Grade: 6 FCPS 2025-2026 Math Grade 6 Topic 8

6th Grade Topic 8: Display, Describe, and Summarize Data	Estimate Time Frame: 20 days
Essential Standards: 6.SP.1, 6.SP.3, 6.SP.4, 6.SP.5 Supporting Standards: 6.SP.0, 6.SP.2 Assessment Resource: enVision Topic 8	

FCPS Supporting Links	Additional Supporting Links
Pacing Guide 6th Grade Topic 8 Standards Resource with Sample Formative Assessments enVision 6th Grade Topic 8 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 8: Display, Describe, and Summarize Data** ***enVision Teacher Guide: page 462A to 462D for specific Topic 8 Focus-Coherence-Rigor***

Big Ideas
Develop understanding of the process of statistical reasoning. Develop an understanding of statistical variability. Summarize and describe distributions.

Essential Questions	Common Preconceptions/Misconceptions
How can data be described? How can tables and graphs represent data and answer questions? How can data be described by a single number? How can tables and graphs be used to represent data and answer questions?	Remind students that the spread (range) is stated as a ***single*** number (such as 15 when describing the spread of data for 6 - 21) and describes how the values vary across the data set. The purpose of the number is not the value itself but the interpretation it provides for the variation of the data. Box plots can seem complicated to some students because of the many steps

How can measures of central tendency be used to predict future events? How do sets of data compare? What are statistical questions, and how can data be used to answer them?	involved in creating them. Students are just beginning to think statistically, and the focus should be on students learning to describe and summarize statistical data sets (not just the *procedure* of creating graphs). Additional practice with finding the mean can be helpful (students often forget to divide and what to divide by). Explain the difference between center and variation or variability. Students may confuse histograms and bar graphs (which leads to difficulty interpreting intervals). Consider displaying histograms and bar graphs side by side with related data and ask students to compare and contrast what can be learned from each graph. Ensure that students understand observation means sample size or *n* size and how it relates to numerical data sets. (For example, a data set with 10 data points has 10 observations, or we can say $n = 10$. Make sure students know the difference between intervals and observations.
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 462E for specific Topic 8 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: Develop understanding of statistical variability.		
KY.6.SP.1 Recognize a statistical question as one that anticipates variability in the data related to the question and accounts for it in the answers. ☐ **Conceptual** ❑ Procedural ❑ Application **Clarifications:** For example, "How old am I?" is not a statistical question, but "How old are the students in my school?" is a statistical question because one anticipates a variety of values with associated variability in students' ages. Coherence KY.5.MD.2→KY.6.SP.1→KY.7.SP.1 **MP.1, MP.3, MP.6, KILP.1, KILP.3** *Supporting Standard: KY.6.SP.0*	We are learning to recognize and understand statistical questions. • I can explain what makes a question statistical. • I can determine if a question is statistical or non-statistical.	• Topic 8 Lesson 8-1 • Topic 8: Let's Investigate! Let's Chat About Data (replaces Lesson 8-1) • enVision Language Support Handbook
KY.6.SP.3 Recognize that a measure of center for a numerical data set summarizes all of its values with a single number to describe a typical value. In contrast, a measure of variation describes how the values in the distribution vary. ☐ **Conceptual** ☐ Procedural ❑ Application **Clarifications:** Emphasis is on the sensitivity of measures of center to changes in the data, such as mean is generally much more likely to be pulled towards an extreme value than the median. Additionally, measures of variation (range, interquartile range) describe the data by giving a sense of the spread of data points. Coherence KY.6.SP.3→KY.7.SP.4 **MP.2, MP.5, MP.6, KILP.1, KILP.7**	We are learning to summarize all values of a set of data with a single number. • I can determine the mean or average, mode and median of a set of data. • I can explain how extreme values can affect measures of center. • I can determine measures of variation. • I can use measures of variation to describe data, such as range, IQR, and mean absolute deviation.	• Topic 8 Lesson 8-2 • enVision Language Support Handbook

Supporting Standard: KY.6.SP.0		
Cluster: Summarize and describe distributions.		
KY.6.SP.4 Display the distribution of numerical data in plots on a number line, including dot plots, histograms, and box plots. ❑ Conceptual ☒ **Procedural** ❑ Application **Clarifications:** Students create the listed graphical representations in the appropriate context and describe the attributes of each. Coherence KY.5.MD.2→KY.6.SP.4→KY.7.SP.1 **MP.6, MP.7, KILP.2, KILP.4, KILP.7** *Supporting Standard: KY.6.SP.0*	We are learning to display numerical data using graphical representations. • I can create a box plot to display data. • I can create a histogram to display data. • I can create dot plots to display data. • I can describe attributes of each data display.	• Topic 8 Lesson 8-3 • Topic 8 Lesson 8-4 • enVision Language Support Handbook
KY.6.SP.5 Summarize numerical data sets with their context, such as: ☒ **Conceptual** ☒ **Procedural** ❑ Application **Clarifications:** Students understand larger numbers of observations create a more accurate statistical representation than smaller numbers of observations. a. Reporting the number of observations. ☒ **Conceptual** ❑ Procedural ❑ Application b. Describing the nature of the attribute under investigation, including how it was measured and its units of measurement. ☒ **Conceptual** ❑ Procedural ❑ Application	We are learning to summarize numerical sets of data. • I can identify the number of observations for a set of data. • I can describe how the data measured is related to answering a statistical question. • I can find a set of data's mean, median, mode, and range. • I can describe distribution in a data display, using terms such as cluster, gap, symmetric, uniform, skewed-left, skewed-right, and outliers. • I can describe the spread/variability of the data using terms such as range, IQR, and mean absolute deviation. • I can explain why choosing certain measures of center or variability are	• Topic 8 Lesson 8-5 • Topic 8 Lesson 8-6 • Topic 8 Lesson 8-7 • 3-Act Math Topic 8: Vocal Ranges • enVision Language Support Handbook

Clarifications: Students describe how the data measured relates to answering a statistical question. c. Determining quantitative measures of center (median and/or mean) to describe the distribution of numerical data. ☐ **Conceptual** ☐ **Procedural** ❑ Application **Clarifications:** Students know methods of finding measures of center, including finding median in non-ordered sets of data and a mean is a mathematical average. d. Describing distributions of numerical data qualitatively relating to shape (using terms such as cluster, mode(s), gap, symmetric,uniform, skewed-left, skewed-right and the presence of outliers) and quantitatively relating to spread/variability (using terms such as range and interquartile range). ☐ **Conceptual** ☐ **Procedural** ❑ Application **Clarifications:** Students describe the shape of data by inspection using the terms listed and calculate the range and interquartile range of a set of data. e. Relating the choice of measures of center and variability to the shape of the data distribution. ☐ **Conceptual** ❑ Procedural ❑ Application **Clarifications:** Students recognize mean and range are appropriate measures for symmetrical data while the median and interquartile range may be better measures for skewed data. Coherence KY.6.SP.5→KY.7.SP.1	related to the shape of the data.	

MP.3, MP.7, KILP.1, KILP.2, KILP.9 *Supporting Standard: KY.6.SP.2*		

Attending to the Standards for Mathematical Practice

The four-step investigative process provides a structure for students to follow that allows them to model many real-world situations with a model (MP.4). Students use the statistical process to seek to understand the world around them, taking time to pursue the entire process in order to gain insights, looping back to make revisions to the question or data gathering if the results they have do not adequately address their question (MP.1).
Students recognize a question such as "What did I eat for breakfast?" is not a statistical question, whereas "What is the most popular breakfast in my school?" will elicit data they can measure precisely (MP.6) and draw conclusions based on that data (MP.3). After collecting data, by creating a distribution of that data, students recognize data generally follows a structure and can be described in terms of that structure (MP.7). By accurately calculating the mean (or any other statistical measure), students are now more precise in describing data, going from, for example, describe the rainfall for the month as "about average" to "the rainfall this month is slightly higher than the mean of the last 10 years and within the interquartile range for that data." (MP.6)
Students make use of structure by aligning numerical data into plots and histograms. Students characterize their data in a distribution using mathematically precise terms, both quantitatively (mean, IQR, etc.) and qualitatively (skewed, clustered, etc.). (MP.7). Students summarize their data in a variety of ways, both numerically and graphically and use these summaries to draw conclusions about their results (MP.3). Additionally, because students are calculating precisely the measures of center and variability for their data, they accurately compare data sets in a variety of ways (MP.6).

Supporting Standards

KY.6.SP.0 Apply the four-step investigative process for statistical reasoning.

Clarifications: Emphasis is on understanding answering a statistical question is completed by an investigative process that encompasses questioning, collection, analysis and interpretation of the data gathered.

☐ **Conceptual** ☐ **Procedural** ☐ **Application**

a. Formulate Questions: Formulate a statistical question as one that anticipates variability and can be answered with data.

☐ **Conceptual** ☐ **Procedural** ❑ Application

b. Collect Data: Design and use a plan to collect appropriate data to answer a statistical question. ☐ **Conceptual** ☐ **Procedural** ❑

Application

c. Analyze Data: Select appropriate graphical methods and numerical measures to analyze data by displaying variability within a group, comparing an individual to an individual, and comparing an individual to a group. Emphasis on understanding and answering a statistical question is completed by an investigative process encompassing questioning, collecting, analyzing, and interpreting the data gathered.

☐ **Conceptual** ☐ **Procedural** ☐ **Application**

Coherence KY.5.MD.2→KY.6.SP.0→KY.7.SP.1

MP.1, MP.4, Coherence KY.5.MD.2→KY.6.SP.0→KY.7.SP.1

KY.6.SP.2 Understand that a set of numerical data collected to answer a statistical question has a distribution that can be described by its center, spread, and overall shape. **MP.2, MP.6, MP.7, KILP.1, KILP.7**

Clarifications: Students distinguish between graphical representations which are skewed or approximately symmetric; use a measure of center to describe a set of data.

☐ **Conceptual** ❑ Procedural ❑ Application

MP.2, MP.6, MP.7, KILP.1, KILP.7

Coherence KY.5.MD.2→KY.6.SP.2→KY.7.SP.3

Vocabulary

box plot - A visual displaying data values distribution using the data set's median, quartiles, and extremes. A box shows the middle 50% of the data.
center - the middle. Ex: The center of a circle.
dot plots - The set of all inputs a function accepts.
histograms - A bar graph in which the labels for the bars are numerical intervals, so the bars touch each other.
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.
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 appears the most in a set of data.

spread - A difference between two figures or totals.
statistics - The collection, organization, and analysis of data.
variability - Measure of spread. A measure of spread tells us how much a data sample is spread out or scattered.

*****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.