Unit 4 - Factors, Fractions, and Exponents

Content Area: **Mathematics**
Course(s): **Pre-Algebra 6**
Time Period: **December**
Length: **4 weeks**
Status: **Published**

Transfer

Big Idea: Factors, Fractions, and Exponents

Enduring Understandings

Every number has one unique prime factorization.

Scientific notation is “shorthand” for very small and very large numbers and why that is advantageous.

Numbers, ways of representing numbers, and relationships among numbers, and are means of representing real-world quantities.

Essential Questions

How can I determine the prime factorization for a number?

How can I use factors in solving problems?

How do I use concrete materials and drawings to understand and show understanding of fractions?

Critical Knowledge and Skills

Vocabulary

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Prime number

Composite number

Prime factorization

Factor tree

Monomial

Common factor

Greatest common factor

Relatively prime

Equivalent fractions

Simplest form

Multiple

Common multiple

Scientific notation

LCM

LCD

Learning Objectives

Fluently divide multi-digit numbers

Write the prime factorization of a number

Find the GCF of two or more whole numbers.

Write equivalent fractions.

Find the least common multiple of two numbers

Multiply and divide powers

Work with negative and zero exponents

Write numbers using powers of 10

Write numbers using scientific notation.

Perform operations with numbers written in scientific notation.

Resources

Prior Knowledge

Evaluated powers

Compared and ordered integers

Written and evaluated variable expressions

Standards

MA.6.NS.B	Compute fluently with multi-digit numbers and find common factors and multiples.
MA.6.NS.B.2	Fluently divide multi-digit numbers using the standard algorithm.
MA.6.NS.B.4	Find the greatest common factor of two whole numbers less than or equal to 100 and the least common multiple of two whole numbers less than or equal to 12. Use the distributive property to express a sum of two whole numbers 1–100 with a common factor as a multiple of a sum of two whole numbers with no common factor.
MA.7.EE.A	Use properties of operations to generate equivalent expressions.
MA.7.EE.A.1	Apply properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients.

MA.7.EE.B	Solve real-life and mathematical problems using numerical and algebraic expressions and equations.
MA.7.EE.B.4	Use variables to represent quantities in a real-world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities.
MA.7.NS.A	Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers.
MA.7.NS.A.1	Apply and extend previous understandings of addition and subtraction to add and subtract rational numbers; represent addition and subtraction on a horizontal or vertical number line diagram.
MA.7.NS.A.1c	Understand subtraction of rational numbers as adding the additive inverse, $p - q = p + (-q)$. Show that the distance between two rational numbers on the number line is the absolute value of their difference, and apply this principle in real-world contexts.
MA.7.NS.A.1d	Apply properties of operations as strategies to add and subtract rational numbers.
MA.7.NS.A.2c	Apply properties of operations as strategies to multiply and divide rational numbers.
MA.7.NS.A.2d	Convert a rational number to a decimal using long division; know that the decimal form of a rational number terminates in 0s or eventually repeats.
MA.K-12.8	Look for and express regularity in repeated reasoning.
	Mathematically proficient students notice if calculations are repeated, and look both for general methods and for shortcuts. Upper elementary students might notice when dividing 25 by 11 that they are repeating the same calculations over and over again, and conclude they have a repeating decimal. By paying attention to the calculation of slope as they repeatedly check whether points are on the line through (1, 2) with slope 3, middle school students might abstract the equation $(y - 2)/(x - 1) = 3$. Noticing the regularity in the way terms cancel when expanding $(x - 1)(x + 1)$, $(x - 1)(x^2 + x + 1)$, and $(x - 1)(x^3 + x^2 + x + 1)$ might lead them to the general formula for the sum of a geometric series. As they work to solve a problem, mathematically proficient students maintain oversight of the process, while attending to the details. They continually evaluate the reasonableness of their intermediate results.