

## AP STATISTICS

# AP Pacing Guide for Flipped Classrooms: Jan.–April 2021

## Overview


Due to the challenges associated with hybrid and remote learning in 2020–21, a significant amount of the content and skills colleges are requiring for credit will likely need to be assigned to students as homework or independent learning. This guide allows students who are currently behind to complete all course topics from the course and exam description by May. This guide assumes students will complete approximately 30 minutes of AP Daily videos (~10 minutes each) and topic questions each day in lieu of, or addition to, assignments the teacher would ordinarily give.

## How to Implement

This guide assumes students covered only ~25% of the course content and skills in the fall of 2020. For classes that have been forced off schedule, there may not be time for teacher-led instruction of all remaining topics.

- Teachers should **assign the AP Daily videos and topic questions** listed below as student assignments each week.
- Using the reports generated by the topic questions, teachers should focus their limited, direct class time on the Learning Objectives where students need more help.
- If students are ahead of the pace indicated below, teachers will be able to incorporate additional days or weeks to spend more time on challenging topics, practicing course skills, or reviewing for the exam.

## Week 1: Jan. 4–8

Topic	Recommended Asynchronous Student Assignments	Options for Synchronous Instructional Focus*	Check for Understanding
4.1 Introducing Statistics: Random and Non-Random Patterns?	AP Daily Video 1	VAR-1.F: Identify questions suggested by patterns in data.	
4.2 Estimating Probabilities Using Simulation	AP Daily Video 1 AP Daily Video 2	UNC-2.A: Estimate probabilities using simulation.	 Topic Questions

\*Prioritize the most challenging Learning Objectives for your students for direct, synchronous instruction.

Topic	Recommended Asynchronous Student Assignments	Options for Synchronous Instructional Focus*	Check for Understanding
4.3 Introduction to Probability	AP Daily Video 1	VAR-4.A: Calculate probabilities for events and their complements. VAR-4.B: Interpret probabilities for events.	💡 Topic Questions
4.4 Mutually Exclusive Events	AP Daily Video 1	VAR-4.C: Explain why two events are (or are not) mutually exclusive.	💡 Topic Questions

 **Week 2: Jan. 11–15**

Topic	Recommended Asynchronous Student Assignments	Options for Synchronous Instructional Focus*	Check for Understanding
4.5 Conditional Probability	AP Daily Video 1	VAR-4.D: Calculate conditional probabilities.	💡 Topic Questions
4.6 Independent Events and Unions of Events	AP Daily Video 1 AP Daily Video 2 AP Daily Video 3	VAR-4.E: Calculate probabilities for independent events and for the union of two events.	💡 Topic Questions
4.7 Introduction to Random Variables and Probability Distributions	AP Daily Video 1 AP Daily Video 2	VAR-5.A: Represent the probability distribution for a discrete random variable. VAR-5.B: Interpret a probability distribution.	💡 Topic Questions
4.8 Mean and Standard Deviation of Random Variables	AP Daily Video 1	VAR-5.C: Calculate parameters for a discrete random variable. VAR-5.D: Interpret parameters for a discrete random variable.	💡 Topic Questions




**📅 Week 3: Jan. 18–22**

Topic	Recommended Asynchronous Student Assignments	Options for Synchronous Instructional Focus*	Check for Understanding
4.9 Combining Random Variables	AP Daily Video 1 AP Daily Video 2	VAR-5.E: Calculate parameters for linear combinations of random variables. VAR-5.F: Describe the effects of linear transformations of parameters of random variables.	💡 Topic Questions
4.10 Introduction to the Binomial Distribution	AP Daily Video 1	UNC-3.A: Estimate probabilities of binomial random variables using data from a simulation. UNC-3.B: Calculate probabilities for a binomial distribution.	💡 Topic Questions
4.11 Parameters for a Binomial Distribution	AP Daily Video 1	UNC-3.C: Calculate parameters for a binomial distribution. UNC-3.D: Interpret probabilities and parameters for a binomial distribution.	💡 Topic Questions
4.12 The Geometric Distribution	AP Daily Video 1 AP Daily Video 2	UNC-3.E: Calculate probabilities for geometric random variables. UNC-3.F: Calculate parameters of a geometric distribution. UNC-3.G: Interpret probabilities and parameters for a geometric distribution.	💡 Topic Questions ✅ Personal Progress Check


**📅 Week 4: Jan. 25–29**



Topic	Recommended Asynchronous Student Assignments	Options for Synchronous Instructional Focus*	Check for Understanding
5.1 Introducing Statistics: Why Is My Sample Not Like Yours?	AP Daily Video 1	VAR-1.G: Identify questions suggested by variation in statistics for samples collected from the same population.	
5.2 The Normal Distribution, Revisited	AP Daily Video 1 AP Daily Video 2 AP Daily Video 3	VAR-6.A: Calculate the probability that a particular value lies in a given interval of a normal distribution. VAR-6.B: Determine the interval associated with a given area in a normal distribution. VAR-6.C: Determine the appropriateness of using the normal distribution to approximate probabilities for unknown distributions.	💡 Topic Questions
5.3 The Central Limit Theorem	AP Daily Video 1 AP Daily Video 2	UNC-3.H: Estimate sampling distributions using simulation.	💡 Topic Questions

 **Week 5: Feb. 1–5**


Topic	Recommended Asynchronous Student Assignments	Options for Synchronous Instructional Focus*	Check for Understanding
5.4 Biased and Unbiased Point Estimates	AP Daily Video 1	UNC-3.I: Explain why an estimator is or is not unbiased. UNC-3.J: Calculate estimates for a population parameter.	 Topic Questions
5.5 Sampling Distributions for Sample Proportions	AP Daily Video 1 AP Daily Video 2	UNC-3.K: Determine parameters of a sampling distribution for sample proportions. UNC-3.L: Determine whether a sampling distribution for a sample proportion can be described as approximately normal. UNC-3.M: Interpret probabilities and parameters for a sampling distribution for a sample proportion.	 Topic Questions
5.6 Sampling Distributions for Differences in Sample Proportions	AP Daily Video 1 AP Daily Video 2	UNC-3.N: Determine parameters of a sampling distribution for a difference in sample proportions. UNC-3.O: Determine whether a sampling distribution for a difference of sample proportions can be described as approximately normal. UNC-3.P: Interpret probabilities and parameters for a sampling distribution for a difference in proportions.	 Topic Questions

 **Week 6: Feb. 8–12**

Topic	Recommended Asynchronous Student Assignments	Options for Synchronous Instructional Focus*	Check for Understanding
5.7 Sampling Distributions for Sample Means	AP Daily Video 1 AP Daily Video 2	UNC-3.Q: Determine parameters for a sampling distribution for sample means. UNC-3.R: Determine whether a sampling distribution of a sample mean can be described as approximately normal. UNC-3.S: Interpret probabilities and parameters for a sampling distribution for a sample mean.	 Topic Questions

Topic	Recommended Asynchronous Student Assignments	Options for Synchronous Instructional Focus*	Check for Understanding
5.8 Sampling Distributions for Differences in Sample Means	AP Daily Video 1 AP Daily Video 2	UNC-3.T: Determine parameters of a sampling distribution for a difference in sample means.  UNC-3.U: Determine whether a sampling distribution of a difference in sample means can be described as approximately normal.  UNC-3.V: Interpret probabilities and parameters for a sampling distribution for a difference in sample means.	 Topic Questions  Personal Progress Check


 **Week 7: Feb. 15–19**

Topic	Recommended Asynchronous Student Assignments	Options for Synchronous Instructional Focus*	Check for Understanding
6.1 Introducing Statistics: Why Be Normal?	AP Daily Video 1	VAR-1.H: Identify questions suggested by variation in the shapes of distributions of samples taken from the same population.	
6.2 Constructing a Confidence Interval for a Population Proportion	AP Daily Video 1 AP Daily Video 2 AP Daily Video 3	UNC-4.A: Identify an appropriate confidence interval procedure for a population proportion.  UNC-4.B: Verify the conditions for calculating confidence intervals for a population proportion.  UNC-4.C: Determine the margin of error for a given sample size and an estimate for the sample size that will result in a given margin of error for a population proportion.  UNC-4.D: Calculate an appropriate confidence interval for a population proportion.  UNC-4.E: Calculate an interval estimate based on a confidence interval for a population proportion.	 Topic Questions

Topic	Recommended Asynchronous Student Assignments	Options for Synchronous Instructional Focus*	Check for Understanding
6.3 Justifying a Claim Based on a Confidence Interval for a Population Proportion	AP Daily Video 1 AP Daily Video 2 AP Daily Video 3	UNC-4.F: Interpret a confidence interval for a population proportion. UNC-4.G: Justify a claim based on a confidence interval for a population proportion. UNC-4.H: Identify the relationships between sample size, width of a confidence interval, confidence level, and margin of error for a population proportion.	💡 Topic Questions
6.4 Setting Up a Test for a Population Proportion	AP Daily Video 1 AP Daily Video 2	VAR-6.D: Identify the null and alternative hypotheses for a population proportion. VAR-6.E: Identify an appropriate testing method for a population proportion. VAR-6.F: Verify the conditions for making statistical inferences when testing a population proportion.	💡 Topic Questions





 **Week 8: Feb. 22–26**

Topic	Recommended Asynchronous Student Assignments	Options for Synchronous Instructional Focus*	Check for Understanding
6.5 Interpreting p-Values	AP Daily Video 1 AP Daily Video 2	VAR-6.G: Calculate an appropriate test statistic and p-value for a population proportion. DAT-3.A: Interpret the p-value of a significance test for a population proportion.	💡 Topic Questions
6.6 Concluding a Test for a Population Proportion	AP Daily Video 1 AP Daily Video 2	DAT-3.B: Justify a claim about the population based on the results of a significance test for a population proportion.	💡 Topic Questions
6.7 Potential Errors When Performing Tests	AP Daily Video 1 AP Daily Video 2	UNC-5.A: Identify Type I and Type II errors. UNC-5.B: Calculate the probability of Type I and Type II errors. UNC-5.C: Identify factors that affect the probability of errors in significance testing. UNC-5.D: Interpret Type I and Type II errors.	💡 Topic Questions




Topic	Recommended Asynchronous Student Assignments	Options for Synchronous Instructional Focus*	Check for Understanding
6.8 Confidence Intervals for the Difference of Two Proportions	AP Daily Video 1 AP Daily Video 2	UNC-4.I: Identify an appropriate confidence interval procedure for a comparison of population proportions. UNC-4.J: Verify the conditions for calculating confidence intervals for a difference between population proportions. UNC-4.K: Calculate an appropriate confidence interval for a comparison of population proportions. UNC-4.L: Calculate an interval estimate based on a confidence interval for a difference of proportions.	 Topic Questions



**Week 9: Mar. 1–5**




Topic	Recommended Asynchronous Student Assignments	Options for Synchronous Instructional Focus*	Check for Understanding
6.9 Justifying a Claim Based on a Confidence Interval for a Difference of Population Proportions	AP Daily Video 1 AP Daily Video 2	UNC-4.M: Interpret a confidence interval for a difference of proportions. UNC-4.N: Justify a claim based on a confidence interval for a difference of proportions.	 Topic Questions
6.10 Setting Up a Test for the Difference of Two Population Proportions	AP Daily Video 1 AP Daily Video 2	VAR-6.H: Identify the null and alternative hypotheses for a difference of two population proportions. VAR-6.I: Identify an appropriate testing method for the difference of two population proportions. VAR-6.J: Verify the conditions for making statistical inferences when testing a difference of two population proportions.	 Topic Questions
6.11 Carrying Out a Test for the Difference of Two Population Proportions	AP Daily Video 1 AP Daily Video 2 AP Daily Video 3	VAR-6.K: Calculate an appropriate test statistic for the difference of two population proportions. DAT-3.C: Interpret the p-value of a significance test for a difference of population proportions. DAT-3.D: Justify a claim about the population based on the results of a significance test for a difference of population proportions.	 Topic Questions  Personal Progress Check

 **Week 10: Mar. 8–12**




Topic	Recommended Asynchronous Student Assignments	Options for Synchronous Instructional Focus*	Check for Understanding
7.1 Introducing Statistics: Should I Worry About Error?	AP Daily Video TBD	VAR-1.I: Identify questions suggested by probabilities of errors in statistical inference.	
7.2 Constructing a Confidence Interval for a Population Mean	AP Daily Video TBD	<p>VAR-7.A: Describe t-distributions.</p> <p>UNC-4.O: Identify an appropriate confidence interval procedure for a population mean, including the mean difference between values in matched pairs.</p> <p>UNC-4.P: Verify the conditions for calculating confidence intervals for a population mean, including the mean difference between values in matched pairs.</p> <p>UNC-4.Q: Determine the margin of error for a given sample size for a one-sample t-interval.</p> <p>UNC-4.R: Calculate an appropriate confidence interval for a population mean, including the mean difference between values in matched pairs.</p>	 Topic Questions
7.3 Justifying a Claim About a Population Mean Based on a Confidence Interval	AP Daily Video TBD	<p>UNC-4.S: Interpret a confidence interval for a population mean, including the mean difference between values in matched pairs.</p> <p>UNC-4.T: Justify a claim based on a confidence interval for a population mean, including the mean difference between values in matched pairs.</p> <p>UNC-4.U: Identify the relationships between sample size, width of a confidence interval, confidence level, and margin of error for a population mean.</p>	 Topic Questions
7.4 Setting Up a Test for a Population Mean	AP Daily Video TBD	<p>VAR-7.B: Identify an appropriate testing method for a population mean with unknown <math>\sigma</math>, including the mean difference between values in matched pairs.</p> <p>VAR-7.C: Identify the null and alternative hypotheses for a population mean with unknown <math>\sigma</math>, including the mean difference between values in matched pairs.</p> <p>VAR-7.D: Verify the conditions for the test for a population mean, including the mean difference between values in matched pairs.</p>	 Topic Questions






 **Week 11: Mar. 15–19**

Topic	Recommended Asynchronous Student Assignments	Options for Synchronous Instructional Focus*	Check for Understanding
7.5 Carrying Out a Test for a Population Mean	AP Daily Video TBD	<p>VAR-7.E: Calculate an appropriate test statistic for a population mean, including the mean difference between values in matched pairs.</p> <p>DAT-3.E: Interpret the p-value of a significance test for a population mean, including the mean difference between values in matched pairs.</p> <p>DAT-3.F: Justify a claim about the population based on the results of a significance test for a population mean.</p>	 Topic Questions
7.6 Confidence Intervals for the Difference of Two Means	AP Daily Video TBD	<p>UNC-4.V: Identify an appropriate confidence interval procedure for a difference of two population means.</p> <p>UNC-4.W: Verify the conditions to calculate confidence intervals for the difference of two population means.</p> <p>UNC-4.X: Determine the margin of error for the difference of two population means.</p> <p>UNC-4.Y: Calculate an appropriate confidence interval for a difference of two population means.</p>	 Topic Questions
7.7 Justifying a Claim About the Difference of Two Means Based on a Confidence Interval	AP Daily Video TBD	<p>UNC-4.Z: Interpret a confidence interval for a difference of population means.</p> <p>UNC-4.AA: Justify a claim based on a confidence interval for a difference of population means.</p> <p>UNC-4.AB: Identify the effects of sample size on the width of a confidence interval for the difference of two means.</p>	 Topic Questions




 **Week 12: Mar. 22–26**

Topic	Recommended Asynchronous Student Assignments	Options for Synchronous Instructional Focus*	Check for Understanding
7.8 Setting Up a Test for the Difference of Two Population Means	AP Daily Video TBD	VAR-7.F: Identify an appropriate selection of a testing method for a difference of two population means. VAR-7.G: Identify the null and alternative hypotheses for a difference of two population means. VAR-7.H: Verify the conditions for the significance test for the difference of two population means.	 Topic Questions
7.9 Carrying Out a Test for the Difference of Two Population Means	AP Daily Video TBD	VAR-7.I: Calculate an appropriate test statistic for a difference of two means. DAT-3.G: Interpret the p-value of a significance test for a difference of population means. DAT-3.H: Justify a claim about the population based on the results of a significance test for a difference of two population means in context.	 Topic Questions
7.10 Skills Focus: Selecting, Implementing, and Communicating Inference Procedures	AP Daily Video TBD	See page 175 of the course and exam description for more information on Topic 7.10.	 Personal Progress Check






 **Week 13: Mar. 29–Apr. 2**

Topic		Recommended Asynchronous Student Assignments	Options for Synchronous Instructional Focus*	Check for Understanding
8.1	Introducing Statistics: Are My Results Unexpected?	AP Daily Video TBD	VAR-1.J: Identify questions suggested by variation between observed and expected counts in categorical data.	
8.2	Setting Up a Chi-Square Test for Goodness of Fit	AP Daily Video TBD	VAR-8.A: Describe chi-square distributions. VAR-8.B: Identify the null and alternative hypotheses in a test for a distribution of proportions in a set of categorical data. VAR-8.C: Identify an appropriate testing method for a distribution of proportions in a set of categorical data. VAR-8.D: Calculate expected counts for the chi-square test for goodness of fit. VAR-8.E: Verify the conditions for making statistical inferences when testing goodness of fit for a chi-square distribution.	 Topic Questions
8.3	Carrying Out a Chi-Square Test for Goodness of Fit	AP Daily Video TBD	VAR-8.F: Calculate the appropriate statistic for the chi-square test for goodness of fit. VAR-8.G: Determine the p-value for chi-square test for goodness of fit significance test. DAT-3.I: Interpret the p-value for the chi-square test for goodness of fit. DAT-3.J: Justify a claim about the population based on the results of a chi-square test for goodness of fit.	 Topic Questions
8.4	Expected Counts in Two-Way Tables	AP Daily Video TBD	VAR-8.H: Calculate expected counts for two-way tables of categorical data.	 Topic Questions

 **Week 14: Apr. 5–9**

Topic	Recommended Asynchronous Student Assignments	Options for Synchronous Instructional Focus*	Check for Understanding
8.5 Setting Up a Chi-Square Test for Homogeneity or Independence	AP Daily Video TBD	VAR-8.I: Identify the null and alternative hypotheses for a chi-square test for homogeneity or independence. VAR-8.J: Identify an appropriate testing method for comparing distributions in two-way tables of categorical data. VAR-8.K: Verify the conditions for making statistical inferences when testing a chi-square distribution for independence or homogeneity.	 Topic Questions
8.6 Carrying Out a Chi-Square Test for Homogeneity or Independence	AP Daily Video TBD	VAR-8.L: Calculate the appropriate statistic for a chi-square test for homogeneity or independence. VAR-8.M: Determine the p-value for a chi-square significance test for independence or homogeneity. DAT-3.K: Interpret the p-value for the chi-square test for homogeneity or independence. DAT-3.L: Justify a claim about the population based on the results of a chi-square test for homogeneity or independence.	 Topic Questions
8.7 Skills Focus: Selecting an Appropriate Inference Procedure for Categorical Data	AP Daily Video TBD	See page 192 of the course and exam description for more information on Topic 8.7.	 Personal Progress Check

 **Week 15: Apr. 12–16**

Topic	Recommended Asynchronous Student Assignments	Options for Synchronous Instructional Focus*	Check for Understanding
9.1 Introducing Statistics: Do Those Points Align?	AP Daily Video TBD	VAR-1.K: Identify questions suggested by variation in scatter plots.	
9.2 Confidence Intervals for the Slope of a Regression Model	AP Daily Video TBD	UNC-4.AC: Identify an appropriate confidence interval procedure for a slope of a regression model. UNC-4.AD: Verify the conditions to calculate confidence intervals for the slope of a regression model. UNC-4.AE: Determine the given margin of error for the slope of a regression model. UNC-4.AF: Calculate an appropriate confidence interval for the slope of a regression model.	 Topic Questions
9.3 Justifying a Claim About the Slope of a Regression Model Based on a Confidence Interval	AP Daily Video TBD	UNC-4.AG: Interpret a confidence interval with the slope of a regression model. UNC-4.AH: Justify a claim based on a confidence interval for the slope of a regression model. UNC-4.AI: Identify the effects of sample size on the width of a confidence interval for the slope of a regression model.	 Topic Questions
9.4 Setting Up a Test for the Slope of a Regression Model	AP Daily Video TBD	VAR-7.J: Identify the appropriate selection of a testing method for a slope of a regression model. VAR-7.K: Identify appropriate null and alternative hypotheses for a slope of a regression model. VAR-7.L: Verify the conditions for the significance test for the slope of a regression model.	 Topic Questions
9.5 Carrying Out a Test for the Slope of a Regression Model	AP Daily Video TBD	VAR-7.M: Calculate an appropriate test statistic for the slope of a regression model. DAT-3.M: Interpret the p-value of a significance test for the slope of a regression model. DAT-3.N: Justify a claim about the population based on the results of a significance test for the slope of a regression model.	 Topic Questions
9.6 Skills Focus: Selecting an Appropriate Inference Procedure	AP Daily Video TBD	See page 206 of the course and exam description for more information on Topic 9.6.	 Personal Progress Check