**PACING GUIDE**

**COURSE:** **GRADE(S):**

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| **MONTH** | **UNIT** | **STANDARDS/SKILLS** | **ASSESSMENTS**What evidence (formative/summative) is utilized to establish that the content, standards, & skills have been mastered? | **CONTENT**Topics being covered? What do students need to know? (*nouns*) | **ACTIVITIES**w/Integration of Technology & Career Ready Practices |
| September-November | 1  | MA.K-12.2MA.K-12.5 MA.9-12.S-ICMA.9-12.S-ID.AMA.9-12.S-ID.B | • Quiz: displaying quantitative data• quiz: experiments• quiz: least-squares regression• quiz: normal distributions• quiz: percentiles and location in a distribution• test: describing relationships• test: designing studies• test: exploring data• test:modeling distributions of data | Comparing distributionsBar graphs and Pie chartsDescribing shapeHow to experiment well: the randomized comparative experiment Relationships between categorical variables: conditional distributionsSimpson's paradoxassessing normality blockingcalculating the equations of the least squares linechoosing measures of center and spreadcomparing the mean and the mediancorrelation and regression wisdomcumulative relative: frequency graphsdata ethicsdensity curvesdescribing density curvesdisplaying relationships: scatterplotsdot plotsexperiments: what can go wrongexplanatory and response variables facts about correlationhistograms how to experiment badlyhow to sample badlyhow to sample well: random samplinghow well the line fits the data: residual plots how well the line fits the data: the role of r-squared in regressionidentifying outliersinference for experiments inference for sampling interpreting Graphs: good and bad interpreting a regression lineinterpreting computer regression outputinterpreting scatterplotsmatched pairs design measuring center: the meanmeasuring center: the medianmeasuring linear association: correlation measuring position: percentilesmeasuring position: z-scoresmeasuring spread: the interquartile range: (IQR)measuring spread: the standard deviationnormal distribution calculationsnumerical summaries with technologyobservational study v. experimental studyorganizing a statistical problemother sampling methodspredictionresiduals and the least-squares regression linesample surveys: what can go wrong?scope of inferencestemplotsthe 68-95-99.7 rulethe challenges of establishing causation the five-number summary and boxplotsthe idea of a sample surveythe language of experimentthe standard normal distribution rulethe three principles of experimental design transforming datatwo-way tables and marginal distributionsusing histograms wisely | cum. freq graphdot plotsNormal CurveGraphing datamanipulating dataexperimentssampling and surveysscatterplots and correlationM&M LabSkittles Lab |
| November-January  | 2 | MA.9-12.S-IC.AMA.9-12.S-MDMA.K-12.7 MA.9-12.S-MD.BMA.9-12.S-CPMA.K-12.1  | • quiz: binomial and geometric variables• quiz: discrete and continuous variables• quiz: probability rules• quiz: venn diagrams and tree diagrams• test: probability• test: random variables• test: random variables | Binomial distributions in statistical sampling Continuous random variables Geometric random variablesIndependence: a special multiplication ruleParameters and statisticsProbability modelsVenn diagrams and probabilitybasic rules of probabilitybinomial settings and binomial random variables binomial probabilitiescalculating conditional probability combining normal random variables combining random variables conditional probability and independence describing sampling distributionsdiscrete random variableslinear transformationsmean (expected value) of a discrete random variablemean and standard deviation of a binomial distribution myths about randomness sampling from a normal distributionsampling variability simulationstandard deviation (and variance) of a discrete random variablethe central limit theoremthe idea of probability the sampling distribution of pthe sampling distribution of x: mean and standard deviation tree diagrams and the general multiplication rule two-way tables and probabilityusing the normal approximation for pwhat is conditional probability | data investigationsprobability rulesrandomness, probability, and simultaionsconditional probability and independencetransforming and combining random variablesbasketball shots simulationcombining random variablesrandom number generatorsimulations |
| January-February | 3 | MA.K-12.3 MA.K-12.4 MA.9-12.S-ICMA.9-12.S-MDMA.9-12.S-ID | Quiz: Sample meansQuiz: estimating a population proportionQuiz: sample proportionsTest: Estimating with confidenceTest: Sampling Distributionquiz: estimating a population mean | Choosing the sample sizecarrying out a significance testcarrying out a significance test for meanchoosing the sample sizeconditions for estimating pconfidence interval for u1-u2confidence intervals for the p1 - p2constructing a confidence intervalconstructing a confidence interval for pconstruction a confidence interval for the meaninference for experimentsinference for means: paired datainterpreting confidence levels and confidence intervalsinterpreting p-valuesplanning studies:The power of a statistical testputting it all together: the P.A.N.I.C processsignificance tests for p1-p2significance tests for u1-u2stating the hypothesisstatistical significance . the idea of a confidence intervalthe one-sample t testthe one-sample z test for a proportionthe reasoning of significance teststhe sampling distribution of a difference between two proportionsthe sampling distribution of a difference of two meansthe two-sample t statistic two-sided teststwo-sided tests and confidence intervalstype 1 and type II errorsusing confidence intervals wiselyusing t procedures wiselyusing tests wiselyusing two-sample t tests wiselywhen standard deviation is known: the t distributionswhen the standard deviation is known: the one-sample z interval for a population meanwhy confidence intervals give more information | data investigationssample meanswhat is a sampling distributionestimating a population meanconfidence interval activityone sample t-testone sample z-testpopulation proportion |
| February/March | 4 | MA.K-12.5 MA.9-12.S-ICMA.K-12.6 MA.K-12.8  | Quiz: GOFQuiz: comparing two meansQuiz: comparing two proportionsQuiz: inference for relationshipsQuiz: test about a population proportionQuiz: tests about a population meanTest: Inference for Distributions of Categorical DataTest: comparing two populations or groupsTest: testing a claim | carrying out a testcomparing distributions of a categorical variablecomparing observed and expected counts: the chi-square statisticcomparing several proportionsconditions for regression inferenceconstructing a confidence interval for slopeestimating the parametersexpected counts and the chi-square statistic follow up analysisperforming a significance test for the sloperelationships between two categorical variablessampling distribution for bthe chi-square distribution and p-valuesthe chi-square test for association/independencethe chi-square test for homogeneitytransforming with logarithms transforming with powers and rootsusing chi-square tests wisely | AP Sample questionscomparing two meanscomparing two proportionsgoodness of fitinference of relationshipstests about a population meantests about a population proportion |
| April/May  | 5 | MA.9-12.S-ID.CMA.K-12.2 MA.K-12.3 MA.K-12.5 MA.9-12.S-ICMA.9-12.S-MDMA.9-12.S-IDMA.K-12.6 MA.K-12.7 MA.9-12.S-CPMA.9-12.S-ID.BMA.K-12.8 MA.K-12.1  | AP Statistics TestAP practice test free response 2013AP practice test free response 2014AP practice test free response 2015AP practice test free response 2016AP practice test free response 2017AP practice test multiple choice 2013AP practice test multiple choice 2014AP practice test multiple choice 2015AP practice test multiple choice 2016AP practice test multiple choice 2017 | Choosing the Correct Inference ProcedureParticipate in Mock AP ExamsParticipate in Mock Grading SessionsPractice Free Response QuestionsPractice Multiple Choice QuestionsReview Grading and Strategies for SuccessStudy sessions | Choosing the Correct Inference ProcedureParticipate in Mock AP ExamsParticipate in Mock Grading SessionsPractice Free Response QuestionsPractice Multiple Choice QuestionsReview Grading and Strategies for SuccessStudy sessions AP Sample questionscollegeboard practice testsdata investigationspowerpoint: jep final review |
| May/June  | 6 | MA.9-12.S-ID.CMA.K-12.2 MA.K-12.3 MA.K-12.5 MA.9-12.S-ICMA.9-12.S-MDMA.9-12.S-IDMA.K-12.6 MA.K-12.7 MA.9-12.S-CPMA.9-12.S-ID.BMA.K-12.8 MA.K-12.1 | "A Civil Action" ProjectEnd of year projectWii bowling project | "A Civil Action" ProjectEnd of year projectWii bowling project | "A Civil Action" ProjectEnd of year projectWii bowling project |