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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**

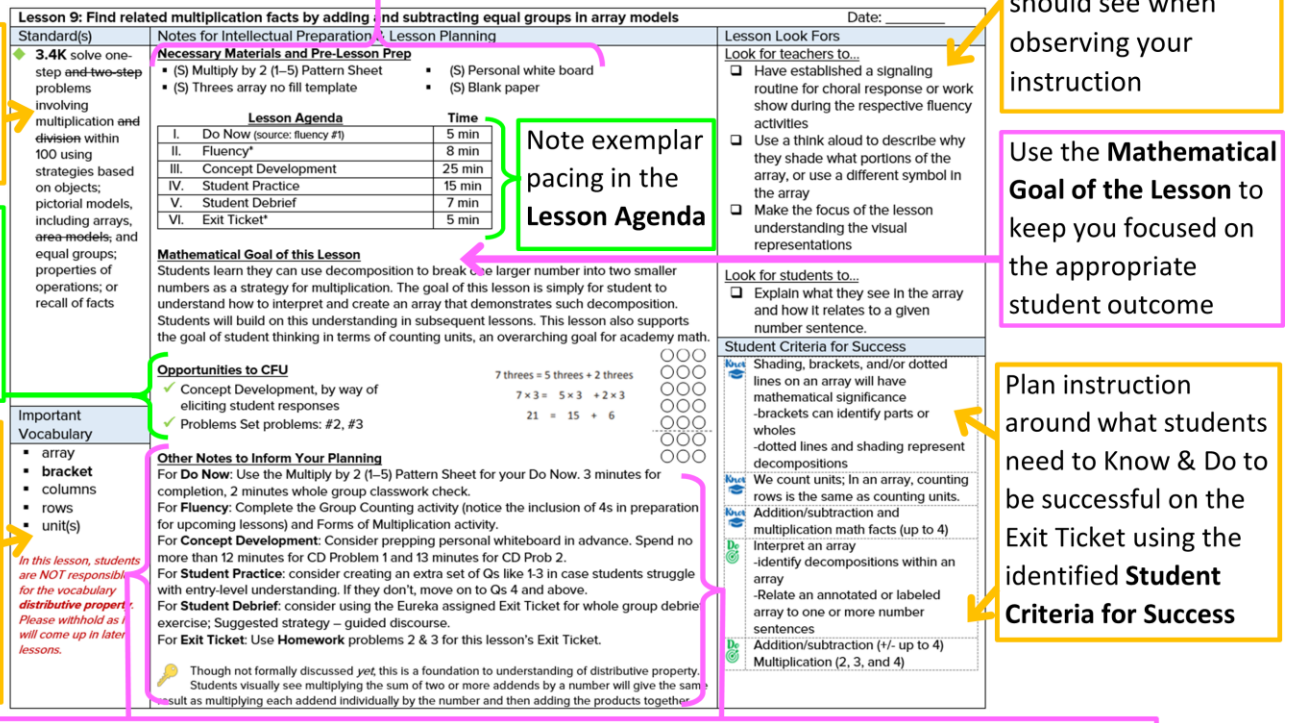
Note exemplar pacing in the **Lesson Agenda**

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

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



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 one 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
- Know: We count units; In an array, counting rows is the same as counting units.
- Know: 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
- Do: 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/MODULE/MISSION SYNOPSIS

In this introduction unit, students encounter negative numbers for the first time, as they do not appear in any previous grade level TEKS. Learning about negative numbers opens up an entire new dimension of mathematics; because students can now work with negative numbers, they learn about opposites and absolute value. Also, they can now classify whole numbers, integers, and rational numbers. Additionally, they learn how to compare and order integers and how to use inequality symbols to compare all rational numbers. In previous grades, students likely became proficient at graphing in Quadrant I of the coordinate plane. Because students begin working with negative numbers now, they now have access to all four quadrants of the coordinate plane. This unit illustrates that the coordinate plane is, at its core, made of a horizontal number line (the x-axis) and a vertical number line (the y-axis) that extend in the positive and negative direction. By the end of the unit, students should be fluent at plotting integers in all four quadrants of the coordinate plane.

CONTENT STANDARDS

Below are the standards addressed in this unit.

Readiness Standards	Supporting Standards
6.11(A) graph points in all four quadrants using ordered pairs of rational numbers **6.2(D)** order a set of rational numbers arising from mathematical and real-world contexts	**6.2(A)** classify whole numbers, integers, and rational numbers using a visual representation such as a Venn Diagram to describe relationships between sets of numbers **6.2(B)** identify a number, its opposite, and its absolute value. **6.2(C)** locate, compare, and order integers and rational numbers using a number line

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

LEARNING SUPPORTS BY LESSON

There is a checkmark for the math support if the lesson	Lessons → / Math Supports	L1	L2	L3	L4	L5
makes a connection to prior content or from a previous unit or academic year	Access Prior Knowledge	✓	✓	✓	✓	✓
uses familiar contexts or experiences to make the learning relevant to students	Real-World Connections	✓	✓	✓	✓	✓
makes use of graphic organizers	Graphic Organizers			✓		
includes tools like rulers, protractors, patty paper, algebra tiles, etc.	Tools or Manipulatives					
incorporates tables, reference charts, displays, pictures, or models, or color-coding	Visual Aids	✓	✓	✓	✓	
includes definitions, examples vs. nonexamples, cognates, etc.	Vocabulary Supports	✓	✓	✓	✓	✓
includes strategies that support language development	Language Supports					
asks students to discuss with their partner to prepare for whole class discussion	- Turn and Talk	✓	✓	✓	✓	✓
teacher facilitates a whole class discussion to debrief key learnings	- Guided Discussion	✓	✓	✓	✓	✓
asks students to think independently, test their idea with a partner, and share whole group	- Think, Pair, Share					
includes sentence stems to support students with explanations	- Sentence Stems					
provides opportunities for students to work with a partner or a group	Peer Collaboration	✓	✓	✓	✓	✓
uses mnemonics such as SohCahToa	Mnemonics					
includes websites or equipment that enhances the lesson	Technological Support					
content can be presented in different forms	Different Modalities					
uses hands-on tools or manipulatives to represent the math	- Concrete			✓	✓	
uses drawings to represent the math	- Pictorial				✓	
uses numbers and number sentences to represent the math	- Abstract	✓	✓	✓	✓	

ROADMAP

AT A GLANCE: Unit 1 – Introduction to Middle School Mathematics			
Day	Date	Lesson	Lesson Title
There is 1 flexible Success Day that should be used prior to the Unit Exam.			
1		1	Introduction to Negative Numbers
2		2	Opposites and Absolute Value
3		3	Classify Wholes, Integers, and Rational Numbers
4		4	Compare and Order Integers
5		5	The Coordinate Plane
6			Unit 1 Success Day – Unit Review
7			End of Unit 1 Assessment

Lesson 1: Introduction to Negative Numbers Date: _____

Standard(s)

- **6.2(B)** identify a number, its opposite, ~~and its absolute value~~
- **6.2(C)** locate~~, compare, and order~~ integers ~~and rational numbers~~ using a number line

Important Vocabulary

- **Integers**
- **Negative Numbers**
- **Opposites**
- Positive Numbers

Notes for Intellectual Preparation & Lesson Planning

Necessary Materials and Pre-Lesson Prep

- MCR SE and TE
- **Print and cut** a class set of task cards
- Rehearse INM and Debrief
- Create an SE Exemplar

Lesson Structure:

- Do Now (5 min)
- INM (20 min)
- Student Practice (20 min)
- Debrief (5 min)
- Exit Ticket (10 min)

Mathematical Goal of this Lesson

By the end of this lesson, students should understand that there is a need for negative numbers to express situations that positive numbers cannot, and students should be able to explain whether a situation can be represented by a positive or negative number. Students should also be able to label positive AND negative missing numbers on a number line.

Opportunities to CFU

✓ INM Q5, Q6, Q7

✓ Student Practice: Q2

Other Notes to Inform Your Planning

Although students will not compare and order integers until later in the year, students should still notice that as you go left or down on the number line, the values decrease, and as you go up or right, values increase.

Focus on Disciplinary Literacy

INM: #3,5
SP: #3, 5

Lesson Look Fors

Look for teachers to…

❑ Punch that number lines can be vertical or horizontal

Look for students to…

❑ Explain whether a situation calls for a positive or a negative integer

Student Know/Do Chart

Know — Identify when a situation calls for a negative number

Know — All negative numbers are shown to the left of zero on a horizontal number line, or underneath zero on a vertical number line.

Know — Negative numbers exist so we can represent the opposite of what positive numbers represent. For example, if we earn $100, we represent that with the number "100," so we need a number to represent what it would mean to spend $100, and that would be "-100."

Do — Create a number line with both positive and negative integers

Do — Accurately assign integers to real-world situations

Lesson 2: Opposites and Absolute Value Date: _____

Standard(s)

◆ **6.2(B)** identify a number, its opposite, and its absolute value.

Important Vocabulary

- **Absolute Value**
- Integer
- Opposites

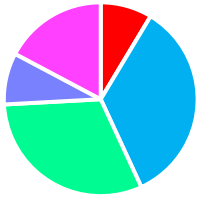
Notes for Intellectual Preparation & Lesson Planning

Necessary Materials and Pre-Lesson Prep

- MCR SE and TE
- PPT
- Create Exemplar SE
- Rehearse INM

Lesson Structure:

- Do Now (5 min)
- INM (20 min)
- Student Practice (20 min)
- Debrief (5 min)
- Exit Ticket (10 min)



Mathematical Goal of this Lesson

Students use number lines to help develop an understanding of "opposite" and "absolute value."

Opportunities to CFU

✓ INM: Q5, Q6

✓ Student Practice: Q4 a-f

Other Notes to Inform Your Planning

Students often want "absolute value" to be the same thing as "opposite," causing them to assign negative absolute values to positive numbers. Stamp that absolute value is always positive because distance is always positive. For example, whether you run a mile forward or backward, you are still moving 1 mile.

Focus on Disciplinary Literacy

INM: #1d, 2c
SP: #4, 5

Lesson Look Fors

Look for teachers to…

- Repeatedly punch the difference between the terms OPPOSITE and ABSOLUTE VALUE
- Repeatedly punch that absolute value is always positive because DISTANCE is always positive
- Guide students to develop the BIG TAKEAWAY section on their own rather than have them copy the TE.

Look for students to…

- Explain the difference between a number's opposite and its absolute value.

Student Know/Do Chart

Know Absolute value is a number's distance away from zero.

Know Absolute value can NEVER be negative because it is distance.

Do Determine a number's opposite and absolute value

Do Compare various numbers' opposites and absolute values.

Lesson 3: Classify Wholes, Integers and Rational Numbers Date: _____

Standard(s)

◆ **6.2(A)** classify whole numbers, integers, and rational numbers using a visual representation such as a Venn Diagram to describe relationships between sets of numbers

Important Vocabulary

- **Integer**
- **Rational Numbers**
- **Whole Numbers**

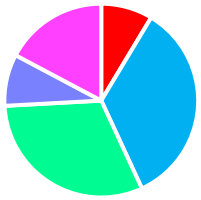
Notes for Intellectual Preparation & Lesson Planning

Necessary Materials and Pre-Lesson Prep

- MCR SE and TE
- Create Exemplar SE
- Rehearse INM

Lesson Structure:

- Do Now (5 min)
- INM (20 min)
- Student Practice (20 min)
- Debrief (5 min)
- Exit Ticket (10 min)



Mathematical Goal of this Lesson

Numbers can be classified based on their properties. Numbers can belong to sets and subsets, and it is possible for numbers to belong to multiple sets.

Opportunities to CFU

✓ INM: Part IV Practice ✓Student Practice: Q3 and Q4

Other Notes to Inform Your Planning

The definition of irrational numbers, they do encounter them and notice that real numbers belong outside the set of rational numbers.

While students do not go deeply into **Focus on Disciplinary Literacy**

INM: #1, 2
SP: #4, 5

Lesson Look Fors

Look for teachers to…

❑ Emphasize that a number can fall into more than one subset

Look for students to…

❑ Articulate the definitions of "whole," "integer," and "rational"

❑ Explain why all whole numbers are integers, but not all integers are whole numbers? Similarly, are they able to explain why all integers are rational, but not all rational numbers are integers?

Student Know/Do Chart

Know — Whole numbers are also integers because they contain no fractional part.

Know — Whole numbers are also rational numbers because it can be written as a ratio of that number to one.

Know — Integers are also rational numbers because they can be written as a ratio of that number to one.

Do — Determine whether a given number is whole and/or integer and/or rational.

Do — Place a given number in the correct spot on a nesting Venn diagram.

Lesson 4: Compare and Order Integers Date: _____

Standard(s)

- **6.2(D)** order a set of rational numbers arising from mathematical and real-world contexts
- **6.2(C)** locate, compare, and order integers ~~and rational numbers~~ using a number line

Important Vocabulary

- Absolute Value
- **Greater Than**
- Integers
- **Less Than**
- **More Than**
- Opposites

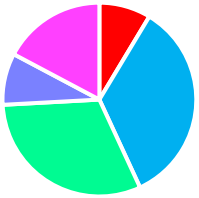
Notes for Intellectual Preparation & Lesson Planning

Necessary Materials and Pre-Lesson Prep

- MCR SE and TE
- Create Exemplar SE
- Rehearse INM

Lesson Structure:

- Do Now (5 min)
- INM (20 min)
- Student Practice (20 min)
- Debrief (5 min)
- Exit Ticket (10 min)



Mathematical Goal of this Lesson

As you move to the right on the number line, numbers increase, and as you move left, numbers decrease. It is important that students arrive at the understanding that if $a < b$, then $-a > -b$.

Opportunities to CFU

- ✓ INM: Q3
- ✓ Student Practice: Q3

Other Notes to Inform Your Planning

This lesson focuses on integers; students will not work with fractions or decimals today. Students recall what they have learned about negative numbers, opposites, absolute value, and the number line to order numbers from least to greatest. Continuously refer to the number line.

Focus on Disciplinary Literacy

INM: #1c, 2, 3
SP: #2

Lesson Look Fors

Look for teachers to…

- ❑ Punch that number lines can be vertical or horizontal
- ❑ Punch that the further to the right on a horizontal number line an number is the larger it is. Punch that the higher a number is on a vertical number line the larger it is.

Look for students to…

- ❑ Sketch number lines to justify how they are placing numbers in order
- ❑ Explain the generalization if $a < b$, then $-a > -b$

Student Know/Do Chart

Know — Identify whether a situation calls for placing numbers in order from least to greatest or greatest to least

Know — Explain what happens as you move up/right or down/left on the number line

Do — Sketch a number line and use it to compare and order integers

Do — Place integers in order from least to greatest or greatest to least

Lesson 5: The Coordinate Plane (Integers Only) Date: _____

Standard(s)

- **6.11(A)** graph points in all four quadrants using ordered pairs of rational numbers

Important Vocabulary

- **Coordinate Plane**
- **Ordered Pair**
- **Origin**
- **Quadrant**
- **x-axis**
- **x-coordinate**
- **y-axis**
- **y-coordinate**

Notes for Intellectual Preparation & Lesson Planning

Necessary Materials and Pre-Lesson Prep

- MCR SE and TE
- Create Exemplar SE
- Rehearse INM

Lesson Structure:

- Do Now (5 min)
- INM (22 min)
- Student Practice (18 min)
- Debrief (5 min)
- Exit Ticket (10 min)

Mathematical Goal of this Lesson

- Students should understand that the coordinate plane is made of a horizontal number line and a vertical number line. They cross at the origin, and all the numbers to the left of zero and under zero are negative, while all the numbers to the right of zero and above zero are positive.

Opportunities to CFU

✓ INM: Part III – Notice Patterns ✓ Student Practice: Battleship

Other Notes to Inform Your Planning

The lesson begins by recalling what students have previously learned about graphing in Quadrant I, then moves into the other 3 quadrants. After some practice plotting and identifying points, students are asked to make generalizations about points in each quadrant and points on each axes.

Focus on Disciplinary Literacy

SP: #4-8

Lesson Look Fors

Look for teachers to…

- ❑ Punch that a coordinate plane is made of two perpendicular number lines.
- ❑ Connect students' prior learning about the existence of negative numbers to the reason we can "unlock" the other three quadrants of the coordinate plane (in 5th grade, only having positive numbers, students could only graph in quadrant I)

Look for students to…

- ❑ Correctly plot ordered pairs in all four quadrants
- ❑ Identify ordered pairs based on plotted points

Student Know/Do Chart

Do Identify the *x* and *y* coordinates in an ordered pair and the quadrant or axis it sits on.

Do Identify and plot ordered pairs made of rational numbers on the coordinate plane in all four quadrants

Recommended Success Day Materials and Resources

6.2D
Compare and Order Integers involving real-world scenarios

6G Sirius 2D Practice (integers only

Notes to Inform Your Planning
This resource is relatively brief and can be used for either small-group or whole-group reteach.

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6.11A
Graph Points in all four quadrants

- 6G Sirius 11A Practice (integers only)

Notes to Inform Your Planning
This resource is relatively brief and can be used for either small-group or whole-group reteach

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>6.2(D) order a set of rational numbers arising from mathematical and real world contexts</td>
<td>
Concepts:

Comparing numbers using inequality symbols
Ordering rational numbers
Justifying comparisons of rational numbers with a number line

Skill:

Order

Including but not limited to:

Using the number line to order integers.
Using place value to order decimals.
Ordering fractions with different denominators.
Finding a set of equivalent fractions with the same denominator when given a set of fractions with different denominators so they can be compared
Interpreting word problems to determine if numbers need to be listed in order from least to greatest or greatest to least.

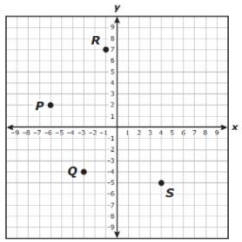
Limitations:

This unit includes ONLY rational numbers.

Vertical Alignment:

In 5th grade students learned how to compare and order two decimals up to the thousandths place using <, >, and = symbols.
In 7th and 8th grade students continue to compare and order rational numbers.

</td>
<td>
2019 6G STAAR Q12
The weights of four puppies are shown in pounds.
$9.5 \quad 9\frac{3}{8} \quad 9.125 \quad 9\frac{3}{4}$
Which list shows these weights in order from greatest to least?
F $9\frac{3}{4}$ 9.5 $9\frac{3}{8}$ 9.125
G 9.5 $9\frac{3}{8}$ $9\frac{3}{4}$ 9.125
H 9.125 $9\frac{3}{8}$ 9.5 $9\frac{3}{4}$
J $9\frac{3}{4}$ $9\frac{3}{8}$ 9.5 9.125
2019 6G STAAR Q30
Mari used a thermometer to record temperatures of −3.4° Celsius and 1.6° Celsius. Which temperature in degrees Celsius is less than both of the temperatures Mari recorded?
F −2.6 °C
G 3.9 °C
H −5.4 °C
J 0 °C
2018 6G STAAR Q40
14 The table shows the portion of a day four students used to build a website.
Time Used
<table>
<tr><th>Student</th><th>Portion of Day</th></tr>
<tr><td>Jamail</td><td>29.4%</td></tr>
<tr><td>Andrew</td><td>37.6%</td></tr>
<tr><td>Ernesto</td><td>$\frac{7}{25}$</td></tr>
<tr><td>Blake</td><td>$\frac{3}{10}$</td></tr>
</table>
Which list shows the students in order from the greatest amount of time used to the least amount of time used?
F Andrew, Blake, Jamail, Ernesto
G Blake, Andrew, Jamail, Ernesto
H Ernesto, Blake, Andrew, Jamail
J Andrew, Jamail, Ernesto, Blake
</td>
</tr>
</table>

Standards Breakdown		
Standards	**Specificity**	**Notes/Explanations/Examples**
6.11(A) graph points in all four quadrants using ordered pairs of rational numbers	**Concepts:** • Coordinate plane • Ordered pair • Rational numbers **Skill:** • Graph **Including but not limited to:** • Graphing an ordered pair made of rational numbers on the coordinate plane. • Writing an ordered pair based on a given point. • Identifying the x- or y-coordinate of a given point. **Limitations:** • Students work only with the two-dimensional Cartesian plane. **Vertical Alignment:** • In 5th grade students learn how to graph in quadrant I of the coordinate plane using positive rational ordered pairs. • In 7th grade students use their knowledge of all four quadrants to graph $y=mx+b$.	**2018 6G STAAR Q21** **21** The coordinate grid shows points *P*, *Q*, *R*, and *S*. All the coordinates for these points are integers.  What is the value of the *x*-coordinate of point *P*? Record your answer and fill in the bubbles on your answer document. Be sure to use the correct place value.

Standards Breakdown		
Standards	**Specificity**	**Notes/Explanations/Examples**
6.2(C) locate, compare, and order integers and rational numbers using a number line	**Concepts:** • Number line • Integers • Rational numbers **Skills:** • Locate • Compare • Order **Including but not limited to:** • Plotting points on the number line • Identifying which number, in a set of numbers, is least or greatest. • Comparing two or more rational numbers • Identifying whether points are plotted incorrectly on a number line **Vertical Alignment:** • In 5th grade students learn how to compare and order decimals up to the thousandths place. • In 8th grade students approximate the value of irrational numbers.	**2019 6G STAAR Q16** Four points are labeled on the number line.  Which point best represents $\frac{1}{3}$? **F** Point *K* **G** Point *L* **H** Point *M* **J** Point *N* **2016 6G STAAR Q19** **19** Alyssa will correctly label the numbers 48.4, $48\frac{1}{2}$, 48.09, and $48\frac{3}{5}$ on the number line below.  Which number will be located closest to 49? **A** 48.4 **B** $48\frac{1}{2}$ **C** 48.09 **D** $48\frac{3}{5}$

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
5.2(B) compare and order two decimals to thousandths and represent comparisons using the symbols >, <, =. **5.8(B)** describe the process for graphing ordered pairs of numbers in the first quadrant of the coordinate plane **5.8(C)** graph in the first quadrant of the coordinate plane ordered pairs of numbers arising from mathematical and real-world problems, including those generated by number patterns or found in an input-output table.	**6.2(D)** order a set of rational numbers arising from mathematical and real world contexts **6.11(A)** graph points in all four quadrants using ordered pairs of rational numbers	**8.2(D)** order a set of rational numbers arising from mathematical and real world contexts **8.3(C)** use an algebraic representation to explain the effect of a given positive rational scale factor applied to two-dimensional figures on a coordinate plane with the origin as the center of dilation
	6.2(A) classify whole numbers, integers, and rational numbers using a visual representation such as a Venn Diagram to describe relationships between sets of numbers	**7.2(A)** extend previous knowledge of sets and subsets using a visual representation to describe relationships between sets of rational numbers. **8.2(A)** extend previous knowledge of sets and subsets using a visual representation to describe relationships between sets of real numbers.
	6.2(B) identify a number, its opposite, and its absolute value.	**8.2(B)** approximate the value of an irrational number, including π and square roots of numbers less than 225, and locate that rational number approximation on a number line.
	6.2(C) locate, compare, and order integers and rational numbers using a number line	**8.2(B)** approximate the value of an irrational number, including π and square roots of numbers less than 225, and locate that rational number approximation on a number line.