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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**

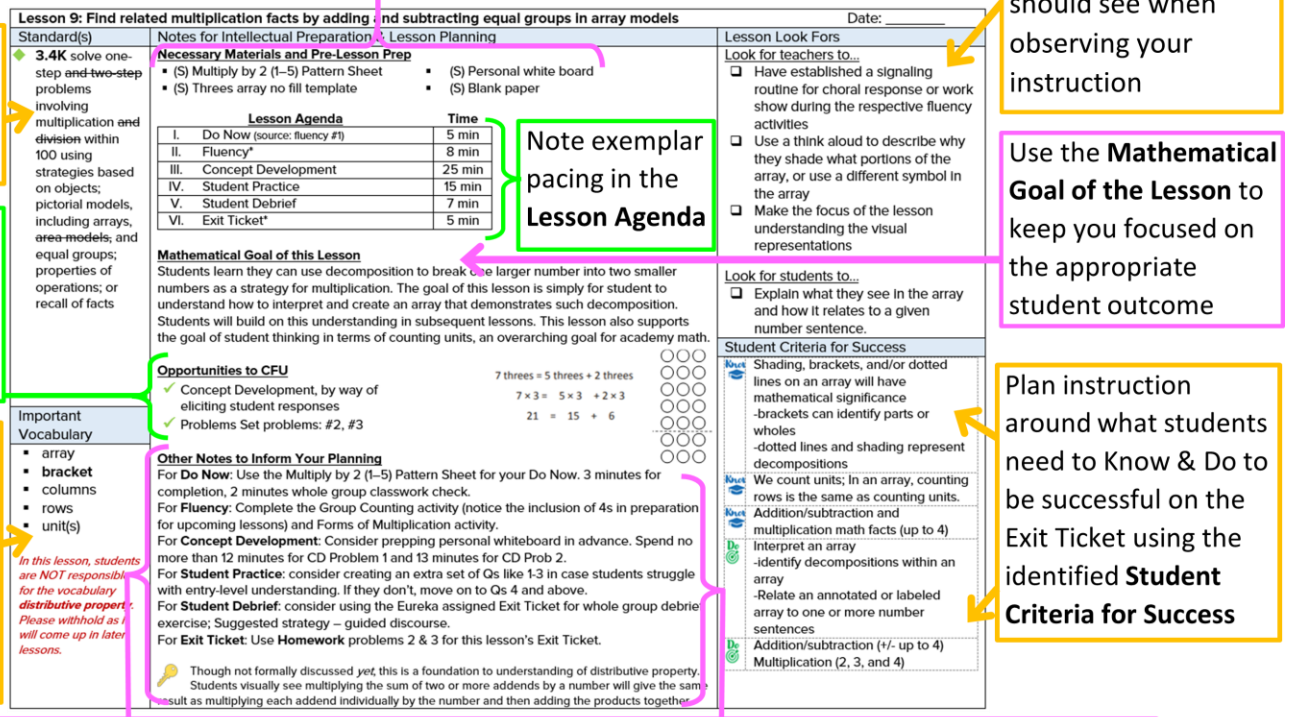
Note exemplar pacing in the **Lesson Agenda**

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/MODULE/MISSION SYNOPSIS

Throughout elementary school, students solved multi-step expressions with the four operations and applied properties of operations informally. In 6th grade, this work deepens as students are introduced to exponents as repeated multiplication, moving from writing expressions in expanded form to standard form. Instruction emphasizes comparing repeated addition to multiplication, then extending to repeated multiplication through exponents. Students also practice with prime factorization using factor trees, noting that different starting factors always lead to the same unique prime factorization, expressed in exponential notation.

Students then revisit and extend their understanding of the order of operations, first solidifying multiplication and division before addition and subtraction (MDAS), and later incorporating parentheses and exponents (GEMDAS). Instructional strategies include modeling real-world scenarios to build a need for order, guiding students to justify the order chosen, and requiring systematic step-by-step work (highlighting or underlining each operation before proceeding).

The unit continues by making explicit the Commutative and Associative Properties, where students explore when order and grouping matter and when they do not. Through real-life analogies and numeric expressions, they generalize that these properties hold for addition and multiplication but not subtraction and division. Students also study the Identity and Inverse Properties, discovering why adding zero, multiplying by one, or using an opposite or reciprocal preserves or undoes a value. Later, they apply the Distributive Property to rewrite expressions and finally practice combining like terms, a skill foundational for algebra.

These lessons build fluency and conceptual understanding of simplifying expressions, with strategies such as repeated multiplication models, factor trees, real-world contexts, step-by-step order of operations routines, and property-based reasoning. These strategies prepare students for 7th grade Pre-Algebra, where they will extend these skills to more complex equations and expressions.

Topic A Overview – *Exponents*

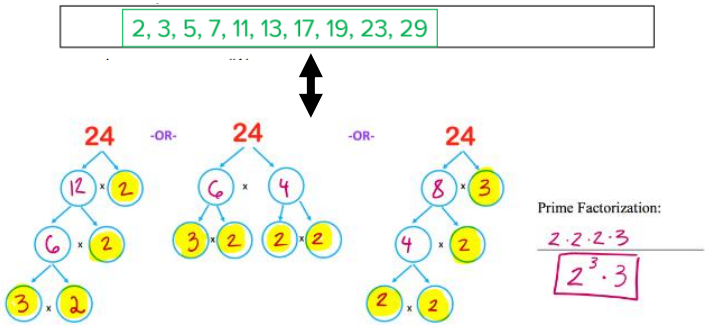
Lesson 1 introduces students to exponents as "repeated multiplication" and distinguishes between "repeated multiplication" and "repeated addition" (a.k.a. multiplication). It is common for many 6th graders to initially want to multiply a base by its exponent, but teachers can address this by stamping that exponents represent repeated MULTIPLICATION, not repeated ADDITION. (Look out for 2^2, as it is a very common exponential expression that doesn't help demonstrate this point.) Lesson 2 introduces students to PRIME FACTORIZATION, and students are expected to find the prime factorization of numbers and express them in simplest form using exponents.

Lesson 1

Power	Repeated Multiplication Form	Value
$(-3)^1$	-3	-3
$(-3)^2$	$(-3)\cdot(-3)$	9
$(-3)^3$	$(-3)\cdot(-3)\cdot(-3)$	-27
$(-3)^4$	$(-3)\cdot(-3)\cdot(-3)\cdot(-3)$	81
$(-3)^5$	$(-3)\cdot(-3)\cdot(-3)\cdot(-3)\cdot(-3)$	-243
$(-3)^6$	$(-3)\cdot(-3)\cdot(-3)\cdot(-3)\cdot(-3)\cdot(-3)$	729

Exponential Form	Expanded Form	Standard Form
3^5	$3\cdot3\cdot3\cdot3\cdot3$	243
4^3	$4\times4\times4$	64
$(1.9)^2$	1.9×1.9	3.61
$\left(\frac{1}{2}\right)^5$	$\frac{1}{2}\times\frac{1}{2}\times\frac{1}{2}\times\frac{1}{2}\times\frac{1}{2}$	$\frac{1}{32}$

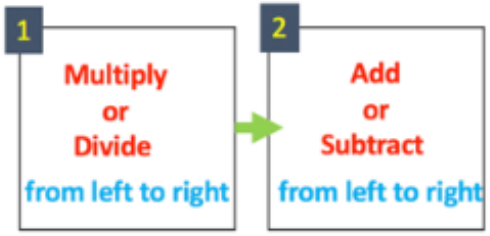
Lesson 2

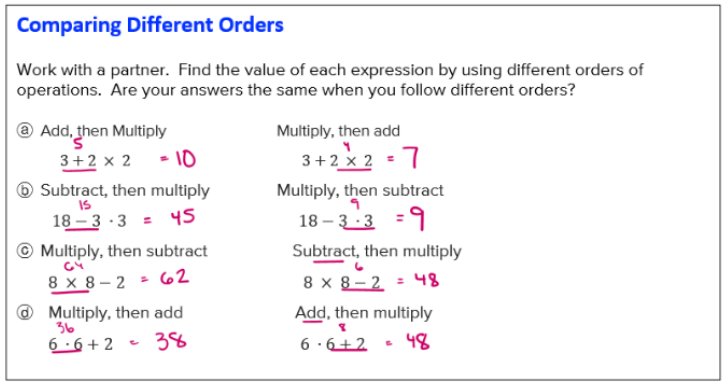


Topic B Overview – *Order of Operations*

In 5th grade, students learned how to use the order of operations to simplify expressions that did NOT involve exponents. In Topic B, students continue to build their skill at simplifying multi-step expressions. They also get to encounter scenarios that call for different orders of operation. Lesson 3 focuses on the MDAS part of PEMDAS, which is something students likely had ample practice within 5th grade; 6th graders must now do this with negative integers. Lesson 4 is the first time students encounter Exponents (the E) of PEMDAS. In both lessons, students see that real-world situations often call for multi-step expressions and that the context of these situations determines which steps happen first and where parentheses should written to preserve the desired order.

Lesson 3





Comparing Different Orders

Work with a partner. Find the value of each expression by using different orders of operations. Are your answers the same when you follow different orders?

ⓐ Add, then Multiply: $3+2\times 2 = 10$ — Multiply, then add: $3+2\times 2 = 7$

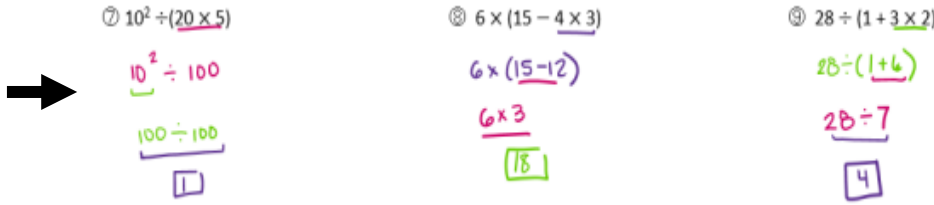
ⓑ Subtract, then multiply: $18-3\cdot 3 = 45$ — Multiply, then subtract: $18-3\cdot 3 = 9$

ⓒ Multiply, then subtract: $8\times 8-2 = 62$ — Subtract, then multiply: $8\times 8-2 = 48$

ⓓ Multiply, then add: $6\cdot 6+2 = 38$ — Add, then multiply: $6\cdot 6+2 = 48$

Lesson 4

The Order of Operations			
1: Grouping Symbols (Parentheses) [Brackets] {Braces} |absolute value|	2: Exponents and Radicals x^2 $\sqrt{x}$	3: Multiplication and Division From LEFT to RIGHT	4: Addition and Subtraction From LEFT to RIGHT



⑦ $10^2 \div (20 \times 5)$ → $10^2 \div 100$ → $100 \div 100$ → 1

⑧ $6 \times (15 - 4 \times 3)$ → $6 \times (15-12)$ → 6×3 → 18

⑨ $28 \div (1 + 3 \times 2)$ → $28 \div (1+6)$ → $28 \div 7$ → 4

Topic C Overview – *Equivalent Expressions*

Topic C "gives names" to properties of mathematics that students have been working with since elementary. During Topic C, students work with the Commutative, Associative, Identity, Inverse, and Distributive Properties. While it is important that they can identify and name these properties, it is most important that they can use them to determine whether two expressions are equivalent or not. Last, they learn how to combine like terms, something they will need to execute flawlessly when they enter Algebra I.

Lesson 5

F $a - (b - c) = (a - b) - c$ T $a \times (b \times c) = (a \times b) \times c$ F $a \div (b \div c) = (a \div b) \div c$

⑥ The Meaning of the Word → Associate → To Interact With

Sometimes you associate with your dog, and sometimes you associate with your cat.

Associative Property: You can use parentheses to regroup #s you are adding or multiplying. [Not true for ⊖ or ÷.]

Lesson 6

② Complete each numeric statement so that it is true:

$18 \times \underline{1} = 18$ $\underline{1} \times 9 = 9$ $450 \times \underline{1} = 450$ $b \times \underline{1} = b$ $\underline{1} \times y = y$

Multiplicative Identity Property: Anything multiplied by 1 is equal to itself. Multiplying any value by 1 doesn't change the value.

③ Complete each numeric statement so that it is true:

$10 + \underline{(-10)} = 0$ $\underline{(-6)} + 6 = 0$ $28 + \underline{(-28)} = 0$ $x + \underline{(-x)} = 0$ $\underline{(-y)} + y = 0$

Additive Inverse Property: The sum of any number and its opposite is zero.

Lesson 7

$3(x + 2)$

	x	2
3	3x	6

$3x + 6$

$4(3x + 1)$

	3x	1
4	12x	4

$12x + 4$

$5(-2a + 5b)$

	-2a	5b
5	-10a	25b

$-10a + 25b$

Lesson 8

② Terms are made up of **coefficients** (numbers) and **variables** (letters). An algebraic expression is comprised of one or more terms. Terms are separated by + or - signs.

$2a - 4cd$ (This expression contains 2 terms)

$d - 3 + e$ (This expression contains 3 terms)

③ Identify the terms in each expression below, then state how many terms the expression has:

Expression	Terms	Number of Terms
ⓐ $12a + 5b$	$12a$ $5b$	2
ⓑ $-9x^2 + 8x - 1$	$-9x^2$ $8x$ 1	3
ⓒ $14m - 3n + 4$	$14m$ $3n$ 4	3
ⓓ $21p^3 + 4p^2 - 9p + 3$	$21p^3$ $4p^2$ $9p$ 3	4

CONTENT STANDARDS

Below are the standards addressed in this unit.

Readiness Standards	Supporting Standards
6.7A Generate equivalent numerical expressions using order of operations, including whole number exponents and prime factorization **6.7D** Generate equivalent expressions using the properties of operations **6.3D** Add, subtract, multiply, and divide integers fluently	**6.7C** Determine if two expressions are equivalent using concrete models, pictorial models, and algebraic representations.

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 6 – Simplifying Expressions				
Topic	Day	Date	Lesson	Lesson Title
Topic A Exponents	1		1	Exponential Expressions
	2		2	Prime Factorization
Topic B Order of Operations	3		3	Order of Operations Day 1
	4			Success Day
	5		4	Order of Operations Day 2
Topic C Equivalent Expressions	6		5	The Commutative and Associative Properties
	7		6	The Identity and Inverse Operations
	8		7	The Distributive Property
	9		8	Combining Like Terms
	10			Review
	11			Unit Exam 6

Lesson 1: Exponential Expressions Date: _____

Standard(s)

- **6.7A** Generate equivalent numerical expressions using order of operations, including whole number exponents and prime factorization

Important Vocabulary

- Base
- Cubed
- Exponent
- Power
- Squared

Notes for Intellectual Preparation & Lesson Planning

Necessary Materials and Pre-Lesson Prep

- Document Camera
- Projector
- Unit 6 Student Workbook
- Debrief Slide

Lesson Agenda

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

Mathematical Goal of this Lesson

The primary goal of this lesson is for students to simplify expressions containing exponents. The lesson starts by activating students' prior knowledge of multiplication as repeated addition and then connects that concept to exponents as repeated multiplication.

Opportunities to CFU

- ✓ INM: #8a-b, #9, #12, #14c-d
- ✓ Student Practice: #2, 3, 6

Other Notes to Inform Your Planning

For **INM**: It will be important to emphasize for student that exponents represent repeated multiplication. Student often make the mistake of multiplying the base and exponents in terms such as 4^2. Holding students accountable for using the appropriate language will be important (i.e., "*4 to the second power*," " *4 squared*," or "*4 to the power of 2*.") Students will need to recall integer rules for multiplication from Unit 2 to support them when the base is a negative number, i.e., -4^3. It will also be important that students understand the difference between Exponential Form, Expanded Form, and Standard Form prior to the student practice. See the snip under Topic A Lesson 1 for an example of material to add to an anchor chart.

Focus on Disciplinary Literacy

INM: #8a-b, 13
SP: #4a-b, 5, 6

Lesson Look Fors

Look for teachers to…

- ❑ Connect the idea of exponents as repeated multiplication to multiplication as repeated addition
- ❑ STAMP that we never multiply the base by the exponent, but that the exponent tells us how many times to multiply the base by itself

Look for students to…

- ❑ Correctly write exponents in expanded form:
  Ask: Why are you writing the 2 so many times?
  Ask: How many times do you need to multiply this number by itself?
  Ask: What does an exponent tell you to do?

Student Know/Do Chart

- Know: Explain that exponents represent repeated multiplication
- Do: Write an exponential expression in expanded form or standard form
- Do: Simplify an exponential expression

Lesson 2: Prime Factorization Date: _____

Standard(s)

- **6.7A** Generate equivalent numerical expressions using order of operations, including whole number exponents and prime factorization

Important Vocabulary

- Exponent
- Factors
- Factor Tree
- Prime Factorization
- Product

Notes for Intellectual Preparation & Lesson Planning

Necessary Materials and Pre-Lesson Prep

- Document Camera
- Projector
- Unit 6 Student Workbook
- Debrief Slide

Lesson Agenda

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

Mathematical Goal of this Lesson

The primary goal for this lesson is for student to find the prime factorization of a number using a factor tree and write their answer using exponential notation. Students will start by finding the prime factorization of the same number using factors to start. They will then discover that their result is always the same no matter which factors they start their factor tree with.

Opportunities to CFU

- ✓ INM: #3a-c, #4, 5
- ✓ Student Practice: #3, 7, 8, 9

Other Notes to Inform Your Planning

For **Do Now**: The Do Now is a great way to assess which students remember about prime and composite numbers from 5th grade. This would be a great opportunity to have students note or review definitions in the case that most students don't remember.

For **INM**: To support students that may struggle with this concept, provide them with a divisibility rules cheat sheet and 12 x12 chart. Students will not need to 'memorize' prime numbers, but it helps if they at least memorize **up to 13:** 2, 3, 4, 5, 7, 11, 13. Consider creating an anchor chart for students to reference. See the snip above of Topic A Lesson 2 for an example of material to add to the anchor chart.

Focus on Disciplinary Literacy

Do Now: A
INM: #2a-b, 4, 5

Lesson Look Fors

Look for teachers to…

- ❑ Stamp that there are often different factor trees that can be made to find the prime factorization of a number.
- ❑ Encourage struggling students to start by dividing the number by 2 or 3, because once students find one factor pair of a number, it's easier to continue the process.
- ❑ Model highlighting or indicating which numbers in the factor tree are PRIME so students stop trying to break those down

Look for students to…

- ❑ Correctly build prime factorization trees"
  (*Ask*: Why are you breaking the number down that way?)
- ❑ Highlight/note prime factors on the tree so that they do not waste time breaking them down (ex: 7 * 1)
  (*Ask:* What kind of number is this?)

Student Know/Do Chart

- Know: To find the prime factorization of a number, it is necessary to break the number down to its prime factors
- Know: If the same prime factor appears more than once, it is necessary to use exponents to simplify the expression
- Do: Draw a prime factorization tree
- Do: Express a number's prime factorization using exponents

Lesson 3: Order of Operations Day 1 Date: _____

Standard(s)

- **6.7A** Generate equivalent numerical expressions using order of operations, including whole number exponents and prime factorization
- **6.3D** Add, subtract, multiply, and divide integers fluently

Important Vocabulary

- Order of Operations

Notes for Intellectual Preparation & Lesson Planning

Necessary Materials and Pre-Lesson Prep

- Document Camera
- Projector
- Unit 6 Workbook
- Debrief Slide

Lesson Agenda

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

Mathematical Goal of this Lesson

The primary goal of this lesson is for students to simplify numeric expressions containing addition, subtraction, multiplication, and division using order of operations. This lesson starts by building a need for order of operations. The focus is on the MDAS part of GEMDAS. Building automaticity in MDAS will support them when GE/PE is introduced.

Opportunities to CFU

- ✓ INM: #3, 4
- ✓ Student Practice: #6, 10,11,15

Other Notes to Inform Your Planning

For **Do Now**: The Do Now is important because it helps students cement the definition of OPERATION in their minds, and also to remember how different operations function.

For **INM**: STAMP for students that the order in which operations are performed matters. A common misconception is that students will try to work problems from left to right instead of applying order of operations. Punch that it is necessary to multiply/divide and add/subtract from left to right even if division comes before multiplication or subtraction comes before addition. Provide students who struggle with multiplication facts a 12X12 Chart. Also, consider creating an anchor chart with a visual representation of MD before AS.

For **Student Practice:** For students with reduced assignments, prioritize #s 1-5. Encourage students to underline/highlight each step to support them as they work through solving.

Focus on Disciplinary Literacy

INM: #1c, 2c, 4e

Lesson Look Fors

Look for teachers to…

- ❑ Use INM #1 to connect GEMDAS to a real-world scenario of writing expressions to represent a situation
- ❑ Use the "Comparing Different Orders" section of the INM to stamp that order of operations really does matter.
- ❑ Be neat, methodical, and precise as they model multi-step problems. Teachers should highlight/underline the step they are about to do and then re-write the problem with that step completed so students can neatly see the progression of PEMDAS.

Look for students to…

- ❑ Be able to explain that order matters.
  Ask: Is 2 – 5 x 3 the same as 2 x 5 – 3? Why or why not?
- ❑ Be neat, methodical, and precise in how they solve multi-step problems.
  Ask: Are you highlighting or underlining the part you will simplify first.

Student Know/Do Chart

Know — Students should know why order matters in order of operations

Do — Simplify a numerical expression involving the four basic operations

Lesson 4: Order of Operations Day 2 Date: _____

Standard(s)

- **6.7D** Generate equivalent expressions using the properties of operations
- **6.3D** Add, subtract, multiply, and divide integers fluently
- **6.7C** Determine if two expressions are equivalent using concrete models, pictorial models, and algebraic representations.

Important Vocabulary

- Order of Operations

Notes for Intellectual Preparation & Lesson Planning

Necessary Materials and Pre-Lesson Prep

- Document Camera
- Projector
- Unit 6 Workbook
- Debrief Slide

Lesson Agenda

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

Mathematical Goal of this Lesson

The primary goal of this lesson is for student to simplify numeric expressions containing addition, subtraction, multiplication, and division using the order of operations. In this lesson, students will explore numeric expressions involving exponents and grouping symbols.

Opportunities to CFU

- ✓ INM: #1b, 2a, 3, 4(#6-8)
- ✓ Student Practice: #1, 2, 5, 6, 9, 10

Other Notes to Inform Your Planning

For **INM**: Provide students with a 12x12 and an anchor chart so that students can see a visual representation of P before E before MD and before AS. Plan opportunities to include student voice, allowing them to justify why they are choosing specific operations first. It will be important to model how students should show their work neatly for each step in the process of solving.

For **Student Practice:** Encourage students to underline/highlight each step to support them as they work through solving. Students with reduced assignments should do #1, 2, 5, 6, 9, 10.

Focus on Disciplinary Literacy

INM: #2a-c, 3

Lesson Look Fors

Look for teachers to…

- ❑ Use INM #s 1 and 2 to help students see that GEMDAS isn't just about calculating for the sake of calculating, but that we truly do use it in the real world to write expressions that represent a situation
- ❑ Be neat, methodical, and precise as they model multi-step problems. Teachers should highlight/underline the step they are about to do and then re-write the problem with that step completed so students can neatly see the progression of PEMDAS.

Look for students to…

- ❑ Be able to explain which step they should do next and why.
  Ask: What will your next step be? Why?
- ❑ Be neat, methodical, and precise in how they solve multi-step problems.
  Ask: Are you highlighting/underlining the part you will simplify first?
  Look: is there a neat progression of steps for each problem, or are they just putting a final answer beneath it, possibly with work scrawled in the margins?

Student Know/Do Chart

Explain why the order of operations matters

Simplify a numerical expression involving the four basic operations by following GEMDAS

Lesson 5: Commutative and Associative Properties Date: _____

Standard(s)

- **6.7C** Determine if two expressions are equivalent using concrete models, pictorial models, and algebraic representations.
- **6.7(D)** generate equivalent expressions using the properties of operations: inverse, identity, commutative, associative, and distributive properties
- **6.3(D)** add, subtract, multiply, and divide integers fluently

Important Vocabulary

- Associate Property
- Commutative Property

Notes for Intellectual Preparation & Lesson Planning

Necessary Materials and Pre-Lesson Prep

- Document Camera
- Projector
- Unit 6 Workbook
- Debrief Slide

Lesson Agenda

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

Mathematical Goal of this Lesson

The primary goal of this lesson is for students to determine whether two expressions are equivalent using the commutative or associate properties. They will explore real-world situations in which order matters and situations in which order does not matter. Students summarize their findings using variables, then classify each operation based on whether order matters or not.

Opportunities to CFU

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

Other Notes to Inform Your Planning

For **INM/Student Practice**: Provide students who struggle with a 12x12 Multiplication Chart. Prepare to remind students that "associative" means that numbers are switching who they "associate" with. Consider creating an anchor chart that defines and models these properties for students to reference. For ideas, see the snip above under Topic C Lesson 5.

Focus on Disciplinary Literacy

INM: #1, 3, 4, 6
SP: #3a-b

Lesson Look Fors

Look for teachers to…

- ❑ Act more as facilitators for INM rather than have students copy teacher writing; students can likely guide themselves through that first page.
- ❑ Guide students to define the Commutative and Associative property rather than give away the exact definition at first

Look for students to…

- ❑ Explain why the Commutative property only works for some operations. (Ask: When does the Commutative Property work? When does it not work?)
- ❑ Use the order of operations to help develop their understanding of the Associative property (*Look*: Are students using the OOO on INM example 5?)
- ❑ Explain when the Associative Property works and when it doesn't. (*Ask:* Can I shift the parentheses when the operations are the same? Can I shift them when they are different?)

Student Know/Do Chart

Know — Define the Commutative and Associative properties

Do — Explain whether two expressions are equivalent or not because of the Commutative and/or Associative properties

Do — Use the Commutative and Associative properties to write equivalent expressions

Lesson 6: Identity and Inverse Properties Date: _____

Standard(s)

- **6.7C** Determine if two expressions are equivalent using concrete models, pictorial models, and algebraic representations.
- **6.7(D)** generate equivalent expressions using the properties of operations: inverse, identity, commutative, associative, and distributive properties
- **6.3(D)** add, subtract, multiply, and divide integers fluently

Important Vocabulary

- Identity Property
- Inverse Property
- Reciprocal

Notes for Intellectual Preparation & Lesson Planning

Necessary Materials and Pre-Lesson Prep

- Document Camera
- Projector
- Unit 6 Workbook
- Debrief Slide

Lesson Agenda

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

Mathematical Goal of this Lesson

The primary goal of this lesson is for students to determine whether two expressions are equivalent using the identity or inverse properties. They will understand why it is necessary to use inverse operations when solving for a variable. It will be important for them to understand why it is necessary for constants to become zero and coefficients to become one to support them in understanding the algebraic way to solve equations for future grades.

Opportunities to CFU

- ✓ INM: #4, 5
- ✓ Student Practice: #4, 9, 13, 19, 25a-b, 26a, 27a-b

Other Notes to Inform Your Planning

For **INM**: STAMP that anything added to zero equals itself, anything multiplied by 1 equals itself, and the sum of any number and its opposite is zero. Remind students that they have been using identity property all year long. If students struggled in Unit 2 with multiplying and dividing fractions prepare to address misconceptions around the multiplicative inverse property. Consider creating an anchor chart that defines and models these properties for students to reference. For ideas, see the snip above under Topic C Lesson 6.

Focus on Disciplinary Literacy

INM: #1-4
SP: #1-3, 25, 26

Lesson Look Fors

Look for teachers to…

- ❑ Act more as facilitators for the INM rather than have students copy teacher writing; students can likely guide themselves through the INM
- ❑ Guide students to define the Identity and Inverse Properties rather than give away the exact definitions at first

Look for students to…

- ❑ Recall what they learned about integer operations in Unit 3 to make sense of the additive inverse property.
  (*Ask*: What can you add to a number to get a sum of zero?) [Ans: Its opposite!]
- ❑ Recall what they learned about reciprocals in Unit 2
  (*Ask:* What can you multiply a number by to get a product of 1?) [Ans: Its reciprocal!]
- ❑ Attempt to define the Identity and Inverse Properties for themselves
  (*Ask (*for example*):* Based the examples shown here, what do you think the Multiplicative Identity Property IS?)

Student Know/Do Chart

Do — Identify and define the Additive and Multiplicative Identity Properties and the Additive and Multiplicative Inverse Properties.

Do — Generalize the Identity and Inverse properties by writing numeric and/or algebraic equations to express them.

Lesson 7: Distributive Property Date: _____

Standard(s)

◆ **6.7C** Determine if two expressions are equivalent using concrete models, pictorial models, and algebraic representations.

Important Vocabulary

- Identity Property
- Inverse Property
- Reciprocal

Notes for Intellectual Preparation & Lesson Planning

Necessary Materials and Pre-Lesson Prep

- Document Camera
- Projector
- Unit 6 Student Workbook
- Debrief Slide

Lesson Agenda

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

Mathematical Goal of this Lesson

The primary goal of this lesson is for students to generate two equivalent expressions using the distributive property and determine if two expressions are equivalent using the distributive property. Students should understand that when a number is next to a set of parentheses, the number needs to be multiplied by every term inside of the parenthesis.

Opportunities to CFU

- ✓ INM: #3, 5 Part II: 5, 7, 8, 9, 14
- ✓ Student Practice: #2, 3c, d, e

Other Notes to Inform Your Planning

For **Do Now**: The Do Now is a good opportunity to highlight for teachers who may not know that parenthesis means multiplication in contexts such as: 2(3) or (2)(3).

For **INM**: The most important thing to stamp throughout the INM is that the factor outside the parentheses must be distributed to all terms inside the parentheses. A common mistake is that students will multiply the factor outside the parenthesis by only the first term inside the parenthesis. Another common mistake is that, when a negative factor is included, students may mistakenly ignore the negative sign when solving. Consider creating an anchor chart that defines and models these properties for students to reference. For ideas, see the snip above under Topic C Lesson 7.

Focus on Disciplinary Literacy

Do Now: #1-2
INM: #3, 4, 5

Lesson Look Fors

Look for teachers to…

- ❑ Use mathematics vocabulary to precisely explain the distributive property (specifically, use the words "factor," "parentheses," "term")
- ❑ STAMP that the factor outside the parentheses must be multiplied by every term inside the parentheses

Look for students to…

- ❑ Use the words "factor," "parentheses," and "term" when talking about today's work. (*Ask*: How would you explain the Distributive Property?)
- ❑ Multiply every term inside the parentheses by the factor outside the parentheses. (*Look*: Look at student work to see if they are forgetting to multiply the second term.)

Student Know/Do Chart

Know — When a number is next to a set of parentheses, it means that number is being multiplied by every term inside of the parenthesis.

Do — Generate and identify equivalent expressions using the distributive property.

Lesson 8: Combining Like Terms Date: _____

Standard(s)

- **6.7C** Determine if two expressions are equivalent using concrete models, pictorial models, and algebraic representations.
- **6.7(D)** generate equivalent expressions using the properties of operations: inverse, identity, commutative, associative, and distributive properties

Important Vocabulary

- Algebraic Expressions
- Equivalent Expressions
- Like Term
- Term

Notes for Intellectual Preparation & Lesson Planning

Necessary Materials and Pre-Lesson Prep

- Document Camera
- Projector
- Unit 6 Student Workbook
- Debrief Slide

Lesson Agenda

		Time
I.	Do Now	5 min
II.	INM/Concept Development	28 min
III.	Student Practice	12 min
IV.	Student Debrief	5 min
V.	Exit Ticket	10 min

Mathematical Goal of this Lesson

The primary goal of this lesson is for students to simplify algebraic expressions by combining like terms. This lesson builds students' understanding of what a term is, they understand that when a term is subtracted, the term is negative. They then build an understanding that when two terms have the same variable and exponent they can be combined (added or subtracted). They also understand that constant values can be combined.

Opportunities to CFU

- ✓ INM: #3, 4, 6c, e, h, i, j
- ✓ Student Practice: #4-6, 7, 8, 9, 11

Other Notes to Inform Your Planning

For **INM/Student Practice**: Prepare to address misconceptions around 'terms' and where one term ends and the next begins. Students will need to recall integer rules from Unit 2 to access some of the material in this lesson. It will be important to first help students to identify what terms are the same or "like" before simplifying by adding or subtracting. To support student understanding ,color code like-terms so that they are more visible when modeling. Set the expectation for students to also color-code terms as they are working through the INM and Student Practice. Students can use highlighters or color pencil, if those are not available, they can use shapes such as circles, squares, triangles etc. to identify like terms. Consider creating an anchor chart that defines and models these properties for students to reference. For ideas, see the snip above under Topic C Lesson 8.

Focus on Disciplinary Literacy

INM: #1, 4

Lesson Look Fors

Look for teachers to…

- ❑ Clearly guide students to understand what a "term" is
- ❑ Use mathematics vocabulary to precisely explain what it means to combine like terms (like "variable," "exponent," "coefficient")
- ❑ Model identifying like terms by color coding or boxing (ex. All terms with *a* are circled in purple, but all terms with a^2 are circled in red)

Look for students to…

- ❑ Use the words "variable," "exponent," and "coefficient" when explaining how they combined like terms
- ❑ (*Ask*: How did you know which terms to combine?" [*Sample Response: "They have different coefficients, but they have the same variable and exponent."]*)
- ❑ Color-code or otherwise indicate which terms are like (*Look:* Are like terms the same color or did students circle one set of like terms while underlining the other?)

Student Know/Do Chart

Know What it means for terms to be "like" and why some can be combined while others cannot.

Do Simplify an expression by combining like terms

Recommended Success Day Materials and Resources

6.7A, 6.7D, 6.3D, 6.7C
Simplifying Expressions

- Evaluating Expressions with Exponents
  Order of Operations Practice
- 6.7A and 6.7D Tech-Enhanced Practice
  Extra Practice SE
  Extra Practice TE

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

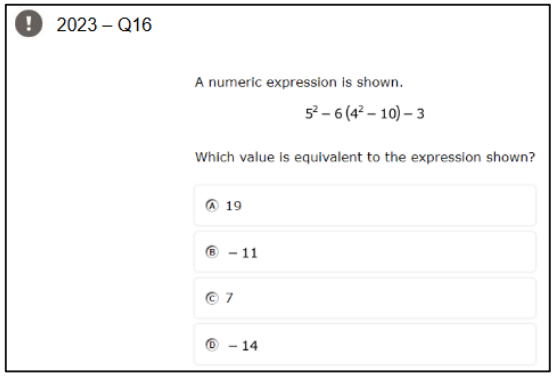
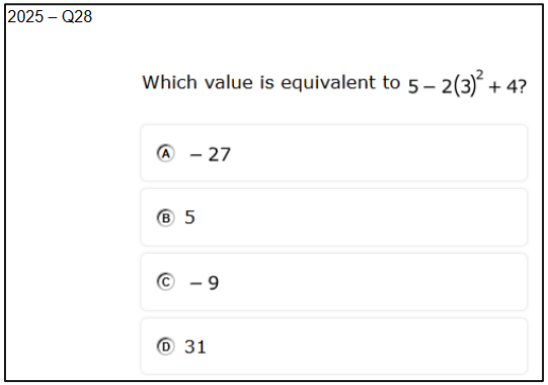
If student data indicates a pause point is not necessary, you can opt to move forward and reserve a Success Day to use at a later date.

Using exit ticket data can help you prioritize what to review. For example, if you remember that students did poorly on Lesson 8, pull problems from lesson 8, 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.

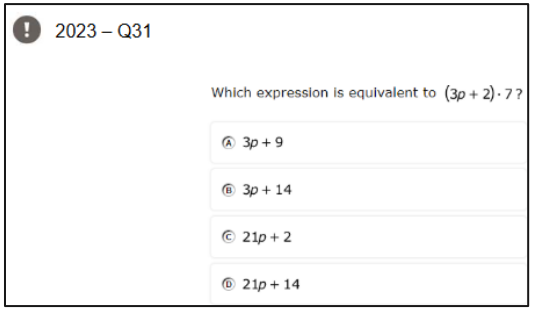
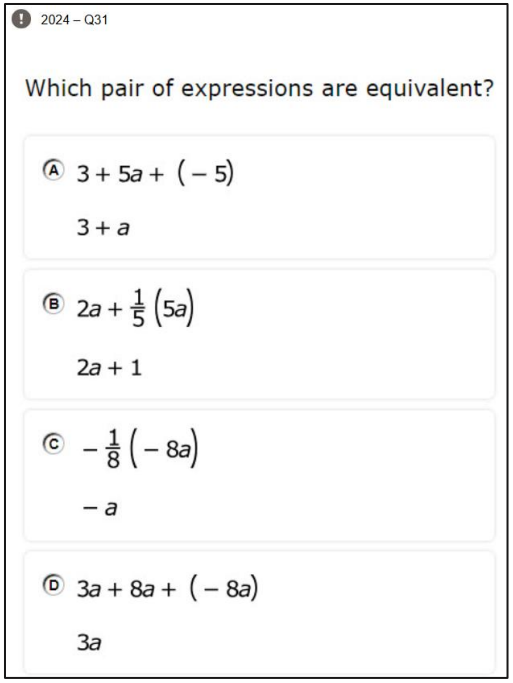
All unit exams should be given online to prepare students for STAAR online.

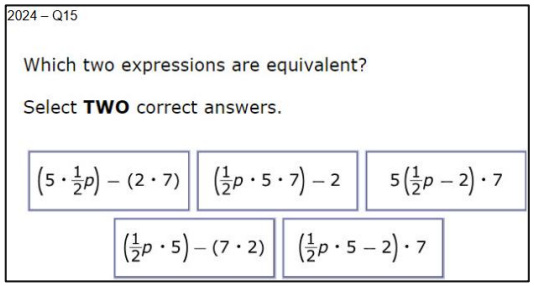
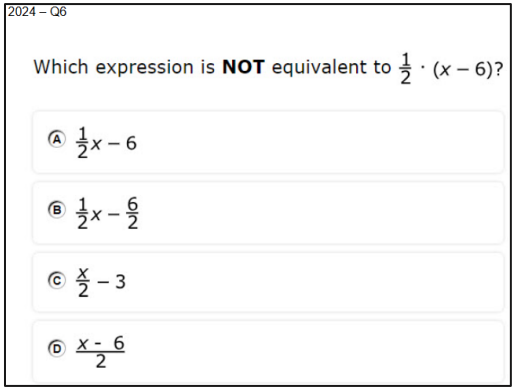
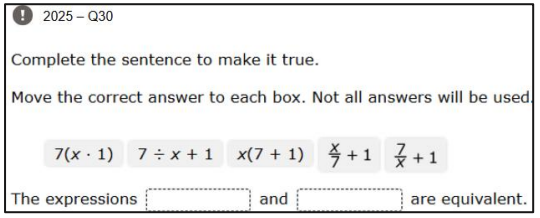
UNPACKED STANDARDS

Focus standards for this unit.

Standards Breakdown		
Standards	**Specificity**	**Notes/Explanations/Examples**
6.7(A) generate equivalent numerical expressions using order of operations, including whole number exponents, and prime factorization	**Concepts:** • Equivalency • Numerical expressions • Order of operations • Exponents • Prime factorization **Skill:** • Generate equivalent numerical expressions **Including but not limited to:** • Distinguishing between prime and composite numbers • Finding the prime factorization of a number and writing that prime factorization using exponents • Evaluating whether an expression is written in prime factorization or not • Simplifying multi-step numeric expressions to a single term • Applying previous knowledge of integer and positive rational number operations to successfully simplify a multi-step numeric expression • Determining whether two numeric expressions are equivalent **Limitations:** • Although students will work with negative integers, they will not work with all negative fractions or decimals. **Vertical Alignment:** In previous grades, students learned how to simplify multi-step expressions that did not include parentheses or exponents. In 6th grade, students build on this knowledge to be able to simplify multi-step expressions that also include parentheses and exponents. In 7th and beyond, students continue to use PEMDAS and use their skills to simplify polynomials.	**2023 6G STAAR Q16**  **2025 6G STAAR Q28** 

Standards Breakdown

Standards	Specificity	Notes/Explanations/Examples
6.7(D) generate equivalent expressions using the properties of operations: inverse, identity, commutative, associative, and distributive properties	**Concepts:** • Equivalency • Inverse Properties • Identity Properties • Commutative Properties • Associative Properties • Distributive Property **Skill:** • Generate equivalent expressions (numeric or algebraic) **Including but not limited to:** • Determining whether two expressions are equivalent • Applying the distributive property to simplify an expression **Limitations:** • Although students will work with negative integers, they will not work with all negative fractions or decimals. **Vertical Alignment:** In previous grades, students worked with identity, commutative, and distributive properties, but most likely did not refer to them by name. In 6th grade, students are expected to be able to name the properties they are using and use them to determine whether two expressions are equivalent. In Algebra and beyond, students are expected to use the distributive property to rewrite polynomial expressions, and from 6th grade on, students are expected to regularly use the inverse and identity properties to solve equations and inequalities.	**2023 6G STAAR Q4**  **2024 6G STAAR Q31** 

Standards Breakdown		
Standards	**Specificity**	**Notes/Explanations/Examples**
		2024 6G STAAR Q15  2024 – Q15 Which two expressions are equivalent? Select **TWO** correct answers. $\left(5 \cdot \frac{1}{2}p\right) - (2 \cdot 7)$ $\left(\frac{1}{2}p \cdot 5 \cdot 7\right) - 2$ $5\left(\frac{1}{2}p - 2\right) \cdot 7$ $\left(\frac{1}{2}p \cdot 5\right) - (7 \cdot 2)$ $\left(\frac{1}{2}p \cdot 5 - 2\right) \cdot 7$ **2024 6G STAAR Q6**  2024 – Q6 Which expression is **NOT** equivalent to $\frac{1}{2} \cdot (x - 6)$? Ⓐ $\frac{1}{2}x - 6$ Ⓑ $\frac{1}{2}x - \frac{6}{2}$ Ⓒ $\frac{x}{2} - 3$ Ⓓ $\frac{x - 6}{2}$ **2025 6G STAAR Q30**  2025 – Q30 Complete the sentence to make it true. Move the correct answer to each box. Not all answers will be used. $7(x \cdot 1)$ $7 \div x + 1$ $x(7 + 1)$ $\frac{x}{7} + 1$ $\frac{7}{x} + 1$ The expressions ____ and ____ are equivalent.

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
5.4(E) describe the meaning of parentheses and brackets in a numeric expression **5.4(F)** simplify numerical expressions that do not involve exponents, including up to two levels of grouping	**6.7(A)** generate equivalent numerical expressions using order of operations, including whole number exponents, and prime factorization	**A.10(A)** add and subtract polynomials of degree one and degree two. **A.10(B)** multiply polynomials of degree one and degree two.
	6.7(D) generate equivalent expressions using the properties of operations: inverse, identity, commutative, associative, and distributive properties	**A.10(D)** rewrite polynomial expressions of degree one and degree two in equivalent forms using the distributive property
5.4(B) represent and solve multi-step problems involving the four operations with whole numbers using equations with a letter standing for the unknown quantity	**6.10(A)** model and solve one-variable, one-step equations and inequalities that represent problems, including geometric concepts	**7.10(A)** model and solve one-variable, two-step equations and inequalities.
	6.9(B) represent solutions for one-variable, one-step equations and inequalities on number lines	**7.10(B)** represent solutions for one-variable, two-step equations and inequalities on number lines
	6.9(C) write corresponding real-world problems given one-variable, one-step equations or inequalities	**7.10(C)** write corresponding real-world problems given one-variable, two-step equation or inequalities
	6.10(B) determine if the given value(s) make(s) one-variable, one-step equations or inequalities true	**7.11(B)** determine if the given value(s) make(s) one-variable, two-step equations or inequalities true