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How to Use This Addenda

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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**

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

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

Throughout elementary students built fluency adding, subtracting, multiplying, and dividing positive rational numbers. This unit is students' first introduction to adding, subtracting, multiplying, and dividing negative integers. Students will not have to compute with negative rational numbers until 7th grade. The unit is split into two topics: Addition/Subtraction, and Multiplication/Division. Within each topic, students move from the concrete to the abstract. A significant amount of time is spent modeling with integer chips and number lines so that students can internalize and understand the "integer rules" that they can generalize by looking at multiple examples. When students are told to memorize integer rules for various operations without understanding where those rules come from or what they look like when modeled, they are likely to apply the wrong set of rules to the wrong operation [e.g. "a negative and a negative make a positive, so -4 + (-4) = 8"].

Once students can make generalizations about the rules for the four integer operations, they apply these generalizations to word problems and are able to compute with two-digit integers (students could work with more digits too, but that is not emphasized in this unit) that would be tedious to model. Additionally, this unit sets them up for success for future units in which they must correctly solve multi-step PEMDAS problems and set up and solve one-step equations that may involve negative values. This unit is significant because it builds students' fluency with integer operations, something students need to execute flawlessly in future courses. For example, students will rely on their integer operation skills to correctly use the Distance and Midpoint formulas in Geometry. In Algebra II, they'll need a solid grasp of integer rules to compute with rational expressions containing integer exponents. In Calculus courses, they'll need to calculate and interpret negative area under curves. They'll also rely on the integer skills they learn in this unit to be able to apply the Power Rule for Derivatives and Integrals.

Topic A Overview – *Sums and Differences of Integers*

In Topic A, students explore and formalize rules for finding the sums and differences of integers. They discover that adding a negative is the same as subtracting and the subtracting a negative is the same as adding. Then, they use integer chips (when numbers are easy to work with) and number lines to formalize a procedure for adding and subtracting with negative values. Finally, they apply their new knowledge to answer real-world application problems involving the sums and differences of integers.
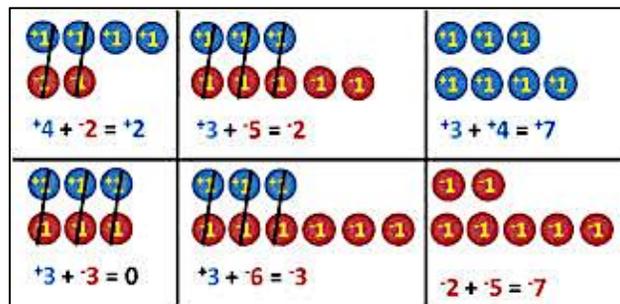
In topic B, students build an understanding of the process of multiplying and dividing integers by connecting to prior knowledge, exploring the conceptual meaning of multiplication, and recognizing patterns and generalizing. Students will derive the rules for multiplying and dividing with signed numbers using their discoveries.

Multiplication is repeated addition:

"I know": $4 \cdot 3 = 4 + 4 + 4$
"so then": $-4 \cdot 3 = -4 + -4 + -4$

Multiplication as repeated addition on a number line:

$$+(-2)+(-2)+(-2)$$
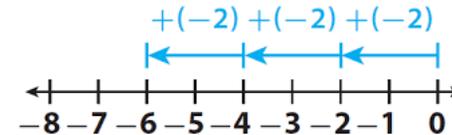
Multiplication is taking a certain number of groups of a quantity. Multiplication as "x" groups of "y"

"I know" 4×6 means four groups of six.
"so then" 4×-6 means four groups of negative six.

$$4 \times -6$$

4 groups of -6

Division is the Inverse of Multiplication:

$18 \div 6$ is asking you what number multiplied by 6 will give you 18.
$-18 \div 6$ is asking what number multiplied by 6 will give you -18.
$-18 \div -6$ is asking what number multiplied by -6 will give you -18.

How many groups of x go into y?

$-8 \div -2 \; or \; \frac{-8}{-2}$ is asking how many groups of -2 go into -8.
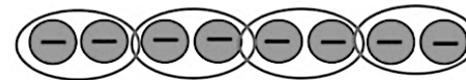
LEARNING SUPPORTS BY LESSON

There is a checkmark for the math support if the lesson	Lessons → Math Supports	L1	L2	L3	L4	L5	L6	L7	L8	L9	L10
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	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

CONTENT STANDARDS

Below are the standards addressed in this unit.

Readiness Standards	Supporting Standards
6.3(D) add, subtract, multiply, and divide integers fluently 6.3(E) multiply and divide positive rational numbers fluently	6.3(C) represent integer operations with concrete models and connect the actions with the models to standardized algorithms 6.2(B) identify a number, its opposite, and its absolute value.

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 2 – INTEGER OPERATIONS				
Topic	Day	Date	Lesson	Lesson Title
There are 2 flexible Success Day that should be used prior to the Unit Exam.				
Topic A: Sums and Differences of Integers	1		1	Sums and Differences using the Number Line
	2		2	Zero Pairs and Opposites Combining to Make Zero Pairs
	3		3	Sums and Differences of Integers using Integer Chips
	4		4	Sums and Differences of Positive and Negative Integers (Day 1)
	5		5	Sums and Differences of Positive and Negative Integers (Day 2)
	6		6	Applications of Integer Sums and Differences
	7			Recommended Day for Topic Quiz A
Topic B: Products and Quotients of Integers	8		7	Multiplying with Integer Models and Discovering the Rules
	9		8	Modeling Integer Division and Discovering the Rules
	10		9	Application of Integer Products and Quotients
	11		10	Applications of Integer Operations
	12			Unit 2 Success Day – Unit Review
	13			End of Unit 2 Assessment

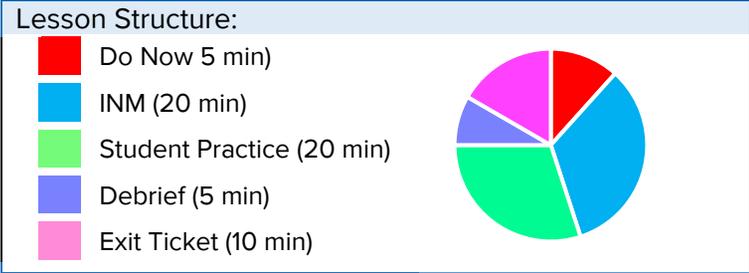| Lesson 1: Sums and Differences using the Number Line		Date: _____
Standard(s)	**Notes for Intellectual Preparation & Lesson Planning**	**Lesson Look Fors**
◆ **6.3(C)** represent integer operations with concrete models and connect the actions with the models to standardized algorithms ◆ ◆ **6.3(D)** add, subtract, multiply, and divide integers fluently	**Necessary Materials and Pre-Lesson Prep** ▪ MCR SE and TE ▪ 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** Students will understand that numbers have both distance and direction and that addition moves you to the right on the number line while subtraction moves you to the left. They will also understand numbers further to the right are larger than those to the left. **Opportunities to CFU** ✓ INM: Part III: A – E ✓ Student Practice: #1a, c **Other Notes to Inform Your Planning** Although the first addend (or minuend, for subtraction problems) in this lesson may be positive or negative, the second addend (or subtrahend, for subtraction problems) will always appear positive. In other words, students will not encounter a number with a negative sign in front of it AFTER the addition or subtraction symbol. (Ex. Students will not see 5 + (-4) or 5 – (-4) yet; they will only see problems like -5 – 2 or -5 + 4) Students will add and subtract negatives in later lessons. In this lesson, students begin by recalling everything they know about positive and negative numbers. They recall what they learned about opposites in Unit 1 and use this information to model integer addition and subtraction on number lines	**Look for teachers to...** ❑ emphasize that the direction you move on a number line depends on whether you are getting bigger or smaller. ❑ clearly model INM Part IIa-2c, pausing to ask students guiding questions as they model **Look for students to...** ❑ draw a model on a number line to represent the addition and subtraction of integers including real-world situations.
Important Vocabulary ▪ Difference ▪ Sum		**Student Know/Do Chart** 📘 Addition makes a quantity bigger and will move you to the right on the number line. 📘 Subtraction makes a quantity smaller and will move you to the left on the number line. 🎯 Students can model integer addition or subtraction on a number line.

Focus on Disciplinary Literacy
INM: Part I #1-5 BIG TAKEAWAYS
SP: Quiz/Quiz Trade

Lesson 2: Zero Pairs and Opposites Combining to Make Zero Pairs		Date: _____
Standard(s)	**Notes for Intellectual Preparation & Lesson Planning**	**Lesson Look Fors**
◆ **6.3(C)** represent integer operations with concrete models and connect the actions with the models to standardized algorithms ◆ **6.2(B)** identify a number, its opposite, and its absolute value.	**Necessary Materials and Pre-Lesson Prep** ▪ MCR SE and TE ▪ Rehearse INM and Debrief ▪ Create an SE Exemplar Lesson Structure: 🟥 Do Now (7 min) 🟦 INM (25 min) 🟩 Student Practice (13 min) 🟪 Debrief (5 min) 🟪 Exit Ticket (10 min) **Mathematical Goal of this Lesson** Students use the number line to discover that for every number a there exists a $-a$ so that $a + (-a) = 0$. They connect this idea to their already present understanding of opposites and are able to use this to identify and generate zero pairs. **Opportunities to CFU** ✓ INM: Zero Pair Pencils ✓ Student Practice: Q3 and Q4 **Other Notes to Inform Your Planning** ❏ Today's lesson builds students' conceptual understanding of zero pairs so that they can make sense of adding and subtracting integers. **Focus on Disciplinary Literacy** **INM:** #7, 9 **SP:** #3, 4	**Look for teachers to...** ❏ stamp that zero pairs are opposites and additive inverses ❏ model zero pairs on the number line and with integer chips **Look for students to...** ❏ be able to justify the idea of a zero pair on the number line. **Student Know/Do Chart** *Know* A zero pair is a pair of numbers that add up to zero because they have the same absolute value and are the same distance away from zero. *Do* Students can create zero pairs and model them on the number line.
Important Vocabulary ▪ absolute value ▪ additive inverse ▪ integer ▪ opposite numbers ▪ zero pair		
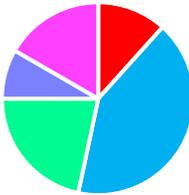
Lesson 3: Sums and Differences of Integers using Integer Chips		Date: _____
Standard(s)	Notes for Intellectual Preparation & Lesson Planning	Lesson Look Fors
◆ **6.3(D)** add, subtract, ~~multiply, and divide~~ integers fluently ◆ **6.3(C)** represent integer operations with concrete models and connect the actions with the models to standardized algorithm **Important Vocabulary** ▪ Difference ▪ Integer ▪ Sum ▪ **Zero Pair**	**Necessary Materials and Pre-Lesson Prep** ▪ MCR SE and TE ▪ Rehearse INM and Debrief ▪ Create an SE Exemplar Lesson Structure: 🟥 Do Now (7 min) 🟦 INM (25 min) 🟩 Student Practice (15 min) 🟪 Debrief (5 min) 🟪 Exit Ticket (10 min) **Mathematical Goal of this Lesson** Students will understand the concept of a zero pair – that all opposite numbers sum to zero – and utilize that concept to compute while reinforcing that adding a negative is the same as subtracting positives and that subtracting a negative is the same as adding positives. **Opportunities to CFU** ✓ INM: Q4: a - d ✓ Student Practice: 2a -d **Other Notes to Inform Your Planning** ●It is critical that students understand that removing a positive integer chip has the same impact as adding a negative integer chip. It is also critical that students understand that removing a negative integer chip has the same impact as adding a positive integer chip. ●Limited to integers between -10 and + 10. ●This lesson relies heavily on integer chip modeling so that students develop an understanding of integer addition and subtraction. In future lessons, students will move away from modeling to drawing generalizations so they can add and subtract larger values. **Focus on Disciplinary Literacy** INM- #2, 3, 4	**Look for teachers to...** ❑ use think aloud strategies as they model with integer chips. **Look for students to...** ❑ use integer chips to correctly model addition and subtraction expressions. **Student Know/Do Chart** *Know* +1 and -1 are a zero pair because they sum to 0 when put together. *Know* When adding and subtracting with integers your answer will be positive if there are more positives and will be negative if there are more negatives. *Do* Students can use +/- integer chips to model expressions in the form of a + b, a – b, a +(-b) or a – (-b) and get the correct solution. *Do* Students can model a simple real-world scenario using integer chips and get the correct solution.

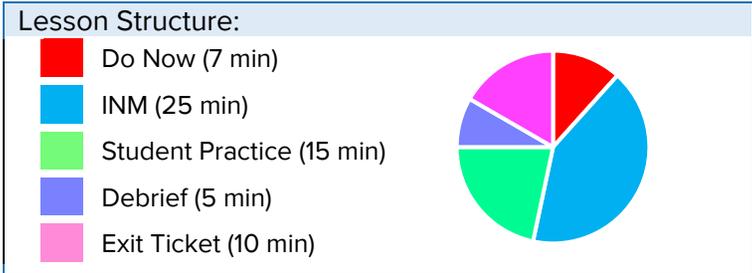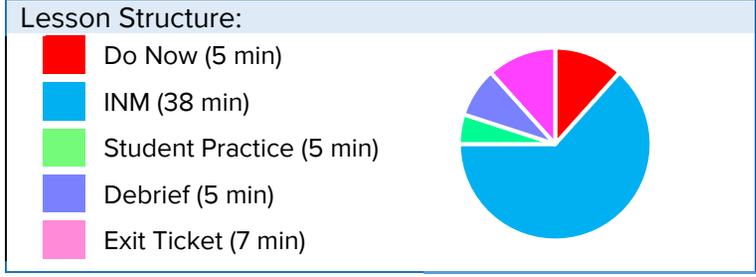| Lesson 4: Sums and Differences of Positive and Negative Integers (Day 1)		Date: _____
Standard(s)	**Notes for Intellectual Preparation & Lesson Planning**	**Lesson Look Fors**
◆ **6.3(D)** add, subtract, ~~multiply, and divide~~ integers fluently ◆ **6.3(C)** represent integer operations with concrete models and connect the actions with the models to standardized algorithm	<u>Necessary Materials and Pre-Lesson Prep</u> ▪ MCR SE and TE　　▪ Rehearse INM and Debrief ▪ Create an SE Exemplar Lesson Structure: 🟥 Do Now (5 min) 🟦 INM (38 min) 🟩 Student Practice (5 min) 🟪 Debrief (5 min) 🟪 Exit Ticket (7 min) <u>Mathematical Goal of this Lesson</u> Students must understand that adding more negatives makes a quantity smaller, so adding a negative is the same as subtracting. a+(-b) = a – b. It is also critical that students understand that subtracting negatives means you are taking away some negatives from your quantity, which means you are getting bigger. Therefore, subtracting a negative is the same as adding. a – (-b) = a + b. <u>Opportunities to CFU</u> ✓ INM :Use Parts a-d to ensure students understand the rules of the game before continuing.　✓ Student Practice: Q2 a-e <u>Other Notes to Inform Your Planning</u> • This lesson starts by discussing the meaning of addition and subtraction. When we think of addition, we think of our quantity growing or getting bigger. When we think of subtraction, we think of our quantity decreasing or getting smaller. **Focus on Disciplinary Literacy** **INM:** Part I A-F • Equivalent addition and subtraction expressions should contain both integers and variables. For Example: 5 + (-7) = 5 – 7 *and* a – (-b) = a + b • Expressions are limited to integers • Operations are limited to addition and subtraction.	<u>Look for teachers to...</u> ❑ emphasize that adding negatives makes you smaller and subtracting negatives makes you bigger. <u>Look for students to...</u> ❑ explain what it means to add negative values and what it means to subtract negative values. (Adding negatives makes you smaller, so adding negatives is the same as subtracting. Subtracting negatives makes you bigger, so subtracting negatives is the same as adding.)
Important Vocabulary ▪ Difference ▪ Integer ▪ Sum		**Student Know/Do Chart** **Know** Adding a negative is the same as subtracting because adding more negatives to a quantity makes it smaller. **Know** Subtracting a negative is the same as adding because getting rid of negative values makes a quantity bigger. Rewrite an expression given in the form of a + (-b) as a – b or rewrite an expression in the form a – (-b) as a + b Use a number line to model an expression in the form of a + (-b) or a – (-b) and find the correct solution

Lesson 5: Sums and Differences of Positive and Negative Integers (Day 2)		Date: _____
Standard(s)	**Notes for Intellectual Preparation & Lesson Planning**	**Lesson Look Fors**
◆ **6.3(D)** add, subtract, ~~multiply, and divide~~ integers fluently ◆ **6.3(C)** represent integer operations with concrete models and connect the actions with the models to standardized algorithm **Important Vocabulary** ▪ Difference ▪ Integer ▪ Sum	<u>**Necessary Materials and Pre-Lesson Prep**</u> ▪ MCR SE and TE ▪ Rehearse INM and Debrief ▪ Create an SE Exemplar Lesson Structure: 🟥 Do Now (5 min) 🟦 INM (28 min) 🟩 Student Practice (12 min) 🟪 Debrief (5 min) 🟪 Exit Ticket (10 min) <u>**Mathematical Goal of this Lesson**</u> Students must understand that adding more negatives makes a quantity smaller, so adding a negative is the same as subtracting. $a+(-b) = a - b$. It is also critical that students understand that subtracting negatives means you are taking away some negatives from your quantity, which means you are getting bigger. Therefore, subtracting a negative is the same as adding. $a - (-b) = a + b$. <u>**Opportunities to CFU**</u> ✓ INM Part III: n ✓ INM Part V ✓ INM Part IV: a, b ✓ Student Practice: 2, 4, 7, 9 <u>**Other Notes to Inform Your Planning**</u> • This lesson starts by discussing the meaning of addition and subtraction. When we think of addition, we think of our quantity growing or getting bigger. When we think of subtraction, we think of our quantity decreasing or getting smaller. **Focus on Disciplinary Literacy** **INM:** Part I A-F • Equivalent addition and subtraction expressions should contain both integers and variables. For Example: $5 + (-7) = 5 - 7$ *and* $a - (-b) = a + b$ • Expressions are limited to integers/Operations are limited to add/sub.	<u>Look for teachers to…</u> ❑ emphasize that adding negatives makes you smaller and subtracting negatives makes you bigger. <u>Look for students to…</u> ❑ explain what it means to add negative values and what it means to subtract negative values. (Adding negatives makes you smaller, so adding negatives is the same as subtracting. Subtracting negatives makes you bigger, so subtracting negatives is the same as adding.) **Student Know/Do Chart** Students can add or subtract positive or negative two-digit integers.

Lesson 6: Applications of Integer Sums and Differences		Date: _____
Standard(s)	Notes for Intellectual Preparation & Lesson Planning	Lesson Look Fors
◆ **6.3(D)** add, subtract, ~~multiply, and divide~~ integers fluently ◆ **6.3(C)** represent integer operations with concrete models and connect the actions with the models to standardized algorithm	<u>Necessary Materials and Pre-Lesson Prep</u> ▪ MCR SE and TE ▪ Rehearse INM and Debrief ▪ Create an SE Exemplar Lesson Structure: 🟥 Do Now (7 min) 🟦 INM (22 min) 🟩 Student Practice (16 min) 🟪 Debrief (5 min) 🟪 Exit Ticket (10 min) <u>Mathematical Goal of this Lesson</u> In this lesson, students will apply their understanding of adding and subtracting integers in order to solve real-world problems. <u>Opportunities to CFU</u> ✓ INM 1-5a ✓ Student Practice: 1, 2, 3 <u>Other Notes to Inform Your Planning</u> • Scenarios include situations that can • be represented in a variety of forms. (a + b, a – b, a + (-b) or a – (-b) • Scenarios are limited to integers • This lesson is limited to addition and subtraction. • Students should be able to check the reasonableness of their solution in the context of the situation. **Focus on Disciplinary Literacy** **INM:** #1-4 **SP:** #6-9	<u>Look for teachers to...</u> ❑ continually ask students if their plans and solutions make sense in the context of the problem. <u>Look for students to...</u> ❑ check answers and makes sure solutions are reasonable and make sense. Student Know/Do Chart Do 🎯 Students can correctly represent a given scenario by writing an expression in the form of a + b, a – b , a + (-b) or a – (-b) .
Important Vocabulary		
▪ Absolute Value ▪ Difference ▪ Negative Integer ▪ Positive Integer ▪ Sum		

Lesson 7: Multiplying with Integer Models and Discovering the Rules		Date: _____
Standard(s)	Notes for Intellectual Preparation & Lesson Planning	Lesson Look Fors
◆ **6.3(C)** represent integer operations with concrete models and connect the actions with the models to standardized algorithms ◆ **6.3(D)** add, ~~subtract,~~ multiply, and ~~divide~~ integers fluently Important Vocabulary ▪ **Factors** ▪ Integer ▪ **Product**	<u>Necessary Materials and Pre-Lesson Prep</u> ▪ MCR SE and TE ▪ Rehearse INM and Debrief ▪ Create an SE Exemplar Lesson Structure: 🟥 Do Now (5 min) 🟦 INM (25 min) 🟩 Student Practice (15 min) 🟪 Debrief (5 min) 🟪 Exit Ticket (10 min) <u>Mathematical Goal of this Lesson</u> This lesson will build students' conceptual understanding of multiplying with integers in several ways: Multiplication as repeated addition, models of multiplication as x groups of y, using patterns to draw conclusions. <u>Opportunities to CFU</u> ✓ INM: , 7, 9, 13 ✓ Student Practice: 1, 2, 3 <u>Other Notes to Inform Your Planning</u> • Multiplication can be written in the form of $a(b), a \times b, ab, or\ a \cdot b$ • Rules for multiplying integers are developed using patterns, models (integer chips or number-lines) and prior knowledge (repeated addition) • It is important that students have a deep understanding of why a positive multiplied by a negative will lead to a negative product and a negative multiplied by a negative will lead to a positive product. • This lesson will reinforce an understanding that adding more negatives makes you smaller but taking away negatives makes you bigger.	<u>Look for teachers to…</u> ❑ guide students to discover the rules for multiplying with signed numbers using patterns, models and prior knowledge. <u>Look for students to…</u> ❑ observe patterns and make conjectures about multiplying integers. Student Know/Do Chart 🎯 Students can use integer chips or a number line to explain why a positive factor times a negative factor results in a negative product. 🎯 Students can use integer chips or a number line to explain why a negative factor times a negative factor results in a positive product.

Lesson 8: Modeling Integer Division and Discovering the Rules		Date: _____
Standard(s)	**Notes for Intellectual Preparation & Lesson Planning**	**Lesson Look Fors**

Standard(s)

◆ **6.3(C)** represent integer operations with concrete models and connect the actions with the models to standardized algorithms
◆ **6.3(D)** ~~add~~, subtract, ~~multiply~~, and divide integers fluently

Important Vocabulary
- Factors
- Integer
- Opposite Value
- Product
- **Quotient**

Notes for Intellectual Preparation & Lesson Planning

Necessary Materials and Pre-Lesson Prep
- MCR SE and TE
- Create an SE Exemplar
- Rehearse INM and Debrief

Lesson Structure:
- Do Now (7 min)
- INM (30 min)
- Student Practice (8 min)
- Debrief (5 min)
- Exit Ticket (10 min)

Mathematical Goal of this Lesson
Students will use their understanding of the relationship between multiplication and division to discover that when they are dividing with positives and negatives the same rules apply as when they were multiplying. Students will also explore equivalent numeric and algebraic expressions involving the division of positive and negative integers.

Opportunities to CFU
- ✓ INM: 5, 7, 8
- ✓ INM Part IV: 1
- ✓ Student Practice: 1, 2, 4a-4c

Other Notes to Inform Your Planning
- Division may be written as $a \div b$ or as $\frac{a}{b}$.
- Expressions are limited to integers
- Operations limited to division

Focus on Disciplinary Literacy
INM: #5,7 SP: #1-3

Lesson Look Fors

Look for teachers to...
❑ make connections to students' prior knowledge of multiplying with integers to build students' understanding of dividing integers.

Look for students to...
❑ derive rules for dividing with integers using their understanding of multiplying integers.

Student Know/Do Chart

Know When you are dividing integers, you follow the same set of rules as when you multiply integers

Know The quotient of two negative values will always be positive and the quotient of a negative and a positive value will always give you a negative quotient.

Do Students can use integer chips or a number line to explain why a negative value divided by a positive value results in a negative quotient.

Do Students can divide positive and negative integers.

Lesson 9: Application of Integer Products and Quotients		Date: _____
Standard(s)	Notes for Intellectual Preparation & Lesson Planning	Lesson Look Fors

Standard(s)

- ◆ **6.3(C)** represent integer operations with concrete models and connect the actions with the models to standardized algorithms
- ◆ **6.3(D)** ~~add, subtract~~, multiply, and divide integers fluently

Important Vocabulary

- Factors
- Integer
- Opposite Value
- Product
- Quotient

Notes for Intellectual Preparation & Lesson Planning

<u>Necessary Materials and Pre-Lesson Prep</u>

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

Lesson Structure:

- 🟥 Do Now (7 min)
- 🟦 INM (30 min)
- 🟩 Student Practice (8 min)
- 🟪 Debrief (5 min)
- 🟪 Exit Ticket (10 min)

<u>Mathematical Goal of this Lesson</u>
Students will continue to build procedural fluency with integers while also applying this skill to solving real-world application problems.

<u>Opportunities to CFU</u>

- ✓ INM: must be teacher-selected based on problem sets you select.
- ✓ Student Practice: 1 and 2

<u>Other Notes to Inform Your Planning</u>

- Both models and the standard algorithm should be used.
- Expressions include integers only

Focus on Disciplinary Literacy

INM: App. #4, 6
SP: #1-3

Lesson Look Fors

<u>Look for teachers to…</u>
- ❑ challenge students to think through the proof on SE p102

- ❑ set clear expectations for partner work before students work on SE pgs103-108

<u>Look for students to…</u>
- ❑ draw models and/or perform the standard algorithm to find the solution.

Student Know/Do Chart

- **Do** 🎯 Students can identify whether a given scenario calls or multiplication and division and carry out the correct operation to arrive at a correct solution.

Lesson 10: Applications of Integer Operations		Date: _____
Standard(s)	Notes for Intellectual Preparation & Lesson Planning	Lesson Look Fors
◆ **6.3(D)** add, subtract, multiply, and divide integers fluently	**Necessary Materials and Pre-Lesson Prep** ▪ MCR SE and TE ▪ Rehearse INM and Debrief ▪ Create an SE Exemplar Lesson Structure: 🟥 Do Now (5 min) 🟦 INM (25 min) 🟩 Student Practice (15 min) 🟪 Debrief (5 min) 🟪 Exit Ticket (10 min) **Mathematical Goal of this Lesson** This lesson specifically focuses on application and using what they have learned to solve real-world problems.	Look for teachers to… ❑ perform an effective think-aloud for INM #1. ❑ continually ask students if their plans and solutions make sense in the context of the problem. Look for students to… ❑ check answers and makes sure solutions are reasonable and make sense.
		Student Know/Do Chart
Important Vocabulary Difference Dividend Divisor Factors Fraction Greater than 1 Integer Product Sum	**Opportunities to CFU** ✓ INM Q2 and Q3 ✓ Student Practice: Q5 **Other Notes to Inform Your Planning** • Both models and the standard algorithm can be used to add, subtract, multiply or divide integers. • Expressions include integers only • Students should utilize the UPSC (**U**nderstand, **P**lan, **S**olve, **C**heck) strategy as they work through each real-world situation. This will help students confidently tackle what may otherwise seem like an intimidating word problem	🎯 Students can identify whether a given scenario calls or addition, subtraction, multiplication, or division and carry out the correct operation to arrive at a correct solution.

Focus on Disciplinary Literacy

INM: #1c,4b
SP: #4

Recommended Success Day Materials and Resources

6.3D
Integer Operations

6g Sirius pg.23-31 only

<u>Notes to Inform Your Planning</u>
This resource can be used for either small-group or whole-group reteach. Allow students to have access to colored-pencils and/or integer chips to support them as they work through this lesson.

6.3D, 6.3E, 6.3C, 6.2B
Integer Operations

Unit 2 Extra Practice TE
Unit 2 Extra Practice SE

<u>Notes to Inform Your Planning</u>
This resource is meant for students to have more at-bats. Use exit data to prioritize what to review. For example, if you students did poorly on Lesson 2 allow them to use the Extra Practice for Lesson 2 to support their understanding.

6.3C
Integer Operations

Integer Operations Practice – Modeling Integers

<u>Notes to Inform Your Planning</u>
This resource can be used for either small-group or whole-group reteach. Allow students to have access to colored-pencils and/or integer chips to support them as they work through this lesson.

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.

UNPACKED STANDARDS

Focus standards for this unit.

Standards Breakdown		
Standards	**Specificity**	**Notes/Explanations/Examples**
6.3(E) multiply and divide positive rational numbers fluently	**Concepts:** • Rational Numbers • Multiplication • Division **Skill:** • Multiply • Divide **Including but not limited to:** • Determining whether a word problem is requiring multiplication, division, or both, and in what order. • Multiplying and dividing fractions and mixed numbers. • Multiplying and dividing decimals up to the thousandths place value. • Using the array method or the standard algorithm to multiply fractions and decimals • Modeling fraction division and multiplication using a number line or tape diagram **Limitations:** • Students do not encounter negative rational numbers. **Vertical Alignment:** In 5th grade students learned how to use the standard algorithm to multiply three-digit by two-digit numbers. They also learned how to solve for products of decimals up to the hundredths place and how to divide whole numbers by unit fractions and vice versa. In 7th grade students continue to multiply and divide rational numbers, but they also work with negative rational numbers.	**2019 6G STAAR Q22** The weight of one serving of trail mix is 2.5 ounces. How many servings are there in 22.5 ounces of trail mix? F 11.5 G 25.0 H 56.25 J 9.0 **2019 6G STAAR Q36** What is the value of $\frac{4}{15} \div \frac{2}{3}$? F $\frac{8}{45}$ G $\frac{14}{15}$ H $\frac{5}{2}$ J $\frac{2}{5}$ **2016 6G STAAR Q2** 2 A baby weighed 7.25 lb at birth. At the end of 8 months, the baby weighed $2\frac{1}{2}$ times its birth weight. How many pounds did the baby weigh at the end of 8 months? F 14.5 lb G 9.75 lb H 18.125 lb J 14.125 lb

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
5.3(A-J) The student applies mathematical process standards to develop and use strategies and methods for positive rational number computations in order to solve problems with efficiency and accuracy.	**6.3(C)** represent integer operations with concrete models and connect the actions with the models to standardized algorithms **6.3(D)** add, subtract, multiply, and divide integers fluently	**7.3(A)** add, subtract, multiply, and divide rational numbers fluently