



2021 Advanced Placement® Statistics

About the AP® Statistics Summer Institute

This session is designed for both new and experienced teachers and will cover the material pertinent to the 2020-2021 AP® Statistics Course.

Day 1: Monday, July 12, 2021

Session 0 (preliminary – before APSI begins) Asynchronous

- Fill out APSI participant survey (Google Form)
- CED Treasure Map Activity
- Prepare short video to introduce yourself (about 1 minute)
- Watch Technology Orientation Video

Session 1 (9am-1030am) Synchronous

- Introductions
- AP Statistics Overview
- College Board Resources (AP Central, AP Classroom, CED)
- Other AP Statistics Resources
- Use of Technology, Formulas and Tables
- AP Audit, Pacing/Syllabi
- Equity and Access as a Guiding Principle in Designing Instruction

Session 2 Asynchronous

- CED Unit 1, Exploring One-Variable Data
- Descriptive Statistics in Words, Numbers, and Charts/Graphs
- Normal Distributions

Session 3 (1pm-230pm) Synchronous

- Asynchronous Work Review
- Problem Sets on Exploring One-Variable Data
- Exploring One-Variable Data Activity (Census at School)

Session 4 Asynchronous

- CED Unit 2, Exploring Two-Variable Data
- Scatterplots and Association
- Correlation and Coefficient of Determination
- Least-Squares Regression Lines
- Residual Plots

Day 2: Tuesday, July 13, 2021

Session 5 (9am-1030am) Synchronous

- Asynchronous Work Review
- Problem Sets on Exploring Two-Variable Data
- Correlation and Regression Methods Activity (Bundesliga Soccer Data)

Session 6 Asynchronous

- CED Unit 3, Collecting Data
- Sampling
- Observational Studies
- Experiments
- Designing Studies
- Scope of Inference
- Simulation and Simulation-Based Inference

Session 7 (1pm-230pm) Synchronous

- Asynchronous Work Review
- Problem Sets on Collecting Data
- Sampling Activity (Sampling at a School Assembly)
- Experimental Design Activity

Session 8 Asynchronous

- CED Unit 4, Probability, Random Variables, and Probability Distributions
- Randomness and Probability Rules
- Conditional Probability
- Mutually Exclusive Events and Independent Events
- Random Variables (Discrete and Continuous)
- Binomial and Geometric Distributions
- Combined Event Probabilities

Day 3: Wednesday, July 14, 2021**Session 9 (9am-1030am) Synchronous**

- Asynchronous Work Review
- Problem Sets on Probability, Random Variables, and Probability Distributions
- Probability Activity (Rock-Paper-Scissors)
- Probability Activity (Casino Lab)

Session 10 Asynchronous

- CED Unit 5, Sampling Distributions
- Sample Proportion
- Sampling Distribution of a Sample Proportion
- Sample Mean
- Sampling Distribution of a Sample Mean

Session 11 (1pm-230pm) Synchronous

- Asynchronous Work Review
- Problem Sets on Sampling Distributions
- Sampling Distributions Activity (Reese's Pieces)
- Sampling Distributions Follow-Up Activity (Reese's Pieces)

Session 12 Asynchronous

- CED Unit 6, Inference for Categorical Data: Proportions
- Confidence Interval for a Proportion
- Conditions for Inference
- Margin of Error and Standard Error
- Significance Tests About a Proportion
- Test Statistics and P-Values
- Power, Type I, and Type II Errors
- 2-Proportion Confidence Intervals and Significance Tests for Proportions

Day 4: Thursday, July 15, 2021

Session 13 (9am-1030am) Synchronous

- Asynchronous Work Review
- Problem Sets on 1-Sample and 2-Sample Inference Procedures for Proportions
- Confidence Interval Activity (Presidential Polls)
- Significance Test Activity (Hershey's Kisses)

Session 14 Asynchronous

- CED Unit 7, Inference for Quantitative Data: Means
- Confidence Interval for a Mean
- T-Distributions and Degrees of Freedom
- Significance Tests About a Mean
- 2-Proportion Confidence Intervals and Significance Tests for Means

Session 15 (1pm-230pm) Synchronous

- Asynchronous Work Review
- Problem Sets on 1-Sample and 2-Sample Inference Procedures for Means
- Confidence Interval and Significance Test Activity for Means (Cereal Box Vouchers)

Session 16 Asynchronous

- CED Unit 8, Inference for Categorical Data: Slopes
- Chi-Square Distributions
- Conditions for Inference
- Chi-Square Goodness of Fit Test
- Chi-Square Test for Association/Independence
- Chi-Square Test for Homogeneity

Day 5: Friday, July 16, 2021

Session 17 (9am-1030am) Synchronous

- Asynchronous Work Review
- Problem Sets on Chi-Square
- Chi-Square Goodness of Fit Activity (M&M's)
- Strategies and Pedagogical Tools

Session 18 Asynchronous

- Instructional Planning Reports PP Slide Deck
- AP Classroom PP Slide Deck (revisited)
- Sample Investigative Task
- Cumulative Review Practice (Exploring Data, Collecting Data, Probability, Inference)

Session 19 (1pm-230pm) Synchronous

- AP Reading
- Common Student Errors
- Assessment Strategies
- AP Exam Review Tips
- Projects in AP Statistics
- Equity and Access as a Guiding Principle in Designing Instruction (revisited)
- Wrap-up

Session 20 Asynchronous

- CED Unit 9, Inference for Quantitative Data: Slopes

- Confidence Interval for Regression Slope
- Significance Test for Regression Slope
- Conditions for Inference
- Review Sample Chapter Tests (1-12)

What you will need for use during the institute:

- a laptop computer & storage device
- a TI-84 Plus graphing calculator
- a current syllabus and pacing guide
- one classroom activity to share
- one best practice to share
- Some materials for class activities (one small bag of M&M's, Hershey's kisses, two 6-sided dice, deck of cards)
- NOTE: a survey will be sent to you before the course begins – please be sure to respond to share some important information including your goals for the week

Instructor:

David Wilcox is currently a member of the mathematics faculty at The Lawrenceville School in Lawrenceville, NJ. He has served as a rubric team member, table leader, and reader for the College Board at the AP Statistics Reading for the past 19 years. David is also an APSI and workshop instructor for the College Board, and has presented at the AP Annual Conference. His consulting work includes recent projects with ETS and Edgenuity. In addition to AP Statistics, David teaches Honors Calculus-Based Probability and Statistics and develops probability and statistics curriculum for integrated math courses at The Lawrenceville School. In 2006, he was a national nominee for the prestigious Siemens Award for Advanced Placement for his work in the AP Statistics classroom, and in his second year at The Lawrenceville School, he received the Robert B Ritter Jr award given by the Headmaster for excellence in academic nurturing. David received a Bachelor of Science in Mathematics from Christian Brothers University in 1989, a Masters of International Business Studies (Spanish Track) from the University of South Carolina in 1994, and a Masters of Applied Statistics degree from the University of South Carolina in 2013.