Marietta City Schools

2024–2025 District Unit Planner

Accelerated Grade 6/7 Mathematics

Unit title	*Unit 1: Exploring Real-Life Phenomena Through Statistics*	**MYP year**	*1*	**Unit duration (hrs)**	*15 hours total*

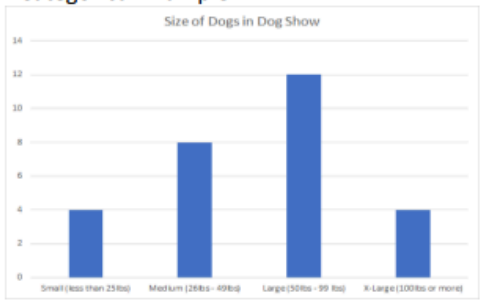
Mastering Content and Skills through INQUIRY (Establishing the purpose of the Unit): ***What will students learn?***

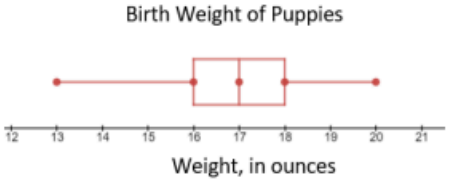
GA DoE Standards

Standards

- **6.NR.2:** Apply operations with whole numbers, fractions and decimals within relevant applications.
- **7.PAR.4.10:** Predict characteristics of a population by examining the characteristics of a representative sample. Recognize the potential limitations and scope of the sample to the population.
- **7.PAR.4.11:** Analyze sampling methods and conclude that random sampling produces and supports valid inferences.
- **7.PAR.4.12:** Use data from repeated random samples to evaluate how much a sample mean is expected to vary from a population mean. Simulate multiples of the same size.
- **6.MP:** Display perseverance and patience in problem-solving. Demonstrate skills and strategies needed to succeed in mathematics, including critical thinking, reasoning, and effective collaboration and expression. Seek help and apply feedback. Set and monitor goals.
- **MCS.Gifted.S1A**. Formulate thought-provoking questions to guide in depth research
- **MCS.Gifted.S1C**. Gather, organize, analyze, evaluate, and synthesize data from multiple sources for research applications.
- **MCS.Gifted.S3A.** Develop and apply core critical thinking skills of metacognition, observation, questioning, prediction, analysis, interpretation, inference, summarization, evaluation, synthesis, explanation, and transference.
- **MCS.Gifted.S4B**. Recognize and examine the value of others strengths, thoughts, ideas, and feelings during collaboration.
- **MCS.Gifted.S4D**. Respectfully collaborate and effectively communicate exchanges of constructive/critical feedback.
- **MCS.Gifted.S6** Students will become self-directed, independent learners.

Concepts/Skills to support mastery of standards

Expectations		Evidence of Student Learning (not all inclusive; see Grade Level Overview for more details)			
6.NR.2.1	Describe and interpret the center of the distribution by the equal share value (mean).	***Age/Developmentally Appropriate*** • The concept of mean should be explored visually and conceptually before introducing the formula. • This is the beginning of the progression of the concept of measures of center and will continue to be developed in 6th grade.		***Strategies and Methods*** • Students should be given the opportunity to use manipulatives such as: snap cubes, tiles, etc...to model equal share value.	***Example*** • "If we combined all of the 5th grade students' candies and shared them equally with each student so everyone has the same number of candies." (This is the mean or equal share value.)
6.NR.2.2	Summarize categorical and quantitative (numerical) data sets in relation to the context: display the distributions of quantitative (numerical) data in plots on a number line, including dot plots, histograms, and box plots and display the distribution of categorical data using bar graphs.	***Fundamentals*** • Students have experience with displaying categorical data using bar graphs from elementary grades. In sixth grade, students are extending their understanding of analyzing categorical data	***Strategies and Methods*** • As a result of an investigation, students should summarize categorical and quantitative (numerical) data sets in relation to the context. • Students should be able to describe the	***Age/Developmentally Appropriate*** • Sixth grade students should be able to create dot plots and box plots to analyze the results of an investigation. • Sixth grade students should focus on describing and interpreting data displayed. • Students should be able to identify that each quartile presented in a box plot	***Examples*** • Categorical Example: 

		displayed on histograms.	nature of the attribute under investigation, including how it was measured and its units of measurement.	represents 25% of the data set.	What could be the weight of the smallest dog? The largest? • Quantitative (Numerical) Example: Here are the birth weights, in ounces, of all the puppies born at a kennel in the past month.  What do you notice and wonder about the distribution of the puppy weights?	

6.NR.2.3	Interpret numerical data to answer a statistical investigative question created. Describe the distribution of a quantitative (numerical) variable collected, including its center, variability, and overall shape.	***Fundamentals*** • In sixth grade, students should explore the conceptual idea of MAD – not the formula. • Students should be able to determine the number of observations from a context or diagram. • Students should be able to describe the distribution of a quantitative (numerical) variable collected, including its center (median, mean), variability (interquartile range (IQR), mean absolute deviation (MAD), and range), and overall shape	***Terminology*** • Students should be able to apply their understanding of absolute value (rather than use operations on negative integers) in the context of MAD.	***Strategies and Methods*** • Students should explore conceptually the measures of center (mean, median) and variability (interquartile range and range) for a set of numerical data gathered from relevant, mathematical situations and use these measures to describe the shape of the data presented in various forms.	***Example*** • Arthur and Aaron are on the same 6th grade basketball team. Both players have scored an average of ten points over the past ten games. Here are the students' number of points scored during each of the last ten games. Arthur: 9, 10, 10, 11, 11, 9, 10, 10, 10, 10 Aaron: 16, 18, 4, 3, 5, 13, 18, 3, 13, 7 Which student is more consistent? Possible Student Response/Solution: Arthur is more consistent because his MAD is smaller than Aaron's

		(symmetrical vs non-symmetrical). • Data sets can be limited to no more than 10 data points when exploring the mean absolute deviation. • Students should be able to describe the nature of the attribute under investigation, including how it was measured and its units of measurement.			MAD; Arthur has less variability than Aaron.
6.NR.2.4	Design simple experiments and collect data. Use data gathered from realistic scenarios and simulations to determine quantitative measures of center (median and/or mean) and variability (interquartile range and range). Use these quantities to draw conclusions about the data, compare different numerical data sets, and make predictions.	***Fundamentals*** • Students should be able to use quantitative measures of center and variability to draw conclusions about data sets and make predictions based on comparisons. • Students should be able to identify that each quartile represents 25% of the data set.		***Strategies and Methods*** • Students should apply understanding of the measures of center (mean, median) and variability (interquartile range and range) to determine quantitative measures of center and variability, draw conclusions about the data, compare different numerical data sets and make predictions using data gathered from realistic scenarios and simulations.	
6.NR.2.5	Relate the choice of measures of center and variability to the shape of the data distribution and the context in which the data were gathered.	***Fundamentals*** • Students should understand the concept of outliers.		***Strategies and Methods*** • Students should be able to analyze the shape of a data distribution and determine which measure of center and variability best describes the data based on the shape of the data and the context in which the data was gathered.	

6.NR.2.6	Describe the impact that inserting or deleting a data point has on the mean and the median of a data set. Create data displays using a dot plot or box plot to examine this impact.	***Strategies and Methods*** • Students should be able to analyze the shape of a data distribution and determine the impact single data points have on the data set represented visually.

7.PAR.4.10	Predict characteristics of a population by examining the characteristics of a representative sample. Recognize the potential limitations and scope of the sample to the population.	***Strategies and Methods*** • Students can generate questions about things they notice and wonder from a relevant situation. Questions posed should be ones that requires data that will vary. • Students should have opportunities to create and answer statistical investigative questions about a population by collecting data from a representative sample, using random sampling techniques to collect the data. • Students should be able to create a statistical investigative question that can be answered by gathering data from practical situations and determine strategies for gathering data to answer the statistical investigative question. • Potential limitations may include how the sample was selected and/or how the questions were asked.
7.PAR.4.11	Analyze sampling methods and conclude that random sampling produces and supports valid inferences.	***Strategies and Methods*** • Students should have opportunities to critique examples of sampling techniques. • Students should conclude when conditions of sampling methods may be biased, random, and not representative of the population.
7.PAR.4.12	Use data from repeated random samples to evaluate how much a sample mean is expected to vary from a population mean. Simulate multiple samples of the same size.	***Fundamentals*** • Students should use sample data collected to draw inferences. ***Examples*** • Estimate the mean word length in a book by randomly sampling words from the book. Gauge how far off the estimate is from the actual mean. • Predict the winner of a school election based on randomly sampled survey data. Gauge how far off the prediction might be.

Vocabulary:

K12 Mathematics Standards Glossary

Box and Whisker Plot	**Grouped Frequency Table**	**Mean**	**Median**	**Numerical Data**	**Skewed Data**

Distribution	**Histogram**	**Measures of Center**	**Minimum Value**	**Outlier**	**Statistical Questions**
Dot Plot	**Interquartile Range (IQR)**	**Measures of Spread**	**Mode**	**Range**	**Variability**
Frequency	**Maximum Value**	**Probability**	**Theoretical Probability**	**Experimental Probability**	**Probability Model**
Outcomes	**Simple Events**	**Inferences**	**Sampling**	**Representative Sample**	**Population**

Key concept	Related concept(s)	Global context
Logic A method of reasoning and a system of principles used to build arguments and reach conclusions.	**Model, Justification**	**Globalization and Sustainability**

Statement of inquiry

Gathering and modeling data provides for a better understanding of a population.

Inquiry questions

Factual

- What are statistical questions?
- What are measures of center and variation?
- What are some ways we can organize a set of data?
- What kind of displays would best represent a given set of data?
- How can a single number be used to summarize a set of data?

Conceptual

- How does data collected about a group help us to understand that group?

Debatable

- Are predictions based on data always reliable?

MYP Objectives	Assessment Tasks

*What specific MYP **objectives** will be addressed during this unit?*	***Relationship** between summative assessment task(s) and statement of inquiry:*	*List of common formative and summative assessments.*
Criteria A (Knowing and Understanding) and Criteria D (Applying Math to real-world context) **Design Cycle** **Transdisciplinary** Inquiring and Analyzing Developing Ideas Creating a Solution Evaluating	Assessments will require students to organize and model the given data in order to draw conclusions regarding that population.	**Formative Assessment(s):** Building Thinking Classrooms Task: Matching Data **Summative Assessment(s):** Unit 1 CSA MYP task and Unit Summative Assessment: Jose's Candy
Approaches to learning (ATL)		
Category: Social **Cluster:** Collaboration Skills **Skill Indicator:**Give and receive meaningful feedback. **Category:** Self-management **Cluster:** Organization, Affective, & Reflection Skills **Skill Indicator:** Organize and depict information logically		

Learning Experiences Add additional rows below as needed.		
Objective or Content	**Learning Experiences**	**Personalized Learning and Differentiation**
• **6.NR.2.2** Summarize categorical and quantitative (numerical) data sets in relation to the context: display the distributions of quantitative (numerical) data in plots on a number line, including dot plots, histograms, and box plots and display the distribution of categorical data using bar graphs. • **6.NR.2.3** Interpret numerical data to answer a statistical investigative question created. Describe the distribution of a quantitative (numerical) variable collected, including its center, variability, and overall shape.	**The Histogram Challenge** In this group activity, students will be given a large number line and various sized bars cut from cardstock to create a histogram that meets the criteria provided by the teacher. They must think about the meaning of "median" and "range" and understand what the bars and intervals of a histogram represent.	Concrete or virtual manipulatives can help to support students who are struggling with access.. Groups who struggle with a challenge will be asked questions that clarify their thought process and provide guidance. Students needing extension should be given the extension problems included in the task.
• **7.PAR.4.10:** Predict characteristics of a population by examining the characteristics of a representative sample. Recognize the potential limitations and scope of the sample to the population. • **7.PAR.4.11:** Analyze sampling methods and conclude that random sampling produces and supports valid inferences. • **7.PAR.4.12:** Use data from repeated random samples to evaluate how much a sample mean is expected to vary from a population mean. Simulate multiples of the same size.	**Random Dice Sampling Activity** Students will be paired up and roll two dice and record their sums 20 times. They will examine the distribution of the sums. They will compare their sample with a larger sample to recognize the relationship between sampling of data and a population.	Students will collaborate with others to complete the task. Teachers will use guiding questions for struggling students.

Content Resources
Teaching Resources **Student Resources** **Unit Interventions:** 1. Distribution: Savvas Reteach Reteach Answer Key 2. Measures of Center: Savvas Reteach 8-2 3. Making a Histogram - Virtual Nerd: How to Make a Histogram GA DOE Interventions **Extra Activities:** 1. Illustrative Mathematics Activity - Comparing Test Scores