analyzing data, so you should be able to interpret graphs and plots without relying on your calculator. Once you know what to expect on the exam, how to take the test, and which topics you should spend the most time learning about, you will be ready to get that 5!

Start your AP Statistics Prep today