Standard #: MAFS.912.S-IC.1.1

This document was generated on CPALMS - www.cpalms.org

Understand statistics as a process for making inferences about population parameters based on a random sample from that population. ★

Grade: 912

Cluster: Understand and evaluate random processes underlying statistical experiments. (Algebra 2 - Supporting Cluster) -
Clusters should not be sorted from Major to Supporting and then taught in that order. To do so would strip the coherence of the mathematical ideas and miss the opportunity to enhance the major work of the grade with the supporting clusters.

Date Adopted or Revised: 02/14

Content Complexity Rating: Level 1: Recall - More Information

Date of Last Rating: 02/14

Status: State Board Approved

Related Courses

Course Number	Course Title
1200330:	Algebra 2 (Specifically in versions: 2014 - 2015, 2015 and beyond (current))
1200340:	Algebra 2 Honors (Specifically in versions: 2014 - 2015, 2015 and beyond (current))
1207310:	Liberal Arts Mathematics (Specifically in versions: 2014 - 2015, 2015 and beyond (current))
1210300:	Probability & Statistics with Applications Honors (Specifically in versions: 2014 - 2015, 2015 and beyond (current))
2000520:	Bioscience 3 Honors (Specifically in versions: 2014 - 2015, 2015 and beyond (current))
1200335:	Algebra 2 for Credit Recovery (Specifically in versions: 2014 - 2015, 2015 - 2019 (course terminated))

Related Access Points

Access Point

Access Points Number	Access Points Title
MAFS.912.S-IC.1.AP.1a:	Determine what inferences can be made from statistics.
MAFS.912.S-IC.1.AP.2a:	Understand that the probability of a chance event is a number between 0 and 1 that expresses the likelihood of the event occurring. Larger numbers indicate greater likelihood. A probability near 0 indicates an unlikely event, a probability around 1/2 indicates an event that is neither unlikely nor likely, and a probability near 1 indicates a likely event.
MAFS.912.S-IC.1.AP.2b:	Approximate the probability of a chance event by collecting data on the chance process that produces it and observing its long-run relative frequency, and predict the approximate relative frequency given the probability. For example, when rolling a number cube 600 times, predict that a 3 or 6 would be rolled roughly 200 times, but probably not exactly 200 times.
MAFS.912.S-IC.1.AP.2c:	Determine what inferences can be made from the model.

Related Resources

Perspectives Video: Expert

Name	Description
Birdsong Series: Statistical Analysis of Birdsong:	Wei Wu discusses his statistical contributions to the Birdsong project which help to quantify the differences in the changes of the zebra finch's song.
fMRI, Phantom Limb Pain and Statistical Noise:	Jens Foell discusses how statistical noise reduction is used in fMRI brain imaging to be able to determine which specifics parts of the brain are related to certain activities and how this relates to patients that suffer from phantom limb pain.
Mathematically Exploring the Wakulla Caves:	The tide is high! How can we statistically prove there is a relationship between the tides on the Gulf Coast and in a fresh water spring 20 miles from each other?
MicroGravity Sensors & Statistics:	Statistical analysis played an essential role in using microgravity sensors to determine location of caves in Wakulla County.
Statistical Inferences and Confidence Intervals :	Florida State University Counseling Psychologist discusses how he uses confidence intervals to make inferences on college students' experiences on campus based on a sample of students.

Perspectives Video: Professional/Enthusiast

Name	Description
Camera versus Trap Sampling: Improving how NOAA Samples Fish :	Underwater sampling with cameras has made fishery management more accurate for NOAA scientists.
Fishery Independent vs Dependent Sampling Methods for Fishery Management:	NOAA Scientist Doug Devries discusses the differences between fishery independent surveys and fishery independent surveys. Discussion includes trap sampling as well as camera sampling. Using graphs to show changes in population of red snapper.
Hurricane Dennis & Failed Math Models:	What happens when math models go wrong in forecasting hurricanes?
Making Inferences about Wetland Population Sizes:	This ecologist from the Coastal Plains Institute discusses sampling techniques that are used to gather data to make statistical inferences about amphibian populations in the wetlands of the Apalachicola National Forest.
Population Sampling and Beekeeping:	This buzzworthy video features statistics, sampling, and how scientists make inferences about populations.

Lesson Plan

Name	Description
Hot Coffee Coming Through:	In this lesson, students will explore data collection using the temperature probe sensor and perform statistical analysis of the data. Students will use a scientific method of inquiry to plan an investigation to determine which coffee mug is the best. This activity is meant to allow students to use a variety of skills they have acquired throughout a statistics unit in a problem based STEM challenge. Due to the multiple skills there are many standards that are covered. There are two options for this lab. The first student handout is for students at an average high school statistics level (Algebra 1) and will allow for standard deviation and graphical analyses of the data. The second option is for advanced students that have been exposed to hypothesis testing of claims (Algebra 2 or AP Stats).
Inferences:	This lesson shows students how to produce a survey and display their results. The lesson takes the students through: 1. What is a statistical question? 2. General population verses sample population. 3. What is a hypothesis? 4. What is a survey? 5. How to make inferences.
Interpreting Statistics: A Case of Muddying the Waters:	This lesson is intended to help you assess how well students are able to: • Interpret data and evaluate statistical summaries. • Critique someone else's interpretations of data and evaluations of statistical summaries. The lesson also introduces students to the dangers of misapplying simple statistics in real-world contexts, and illustrates some of the common abuses of statistics and charts found in the media.
Is It a Guess or Statistics?:	This lesson is designed to teach the implementation of random sampling that leads to inference to a larger group or population.
Sensoring Data:	In this follow up lesson, students will explore data collection using the weather station sensor and perform statistical analysis of the data. Students will use a scientific method of inquiry to plan an investigation of their own. This activity is meant to allow students to use a variety of skills they have acquired throughout a statistics unit in a personally meaningful way.
Sensoring Data:	In this follow up lesson, students will explore data collection using the weather station sensor and perform statistical analysis of the data. Students will use a scientific method of inquiry to plan an investigation of their own. This activity is meant to allow students to use a variety of skills they have acquired throughout a statistics unit in a personally meaningful way.

Text Resource

Name	Description
How to Win at Rock-Paper-Scissors:	This informational text resource is intended to support reading in the content area. This article describes a new study about the game rock-paper-scissors. The study reveals that people do not play randomly; there are patterns and hidden psychology players frequently use. Understanding these potential moves can help a player increase their winning edge. As part of interpreting the results of the study, the article references the Nash equilibrium and the "win-stay lose-shift" strategy.
Sample Size Calculation:	This informational text resource is intended to support reading in the content area. This article describes the important process used when setting up trials for statistical investigation. The article explains each parameter that is needed to calculate the sample size, then provides examples and illustrates the process. This article will enhance an upper level math course's study of statistics after significance levels and basic inferential statistics concepts have been taught.
Scientists See the World Differently:	This informational text resource is intended to support reading in the content area. Pew Research Center surveyed scientists and the general public on 12 science oriented issues, including genetically modified foods, vaccines, nuclear power and evolution. Results of the survey showed large discrepancies between the thoughts, causes and recommendations on the issues of the scientists and the general public. Sample sizes and margins of errors are given on the survey results which are represented in percent form. The overall survey showed that the public and the scientists see the world very differently.

Video/Audio/Animation

Name	Description
MIT BLOSSOMS - Flu Math Games:	This video lesson shows students that math can play a role in understanding how an infectious disease spreads and how it can be controlled. During this lesson, students will see and use both deterministic and probabilistic models and will learn by doing through role-playing exercises. There are no formal prerequisites, as students in any high school or even middle school math class could enjoy this learning video. But more advanced classes can go into the optional applied probability modeling that accompanies the module in a downloadable pdf file. The primary exercises between video segments of this lesson are class-intensive simulation games in which members of the class 'infect' each other under alternative math modeling assumptions about disease progression. Also there is an occasional class discussion and local discussion with nearby classmates.

Problem-Solving Task

Name	Description
Musical Preferences:	This problem solving task asks students to make deductions about what kind of music students like by examining a table with data.
School Advisory Panel:	Students are asked to choose the best sampling method for choosing the new School Advisory Panel.
Strict Parents:	This task challenges students to describe parameter of interest for the given context, and design a sample survey.
Why Randomize?:	This task requires students to estimate the mean (average) area of the population of 100 rectangles using the average area of a sample of 5 rectangles. Students are asked to make one estimate using a judgement sample and another using a random sample of the population. Finally, students are asked to consider bias in sampling methods.

Assessment

Name	Description
Sample 4 - High School Algebra 2 State Interim Assessment:	This is a State Interim Assessment for 9th-12th grade.

Teaching Idea

Name	Description
The Birthday Paradox:	The exercise detailed in this resource poses a paradox regarding birthdays. The question raised: how large does a group have to be in order to have a 50% or better probability that two or more people in the group share the same birthday? Intuitions about probability are challenged as students use their calculators to simulate random values to represent the birthdays and reach an answer.

Student Resources

Name	Description
Mathematically Exploring the Wakulla Caves:	The tide is high! How can we statistically prove there is a relationship between the tides on the Gulf Coast and in a fresh water spring 20 miles from each other?
MicroGravity Sensors & Statistics:	Statistical analysis played an essential role in using microgravity sensors to determine location of caves in Wakulla County.
Musical Preferences:	This problem solving task asks students to make deductions about what kind of music students like by examining a table with data.
Population Sampling and Beekeeping:	This buzzworthy video features statistics, sampling, and how scientists make inferences about populations.
School Advisory Panel:	Students are asked to choose the best sampling method for choosing the new School Advisory Panel.

Parent Resources

Name	Description
Musical Preferences:	This problem solving task asks students to make deductions about what kind of music students like by examining a table with data.
Population Sampling and Beekeeping:	This buzzworthy video features statistics, sampling, and how scientists make inferences about populations.
School Advisory Panel:	Students are asked to choose the best sampling method for choosing the new School Advisory Panel.