Grade: 7 FCPS 2025-2026 Math Grade 7 Topic 6

7th Grade Topic 6 : Use Sampling to Draw Inferences About Populations	Estimate Time Frame: 12 days
Essential Standards: 7.SP.1, 7.SP.2, 7.SP.3, 7.SP.4 Supporting Standards: 7.SP.0 Assessment Resource: enVision Topic 6 and Formative Assessment Lesson (FAL): Representing Data with Frequency Graphs and Box Plots and Sampling with Trees	

FCPS Supporting Links	Additional Supporting Links
Pacing Guide 7th Grade Topic 6 Standards Resource with Sample Formative Assessments enVision 7th Grade Topic 6 Standards Crosswalk Resource FCPS P-12 Mathematics Guidance Document FCPS Achievement & Trauma-Informed Strategies in the Classroom	Kentucky Academic Standards KSA Blueprint Target of the Standards - conceptual, procedural & application Three-Reads Routine Notice and Wonder Routine **MILC Resources Topic 6: Use Sampling to Draw Inferences About Populations** ***enVision Teacher Guide: page 316A to 316D for specific Topic 6 Focus-Coherence-Rigor***

Big Ideas
Use random sampling to draw inferences about a population. Draw informal comparative inferences about two populations.

Essential Questions	Common Preconceptions/Misconceptions

How can sampling be used to draw inferences about one or more populations? What are some possible real-life situations to which there may be more than one solution? Why is random sampling important when collecting data? Why is it necessary to compare information about two populations? How can data collection assist in making predictions about an event? How can a model help me solve a statistical problem?	While graphing, students may need to be reminded that the same types of quantities need to be graphed on the same axis. Make sure students understand that the circle graph focuses more on the relative values of the data clustering while the bar and pictographs add a quantity dimension. To assist with the many new vocabulary words, use word walls, foldables, Frayer models, and graphic organizers to help students become fluent in using these words.
Standards for Mathematical Practices	**Kentucky Interdisciplinary Literacy Practices (KILP)**
MP.1. Make sense of problems and persevere in solving them. **MP.2. Reason abstractly and quantitatively.** **MP.3. Construct viable arguments and critique the reasoning of others.** MP.4. Model with mathematics. **MP.5. Use appropriate tools strategically.** **MP.6. Attend to precision.** **MP.7. Look for and make use of structure.** MP.8. Look for and express regularity in repeated reasoning. ***enVision Teacher Guide: page 316E for specific Topic 6 Math Practice suggestions***	1. Recognize that text is anything that communicates a message. 2. Employ, develop, and refine schema to understand and create text. 3. View literacy experiences as transactional, interdisciplinary and transformational. 4. Utilize receptive and expressive language arts to better understand self, others, and the world. **5. Apply strategic practices, with scaffolding and then independently, to approach new literacy tasks.** **6. Collaborate with others to create new meaning.** **7. Utilize digital resources to learn and share with others.** **8. Engage in specialized, discipline-specific literacy practices.** **9. Apply high level cognitive processes to think deeply and critically about text.** 10. Develop a literacy identity that promotes lifelong learning. *Incorporating texts into math instruction fosters interdisciplinary learning for a more engaging educational experience.*

Essential Standards	Sample Learning Intentions & Success Criteria	HQIR/Resource Considerations
Cluster: Use random sampling to draw inferences about a population.		
KY.7.SP.1 Understand that statistics can be used to gain information about a population by examining a population sample; generalizations about a population from a sample	We are learning to understand how examining a sample can be used to gain information about a population.	• Topic 6 Lesson 6-1 • enVision Language Support Handbook

are valid only if the sample is representative of that population. Understand that random sampling tends to produce representative samples and support valid inferences. **Conceptual** ❑ Procedural ❑ Application Clarifications: Recognize what makes a valid and non-valid sample of a population. Recognize the size of the sample holds importance to the accuracy of the sample. Coherence KY.6.SP.2→KY.7.SP.1→KY.HS.SP.9 **MP.3, MP.6, KILP.1, KILP.4, KILP.6**	• I can describe a population and a sample size. • I can describe valid sample strategies. • I can describe non-valid sample strategies. • I can describe ways to create a representative sample. • I can connect the sample size to the validity. • I can establish whether a sample is representative of a population.	
KY.7.SP.2 Use data from a random sample to draw inferences about a population with an unknown characteristic of interest. **Conceptual** **Procedural** **Application** **Clarifications:** Emphasis is on the sample size and how this affects the validity of the estimate or prediction. a. Generate multiple samples of categorical data of the same size to gauge the variation in estimates or predictions. Clarifications: Examples: Randomly sample 6th, 7th and 8th graders about who their favorite superhero is to generate samples of data that are roughly the same size, looking specifically at patterns, if any. b. To gauge the variation in estimates or predictions, generate multiple numerical data samples (or simulated samples).	We are learning to use data from a random sample to make inferences about a population. • I can generate multiple samples of data to make predictions of the population. • I can make qualitative and quantitative inferences from a data set. • I can estimate a population based on a sample data set and assess whether inferences are valid. • I can use data from random sampling to draw conclusions about a population. • I can make qualitative and quantitative inferences from a data set. • I can determine how far off an estimate or prediction is related to a population.	• Topic 6 Lesson 6-2 • Topic 6: Let's Investigate! Good Samples Aren't Simple (replaces parts of Lessons 6-1 and 6-2 - will need to explicitly teach vocabulary) • enVision Language Support Handbook • Formative Assessment Lesson (FAL): Representing Data with Frequency Graphs and Box Plots • Formative Assessment Lesson (FAL): Sampling with Trees (includes writing to demonstrate knowledge)

Clarifications: Examples: 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. c. Gauge how far off an estimate or prediction might be related to a population character of interest. Coherence KY.6.SP.0→ 7.SP.2→ KY.HS.SP.12 **MP.2, MP.3, MP.7, KILP.2, KILP.7, KILP.9**		

Attending to the Standards for Mathematical Practice

Students understand the method of sampling a population affects the reliability and validity of the data gleaned, so they justify their conclusions and inferences in a valid way (MP.3). In doing so, they create an accurate picture of the question posed (MP.6). In drawing inferences and reasoning about the variation of their estimates, students construct arguments based on data (MP.2, MP.3). When students, for example, examine a sample of 10 data points, versus a sample of 100 data points, they generalize why the samples may have two different sample errors (MP.7).

Essential Standards	Sample Learning Intentions & Success Criteria	HQIR/Resource Considerations
Cluster: Draw informal comparative inferences about two populations.		
KY.7.SP.3 Describe the degree of visual overlap (and separation) from the graphical representations of two numerical data distributions (box plots, dot plots) with similar variabilities with similar contexts (same variable), measuring the difference between the centers (medians or means) by expressing this difference as a multiple of a measure of variability (interquartile range when comparing medians or the mean absolute deviation when comparing means). ☐ **Conceptual** ☐ **Procedural** ❑ Application	We are learning to describe and compare two dot plots. • I can compare visual overlap and/or separation of two data distributions. • I can compare means. • I can compare medians. • I can use the mean absolute deviation to compare the variability of two data distributions. We are learning to describe and compare two box plots.	• Lesson 6-3 • Lesson 6-4 • enVision Language Support Handbook

Clarifications: 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. Coherence KY.6.NS.1→KY.7.SP.3→KY.HS.SP.13 **MP.1, MP.5, MP.7, KILP.1, KILP.7, KILP.10** *Supporting Standard KY.7.SP.0*	• I can compare visual overlap and/or separation. • I can compare medians. • I can use interquartile range (IQR) of datasets to compare the variability of two populations.	
KY.7.SP.4 Calculate and use measures of center (mean and median) and measures of variability (interquartile range when comparing medians and mean absolute deviation when comparing means) for numerical data from random samples to draw informal comparative inferences about two populations. ❑ Conceptual ❑ **Procedural** ❑ **Application** **Clarifications:** For example, decide whether the words in a chapter of a grade seven science book are generally longer than the words in a chapter of a grade four science book. **MP.2, MP.5, MP.7, KILP.2, KILP.3, KILP.8** *Supporting Standard KY.7.SP.0*	We are learning to make comparative inferences about two populations from random samples. • I can find similarities and differences in two different data sets (including mean, median, interquartile range, mean absolute deviation, etc.). • I can calculate and use mean absolute deviation to make comparative statements. • I can compare and draw conclusions from two populations based on their measures of center. • I can make comparative inferences based on variability. • I can make informal comparative inferences about two populations by examining samples.	• Lesson 6-3 • Lesson 6-4 • 3-Act Math Topic 6: Raising Money • enVision Language Support Handbook

Attending to the Standards for Mathematical Practice

When comparing two data distributions, students visually note differences, for example, of two dot plots. What is more difficult at times is to conceptualize this in mathematical terms, such that one distribution may have twice the variability of the other (MP.2). In moving from visual representation to measures of center and variability, students using these measures mathematically describe a situation that may be difficult to otherwise describe (MP.5, MP.7). Categorically summarizing data in circle graphs, gives students a basis for bringing their number

sense from percents to statistics, allowing them to be precise when describing data (57% of students have brown shoes) (MP.6), while reasoning and drawing conclusions from data presented (MP.2, MP.3). Now, students drawing inferences from their calculations they have learned in grade 6 and earlier in grade 7 allows them to use these tools (MP.5) and allows them to mathematically compare (MP.7) in such a way that their inferences and conclusions make sense in context (MP.2).

Supporting Standards

KY.7.SP.0 Create displays, including **circle graphs** (pie charts) and bar graphs, to compare and analyze categorical data distributions from matching and different-sized samples. **MP.2, MP.3, MP.6**

Considerations: Circle graphs are new and connected to the grade 7 focus on percentages.

Students are comparing two distributions. Circle graphs lend to comparing different-sized samples because circle graphs are based on percentages.

❑ Conceptual ❑ **Procedural** ❑ Application

Coherence KY.6.SP.O→KY.7.SP.4

Vocabulary

box plot - Method of visually displaying a distribution of data values by using median, quartiles, and extremes. A box shows the middle 50% of the data.
clusters - Small group or bunch of something resulting from a "natural" grouping evident in a data set.
data display - An organized way to display data Ex: tables, charts, tally tables, pictographs, bar graphs, circle graphs, line plots, and Venn Diagrams.
data set - Numeric information, usually gathered for analysis.
dot plot - A visual displaying a distribution of data values where each value is shown as a dot or mark above a number line. Also known as a line plot.
first quartile - For a set of data with a median M, the first quartile is the median of the data values less than M. Example: *For the data set {2, 3, 6, 7, 10, 12, 14, 15, 22, 25, 28}, the first quartile is 6.*
inference - The process of drawing conclusions from data that are subject to random variation, for example, observational errors or sampling variation; systems of procedures that can be used to draw conclusions from data sets arising from systems affected by random variation.
maximum value - The highest/largest value of a given data set.
mean - A measure of center in a set of numerical data, computed by adding the values in a list and then dividing by the number of values in the list. EX: *For the data set {1, 3, 6, 7, 10, 12, 14, 15, 22, 120}, the mean is 21.*
mean absolute deviation - The average distance of a set of numbers from the mean of the set.
measure of center - A calculation resulting in a central value for a set of data; a mean, median, or mode.
median - The middle value in a set of data when the data is ordered from the greatest to least; EX: *The median of 13,7,6,4,2,2,1 is 4.*

mode - The value that occurs the most in a set of data.
observed frequency - The number of measurements in an interval of a frequency distribution.
outliers - extreme data points.
random sample - A sample in which every element in the population has an equal chance of being selected.
range - The difference between the largest and smallest number in a data set; EX: *The range of 13,7,6,5,4,2,2,1 is 12 (13-1 = 12.*
statistical thinking - A mode of thinking that includes logical and analytical reasoning.
third quartile - For a set of data with a median M, the third quartile is the median of the data values greater than M. Example: *For the data set {2, 3, 6, 7, 10, 12, 14, 15, 22, 25, 28}, the third quartile is 22.*

*****Disclaimer: Success Criteria is the evidence students must produce to demonstrate learning. This example is not comprehensive.
** Mathematical Practices (A.MP.1- 8) should be evidenced at some point throughout each unit, depending on the explored tasks. It is important to note that MP. 2 should support learning in every lesson.
******* Modeling Standards: Modeling is best interpreted not as a collection of isolated topics but rather in relation to other standards. Making mathematical models is a Standard for Mathematical Practice, and specific modeling standards appear throughout the high school standards indicated by a star symbol (★). The star symbol sometimes appears on the heading for a group of standards; in that case, it should be understood to apply to *all* standards in that group.