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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**

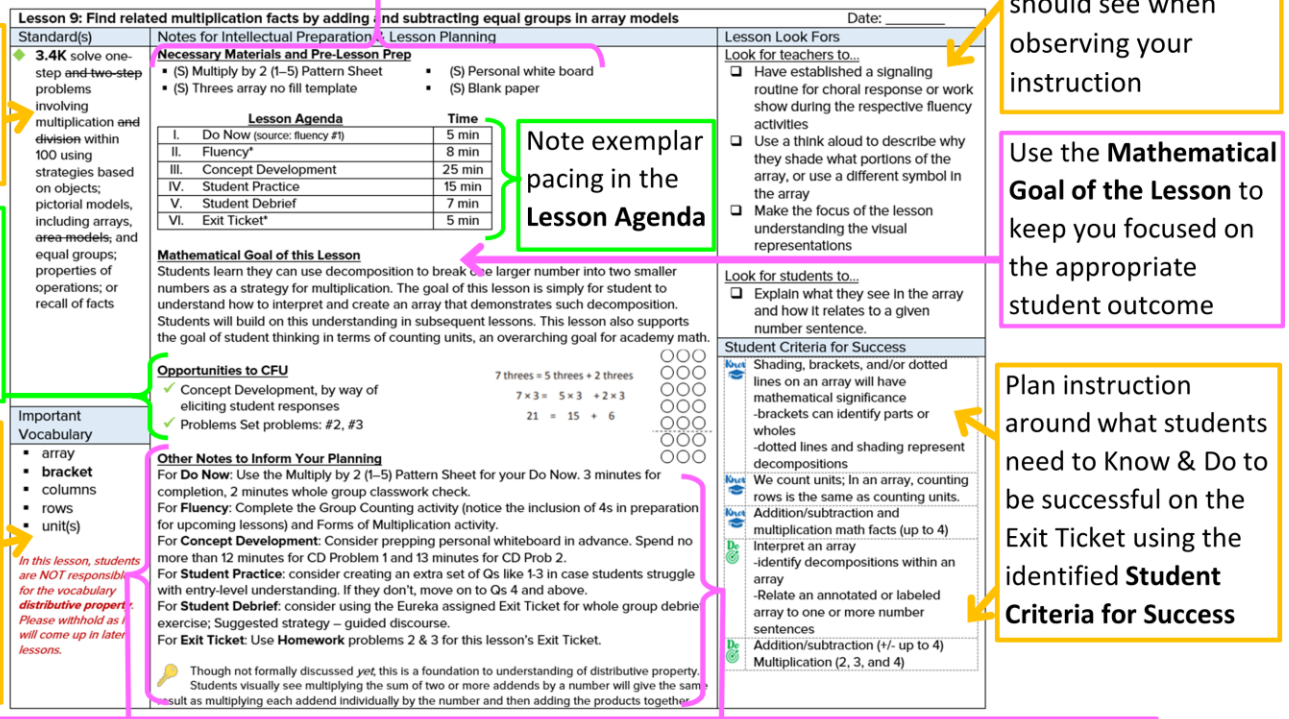
Note exemplar pacing in the **Lesson Agenda**

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



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

In this sequence, students build on earlier proportional reasoning and percent application to analyze and interpret data. They begin with bar graphs and dot plots, using part-over-whole ratios and percent over 100 to calculate missing values and describe data. Students then extend to circle graphs, where they practice finding missing parts, wholes, and percentages using proportions and scale factors, reinforcing work from earlier percent units.
Next, students apply proportional reasoning to random samples, setting up proportions to make inferences about populations. Emphasis is placed on using scale factors instead of cross multiplication to promote conceptual understanding and accurate scaling. Students then explore measures of center (mean and median) through redistributing data and reasoning about outliers, followed by measures of variation (range and interquartile range) to describe spread.
Finally, students create and compare box plots, using quartiles to interpret how data is distributed across 25% intervals.

Key strategies and models include:

- Setting proportions as part/whole and percent/100.
- Using scale factors to solve for missing pieces and make inferences.
- Visual models such as bar graphs, dot plots, circle graphs, and box plots.
- Reasoning with measures of center and variation to compare data sets.
- Interpreting quartiles to connect box plots with proportional reasoning.

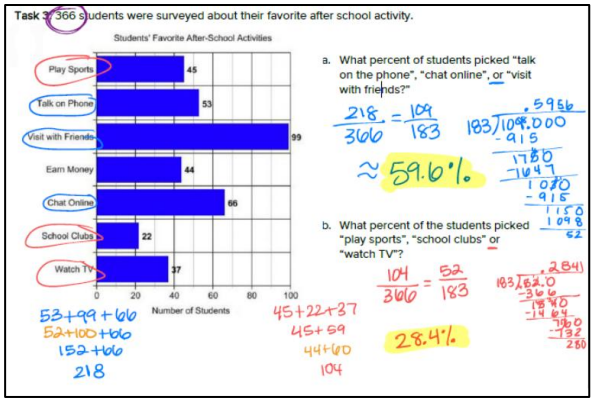
By the end, students are fluent in applying proportional reasoning to multiple data displays and contexts, and they are prepared for future work with formal inference and more advanced statistical models.

This unit features 4 topic(s).

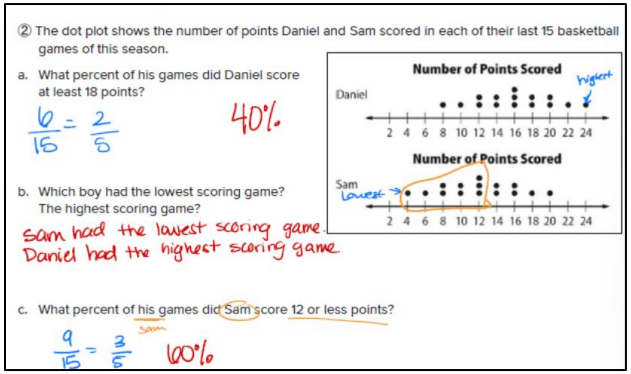
Topic A Overview – Analyzing Data from a Visual Display

Lessons 1-3 focus largely on analyzing data presented in a dot plot, bar graph or circle graph by calculating the percent of data that falls into each discrete category. Students will also analyze the shape of quantitative data presented in a dot plot/line plot. They will be introduced to outliers and will evaluate the impact of outliers on a data's shape. Students will describe as set of data as either symmetrical or non-symmetrical and will be able to identify if the data is skewed to the left or the right. This topic is also rooted in percent application and will require students to use what they learned about ratios and proportions when answering questions involving percentages. Students will be asked to find missing percentages when given the quantity of each sector or category. Students will be asked to find missing parts when given the percent of data that falls in a section and the total number of pieces of data. Finally, students will also be asked to find the total number of data pieces when given a part and a percent. It is critical that you use the same process for answering questions involving missing percentages, parts or wholes that you used in previous units. Students should be solidifying their understanding of equivalent ratios, scale factors, percentages as a ratio of a number to 100, and part to whole ratios.

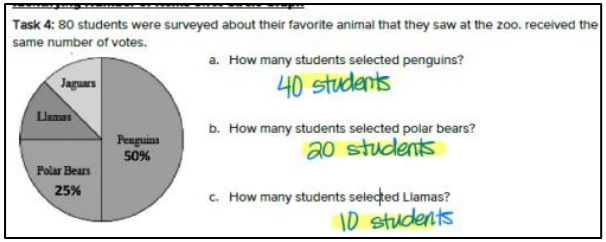
Lesson 1

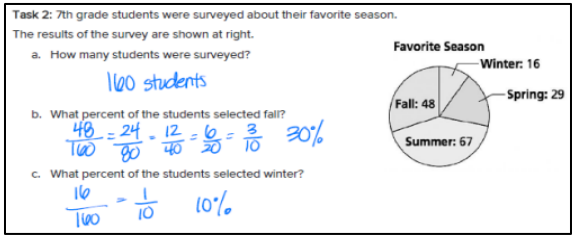


Lesson 2

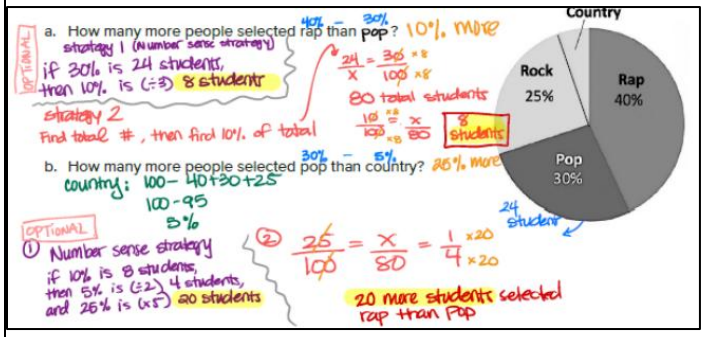


Lesson 3





Lesson 4



Topic B Overview – Random Sampling and Statistics and Summarizing Data using Center and Spread

In Lesson 5 will extend students' understanding of gathering valid data to taking that data and making inferences about an entire population. Students will use proportional reasoning again to go from the sample's data to the prediction of the data for the entire population. Students should set their proportions up as part over whole = part over whole and use a scale factor to find the missing value in their proportion. Lesson 6 will present them with two situations in which they must redistribute data so that it is equally or fairly divided. Students will describe the center of data by the mean and median and will be able to describe the impact that outliers may have. Students will be able to explain whether the mean or median better represents a given set of data based on the presence or absence of outliers. In Lesson 7, they will discover the need for describing a data set by its spread as well as its center when they are comparing to sets of data that have the same central values but very different variabilities. These lessons will require students to describe the spread of data using its range and inter quartile range. Students will be able to visualize the spread of data by plotting it on a number line. They will see that the range is the distance between the smallest piece of data and the largest. Later, in Topic C, they will be able to visualize the IQR as the distance between the first and third quartile. Students should understand why this measure is often called the mid-spread and should understand why/when it is beneficial to calculate the IQR in addition to the range. Students should build an understanding that when analyzing or comparing data sets it is important to know about both the center of the data and the variation of the data. By the end of the unit, students should be able to look at the data of two or more groups given in a dot plot or box plot and compare their central tendency and their variation without doing any calculations. They should also be able to describe the data set as symmetrical or not and should be able to explain the impact that outliers have on a data set's center and variation.

Lesson 5

Task 2: There are three students running for student council president. Mrs. Miller randomly surveyed some of the students who will vote and recorded the results in the table below. If there are 480 students in the school, approximately how many more votes would you expect Jackson to get than Taylor? Explain.

Candidates	Nick	Jackson	Taylor
# of Votes	15	18	12

population: 480
sample: 45
total 45
6 more
$\frac{16}{45} \div 3 = \frac{x}{480} = \frac{2}{15} \times 32$
scaling factor
$15\overline{)480}$ 45 30 → 32
104 more votes for Jackson than Taylor

Task 3: In a re-capture study, 99 grizzly bears were tagged and released back into the wild. A month later, 200 bears were captured of which 36 were tagged. How many grizzly bears are in the population? Explain your answer.

$\frac{36}{200} \div 4 = \frac{99}{x} = \frac{9}{50} \times 11$
550 bears were in the population

Lesson 6

Task 1: Find the mean, median and outlier(s) for each data set. Draw a circle around the central measure that best represents the data set, and then explain your reasoning.

Data Set One: 16, 21, 20, 19, 21, 75, 18, 21, 20 (n=9)
16, 18, 19, 20, 20, 21, 21, 21, 75
Mean: 25.6 Median: 20 Outlier(s) 75
Explanation for best: outlier effects the central measure

Data Set Two: 99, 42, 99, 100, 100, 98, 99 (n=7)
42, 98, 99, 99, 100, 100
Mean: 91 Median: 99 Outlier(s) 42
Explanation for best: outlier effects the central measure

Lesson 7

Justin and Alvin both recorded the number of points they scored this season on their basketball team

Justin's Points

Game	1	2	3	4	5	6
Points	17	22	25	16	21	19

16 17 19 21 22 25

Alvin's Points

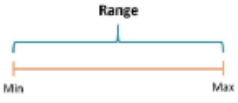
Game	1	2	3	4	5	6
Points	34	4	8	32	2	40

2 4 8 32 34 40

Justin's mean: 20 pts Justin's median: 20 pts

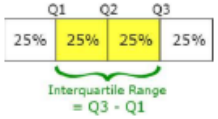
Measures of Variation

Range



The distance between the greatest and least values in the data set. The range tells us how spread out a data set is.

Interquartile Range (IQR)



(Widespread) The IQR is the distance between the 3rd and 1st quartile. It is the range for the middle of the data set.

Topic C Overview – Summarizing Data using Center and Spread

In lessons 8-10, students will work with box plots. This topic ties topics A and B together by having students analyze a set of data by its center and spread and by the percent of data that falls in each of the four quartiles. Students will begin this topic by creating their own box plot to represent a set of data that is collected as a class (number of cousins each student has). Students will learn to use the box plot of a data set to analyze the central value of the data (median) and the spread of the data (range and IQR). They will compare two or more data sets shown as box plots by their spreads and centers. Students should build an understanding of the need for measuring a data's IQR as well as its overall range. Students will also need to understand that 25% of the data falls into each of the four sections of a box plot. They will be given different values that represent a portion of the box plot and asked to find missing parts or wholes. This should be explored using proportional reasoning. Students should be able to answer application questions using proportional reasoning. In the last lesson of the unit, students compare two groups of data using comparative dot plots and box plots, by comparing their shapes, centers, and/or spreads.

Lesson 8

Task 1: The heights of the players on a basketball team are shown in the table below.

Player 1	Player 2	Player 3	Player 4	Player 5	Player 6	Player 7	Player 8	Player 9	Player 10	Player 11	Player 12
60 in.	68 in.	64 in.	72 in.	74 in.	58 in.	64 in.	63 in.	61 in.	66 in.	70 in.	60 in.

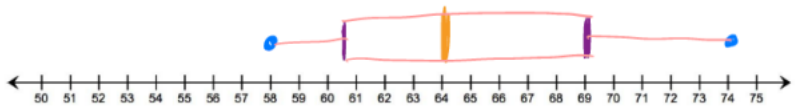
a. Order the data from least to greatest.

58, 60, 60, 61, 63, 64, 64, 66, 68, 70, 72, 74

b. Identify your 5 number summary:

Minimum: 58 Quartile 1: 60.5 Median: 64 Quartile 3: 69 Maximum: 74

c. Draw a box-and-whisker plot of the data on the number-line below.



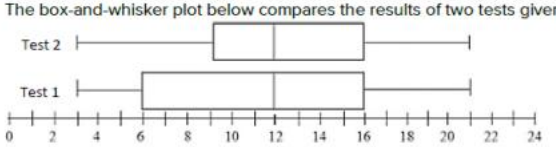
d. Identify the data's variability:

Range: 16 Inter-Quartile Range: 8.5

Lesson 9

Let's Discuss!

The box-and-whisker plot below compares the results of two tests given.

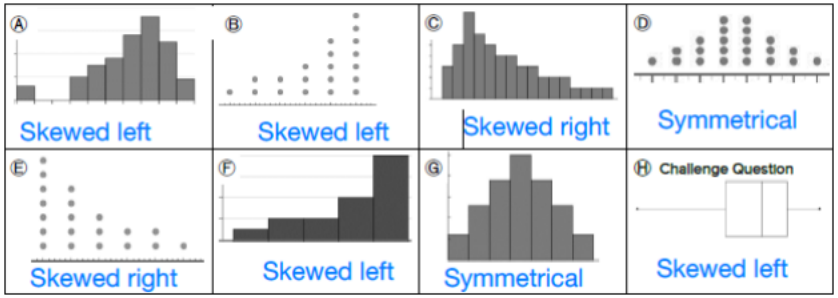


How do the box plots for Test 1 and Test 2 differ? What implications does this have regarding the data?

The box for test 2 is smaller. This means there was less variability for 50% of the scores. This could mean more students had a similar understanding of the material on the test.

Lesson 10

Task 1: Identify the space of the data displayed as symmetrical, skewed left or skewed right.



CONTENT STANDARDS

Below are the standards addressed in this unit.

Readiness Standards	Supporting Standards
7.6(G) solve problems using data represented in bar graphs, dot plots, and circle graphs, including part-to-whole and part-to-part comparisons and equivalents **7.12(A)** compare two groups of numeric data using comparative dot plots or box plots by comparing their shapes, centers, and spreads	**7.12(B)** use data from a random sample to make inferences about a population **8.11(B)** determine Pe

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 Analyzing Data from a Visual Display	1		1	Bar Graphs
	2		2	Dot Plots
	3		3	Circle Graphs – Day 1
	4		4	Circle Graphs Day 2
	5			Topic Quiz 8
Topic B Random Sampling and Statistics and Summarizing Data using Center and Spread	6		5	Inferences – Sample to Population
	7		6	Measure of Center
	8		7	Measures of Center and Variation
Topic C Boxplots and Comparing Data Displays	9		8	Box Plots Day 1
	10		9	Box Plots Day 2
	11		10	Comparing Data Displays
	12			Review Day
	13			Unit Exam 10

Lesson 1: Bar Graphs Date: _____

Standard(s)

- **7.6(G)** solve problems using data represented in bar graphs, dot plots, and ~~circle graphs~~, including part-to-whole and part-to-part comparisons and equivalents

Important Vocabulary

- Bar Graph
- Dot Plot
- Percent
- Relative Frequency

Notes for Intellectual Preparation & Lesson Planning

Necessary Materials and Pre-Lesson Prep

- Unit 10 Student Workbook or Printed Student Pages
- Document Camera
- Calculators

Lesson Agenda

		Time
I.	Do Now	8 min
II.	INM/Concept Development	21 min
III.	Student Practice	30 min
IV.	Student Debrief	5 min
V.	Exit Ticket	7 min

Mathematical Goal of this Lesson

The goal of this lesson is for students to read and analyze bar graphs. This lesson starts with the most common and basic type of data analysis of reading and interpreting bar graphs. . Students use percentages to describe the amount of data that falls into each discrete category in a set of data.

Opportunities to CFU

- ✓ INM: Task 2 and Task 3
- ✓ Student Practice: #1 and #2

Other Notes to Inform Your Planning

For **Do Now**: The Do Now is a great opportunity to assess student's understanding/address misconceptions around setting up proportions to find the scale factor/finding percent of a number.

These are the understandings they will need to access the day's lesson.

For **INM/Student Practice**: Allow students to use a calculator to some of the computations as long as they understand the process and show their thinking. Some of the numbers are difficult to work with but the objective of the lesson is for students to interpret the data, not compute the numbers. Allow students to use graph paper to support them with organizing their numbers when setting up proportions or using long division.

Focus on Disciplinary Literacy

INM: Task 1-3
SP: #2

Lesson Look Fors

Look for teachers to…

- ❑ Use students prior knowledge of proportions and percents to build understanding of analyzing bar graphs and dot plots
- ❑ STAMP for students that they will need to show their process of solving each problem and use calculators **only** for calculating challenging numbers

Look for students to…

- ❑ Set up and solve proportions using scale factors to find missing percents or quantities in a bar graph or dot plot.
- ❑ Interpret a bar graph or dot plot using the information given.

Student Criteria for Success

Know
- Bar graphs are used to represent statistical data visually by showing the frequency or number of items that fall into different sets of discrete data

Do
- Use percents to describe the amount of data that falls into each discrete category in a set of data.
- Set up a proportion and find scale factor to solve
- Convert fractions to decimals to percent

Lesson 2: Dot Plots Date: _____

Standard(s)

- **7.6(G)** solve problems using data represented in bar graphs, dot plots, and ~~circle graphs~~, including part-to-whole and part-to-part comparisons and equivalents

Important Vocabulary

- Bar Graph
- Dot Plot
- Percent
- Relative Frequency

Notes for Intellectual Preparation & Lesson Planning

Necessary Materials and Pre-Lesson Prep

- Unit 10 Student Workbook or Printed Student Pages
- Document Camera
- Calculators

Lesson Agenda

		Time
I.	Do Now	7 min
II.	INM/Concept Development	21 min
III.	Student Practice	20 min
IV.	Student Debrief	5 min
V.	Exit Ticket	7 min

Mathematical Goal of this Lesson

The goal of this lesson is for students to read and analyze dot plots which are very similar to bar graphs. Students use percentages to describe the amount of data that falls into each discrete category in a set of data.

Opportunities to CFU

- ✓ INM: Task 2 and Task 3
- ✓ Student Practice: #1 and #3

Other Notes to Inform Your Planning

For **INM/Student Practice**: Allow students to use a calculator to some of the computations as long as they understand the process and show their thinking. Some of the numbers are difficult to work with but the objective of the lesson is for students to interpret the data, not compute the numbers. Allow students to use graph paper to support them with organizing their numbers when setting up proportions or using long division.

Focus on Disciplinary Literacy

INM: Task 1-3
SP: #1, 2

Lesson Look Fors

Look for teachers to…

- ❑ Use students prior knowledge of proportions and percents to build understanding of analyzing bar graphs and dot plots
- ❑ STAMP for students that they will need to show their process of solving each problem and use calculators **only** for calculating challenging numbers

Look for students to…

- ❑ Set up and solve proportions using scale factors to find missing percents or quantities in a bar graph or dot plot.
- ❑ Interpret a bar graph or dot plot using the information given.

Student Criteria for Success

Know
- Dot Plots are used to represent statistical data visually by showing the frequency or number of items that fall into different sets of discrete data

Do
- Use percents to describe the amount of data that falls into each discrete category in a set of data.
- Set up a proportion and find scale factor to solve
- Convert fractions to decimals to percent

Lesson 3: Circle Graphs – Day 1 Date: _____

Standard(s)

- **7.6(G)** solve problems using data represented in ~~bar graphs, dot plots,~~ and circle graphs, including part-to-whole and part-to-part comparisons and equivalents

Important Vocabulary

- Circle Graph
- Percent
- Sector

Notes for Intellectual Preparation & Lesson Planning

Necessary Materials and Pre-Lesson Prep

- Unit 10 Student Workbook
- Document Camera
- Projector

Lesson Agenda

		Time
I.	Do Now	8 min
II.	INM/Concept Development	35 min
III.	Student Practice	15 min
IV.	Student Debrief	5 min
V.	Exit Ticket	7 min

Mathematical Goal of this Lesson

The primary goal of this lesson is for students to analyze a set of data using a circle graph then calculate missing percentages and data values within a circle graph. This lesson starts by having students calculate missing percentages in a circle graph then students will be given percentages and the whole and will be expected to calculate the number of items that each sector in the graph represents. Students should understand that the entire graph will always sum to 100%.

Opportunities to CFU

- ✓ INM: Task 3, Task 5
- ✓ Student Practice: #1c, #3a-b

Other Notes to Inform Your Planning

For **Do Now:** Use this as an opportunity to remind students how to set up a proportion and find scale factor.

For **INM/Student Practice**: Prepare to address misconceptions around students ignoring the percent symbol in a circle graph and confusing the total percentage of a circle graph with the total number of items. Consider creating an anchor chart with an example of each for students to reference. Provide students who struggle with benchmark conversions chart to support them in calculating benchmark percentages and a 12x12 to support them with simplifying or setting up a proportion to find a missing percentage or number. It may be necessary to review some students on converting a fraction to a decimal then to a percent.

Focus on Disciplinary Literacy

INM: Task 5
SP: #1, 3

Lesson Look Fors

Look for teachers to…

- ❑ Use proportional reasoning or faction=>decimal=>percent to model answering questions.
- ❑ STAMP for students that sometimes a circle graph may provide percentages and sometimes a circle graph may provide the number of items.
- ❑ STAMP that the sectors in a circle graph have a sum of 100%.

Look for students to…

- ❑ Set up proportions as part=>whole = part=>whole or convert using fraction =>decimal=>percent.
- ❑ Use a circle graph to find a missing percentage or missing frequency.

Student Criteria for Success

- Know: The sectors in a circle graph have a sum of 100%
- Know: Proportional reasoning can be used to calculate missing frequencies or percentages in a circle graph
- Do: Find missing percentages in a circle graph by subtracting the sum of the given percentages from 100%.
- Do: Find missing percentages in a circle graph using proportional reasoning.
- Do: Find a missing frequency in a circle graph using proportional reasoning

Lesson 4: Circle Graphs – Day 2 Date: _____

Standard(s)

◆ **7.6(G)** solve problems using data represented in ~~bar graphs, dot plots,~~ and circle graphs, including part-to-whole and part-to-part comparisons and equivalents

Important Vocabulary

- Circle Graph
- Percent
- Sector

Notes for Intellectual Preparation & Lesson Planning

Necessary Materials and Pre-Lesson Prep

- Unit 10 Student Workbook
- Document Camera
- Projector

Lesson Agenda

		Time
I.	Do Now	8 min
II.	INM/Concept Development	35 min
III.	Student Practice	15 min
IV.	Student Debrief	5 min
V.	Exit Ticket	7 min

Mathematical Goal of this Lesson

The goal of this lesson is for students to find missing parts, wholes, and percentages on a circle graph. This lesson builds on understandings from the previous lesson. They will be expected to use given percentages and parts to find a missing whole.

Opportunities to CFU

✓ INM: Task 1, 3, 4
✓ Student Practice: #1a, b

Other Notes to Inform Your Planning

For **INM/Student Practice:** Throughout the INM/Student Practice, students will be mostly finding the missing whole, given the percentages. Students should be encouraged to choose the strategy that works best for them when solving. In most cases, setting up a proportion would be the best strategy, but some students may prefer to use number sense. In either case, students should show their thinking as they are solving. Consider adding an example of each on the anchor chart created for Circle Graphs (if there was one created for the previous lesson) for students to reference. Prepare to address misconceptions around determining the missing value as the 'whole'(i.e., If 96 students picked Tacos as their favorite option, how many students picked chicken fingers?') STAMP/MODEL for students that 96 represents the part/percentage. This information helps to set up a proportion to determine the total which will then help with setting up a proportion to find the number of students that picked chicken tenders). Students who struggle will need a 12x12 Chart or calculator for those that are able to use it on STAAR.

Focus on Disciplinary Literacy

INM: Task 3, 4
SP: #1, 2

Lesson Look Fors

Look for teachers to…

- ❑ Model how to use Proportional Reasoning/Number Sense to find missing parts/wholes
- ❑ Allow students the autonomy to use the strategy that works best for them: *Number Sense or Set up a Proportion*
- ❑ STAMP that students should show their thinking with either strategy to solve.

Look for students to…

- ❑ Use Proportional Reasoning or Number Sense to find missing parts or wholes
- ❑ Show work with either strategy

Student Criteria for Success

Know The sectors in a circle graph have a sum of 100%
Know Proportional Reasoning/Number Sense can be used to find missing parts or wholes in a circle graph
Do Find the total number of data in a set using Proportional Reasoning/Number Sense
Do Set up and solve a proportion using the scale factor that they calculate.

Lesson 5: Inferences – Sample to Population Date: _____

Standard(s)

- **7.12(B)** use data from a random sample to make inferences about a population

Important Vocabulary

- Inference
- Population
- Population
- Proportion
- Random Sample
- Sample
- Scale Factor

Notes for Intellectual Preparation & Lesson Planning

Necessary Materials and Pre-Lesson Prep

- Unit 10 Student Workbook
- Document Camera
- Projector

Lesson Agenda

		Time
I.	Do Now	8 min
II.	INM/Concept Development	30 min
III.	Student Practice	20 min
IV.	Student Debrief	5 min
V.	Exit Ticket	7 min

Mathematical Goal of this Lesson

The goal of this lesson is for students to make inferences about a population using data from a random sample. In this lesson, students will build on what they learned in the previous lesson about selecting a random sample to represent a population. Students will now use the data collected from a random sample to make inferences about the entire population. They will use proportional reasoning to scale the data from a sample up to fit the population size.

Opportunities to CFU

- ✓ INM: Task 3
- ✓ Student Practice: #1a-d

Other Notes to Inform Your Planning

For **INM/Student Practice**: It will be important that students set up proportions accurately. Students will need to be able to determine the differences between the whole in the sample vs. the whole that represents the population. This could be represented in a verbal description or table. Support students by modeling Read, Draw, Write to make sense of verbal descriptions and determining the whole in the sample and the whole that represents the population. For those that struggle, if not all, have them label their proportions (i.e., $\frac{part}{whole} \; \frac{\text{Sample } 6}{45} = \frac{\text{Population } x}{480}$).

Focus on Disciplinary Literacy

INM: Task 1-3
SP: #1, 2

Lesson Look Fors

Look for teachers to…

- ❑ Connect student's prior knowledge of proportions and scale factors.
- ❑ STAMP that students should label their proportions and check for accurate set up.
- ❑ PUNCH the difference between the whole in the sample vs. the whole in the population.

Look for students to…

- ❑ Label and set up proportions accurately.
- ❑ Explain the difference between the whole in the sample vs. the whole that represents the population given a verbal description or table.
- ❑ Use proportional reasoning to go from data in a sample to predictions about a population

Student Criteria for Success

- Know: Proportional reasoning can be used to make inferences about a population using data from a sample
- Do: Set up and solve a proportion using a scale factor
- Do: Make predictions/inferences about a population using data from a random and unbiased sample.

Lesson 6: Measures of Center | Date: _____

Standard(s)

- **7.12(A)** compare two groups of numeric data using comparative dot plots or box plots by comparing their shapes, centers, and spreads

Important Vocabulary

- Mean
- Median
- Outlier

Notes for Intellectual Preparation & Lesson Planning

Necessary Materials and Pre-Lesson Prep

- Unit 10 Student Workbook
- Document Camera
- Projector

Lesson Agenda

		Time
I.	Do Now	8 min
II.	INM/Concept Development	35 min
III.	Student Practice	15 min
IV.	Student Debrief	5 min
V.	Exit Ticket	7 min

Mathematical Goal of this Lesson

The goal of this lesson is for students to calculate the center of a data set using the mean and median. Students will describe which measure of center best describes a data set make inferences about a population using data from a sample. In this lesson, they will explore measure of center. They begin the lesson by being asked to make equal groups when given a set of different sized groups.

Opportunities to CFU

- ✓ INM: Task 1
- ✓ Student Practice: #2a-b

Other Notes to Inform Your Planning

For **Do Now**: The Do Now is a ***Must Do*** as it prepares students for the lesson. Allow students to work independently and come up with their own ways to answer the questions.

For **INM**: In Task 1, it may be necessary to model finding the mean and median. It will be important to STAMP that outliers affect the central measure and that the mean best represents the data when there are no outliers. Support students with calculations by providing a 12x12 chart, graph paper, and/or calculator (for those that can use it on STAAR).

Focus on Disciplinary Literacy

INM: Task 1-3
SP: #1, 3

As always, consider creating an anchor chart with the academic vocabulary for this lesson, include the definition and an example of the process of solving to find each (mean/median) and determining the best representation for a data set.

Lesson Look Fors

Look for teachers to…

- ❑ Build students conceptual understanding of central tendency of data using real-world situations.
- ❑ Build student understanding of determining the best measure of center that represents a data set

Look for students to…

- ❑ Build an understanding of center by making equal groups during the inquiry portion of the lesson
- ❑ Determine the best measure of center that represents a data set and explain their reasoning.

Student Criteria for Success

- Know: Measure of center are used to summarize data in a set.
- Know: The mean is a better representation of the data when there are no outliers in the set and the median is a better representation of a set of data when there are outliers in the set.
- Do: Calculate the mean of a set of data
- Do: Calculate the median of a set of data.
- Do: Identify whether the mean or median are a better representation of a data set.

Lesson 7: Measures of Center and Variation | Date: _____

Standard(s)

- **8.11(B)** determine the mean absolute deviation and use this quantity as a measure of the average distance data are from the mean using a data set of no more than 10 data points
- **7.6(G)** solve problems using data represented in bar graphs, dot plots, and circle graphs, including part-to-whole and part-to-part comparisons and equivalents
- **7.12(A)** compare two groups of numeric data using comparative dot plots or box plots by comparing their shapes, centers, and spreads

Important Vocabulary

- Mean
- Mean-Absolute-Deviation (MAD)
- Range
- Variation/Variance

Notes for Intellectual Preparation & Lesson Planning

Necessary Materials and Pre-Lesson Prep

- Unit 10 Student Workbook
- Document Camera
- Projector

Lesson Agenda

		Time
I.	Do Now	8 min
II.	INM/Concept Development	35 min
III.	Student Practice	15 min
IV.	Student Debrief	5 min
V.	Exit Ticket	7 min

Mathematical Goal of this Lesson

The primary goal of this lesson is for students to calculate measures of center and variation to describe spread of data sets. Students will be presented with situations in which two data sets have the same measure of center but look different. When comparing the two data sets, students will see the need for also calculating measures of variation or spread. They will be introduced to calculating the range of sets of data to describe how the data spread.

Opportunities to CFU

- ✓ INM: Task 2, Task 4
- ✓ Student Practice: #2 and #3

Other Notes to Inform Your Planning

For **INM/Student Practice:** Allow students to use calculators. The focus of the lesson is on describing sets by their measures of center and measures of variation, as well as understanding the process for the calculations. The goal is to avoid computation errors that will prevent students from being successful in this lesson.

Focus on Disciplinary Literacy

INM: Reflection Questions comparing data sets; Task 2b, c, Task 4a,b
SP: #3

Lesson Look Fors

Look for teachers to…

- ❑ Push students to describe a set of data using both its measure of center and its measures of variation

Look for students to…

- ❑ Explain the difference between a data set's central tendency and its variation.

Student Criteria for Success

- Know: Measures of variation describe how spread apart a set of data is and how far the data falls from the center.
- Know: Measure of center are used to summarize data in a set.
- Do: Calculate the Range, IQR, and Mean of the data
- Do: Compare data sets by their central tendency and variation

Lesson 8: Box Plots – Day 1 Date: _____

Standard(s)

- **7.12(A)** compare two groups of numeric data using comparative dot plots or box plots by comparing their shapes, centers, and spreads

Important Vocabulary

- Box Plots
- Interquartile Range
- Median
- Quartiles

Notes for Intellectual Preparation & Lesson Planning

Necessary Materials and Pre-Lesson Prep

- Unit 10 Student Workbook
- Document Camera
- Projector

Lesson Agenda

		Time
I.	Do Now	5 min
II.	INM/Concept Development	30 min
III.	Student Practice	20 min
IV.	Student Debrief	5 min
V.	Exit Ticket	8 min

Mathematical Goal of this Lesson

The primary goal of this lesson is for students to create a box plot given a whole number data set containing 12-20 data points.

Opportunities to CFU

- ✓ INM: Task 2
- ✓ Student Practice: Task 1

Other Notes to Inform Your Planning

For **INM/Student Practice:** Allow students to use a calculator for calculations **only**, share with them that they will still need to show their process (Show your work) for solving during the INM and Student Practice. It will be important to model the process of creating a Box and Whisker Plot to support student understanding. The Student Practice is 20 minutes, consider pulling a small group to work with during the Student Practice. Allow students who are working independently to have access to an answer key to check their answers after the first 10 minutes of the Student Practice.

Focus on Disciplinary Literacy

INM: Let's Create; Stop and Jot
SP: #1

For **Student Debrief**: When students are pulled back whole group, use show call to display an example that is correct then allow students to do an error analysis. This will provide an opportunity to address misconceptions that may have occurred as you were working in small groups before students complete the exit ticket.

Lesson Look Fors

Look for teachers to…

- ❑ Model how to find Q1, Median, Q3, and Maximum then model how to use these values to create a Box and Whisker Plot.
- ❑ Build students' understanding of data sets using box and whisker plots to visualize the four quartiles.

Look for students to…

- ❑ Find Q1, Median, Q3 and Maximum then use these values to create a Box and Whisker Plot
- ❑ Describe a set of data using its four quartiles

Student Criteria for Success

- Know: Each section of a box plot represents 25% or one-fourth of the data set.
- Know: A box plot divides a set of data into four equal quartiles.
- Do: Compare measures of center and measures of variability.
- Do: Find missing parts or wholes in a box plot

Lesson 9: Box Plots – Day 2 Date: _____

Standard(s)

- **7.12(A)** compare two groups of numeric data using comparative dot plots or box plots by comparing their shapes, centers, and spreads

Important Vocabulary

- Box Plot
- Interquartile Range
- Median
- Quartiles

Notes for Intellectual Preparation & Lesson Planning

Necessary Materials and Pre-Lesson Prep

- Unit 10 Student Workbook
- Document Camera
- Projector

Lesson Agenda

		Time
I.	Do Now	8 min
II.	INM/Concept Development	25 min
III.	Student Practice	20 min
IV.	Student Debrief	7 min
V.	Exit Ticket	8 min

Mathematical Goal of this Lesson

The primary goal of this lesson is for students to compare groups of numeric data using comparative box plots by comparing their shapes, centers, and/or spreads. In this lesson, students will have the opportunity review basic understanding of components of a box plot.

Opportunities to CFU

- ✓ INM: Let's Review, Let's Apply
- ✓ Student Practice: #2a-e

Other Notes to Inform Your Planning

For **INM**: In the beginning of the INM, 'Lets Review', give students 4 minutes to complete the review questions silent /solo.

Prepare to address misconceptions around b and f. To support student understanding model by labeling each section with the percentages on the Box Plot for 'b' and for 'f' represent the four sections on the Box Plot as you are modeling. Click here for an example. Consider having students label Box Plots in this way to support their understanding with similar situations.

Focus on Disciplinary Literacy

INM: Let's Discuss, Let's Apply our Understanding
SP: #2

Lesson Look Fors

Look for teachers to…

- ❑ Model for students how to label the Box Plot Quartiles (1-4) and Percentages.
- ❑ Build students' understanding of data sets using box plots as a way to visualize the four quartiles.

Look for students to…

- ❑ Label the Box Plot Quartiles (1-4) and Percentages.
- ❑ Describe a set of data using its four quartiles.

Student Criteria for Success

- Know: Each section of a box plot represents 25% or one-fourth of the data set
- Do: Create a box plot from a set of data
- Do: Find missing parts or wholes in a box plot

Lesson 10: Comparing Data Displays Date: _____

Standard(s)

- **7.12(A)** compare two groups of numeric data using comparative dot plots or box plots by comparing their shapes, centers, and spreads

Important Vocabulary

- Skew

Notes for Intellectual Preparation & Lesson Planning

Necessary Materials and Pre-Lesson Prep

- Unit 10 Student Workbook
- Document Camera
- Projector

Lesson Agenda

		Time
I.	Do Now	5 min
II.	INM/Concept Development	38 min
III.	Student Practice	15 min
IV.	Student Debrief	5 min
V.	Exit Ticket	7 min

Mathematical Goal of this Lesson

The primary goal of this lesson is for students to compare two groups of data using comparative dot plots and box plots, by comparing their shapes, centers, and/or spreads. In this lessons, students take the learning they've acquired regarding dot plots and box plots and applying to formal comparisons of data displays.

Opportunities to CFU

- ✓ INM: Task 2 and 3
- ✓ Student Practice: #3 and #4

Other Notes to Inform Your Planning

For **INM**: Students will mostly work through the INM in partners. They will use what they've learned about dot plots and box plots to work through the material in the INM. They will be introduced to the concept of skew and then practice in Task 1. Consider creating an anchor chart for students to reference during the practice. See Topic D for ideas. Consider working with a small group during Student Practice and allowing students who are working independently/in partners access to an answer key to check their work after 7 minutes. Students will need to understand that 'spread' is the same as range.

Focus on Disciplinary Literacy

INM: Task 1-3
SP: #1, 4

For **Student Debrief**: Use the debrief as a time to pull students back whole group to address misconceptions prior to the exit ticket.

Lesson Look Fors

Look for teachers to…

- ❑ Allow students to do the heavy lifting throughout the INM.
- ❑ STAMP the meaning of the space of data displayed as symmetrical, skewed left or skewed right.

Look for students to…

- ❑ Compare data displays and determine if they meet specific descriptions such as: equal spread, equal/less/greater median, mode
- ❑ Determine the skew in a data set.

Student Criteria for Success

- Know: Data can be organized in a variety of different ways.
- Know: Know how to find each measure of variation and central tendency
- Do: Determine the mean and median from a dot plot or box and whisker plot.
- Do: Compare shapes, centers, and spreads.

Recommended Success Day Materials and Resources

Statistics
7.6G and 7.12
Circle Graphs and Bar Graphs
Dot Plots and Box Plots Practice
Tech-enhanced Question Practice

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

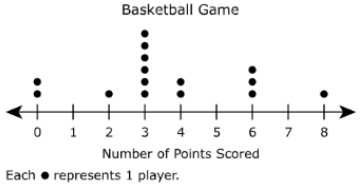
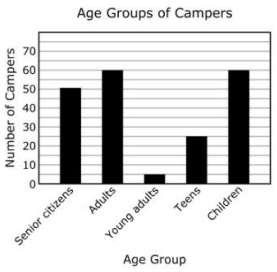
If student data indicates a pause point is not necessary, you can opt to move forward and reserve a Success Day to use at a later date.

Using exit ticket data can help you prioritize what to review. For example, if you remember that students did poorly on Lesson 2, pull problems from lesson 2, 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

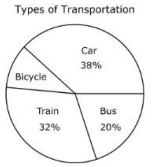
Focus standards for this unit.

Standard Breakdown		
Standard	**Specificity**	**STAAR Alignment**
7.6(G) solve problems using data represented in bar graphs, dot plots, and circle graphs, including part-to-whole and part-to-part comparisons and equivalents	**Concepts:** - Data - Bar Graphs - Dot Plots - Circle Graphs - Part-to-Part Comparisons - Part-to-Whole Comparisons **Skills:** - Solve **Clarifications Including but Not Limited To:** • Students will find missing percents, parts and wholes. • Bar graphs can be vertical and horizontal.	**2025 Q15** 2025 – Q15 The dot plot shows the number of points scored by each player on a basketball team during a game.  Which statement is **NOT** supported by the information shown in the dot plot? Ⓐ Exactly 20% of the players scored 6 points during the game. Ⓑ Exactly 40% of the players scored 3 points during the game. Ⓒ Less than $\frac{1}{3}$ of the players scored 4 points during the game. Ⓓ More than $\frac{1}{10}$ of the players scored 8 points during the game. 2025 – Q30 The bar graph shows the age groups of campers at a state park over a weekend.  What part of the campers were young adults, teens, or children? Ⓐ $\frac{11}{20}$ Ⓑ $\frac{3}{5}$ Ⓒ 45% Ⓓ 90%

2024 Q11

2024 – Q11

A survey of 150 employees at a company asked which type of transportation the employee uses to get to work. The types of transportation and some of their percentages are shown on the circle graph.



How many more people use a car than ride a bicycle to get to work?

Ⓐ 15

Ⓑ 28

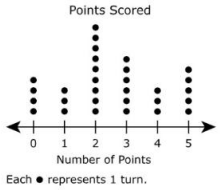
Ⓒ 42

Ⓓ 57

2024 Q11

2024 – Q21

The dot plot shows the number of points a player scored in each of 30 turns in a game.



Which statements are best supported by the data in the dot plot?

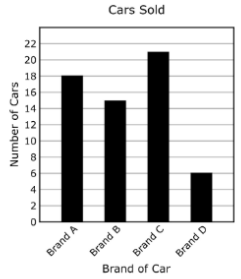
Select **TWO** correct answers.

- ☐ Exactly 9% of the turns were 2 points.
- ☐ Exactly $\frac{1}{6}$ of the turns were 5 points.
- ☐ Exactly half of the turns were 3 points or more.
- ☐ Exactly $\frac{1}{10}$ of the turns were 1 point or fewer.
- ☐ Exactly 50% of the turns were 2 or 3 points.

2023 Q12

2023 – Q12

A salesperson made a bar graph of different brands of cars sold in a month.



Based on the information in the graph, which car brands represented 60% of sales?

Ⓐ Brand A and Brand B

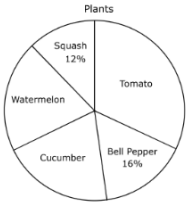
Ⓑ Brand A and Brand C

Ⓒ Brand B and Brand C

Ⓓ Brand C and Brand D

2023 – Q28

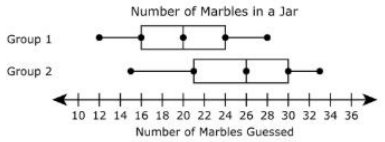
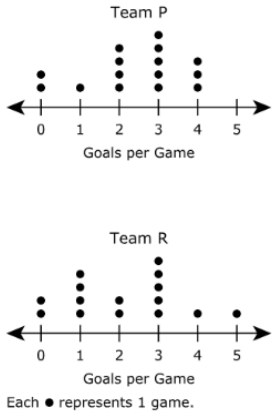
A garden contains 50 plants. The number of tomato plants is twice the number of bell pepper plants. The number of cucumber plants is the same as the number of watermelon plants. The remainder of the garden consists of squash plants. The circle graph shows the percentages of some of the types of plants in the garden.



Which statements are true?

Select **THREE** correct answers.

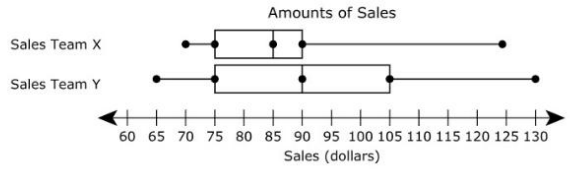
- The number of tomato plants is 16.
- The total number of cucumber and bell pepper plants is 18.
- Over 50% of the plants are tomatoes and bell peppers.
- Watermelon and cucumber plants combined are 40% of the plants.
- Cucumber plants are 26% of the plants.

Standard	Specificity	STAAR Alignment
7.12(A) compare two groups of numeric data using comparative dot plots or box plots by comparing their shapes, centers, and spreads	**Concepts:** - Numeric Data - Dot Plots - Box Plots - Shapes - Centers - Spreads **Skills:** Compare **Clarifications Including but Not Limited To:** From a box plot, students should be able to identify: - IQR - Range - Median From a dot plot, students should be able to identify: - Median - Mean - Range - Symmetrical or asymmetrical Students should compare two sets of data by their: - Shape (symmetrical vs asymmetrical) - Spread or Variation - Central Tendency	**2025 Q17** 2025 – Q17 Students in two groups were asked to guess the number of marbles in a jar. The box plots display each group's responses.  Which statement is best supported by the information in the box plots? Ⓐ The range of the data for Group 2 is equal to the range of the data for Group 1. Ⓑ The distribution of the data for Group 1 is more symmetrical than the distribution of the data for Group 2. Ⓒ The interquartile range of the data for Group 1 is greater than the interquartile range of the data for Group 2. Ⓓ The median number of the data for Group 1 is greater than the median number of the data for Group 2. 2025 – Q34 The dot plots show the number of goals scored in each game of the season by two soccer teams.  Choose the correct answer from each drop-down menu to complete the sentences. The median is greater for [ ]. The [ ] is the same for the two sets of numbers.

2024 Q17

2024 – Q17

A company divided its salespeople into two teams and recorded the amount of each employee's sales in dollars for a week. The box plots display the results.



Which statement is best supported by the information in the box plots?

Ⓐ The range for Sales Team X is $10 more than the range for Sales Team Y.

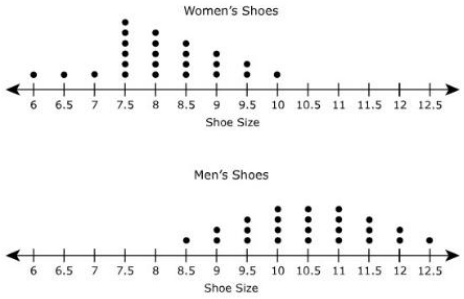
Ⓑ The interquartile range for Sales Team X is half the interquartile range for Sales Team Y.

Ⓒ The mean for Sales Team X is $5 less than the mean for Sales Team Y.

Ⓓ The interquartile range for Sales Team X is twice the interquartile range for Sales Team Y.

2024 – Q32

A shoe store manager ordered various sizes of running shoes. The dot plots show the sizes of women's shoes and men's shoes that the manager ordered.



Which statement is best supported by the information in the dot plots?

Ⓐ The distributions of the data for both the women's and the men's shoes are symmetric.

Ⓑ The distribution of the data for the men's shoes is symmetric, but the distribution for the women's shoes is not.

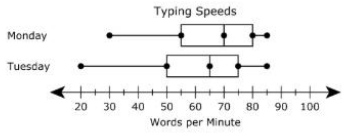
Ⓒ The distribution of the data for the women's shoes is symmetric, but the distribution for the men's shoes is not.

Ⓓ The distribution of the data for neither the women's nor the men's shoes is symmetric.

2023 Q10

2023 – Q10

A teacher recorded the typing speeds of her students on Monday and Tuesday. The results are shown in the box plots.



Which statement is best supported by the information in the box plots?

Ⓐ The median typing speed on Monday was less than the median typing speed on Tuesday.

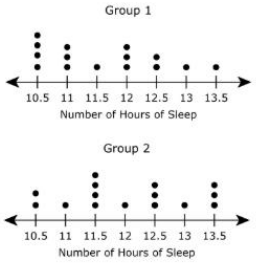
Ⓑ The maximum typing speed on Monday was greater than the maximum typing speed on Tuesday.

Ⓒ The range of the typing speeds on Monday was equal to the range of the typing speeds on Tuesday.

Ⓓ The interquartile range of the typing speeds on Monday was equal to the interquartile range of the typing speeds on Tuesday.

2023 – Q32

Researchers at a zoo recorded the number of hours that the gorillas in two groups slept at night. The dot plots sho
the results.



Each ● means 1 gorilla.

Compare the data in the dot plots.

Choose the correct answer from each drop-down menu to complete the sentence.

The distribution of the data for both groups is [ ], and both groups have the same [ ].

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.

6th Grade	7th Grade (previous units)	Algebra 1
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 **6.12(A)** represent numeric data graphically, including 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 **6.13(B)** distinguish between situations that yield data with and without variability **6.4(B)** apply qualitative and quantitative reasoning to solve prediction and comparison of real- world problems involving ratios and rates **6.5(B)** solve real-world problems to find the whole given a part and the percent, to find the part given the whole and the percent, and to find the percent given the part and the whole, including the use of concrete and pictorial models	**7.4(D)** solve problems involving ratios, rates, and percents, including multi-step problems involving percent increase and percent decrease, and financial literacy problems **8th Grade** **8.5(D)** use a trend line that approximates the linear relationship between bivariate sets of data to make predictions **8.5(C)** contrast bivariate sets of data that suggest a linear relationship with bivariate sets of data that do not suggest a linear relationship from a graphical representation **8.11(A)** construct a scatterplot and describe the observed data to address questions of association such as linear, nonlinear, and no association between bivariate data **8.11(B)** determine the mean absolute deviation and use this quantity as a measure of the average distance data are from the mean using a data set of no more than 10 data points	**A.2(A)** determine the domain and range of a linear function in mathematical problems; determine reasonable domain and range values for real-world situations, both continuous and discrete; and represent domain and range using inequalities **A.4(A)** calculate, using technology, the correlation coefficient between two quantitative variables and interpret this quantity as a measure of the strength of the linear association **A.4(B)** compare and contrast association and causation in real-world problems