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How to Use This Addenda

Make sure you're ready to teach by noting the **Necessary Materials and Pre-Lesson Prep** you will need to gather or complete prior to the lesson

Find high-leverage instructional moves in the **Lesson Look Fors**. This is what leaders should see when observing your instruction

Note how your lesson objective ties to your state **Standards**

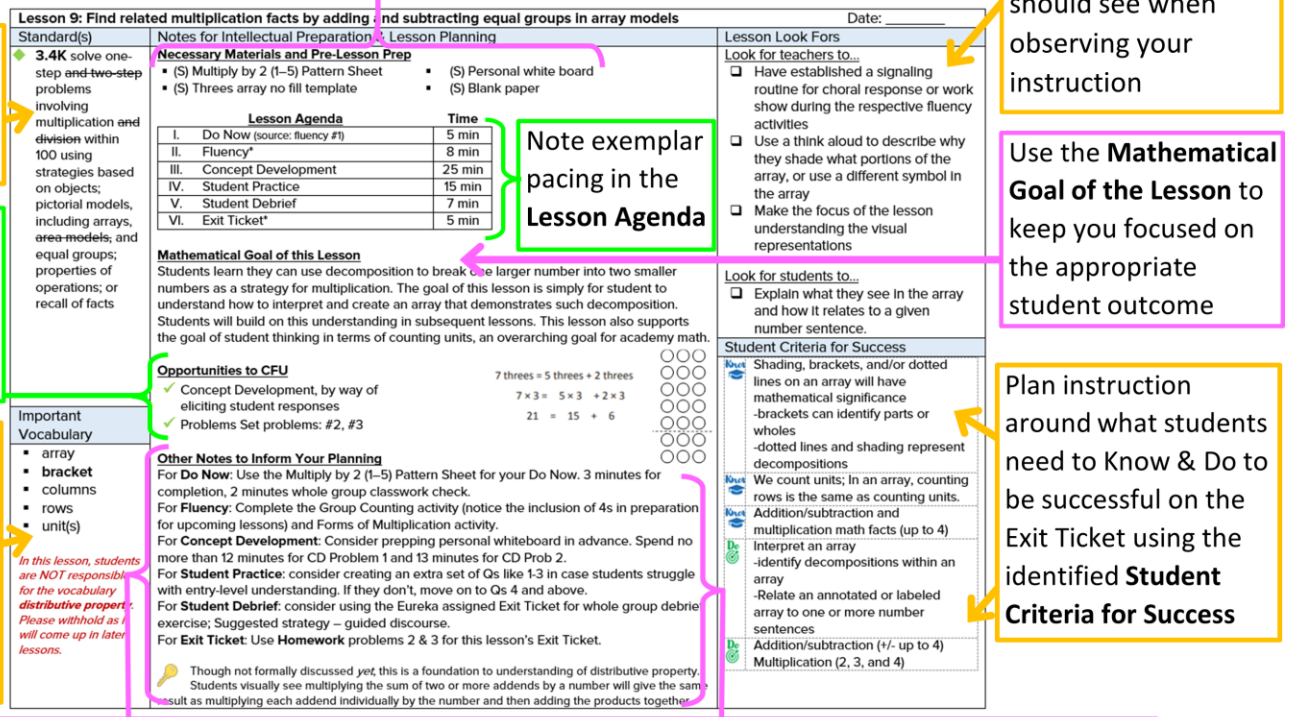
Note exemplar pacing in the **Lesson Agenda**

Use the **Mathematical Goal of the Lesson** to keep you focused on the appropriate student outcome

Plan purposeful questioning and responses using **Opportunities to CFU**

Plan instruction around what students need to Know & Do to be successful on the Exit Ticket using the identified **Student Criteria for Success**

Plan to stress **Important Vocabulary** in the lesson. New vocab for the unit is indicated in bold



Lesson 9: Find related multiplication facts by adding and subtracting equal groups in array models Date: _____

Standard(s)

3.4K solve one-step ~~and two-step~~ problems involving multiplication ~~and division~~ within 100 using strategies based on objects; pictorial models, including arrays, ~~area models~~, and equal groups; properties of operations; or recall of facts

Notes for Intellectual Preparation & Lesson Planning

Necessary Materials and Pre-Lesson Prep
- (S) Multiply by 2 (1–5) Pattern Sheet
- (S) Threes array no fill template
- (S) Personal white board
- (S) Blank paper

Lesson Agenda		Time
I.	Do Now (source: fluency #1)	5 min
II.	Fluency*	8 min
III.	Concept Development	25 min
IV.	Student Practice	15 min
V.	Student Debrief	7 min
VI.	Exit Ticket*	5 min

Mathematical Goal of this Lesson
Students learn they can use decomposition to break the larger number into two smaller numbers as a strategy for multiplication. The goal of this lesson is simply for student to understand how to interpret and create an array that demonstrates such decomposition. Students will build on this understanding in subsequent lessons. This lesson also supports the goal of student thinking in terms of counting units, an overarching goal for academy math.

Opportunities to CFU
- ✓ Concept Development, by way of eliciting student responses
- ✓ Problems Set problems: #2, #3

7 threes = 5 threes + 2 threes
7 × 3 = 5 × 3 + 2 × 3
21 = 15 + 6

Important Vocabulary
- array
- **bracket**
- columns
- rows
- unit(s)

*In this lesson, students are NOT responsible for the vocabulary **distributive property**. Please withhold as it will come up in later lessons.*

Other Notes to Inform Your Planning
For **Do Now**: Use the Multiply by 2 (1–5) Pattern Sheet for your Do Now. 3 minutes for completion, 2 minutes whole group classwork check.
For **Fluency**: Complete the Group Counting activity (notice the inclusion of 4s in preparation for upcoming lessons) and Forms of Multiplication activity.
For **Concept Development**: Consider prepping personal whiteboard in advance. Spend no more than 12 minutes for CD Problem 1 and 13 minutes for CD Prob 2.
For **Student Practice**: consider creating an extra set of Qs like 1-3 in case students struggle with entry-level understanding. If they don't, move on to Qs 4 and above.
For **Student Debrief**: consider using the Eureka assigned Exit Ticket for whole group debrief exercise; Suggested strategy – guided discourse.
For **Exit Ticket**: Use **Homework** problems 2 & 3 for this lesson's Exit Ticket.

Though not formally discussed *yet*, this is a foundation to understanding of distributive property. Students visually see multiplying the sum of two or more addends by a number will give the same result as multiplying each addend individually by the number and then adding the products together.

Lesson Look Fors

Look for teachers to...
- ❑ Have established a signaling routine for choral response or work show during the respective fluency activities
- ❑ Use a think aloud to describe why they shade what portions of the array, or use a different symbol in the array
- ❑ Make the focus of the lesson understanding the visual representations

Look for students to...
- ❑ Explain what they see in the array and how it relates to a given number sentence.

Student Criteria for Success

Know
- Shading, brackets, and/or dotted lines on an array will have mathematical significance
  -brackets can identify parts or wholes
  -dotted lines and shading represent decompositions
- We count units; In an array, counting rows is the same as counting units.
- Addition/subtraction and multiplication math facts (up to 4)

Do
- Interpret an array
  -identify decompositions within an array
  -Relate an annotated or labeled array to one or more number sentences
- Addition/subtraction (+/- up to 4)
  Multiplication (2, 3, and 4)

Find recommended lesson modifications, content knowledge boosters, and/or high-leverage instructional moves that may not be in your Teacher Edition located in **Other Notes to Inform Your Planning**

UNIT SYNOPSIS

This sequence of learning begins with an introduction to measures of center (median and mean) and measures of variation (range and interquartile range). Students learn how these measures describe data and how they can be used to compare sets, marking an important new idea for 6th grade. The work then reintroduces students to dot plots and stem-and-leaf plots, both of which they encountered in earlier grades. From there, they extend their skills to new representations, including histograms, box plots, and percent bar graphs.

Students learn not only how to interpret each of these displays but also how to create them. This dual focus ensures that students develop both procedural fluency and conceptual understanding. For example, when constructing dot plots or stem-and-leaf plots, students strengthen their ability to order and organize data. When working with histograms and box plots, they practice grouping data, using quartiles, and comparing distributions. With percent bar graphs, they apply their understanding of percents to interpret proportional data.

Key strategies and models across this learning sequence include:

- Hands-on explorations (surveys, data collection, dice rolling) that ground abstract measures in concrete experiences.
- Visual models such as dot plots, stem-and-leaf plots, box plots, histograms, and percent bar graphs to show how data can be represented in multiple ways.
- Step-by-step procedures for calculating mean, median, mode, range, and interquartile range, paired with reasoning about what each measure tells us.
- Real-world contexts like birthdays, ticket counts, or survey responses that make data analysis meaningful and relatable.
- Comparative reasoning tasks, particularly with box plots and histograms, to highlight the importance of both center and spread.

This content relies on strong rational number fluency from earlier learning, as students use operations with fractions and decimals to calculate measures and interpret data. Prior work with percents also plays a central role, especially when analyzing percent bar graphs.
Looking ahead, the concepts in this sequence prepare students for later grades where they compare distributions more formally. In 7th grade, students begin using informal inference procedures, noting differences between data sets using the measures of center and variation they learned here. In high school and AP Statistics, these ideas extend into formal inference procedures, including interval estimation and statistical tests, showing how this early work provides a foundation for advanced study.
This unit features 2 topics.

Topic A Overview – *Measures of Center and Variation and Stem and Leaf Plot*

Lesson 1 students distinguish between situations that yield data with and without variability. They will also distinguish between categorical and numerical data. Students then create and interpret dot plots. In Lesson 2 students to find the mean, median, model, and outlier of a set of data, and describe what it means to find the measures of center. In Lesson 3, students describe and summarize data presented in stem and leaf plots.

Lesson 1

Part II: Numeric vs Categorical Data

② Think back to the Do Now.

ⓐ Which questions had an answer that was a number?	ⓑ Which questions had answers that were NOT numbers?
4, 7, 9, 11-14	1-3, 5, 6, 8, 10, 15

ⓒ Data can be categorized into two types: categorical, and numerical (also known as quantitative). What do you think the difference is between categorical data and numerical data?

Numerical data: data that are numbers.

Categorical data: data that are names of things.

Lesson 2

⑤ The table below shows the high and low temperatures over a week's time.

	Sun	Mon	Tue	Wed	Thu	Fri	Sat
High	90° F	91° F	91° F	97° F	101° F	99° F	91° F
Low	74° F	78° F	77° F	77° F	83° F	78° F	72° F

ⓐ What was the median high temperature that week?

89 90 91 91 97 99 101

91°

ⓑ What was the median low temperature that week?

72 74 77 77 78 78 83

77°

ⓒ What high temperature represents the mode?

91° appeared twice

ⓓ What low temperature represents the mode?

77° and 78° (bimodal)

Lesson 3

Prices of Bicycles:

$86, $125, $95, $130, $215, $148, $120, $90, $195, $248, $325, $120

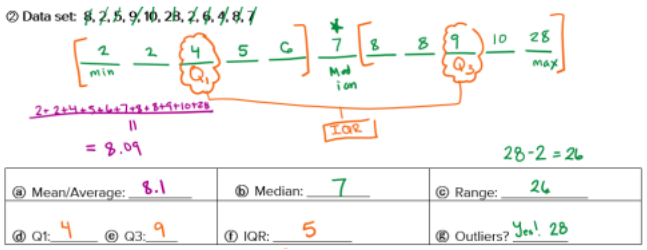
Stem	Leaf
0	86 90 95 99
1	20 20 25 30 48 95
2	15 48 78
3	25 50

Key: 2 | 45 = $245

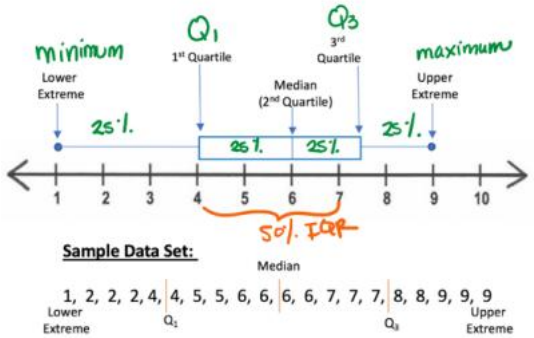
Topic B Overview – *Numeric Displays*

In Lesson 4, students use range and interquartile range to compare two data sets. In Lesson 5,students learn how to create and interpret a dot plot by looking at its measures of center and measures of variation. Lessons 6 is similar to lesson 5, but 6 is on application using Box Plots. Lesson 7 is on Histograms, students to describe and summarize data presented in a histogram. Box plots are covered over two lessons because traditionally, they have been the most challenging for students to create and to interpret. As students explore each data display, they will think about what one CAN and CANNOT tell from a data display. Lesson 8 introduces students to using frequency tables to generate a percent bar graph. Success on Lesson 8 depends heavily on how well students understood Unit 5 on percents. Percent bar graphs closely resemble the percent bar that students worked with in the second half of Unit 5.

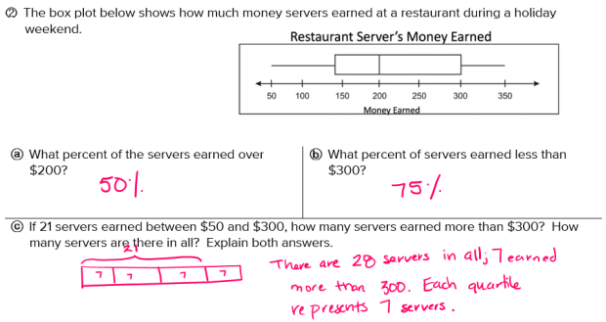
Lesson 4



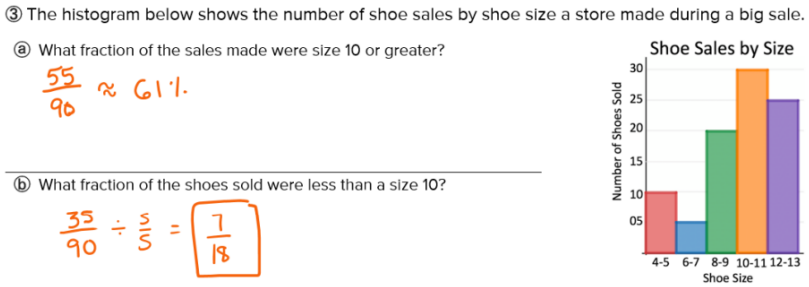
Lesson 5



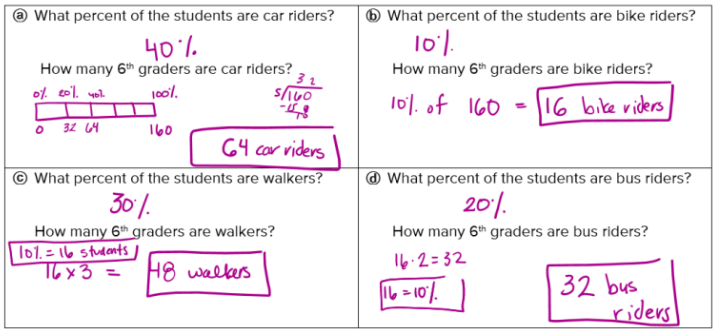
Lesson 6



Lesson 7



Lesson 8



CONTENT STANDARDS

Below are the standards addressed in this unit.

Readiness Standards	Supporting Standards
6.13A interpret numeric data summarized in dot plots, stem-and-leaf plots, histograms, and box plots **6.12C** summarize numeric data with numerical summaries, including the mean and median (measures of center) and the range and interquartile range (IQR) (measures of spread), and use these summaries to describe the center, spread, and shape of the data distribution **6.12D** summarize categorical data with numerical and graphical summaries, including the mode, the percent of values in each category (relative frequency table), and the percent bar graph, and use these summaries to describe the data distribution	**6.13B** distinguish between situations that yield data with and without variability **6.12B** use the graphical representation of numeric data to describe the center, spread, and shape of the data distribution

Focus on Disciplinary Literacy 	**Mathematical Process Standard (F) – analyze mathematical relationships to connect and communicate mathematical ideas**
	Mathematical Process Standard (G) – display, explain, and justify mathematical ideas and arguments using precise mathematical language in written or oral communication

ROADMAP

AT A GLANCE: Unit 10 – Statistics				
Topic	Day	Date	Lesson	Lesson Title
Topic A Measures of Center and Variation and Stem and Leaf Plots	1		1	Introduction to Statistics and Dot Plots
	2		2	Measures of Center
	3		3	Stem and Leaf Plots
	4			Flex Day|Topic Quiz 10 (Optional)
	5		4	Measures of Variation
Topic B Numeric Displays	6		5	Box Plots Exploration
	7		6	Application of Box Plots
	8		7	Histograms
	9		8	Percent Bar Graphs
	10			No UE (Too close to The IA Window)

Lesson 1: Intro to Statistics and Dot Plots | Date: _____

Standard(s)

- **6.13(A)** interpret numeric data summarized in dot plots, ~~stem and leaf plots, histograms, and box plots~~
- **6.13(B)** distinguish between situations that yield data with and without variability

Important Vocabulary

- Dot Plot

Notes for Intellectual Preparation & Lesson Planning

Necessary Materials and Pre-Lesson Prep

- Document Camera
- Projector
- Dot Stickers or Post Its
- Unit 10 Student Workbook
- Debrief Slide

Lesson Agenda

		Time
I.	Do Now	5 min
II.	INM/Concept Development	25 min
III.	Student Practice	15 min
IV.	Student Debrief	5 min
V.	Exit Ticket	10 min

Mathematical Goal of this Lesson

The primary goal of this lesson is for students to distinguish between situations that yield data with and without variability. They will also distinguish between categorical and numerical data. Students will then create and interpret dot plots.

Opportunities to CFU

- ✓ INM: #3a-d
- ✓ Student Practice: #2, 3, 4, 5

Other Notes to Inform Your Planning

For **Do Now**: Students should have ***only*** 5 minutes to complete. Set a timer. It will be important to share with them that it is okay if they don't know all the answers and that they should try their best. In the case that they finish early, have them to start thinking about WHY they don't know all the answers.

For **INM**: **Before class**, prepare an anchor chart with the 'number line' for the dot plot that has room for the months of the year. Students will put their dot above the month it belongs. Encourage them to be neat.

Focus on Disciplinary Literacy

INM: #2, 3b, 4, 5
SP: #2, 6

Lesson Look Fors

Look for teachers to…

- ❑ Allow students to have an opportunity to figure out the difference between a statistical and numerical question in the INM.
- ❑ Use the guided questions in the T.E. to support students who struggle with dot plot questions.

Look for students to…

- ❑ Explain the difference between statistical and numerical data
- ❑ Interpret the data represented in a dot plot and justify their reasoning

Student Know/Do Chart

A statistical question is one that can be answered by collecting data that vary

Numeric data are always numbers; categorical data are never numbers, but names or groups or categories

On a dot plot, each dot represents one piece of data from a data set

Determine if a set of data is statistical or numeric.

Interpret numeric data in a dot plot

Lesson 2: Measures of Center | Date: _____

Standard(s)

- **6.12(C)** summarize numeric data with numerical summaries, including the mean and median (measures of center) ~~and the range and interquartile range (IQR) (measures of spread)~~, and use these summaries to describe the center, spread, and shape of the data distribution
- **6.12(B)** use the graphical representation of numeric data to describe the center, spread, and shape of the data distribution

Important Vocabulary

- Mean/Average
- Median
- Mode
- Bimodal
- Trimodal
- Measure of Center

Notes for Intellectual Preparation & Lesson Planning

Necessary Materials and Pre-Lesson Prep

- Document Camera
- Projector
- Dabbing Unicorn Sheets (enough for each group)
- Unit 10 Student Workbook
- Debrief Slide

Lesson Agenda		Time
I.	Do Now	5 min
II.	INM/Concept Development	25 min
III.	Student Practice	15 min
IV.	Student Debrief	5 min
V.	Exit Ticket	10 min

Mathematical Goal of this Lesson

The primary goal of this lesson is for students to find the mean, median, model, and outlier of a set of data, and describe what it means to find the measures of center.

Opportunities to CFU

- ✓ INM: #4a-b, #5
- ✓ Student Practice: #1, #2a, c, d

Other Notes to Inform Your Planning

For **INM/Student Practice**: Some students will likely confuse mode with the greatest number out of a data set rather than the number that appears the most. Consider creating an anchor chart with the definitions and examples to support student understanding. Allow students who struggle to have a calculator so that they can solve for the mean. Hold them accountable by setting the expectation that they will need to show their work **then** use the calculator to calculate the mean.

Focus on Disciplinary Literacy

INM: Part I #2, 3b, 4, 5
SP: #2a-d

Lesson Look Fors

Look for teachers to…

- ❑ Deliver clear expectations and directions for the exploration activity (scissors are involved!)
- ❑ Facilitate, rather than directly teach, Part I. Students can explore the math without teacher guidance; however, they may need to be held accountable for staying on task.
- ❑ Get students' input while setting definitions in Part II

Look for students to…

- ❑ Accurately find the mean, median, and mode(Ask: "How do you know *x* is the mode? How do you know *y* is the median? How did you find the mean?)
- ❑ Explain how to find the mean, median, and mode.(Ask: How do you find the mean? The median? The mode?)

Student Know/Do Chart

- Find the mean, median, and mode of a set of data.
- Explain the procedure to find the mean, median, and mode and why it makes sense

Lesson 3: Stem and Leaf Plots Date: _____

Standard(s)

- **6.13(A)** interpret numeric data summarized in ~~dot plots~~, stem-and-leaf plots, ~~histograms and dot plots~~
- **6.12(B)** use the graphical representation of numeric data to describe the center, ~~spread~~, and shape of the data distribution

Important Vocabulary

- Stem and Leaf Plot

Notes for Intellectual Preparation & Lesson Planning

Necessary Materials and Pre-Lesson Prep

- Document Camera
- Projector
- Unit 10 Student Workbook
- Debrief Slide

Lesson Agenda

		Time
I.	Do Now	5 min
II.	INM/Concept Development	25 min
III.	Student Practice	15 min
IV.	Student Debrief	5 min
V.	Exit Ticket	10 min

Mathematical Goal of this Lesson

The primary goal of this lesson is for students to describe and summarize data presented in stem and leaf plots. In this lesson, students start by analyzing a stem and leaf plot and describing what they think the stems represent and what the leaves represent. They will discover that when analyzing a stem and leaf plot that the key is very important as it tells you which place values are represented where.

Opportunities to CFU

- ✓ INM: #2, 3, 4, 6
- ✓ Student Practice: 1a, 2b, 3

Other Notes to Inform Your Planning

For **INM/Student Practice:** Stem and Leaf Plots rely heavily on place value understandings. It may be beneficial to allow students to quickly create a place value chart that begins at hundreds and ends at tenths so that they are able to reference it if necessary. To support students who struggle, allow them to use a calculator to access the material in this lesson. As always, an anchor chart would be a useful tool to help support student understanding of Stem and Leaf Plot, particularly the key.

Focus on Disciplinary Literacy

INM: #1a-c, 2a-c
SP: #2b, 3

Lesson Look Fors

Look for teachers to…

- ❑ Direct students to the key, allowing students to figure out that stem and leaf plots are organized by place value.
- ❑ Allow students to use calculators to perform calculations to save time, as today's lesson is not about learning how to calculate, but about how to analyze stem and leaf plots.
- ❑ Support struggling students by showing them how to "extract" data from a stem and leaf plot. (In other words, write out the list of values from the stem and leaf plot if students need it.)

Look for students to…

- ❑ Explain what the key means in a stem and leaf plot.
- ❑ "extract" values from a stem and leaf plot
- ❑ Generate the mean, median, mode, and/or range from a stem and leaf plot

Student Know/Do Chart

- Know: Explain how to read a stem and leaf plot and how the key helps to make sense of a stem and leaf plot.
- Do: Create a stem and leaf plot when given sets of data
- Do: Find the measures of center and spread when given a stem and leaf plot

Lesson 4: Measures of Variation Date: _____

Standard(s)

- **6.12(C)** summarize numeric data with numerical summaries, including the mean and median (measures of center) and the range and interquartile range (IQR) (measures of spread), and use these summaries to describe the center, spread, and shape of the data distribution

Important Vocabulary

- Range
- Lower half
- Upper half
- 1st Quartile
- 3rd Quartile
- Interquartile Range (IQR)
- Spread
- Variability

Notes for Intellectual Preparation & Lesson Planning

Necessary Materials and Pre-Lesson Prep

- Document Camera
- Projector
- Unit 10 Student Workbook
- Debrief Slide

Lesson Agenda

		Time
I.	Do Now	5 min
II.	INM/Concept Development	32 min
III.	Student Practice	8 min
IV.	Student Debrief	5 min
V.	Exit Ticket	10 min

Mathematical Goal of this Lesson

The primary goal of this lesson is for students to describe the data by its variation (spread) explain what the variation tells us about the data. Students should understand that only looking at measures of center is not enough to truly understand a data set. They will also need to understand that the spread of the data is importa#1bnt to know. They will then formalize definitions of range and interquartile range.

Opportunities to CFU

- ✓ INM: #1b, **Part II:** #3, #4
- ✓ Student Practice: #2

Other Notes to Inform Your Planning

For **INM/Student Practice**: The Student Practice is only 8 minutes. Consider omitting #3 in the INM to allot more time for the Student Practice. Allow students all students to use a calculate to access the material in this lesson. Set the expectation that they will still need to show their work then use the calculator for any calculations. It will be important to use color-coding when modeling how to find the median Q1 and Q3 in a data set.

Focus on Disciplinary Literacy

INM: Part I #1b, c
SP: #2a-b

Lesson Look Fors

Look for teachers to…

- ❑ Give students the opportunity to notice (rather than tell directly) how two data sets with similar measures of center can have different measures of variation (see especially INM #1).
- ❑ Model how to find the IQR of a set of data.
- ❑ STAMP that when finding IQR, the median is never included.

Look for students to…

- ❑ Use what they learned in INM Part I 1b to problem solve for 1c.
- ❑ Explain the difference between range and interquartile range.
- ❑ Explain how to find the interquartile range and find it.

Student Know/Do Chart

State the difference between the range and the interquartile range

Organize a set of data to find its Q1, Q3, and IQR

Use range and IQR to describe the variation of a set of data.

Explain how removing a piece of data from a set of data would change affect the measures of variation

Lesson 5: Box Plots Exploration Date: _____

Standard(s)

- **6.12(C)** summarize numeric data with numerical summaries, including the mean and median (measures of center) and the range and interquartile range (IQR) (measures of spread), and use these summaries to describe the center, spread, and shape of the data distribution
- **6.12(B)** use the graphical representation of numeric data to describe the center, spread, and shape of the data distributions

Important Vocabulary

- Box Plot
- Range
- Lower half
- Upper half
- 1st Quartile
- 3rd Quartile
- Interquartile Range (IQR)
- Spread
- Variability

Notes for Intellectual Preparation & Lesson Planning

Necessary Materials and Pre-Lesson Prep

- Document Camera
- Projector
- Unit 10 Student Workbook
- Debrief Slide
- Class per of dice (1 per group/pair)

Lesson Agenda		Time
I.	Do Now	5 min
II.	INM/Concept Development	25 min
III.	Student Practice	15 min
IV.	Student Debrief	5 min
V.	Exit Ticket	10 min

Mathematical Goal of this Lesson

The primary goal of this lesson is for students to create box plots and explain which measures of center and variation can and cannot be determined from the box plot. Students will make box plots using minimum, Q1, Median, Q3, and Maximum. They will then interpret the box plot, understanding that each quartile of the box plot represents 25% of the data used to create the box plot.

Opportunities to CFU

- ✓ INM: #1b-f, #2
- ✓ Student Practice:#2, #3

Other Notes to Inform Your Planning

For **INM/Student Practice**: Students may struggle to understand why each part of the box plot is worth 25% if some parts seem more stretched out than others. Remind them that its not always going to look like a fraction bar cut into fourths – the box plot is split up to represent ¼ of the data, not ¼ of the range from minimum to maximum. Consider having an anchor chart already labeled for students to reference during the Student Practice and Exit Ticket but **not before** students begin to work independently.

Focus on Disciplinary Literacy

INM: #1a-f
SP: #3a-b

Lesson Look Fors

Look for teachers to…

- ❑ Model for students how to get their own set of data using the document camera so that they can model each step and then give students the time to complete each step with their own set of data.
- ❑ STAMP that the data is being divided into four equal pieces
- ❑ STAMP what each of the five pieces of data needed to make a box plot represents.

Look for students to…

- ❑ Explain what each of the five pieces of data needed to make a box plot represents
- ❑ Explain why each part is called a quartile
- ❑ Construct a box plot from a set of data

Student Know/Do Chart

Explain what each part of a box plot represents

Create a box plot when given a set of data.

Lesson 6: Applications of Box Plots Date: _____

Standard(s)

- **6.12(C)** summarize numeric data with numerical summaries, including the mean and median (measures of center) and the range and interquartile range (IQR) (measures of spread), and use these summaries to describe the center, spread, and shape of the data distribution
- **6.12(B)** use the graphical representation of numeric data to describe the center, spread, and shape of the data distributions

Important Vocabulary

- Box Plot
- Range
- Lower half
- Upper half
- 1st Quartile
- 3rd Quartile
- Interquartile Range (IQR)
- Spread
- Variability

Notes for Intellectual Preparation & Lesson Planning

Necessary Materials and Pre-Lesson Prep

- Document Camera
- Projector
- Unit 10 Student Workbook
- Debrief Slide

Lesson Agenda

		Time
I.	Do Now	5 min
II.	INM/Concept Development	20 min
III.	Student Practice	20 min
IV.	Student Debrief	5 min
V.	Exit Ticket	10 min

Mathematical Goal of this Lesson

The primary goal of this lesson is for students to interpret and compare box plots. This lesson is a continuation of the previous one. Students will get more practice interpreting box plots and use the information from box plots to set up and solve proportions

Opportunities to CFU

- ✓ INM: #1a-e, #2, #3
- ✓ Student Practice: #2

Other Notes to Inform Your Planning

For **INM/Student Practice**: This lesson is intended to provided students with more opportunities to practice. Allow students to do the heavy lifting in this lesson. The Student Practice is 20 minutes, consider pulling a small group of students who struggled in the previous lesson to work with during this time. Offer students who are working independently access to an answer key after the first 8 minutes of the Student Practice so that they are able to check their responses as you are working with a small group.

Focus on Disciplinary Literacy

INM: #1f, 2C
SP: #2
Student Debrief

Lesson Look Fors

Look for teachers to…

- ❑ Support individual students that they know struggled with Unit 5 (Percents) as many questions today spiral in percent/part/whole problems from Unit 5, as they naturally lend themselves to box plots.
- ❑ When students struggle and ask for help, ask, "What percent does each section of the box plot represent?"

Look for students to…

- ❑ Find the median, minimum, maximum, range, and IQR when given a box plot
- ❑ Explain how much of the data lies between two given points

Student Know/Do Chart

Know — Each section of a box plot represents 25% of the data used to make the box plot.

Know — If you know how many pieces of data there are, or if you know how many lie in one quartile, you can figure out how many pieces of data there are in each quartile OR set up a proportion to solve for missing information.

Do — Find the median, minimum, maximum, range, and IQR when given a box plot.

Lesson 7: Histograms Date: _____

Standard(s)

- **6.13(A)** Interpret numeric data summarized in ~~dot plots, stem-and-leaf plots,~~ histograms, and ~~box plots~~
- **6.12(B)** use the graphical representation of numeric data to describe the center, spread, and shape of the data distribution

Important Vocabulary

- Histogram
- Interval Bin
- Symmetrical Distribution
- Asymmetrical Distribution
- Skewed Left
- Skewed Right

Notes for Intellectual Preparation & Lesson Planning

Necessary Materials and Pre-Lesson Prep

- Document Camera
- Projector
- Unit 10 Student Workbook
- Debrief Slide

Lesson Agenda

		Time
I.	Do Now	5 min
II.	INM/Concept Development	27 min
III.	Student Practice	13 min
IV.	Student Debrief	5 min
V.	Exit Ticket	10 min

Mathematical Goal of this Lesson

The primary goal of this lesson is for students to describe and summarize data presented in a histogram. They will start off by exploring what kind of information they can gather from a histogram. Then they will analyze histograms and answer various questions about the data including finding percents.

Opportunities to CFU

- ✓ INM: #1 a-f, #3a-b
- ✓ Student Practice: #1a,c and #2a

Other Notes to Inform Your Planning

For **Do Now**: This lesson works a lot with percents. Students that struggled with percents and rational numbers may need a quick review on finding percents. Consider adding practice for this in the Do Now.

For **INM/Student Practice**: Watch this 6-minute video explaining histograms. It will be important for students to understand what can and cannot be determined from a histogram. Note that some scholars will be able to work on part C without the group discussion on what plan to use. If you think this applies to the entire class, you can skip this discussion. If students struggled through units 2 (rational number ops) and 5 (percents), you should probably keep the discussion.

Focus on Disciplinary Literacy

INM: #1a-f
SP: #2
Student Debrief

Lesson Look Fors

Look for teachers to…

- ❑ Facilitate student discussion on what kind of information you CAN and CAN'T get from a histogram
- ❑ STAMP the meaning of "interval bin," as it is the first time students are working with interval bins in data representations as opposed to single values like they did it dot plots and stem and leaf plots.

Look for students to…

- ❑ Explain what can and cannot be determined from a histogram
- ❑ Find the percent a certain interval bin represents out of the total data represented

Student Know/Do Chart

Know — Explain what information can and cannot be known from a histogram.

Do — Use histograms to answer questions involving percent, part, and whole

Lesson 8: Percent Bar Graphs Date: _____

Standard(s)

- **6.12(D)** summarize categorical data with numerical and graphical summaries, including the mode, the percent of values in each category (relative frequency table), and the percent bar graph, and use these summaries to describe the data distribution

Important Vocabulary

- Percent Bar Graph

Notes for Intellectual Preparation & Lesson Planning

Necessary Materials and Pre-Lesson Prep

- Document Camera
- Projector
- Unit 10 Student Workbook
- Debrief Slide

Lesson Agenda

		Time
I.	Do Now	5 min
II.	INM/Concept Development	20 min
III.	Student Practice	20 min
IV.	Student Debrief	5 min
V.	Exit Ticket	10 min

Mathematical Goal of this Lesson

The primary goal of this lesson is for students to create and/or interpret a percent bar graph. Scholars begin by interpreting a percent bar graph and finding parts when give a whole and percents. Then, they practice making a percent bar graph from a frequency table

Opportunities to CFU

- ✓ INM: #1b-d, #2
- ✓ Student Practice: #2

Other Notes to Inform Your Planning

For **INM/Student Practice**: In the INM, it may be necessary to remind students how to use the percent bar or how to estimate 10% of a number. For students that may still struggle consider pulling them in a small group during the student practice and allowing students who are working independently access to an answer key after the first 7 or 8 minutes of the student practice. Displaying a timer will be help with pacing. See this short video, explaining Q2 in the Student Practice.

Focus on Disciplinary Literacy

INM: #2
SP: #1, 2
Student Debrief

Lesson Look Fors

Look for teachers to…

- ❑ Connect today's lesson to the percent bars students made in Unit 5.
- ❑ Stamp that 100% represents the total # in a percentage bar graph.

Look for students to…

- ❑ Create their own percent bar graph.
- ❑ Interpret a percent bar graph

Student Know/Do Chart

- Find the percent a category makes up on a percent bar graph.
- Find the value represented by a percent in a percent bar graph.

Recommended Success Day Materials and Resources

6.12D and 6.13A
Statistics

6.13A Practice
6.12D Practice
Tech-enhance Practice -6.12D and 6.13A

Notes to Inform Your Planning
These resources can be used for either small-group or whole-group reteach.

If student data indicates a pause point is not necessary, you can opt to move forward and reserve a Success Day to use at a later date.

Using exit ticket data can help you prioritize what to review. For example, if you remember that students did poorly on Lesson 8, pull problems from lesson 4, especially if they are problems students did not do before (for example, SP or INM problems you skipped during class). You can also take questions from the resources linked above.

All unit exams should be given online to prepare students for STAAR online.

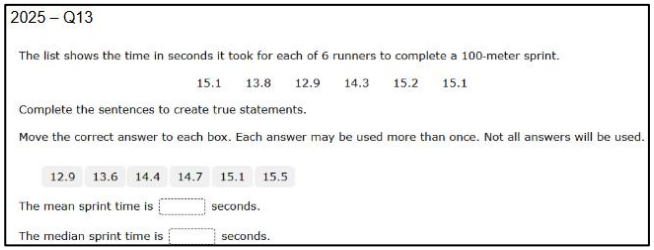
UNPACKED STANDARDS

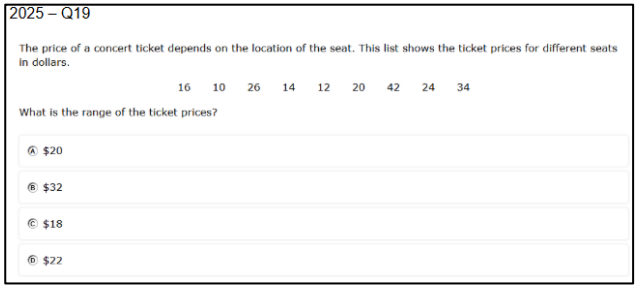
Focus standards for this unit.

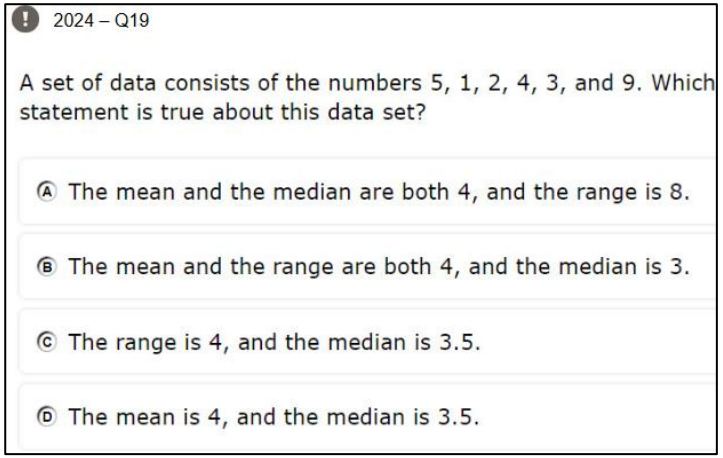
<table>
<tr><th colspan="3">Standards Breakdown</th></tr>
<tr><th>Standards</th><th>Specificity</th><th>Notes/Explanations/Examples</th></tr>
<tr>
<td>6.12(C) summarize numeric data with numerical summaries, including the mean and median (measures of center) and the range and interquartile range (IQR) (measures of spread), and use these summaries to describe the center, spread, and shape of the data distribution</td>
<td>
Concepts:
• Measures of center (mean and median)
• Measures of spread (range and IQR)
• Center, spread, and shape

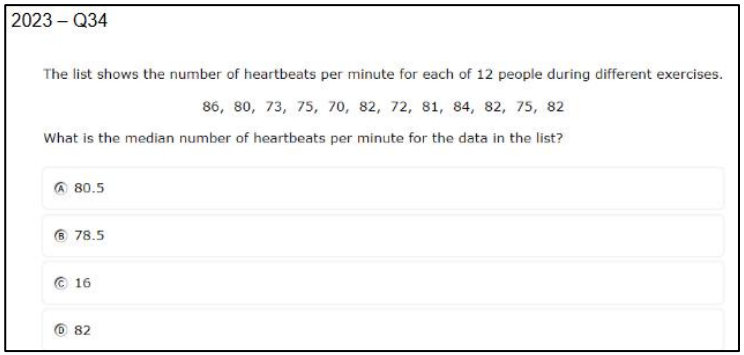
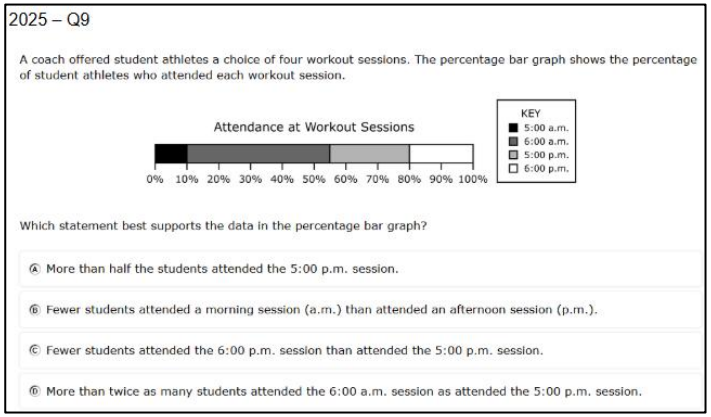
Skill:
• Summarize

Including but not limited to:
• Finding measures of spread or center from a list of numbers or a graphical representation (including dot plots, stem and leaf plots, histograms, and box plots)

Vertical Alignment:
In 5th grade, students interpreted data displays by answering questions like “What is the difference between the highest and lowest score?” or “How many did not choose the color red?” 6.12(B) is new to 6th graders – it’s the first time they’re having to analyze data displays to find measures of center and spread. Our 6th graders will use the skills they build this year to successfully compare multiple data sets in 7th grade and AP Statistics.
</td>
<td>
<u>2025 6G STAAR Q13</u>

2025 – Q13
The list shows the time in seconds it took for each of 6 runners to complete a 100-meter sprint.
15.1 13.8 12.9 14.3 15.2 15.1
Complete the sentences to create true statements.
Move the correct answer to each box. Each answer may be used more than once. Not all answers will be used.
12.9 13.6 14.4 14.7 15.1 15.5
The mean sprint time is ____ seconds.
The median sprint time is ____ seconds.


2025 – Q19
The price of a concert ticket depends on the location of the seat. This list shows the ticket prices for different seats in dollars.
16 10 26 14 12 20 42 24 34
What is the range of the ticket prices?
Ⓐ $20
Ⓑ $32
Ⓒ $18
Ⓓ $22

<u>2024 6G STAAR Q19</u>

2024 – Q19
A set of data consists of the numbers 5, 1, 2, 4, 3, and 9. Which statement is true about this data set?
Ⓐ The mean and the median are both 4, and the range is 8.
Ⓑ The mean and the range are both 4, and the median is 3.
Ⓒ The range is 4, and the median is 3.5.
Ⓓ The mean is 4, and the median is 3.5.
</td>
</tr>
</table>

Standards Breakdown		
Standards	**Specificity**	**Notes/Explanations/Examples**
		2023 6G STAAR Q34 
6.12(D) summarize categorical data with numerical and graphical summaries, including the mode, the percent of values in each category (relative frequency table), and the percent bar graph, and use these summaries to describe the data distribution	**Concepts:** • categorical data • mode • percent bar graph • relative frequency table **Skills:** • summarize **Including but not limited to:** • determining whether a statement about a percent bar graph or table is true or false • matching a frequency table to a percent bar graph **Vertical Alignment:** In 5th grade, students worked with traditional bar graphs; however, the questions they saw on bar graphs required only addition or subtraction. (For example, "How many students did not choose strawberry as their favorite ice cream?") Like 6.12(B), 6.12(D) is new to 6th graders, and they'll use the skills they build this year to successfully compare multiple data sets in 7th grade and AP Statistics.	**2025 6G STAAR Q9** 

6.13(A) interpret numeric data summarized in dot plots, stem-and-leaf plots, histograms, and box plots

Concepts:

- dot plots
- stem-and-leaf plots
- place value
- histograms
- interval bin
- box plots
- interquartile range
- minimum
- maximum
- 1st Quartile
- 3rd Quartile
- range
- mean
- median
- mode

Skills:

- interpret

Including but not limited to:

- determining whether a statement about a data display (including dot plots, stem and leaf plots, histograms, and box plots) accurately represents the data display
- describing part of a data display as a fraction or percent of the whole
- identifying the range and interquartile range of multiple data sets and identify a statement that accurately describes them.
- determining what can and cannot be known from a data display.
- knowing what box plot quartiles represent and determining whether a statement about a box plot aligns with the box plot

Vertical Alignment:

In 5th grade, students learned how to answer one-step addition and subtraction equations about dot plots, bar graphs, scatterplots, and stem-and-leaf plots. In 6th, they must determine whether a statement about a data display accurately represents the data display, and bar graphs and scatterplots are replaced by percentage bar graphs. 6th

2024 6G STAAR Q2

2024 – Q2

A skateboarder recorded the colors of the skateboards in use at a skate park one day. The tally chart shows the frequency of each color.

Skateboard Colors

Color	Frequency
Blue	𝍸
Green	𝍸 ||
Red	𝍸 |
Silver	𝍸 ||

Which colors represent the mode of the data?

Ⓐ Red and blue

Ⓑ Blue and green

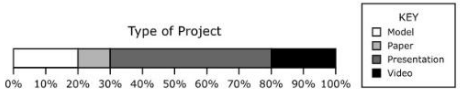
Ⓒ Silver and red

Ⓓ Green and silver

2024 6G STAAR Q17

2024 – Q17

A project was assigned to 60 students. Each student could choose to create a model, write a paper, create a computer presentation, or make a video. The percentage bar graph shows the percentage of the students who created each type of project.



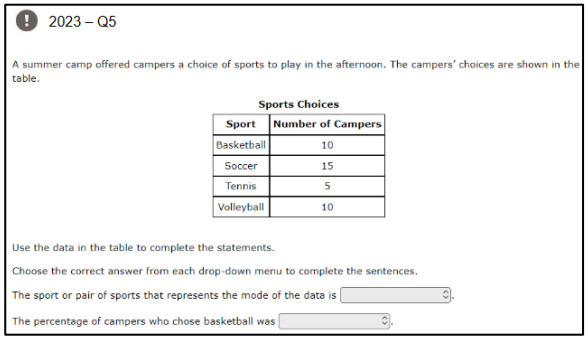
What is the number of students who created each type of project?

Move the correct answer to each box in the table. Each answer may be used more than once. Not all answers will be used.

6 10 12 20 30 50

Type of Project

Item	Number of Students
Model	
Paper	
Presentation	
Video	

	graders will build on these foundational skills in 7th and AP Statistics.	**2023 6G STAAR Q5**  2023 – Q5 A summer camp offered campers a choice of sports to play in the afternoon. The campers' choices are shown in the table. **Sports Choices** Sport / Number of Campers Basketball 10 Soccer 15 Tennis 5 Volleyball 10 Use the data in the table to complete the statements. Choose the correct answer from each drop-down menu to complete the sentences. The sport or pair of sports that represents the mode of the data is . The percentage of campers who chose basketball was .

VERTICAL STANDARDS

This section details the **progression** of key student expectations/standards** in the courses **before** and **after** this course. This will help you understand what **prior knowledge skills to build upon** and guide you in knowing what **skills you are preparing your students** for in the subsequent course.

5th grade	6th grade Mathematics	7th grade Pre-Algebra / 8th grade Algebra I
	6.12(B) use the graphical representation of numeric data to describe the center, spread, and shape of the data distribution	**7.12(A)** compare two groups of numeric data using comparative dot plots or box plots by comparing their shapes, centers, and spreads.
	6.12(C) summarize numeric data with numerical summaries, including the mean and median (measures of center) and the range and interquartile range (IQR) (measures of spread), and use these summaries to describe the center, spread, and shape of the data distribution	

	6.12(D) summarize categorical data with numerical and graphical summaries, including the mode, the percent of values in each category (relative frequency table), and the percent bar graph, and use these summaries to describe the data distribution	
5.9(C) solve one- and two-step problems using data from a frequency table, dot plot, bar graph, stem-and-leaf plot, or scatterplot.	**6.13(A)** interpret numeric data summarized in dot plots, stem-and-leaf plots, histograms, and box plots	