learning focus:

✓ generate equivalent numerical expressions using order of operations

✓ determine if two expressions are equivalent

✓ apply properties of operations to generate equivalent expressions

EXPRESSIONS UNIT

11 DAY TEKS-ALIGNED UNIT

6th GRADE

EXPRESSIONS UNIT
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EXPRESSIONS PACING GUIDE

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Intro to Expressions	Intro to Exponents	Prime Factorization	Order of Operations
Student Handout 1 Homework 1	Student Handout 2 Homework 2	Student Handout 3 Homework 3	Student Handout 4 Homework 4

DAY 6	DAY 11
Expressions Qui...	Quiz 1

...ONS II

...pend them in the school store. Mrs. ...solving four different tasks below.

TASK 1
Mrs. Bairnsdale receives a random ...plies and then sells some of those ...Practice using integer operations ...by solving the questions below.

18 – 7 =
-6 + (-7) =
-3(-12) =
6 – 15 =
-30 ÷ 5 =

Student Handout 5

EXPRESSIONS

6th GRADE

an 11 day TEKS-aligned unit
TEKS: 6.7A, 6.7B, 6.7C, 6.7D

ready-to-go, scaffolded student materials

EXPRESSIONS UNIT

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EXPRESSIONS

6th GRADE

student friendly + real-world application

use of grade level modeling

Unit: Expressions
Homework 1

Name _____
Date _____ Pd _____

INTRO TO EXPRESSIONS

Use representations A-F to determine if each statement in the table is true or false. Justify your choices.

A | 4x + 2 = 42

B | three plus six equals nine

C | 3 + 6 = 9

D | x x x | 1 1 1 1 1 1

STATEMENT	T
1. Cards A and F are equivalent	
2. Cards D, E, and F are all examples of an expression	
3. Cards D and C are equivalent	
4. Cards A, B, and C are examples of equations	
5. Card E can also be represented by the expression x − 3	

Use your knowledge of expressions to answer

6. Which of the following cannot be written as an equation?

a. x increased by three
b. Seven more than m is 15
c. Three minus five is -2
d. Twelve is half a number

Using cards A-B as an example, use algebra tiles to model the expressions in cards C-D.

A | 3x + 3 | x x x | 1 1 1

B | 2 + x + x + 1 | 1 1 | x x | 1

C | 2x − 3

D | x − 3 + x

a. Which expressions above are equiv...

b. Catherine is asked to write an expre... Catherine write?

1. Kari and Brenden write two algebraic... equivalent. Do you agree or disagree?

2. Four statements are given below. C...

fifty plus tw...

50 + 12...

3. Karmen modeled an expression belo... algebra tiles, but part of her solution w... erased. Find the missing part of her s...

x x | -1 -1 | -1 -1

2x

Summarize today's lesson:

Unit: Expressions
Student Handout 1

Name _____
Date _____ Pd _____

INTRO TO EXPRESSIONS

EXPRESSION	• Verbal statements can be _____ to algebraic expressions. It is similar to deciphering a code or translating from one _____ to another. • An expression is a mathematical phrase that contains _____, _____, and _____. • It does not contain an _____ sign.
EQUATION	• A mathematical statement that shows two expressions are _____. • It _____ contain an equal sign.

Classify each representation below as an expression or equation. Explain your thinking in the last column.

	EXPRESSION OR EQUATION?	EXPLAIN
8(12) − 20		
37 − x = 90		
seventeen minus two		
19 + 4x + 8		
five times ten is fifty		
4(25) = 100		

Label all the parts of the expression below.

4d − 9
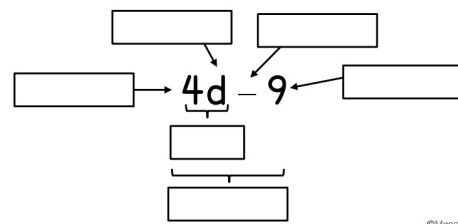
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multiple representations

EXPRESSIONS

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6th GRADE

streamline your planning process with unit overviews

✓ key vocabulary

✓ vertical alignment

sample pacing calendar

teaching ideas

EXPRESSIONS OVERVIEW

TEKS

READINESS

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: inverse, identity, commutative, associative, and distributive properties.

SUPPORTING

6.7B Distinguish between expressions and equations verbally, numerically, and algebraically.

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

BIG IDEAS

- Expressions are mathematical statements
- Expressions can be translate
- Expressions are used in real

ESSENTIAL QUESTION

- What process can you use t
- Why do properties of operat
- Why is there a process for s

EXPRESSIONS PACING GUIDE

TEKS

DAY 1	DAY 2	DAY 3	DAY 4	DAY 5
Intro to Expressions	Intro to Exponents	Prime Factorization	Order of Operations I	Order of Operations II
Student Handout 1 Homework 1	Student Handout 2 Homework 2	Student Handout 3	Student Handout 4	Student Handout 5

DAY 6	DAY 7	
Expressions Quiz	Properties of Operations	
Quiz 1	Student Handout 4 Homework 4	

DAY 11	NOTES
Expressions Unit Test	
Unit Test	

EXPRESSIONS OVERVIEW

TEKS

TOPIC	TEACHING TIPS
Exponent and Expanded Form	• Two common errors students make with exponent and expanded form is mistaking the base for the exponent and multiplying the base times the exponent. • Consider using sticky notes to demonstrate repeated multiplication and expand the number with each sticky note.
Order of Operations	• There are various ways to help students remember the order of operations, from PEMDAS to "please excuse my dear aunt sally." The struggle is when students apply the process they are mistaking the acronym for the process and, thus, multiplying before dividing no matter the location in the problem. • On the board, jot down an order of operations problem with only two different operations. Then, change the operations and have students determine which operation would come first. After success, then add a third operation and have students determine the steps without doing the math. Try and isolate the process and then actually have them simplify the problem.
Prime Factorization	• I have found factor trees to be the most effective way to determine the prime factorization of a number. I loved comparing this to the color wheel. For example, the color purple is made up of red and blue. Each color can be broken down into the three primary colors (red, blue, yellow). Just like colors, all numbers can be broken down into their prime factors. • Teach students that if a number is divisible by 10 (ends in 0), then they can always factor out the 10. It will usually simplify the process and help them from continuing to divide by 2 over and over again.
Properties of Operations	• Properties are a struggle to recall and apply. I would suggest creating a large anchor chart with a three-column table. Include the name of the property and an example of two equivalent expressions. The key concept students should be able to recognize is that each property results in an equivalent expression; the property does not change the problem.

A MANEUVERING THE MIDDLE® RESOURCE

EXPRESSIONS

an 11 day TEKS-aligned unit
TEKS: 6.7A, 6.7B, 6.7C, 6.7D

unit study guide + assessments

✓ **quizzes**

✓ **editable unit test**

Unit: Expressions
Quiz 1

Name _____
Date _____ Pd _____

QUIZ: EXPRESSIONS

Solve each of the problems below. Be sure to show your thinking.

1. What is the value of the expression $6 + 5 \cdot (8 \div 2)^2$?

Answers
1. _____
2. _____
3. _____

2. Which expression is not equivalent t...

A. 6^3
B. $6 \cdot 6 \cdot 6$
C. $8 \cdot 6^2$
D. $3^3 \cdot 8$

3. What is the prime factorization of 84...

5. Which of the following is an expressi...

   I. $8 - 4(12)$
   II. Fifteen is greater than a number
   III. $2x + 5 = 9$
   IV. Half a number is 13

A. I and II only
B. I only
C. I, II, and IV only
D. II and IV only

Unit: Expressions
Review

Name _____
Date _____ Pd _____

EXPRESSIONS UNIT STUDY GUIDE

Solve each of the problems below. These represent the types of questions on your test. Be sure to ask questions if you need more help with a topic.

I CAN GENERATE EQUIVALENT EXPRESSIONS USING WHOLE NUMBER EXPONENTS. 6.7A

1. Write each expression is expanded form

  a. 18^1 _____
  b. q^3 _____
  c. 6^7 _____
  d. 7^6 _____

2. Write each expression in standard form

I CAN GENERATE EQUIVALENT...

3.
$$\frac{(18 - 6) + 4 \cdot 4}{7}$$

4.

6. Which operation is performed in... second step of the problem below?

$$7 \cdot 6 - (18 + 3^2)$$

SIXTH GRADE CURRICULUM

EXPRESSIONS

UNIT SIX: ANSWER KEYS

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answer keys included

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