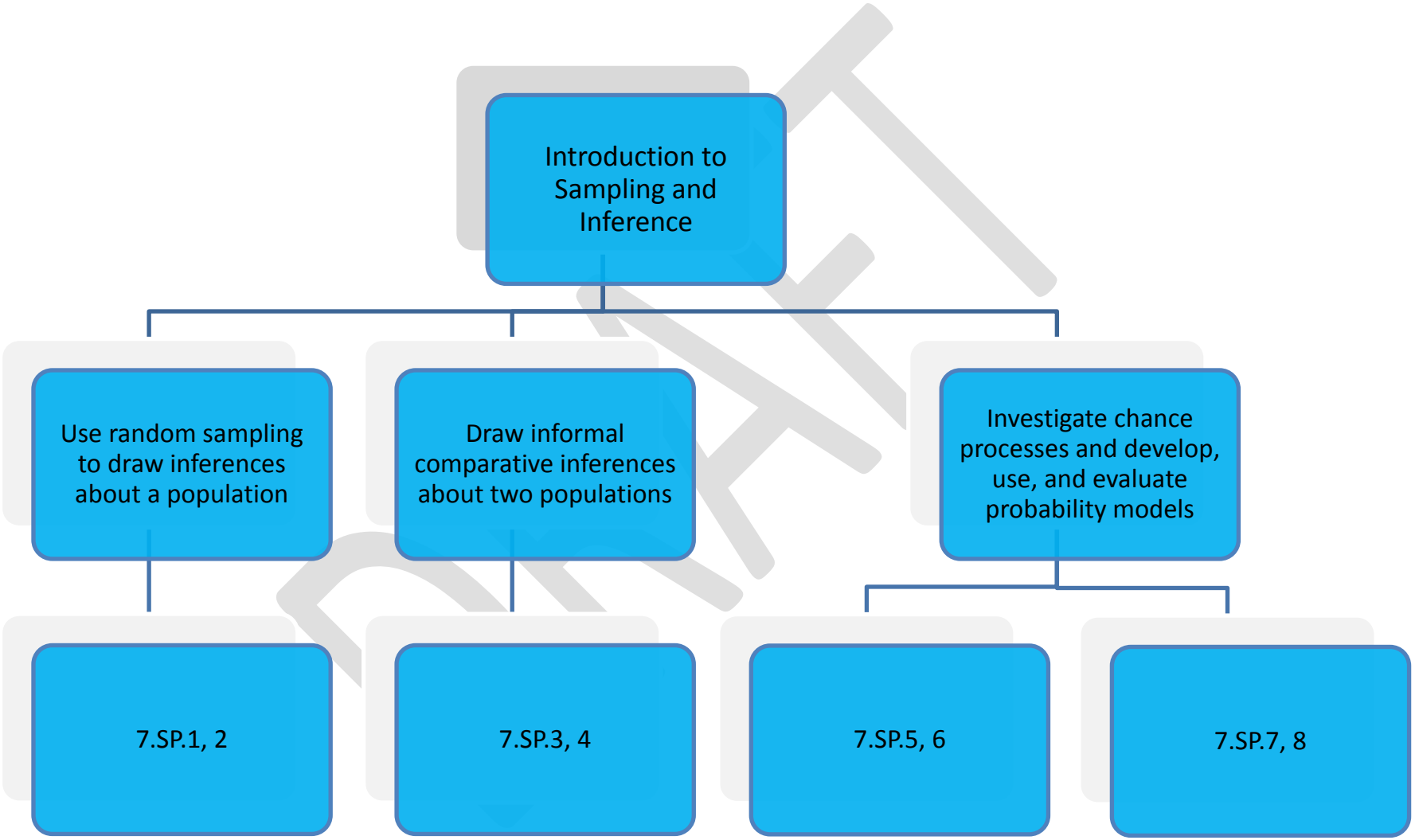
Accelerated Grade 7

Unit 3



Key: Major Clusters; Supporting Clusters and Additional Clusters

Accelerated Grade 7 – UNIT 3
Introduction to Sampling and Inference

Students build on their previous work with single data distributions to compare two data distributions and address questions about differences between populations. They begin informal work with random sampling to generate data sets and learn about the importance of representative samples for drawing inferences.

CLUSTERS	COMMON CORE STATE STANDARDS
Statistics and Probability **(s/a)2 Use random sampling to draw inferences about a population.**	**7.SP.1**. Understand that statistics can be used to gain information about a population by examining a sample of the population; generalizations about a population from a sample are valid only if the sample is representative of that population. Understand that random sampling tends to produce representative samples and support valid inferences. **7.SP.2**. Use data from a random sample to draw inferences about a population with an unknown characteristic of interest. Generate multiple samples (or simulated samples) of the same size to gauge the variation in estimates or predictions. *For example, estimate the mean word length in a book by randomly sampling words from the book; predict the winner of a school election based on randomly sampled survey data. Gauge how far off the estimate or prediction might be.*
(s/a)2 Draw informal comparative inferences about two populations.	**7.SP.3**. Informally assess the degree of visual overlap of two numerical data distributions with similar variabilities, measuring the difference between the centers by expressing it as a multiple of a measure of variability. *For example, the mean height of players on the basketball team is 10 cm greater than the mean height of players on the soccer team, about twice the* *variability (mean absolute deviation) on either team; on a dot plot, the separation between the two distributions of heights is noticeable.* **7.SP.4**. Use measures of center and measures of variability for numerical data from random samples to draw informal comparative inferences about two populations. *For example, decide whether the words in a chapter of a seventh-grade science book are generally longer than the words in a chapter of a fourth-grade science book.*
(s/a)2 Investigate chance processes and develop, use, and evaluate probability models.	**7.SP.5**. 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. **7.SP.6**. 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. **7.SP.7**. Develop a probability model and use it to find probabilities of events. Compare probabilities from a model to observed frequencies; if the agreement is not good, explain possible sources of the discrepancy. a. Develop a uniform probability model by assigning equal probability to all outcomes, and use the model to determine probabilities of events. *For example, if a student is selected at random from a class, find the probability that Jane will be selected and the probability that a girl will be selected.* b. Develop a probability model (which may not be uniform) by observing frequencies in data generated from a chance process. *For example, find the approximate probability that a spinning penny will land heads up or that a tossed paper cup will land open-end down. Do the outcomes for the spinning penny appear to be equally likely based on the observed frequencies?* **7.SP.8**. Find probabilities of compound events using organized lists, tables, tree diagrams, and simulation. a. Understand that, just as with simple events, the probability of a compound event is the fraction of outcomes in the sample space for which the compound event occurs. b. Represent sample spaces for compound events using methods such as organized lists, tables and tree diagrams. For an event described in everyday language (e.g., "rolling double sixes"), identify the outcomes in the sample space which compose the event. c. Design and use a simulation to generate frequencies for compound events. *For example, use random digits as a simulation tool to approximate the answer to the question: If 40% of donors have type A blood, what is the probability that it will take at least 4 donors to find one with type A blood?*
MATHEMATICAL PRACTICES	LEARNING PROGRESSIONS
1. Make sense of problems and persevere in solving them. **2. Reason abstractly and quantitatively.** **3. Construct viable arguments and critique the arguments of others.** **4. Model with mathematics.** **5. Use appropriate tools strategically.** **6. Attend to precision.** **7. Look for and make use of structure.** **8. Look for and express regularity in repeated reasoning.**	http://ime.math.arizona.edu/progressions/#committee. CDE Progress to Algebra continuum K-8 www.**cde**.ca.gov/be/cc/**cd**/documents/updateditem12catt3.doc

[1] **Major Clusters – area of intensive focus where students need fluent understanding and application of the core concepts.**

[2] **Supporting/Additional Clusters – designed to support and strengthen areas of major emphasis/expose students to other subjects.**

ENDURING UNDERSTANDINGS	ESSENTIAL QUESTIONS	KEY VOCABULARY
• Compare two data distributions and address questions about differences between populations. • Begin informal work with random sampling to generate data sets and learn about the importance of representative samples for drawing inferences.	• How do you determine which measures of variability should be used to draw informal comparative inferences? • How are lists, tables, tree diagrams or simulation used to find the probability of an event? • 3. How is probability used to predict frequency of an event?	• comparative • compound events • deviation • Discrepancy • distribution • draw inference • frequency • gauge • inferences • prediction • probability • random • relative • simple events • simulation • statistics • variability • variation

RESOURCES	INSTRUCTIONAL STRATEGIES	ASSESSMENT
NLVM http://nlvm.usu.edu/ **California Draft Mathematics Framework:** http://www.cde.ca.gov/be/cc/cd/draftmathfwchapters.asp **LAUSD Adopted Textbooks:** **California Mathematics: Concepts Skills and Problem Solving, Glencoe McGraw-Hill** 11.1 Problem Solving Investigation 11.4 Measures of Central Tendency and Range 11.5 Measures of Variation 11.8 Select an Appropriate Display **California Math: Course 2 - McDougal Littell** 11.1 Mean, Median, Mode, and Range 11.2 Bar Graphs and Circle Graphs 11.3 Frequency Tables and Histograms	• Journal writing prompts • Use of spreadsheets and graphing tools • Use visuals to illustrate multiple representations of rate of change • Real-world connections • Structured instructional conversations (Think-Pair-Share)	SBAC - http://www.smarterbalanced.org/

LANGUAGE GOALS

Students will understand that some verbs have different meanings in different mathematical situations. (draw)

Students will be able to interpret the characteristics of 2D and 3D figures in order to manipulate them.
Example: The difference between 2D figure and 3D figure is _____.

Students will understand the context and relationship between data in order to make prediction and draw inferences.
Example: Given two different sets of data, I can predict that _____ . Based on this prediction, I could draw inference that _____.

Students will be able to select the appropriate formulas needed to solve real-world and mathematical problems.
Example: I can compare the formulas for computing area, surface area, and volume of figures and objects, by _____.

Students will be able to justify steps taken to arrive at a logical conclusion.
Example: If the situation is_____, then I can conclude that _____.

PERFORMANCE TASKS

MATHEMATICS ASSESSMENT PROJECT

7.G.6 Maximizing Area: Gold Rush http://map.mathshell.org/materials/lessons.php?taskid=415#task415
7.G.4 and 7.G.6 Using Dimensions: Designing a Sports Bag http://map.mathshell.org/materials/lessons.php?taskid=416#task416
7.G.4 and 7.G.6 Drawing to Scale: Designing a Garden http://map.mathshell.org/materials/lessons.php?taskid=494#task494
7.SP.1 Estimating: Counting Trees http://map.mathshell.org/materials/lessons.php?taskid=422#task422
7.G.6 Estimations and Approximations: The Money Munchers http://map.mathshell.org/materials/lessons.php?taskid=220#task220
7.SP.5-8 Evaluating Statements About Probability http://map.mathshell.org/materials/lessons.php?taskid=225#task225

ILLUSTRATIVE MATHEMATICS

7.SP.1, 7.SP.2 and 7.SP.7 Estimating the Mean State Area http://www.illustrativemathematics.org/illustrations/260
7.SP.2 and &.SP.7 Election Poll, Variation 1 http://www.illustrativemathematics.org/illustrations/235
7.SP.2 and SP.2 Election Poll, Variation 2 http://www.illustrativemathematics.org/illustrations/559/

DIFFERENTIATION 🕮		
FRONT LOADING	ACCELERATION	INTERVENTION
• Students Formulate questions that can be answered with data • Students design and use a plan to collect relevant data • Students analyze the data with appropriate methods • Students are able to interpret results and draw valid conclusions from the data that relate to the questions posed. • Such investigations involve making sense of practical problems by turning them into statistical investigations; moving from context to abstraction and back to context; repeating the process of statistical	• Provide students with opportunities to be recognized for their previous knowledge and to be allowed to avoid redundant learning by being encouraged to learn the sophisticated and advanced information and skills of the curriculum at their own rate. This also includes the opportunity for students to make personal meeting of the lesson. • Statistics and Probability: Simulating probability experiments via technology where students collect meaningful data (type of music, who eats cafeteria food). Use the following activity for acceleration: Election Poll, Variation 3 http://www.illustrativemathematics.org/illustrations/55	• Small teacher to student ratio discussion – have students draw informal comparative inferences about two populations (boys vs. girls) • Data discussed comes from sampling life data (soccer team height vs. football team height) • In probability and statistics: Census data, experimental results

References:

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5. Smarter Balanced Assessment Consortium. (2012). Smarter Balanced Assessments. Retrieved from http://www.smarterbalanced.org/.
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7. Institute for Mathematics & Education (2013). Illustrative Mathematics. Retrieved from http://www.illustrativemathematics.org/
8. California Department of Education. (2013). Draft Mathematics Framework Chapters. Retrieved from http://www.cde.ca.gov/be/cc/cd/draftmathfwchapters.asp.
9. National Council of Teachers of Mathematics (NCTM) Illuminations. (2013). Retrieved from http://illuminations.nctm.org/Weblinks.aspx.

10. The University of Arizona. (2011-12). Progressions Documents for the Common Core Math Standards. Retrieved from http://ime.math.arizona.edu/progressions.