Unit 1: Numerical Expressions & Factors

Content Area: **Math**
Course(s):
Time Period: **September**
Length: **4-5 Weeks**
Status: **Published**

Technology and Design Integration

Modifications & Accommodations

- High-achieving students will assist low-achieving students in mixed ability groupings for games and activities.

- High-achieving students can complete sudoku puzzles and logic puzzles as extension activities.
- Limit number/difficulty of problems for low-achieving students to demonstrate mastery.
- Narrow down problem choice to core concepts for low-achieving students.
- Leveled group-based activities, determined by formative assessment.

Unit Overview

In this unit, students learn about the following topics:

- Powers & Exponents

- Order of Operations

- Properties of Operations

- Prime Factorization

- GCF & LCM

Enduring Understandings

SWBAT:

- Write and evaluate expressions involving exponents

- Write and evaluate numerical expressions using the order of operations

- Apply properties of operations to write and evaluate equivalent expressions

- Write a number as the product of prime factors and represent the product using exponents

- Find the greatest common factor of two numbers

- Find the least common multiple of two numbers

Essential Questions

How can we:

- write an evaluate expressions involving exponents?

  - Can we write products of repeated factors as powers?
  - Can we evaluate powers?
  - Do we understand the concepts of squared, cubed, and perfect square?

- write and evaluate numerical expressions using the order of operations?

  - Can we explain why there is a need for a standard order of solving expressions?
  - Can we evaluate numerical expressions involving several operations, exponents, and grouping symbols?
  - Can we write numerical expressions involving exponents to represent a real-life problem?

- apply properties of operations to write and evaluate/simplify equivalent expressions?

  - Can we identify equivalent expressions?
  - Are we able to use properties of operations to rewrite expressions?
  - Can we accurately evaluate expressions?

- write a number as the product of prime factors and represent the product using exponents?

  - Can we find factor pairs of numbers?
  - Are students able to explain meanings of prime and composite numbers?
  - Can students create a factor tree to find the prime factors of a number?
  - Can students write the prime factorization of a number?

- find the greatest common factor of two or more numbers?

  - Can students explain the meaning of factors of a number?
  - Can they use lists of factors to identify the greatest common of them?
  - Can they use factor trees (prime factors) to identify the greatest common of them?

- find the least common multiple of two numbers?

  - Can students explain the meaning of multiples of numbers?
  - Can students use lists of multiples to identify the least common multiple of numbers?
  - Can students use factor trees (prime factors) to identify the least common multiple of numbers?

- use the stacking/ladder method to efficiently find both GCF and LCM?

Integration of 21st Century Themes and Skills

	There is a relationship between an individual's values, emotions, and the ways he/she chooses to spend money.
PFL.9.1.2.FP.1	Explain how emotions influence whether a person spends or saves.
	External factors can influence the items that an individual wants or needs.
PFL.9.1.2.FP.2	Differentiate between financial wants and needs.
PFL.9.1.2.FP.3	Identify the factors that influence people to spend or save (e.g., commercials, family, culture, society).
PFL.9.1.2.PB	Planning and Budgeting
	A budget is a plan that helps an individual obtain his/her financial goals.
PFL.9.1.2.PB.1	Determine various ways to save and places in the local community that help people save and accumulate money over time.
	Saving money is a habit that can be developed.
PFL.9.1.2.PB.2	Explain why an individual would choose to save money.
TECH.9.4.8.TL.1	Construct a spreadsheet in order to analyze multiple data sets, identify relationships, and facilitate data-based decision-making.
TECH.9.4.8.TL.3	Select appropriate tools to organize and present information digitally.

Technology and Design Integration

CS.6-8.8.1.8.CS.4	Systematically apply troubleshooting strategies to identify and resolve hardware and software problems in computing systems.
CS.6-8.8.1.8.DA.1	Organize and transform data collected using computational tools to make it usable for a specific purpose.
CS.6-8.8.1.8.DA.5	Test, analyze, and refine computational models.
CS.6-8.8.1.8.IC.1	Compare the trade-offs associated with computing technologies that affect individual's everyday activities and career options.
CS.6-8.8.2.8.ITH.1	Explain how the development and use of technology influences economic, political, social, and cultural issues.
CS.6-8.8.2.8.ITH.2	Compare how technologies have influenced society over time.
CS.6-8.DA	Data & Analysis
	Computer models can be used to simulate events, examine theories and inferences, or make predictions.
	People use digital devices and tools to automate the collection, use, and transformation of data. The manner in which data is collected and transformed is influenced by the type of digital device(s) available and the intended use of the data.

Advancements in computing technology can change individuals' behaviors. Society is faced with trade-offs due to the increasing globalization and automation that computing brings.

Troubleshooting a problem is more effective when knowledge of the specific device along with a systematic process is used to identify the source of a problem.

Interdisciplinary Connections

LA.RI.6.4	Determine the meaning of words and phrases as they are used in a text, including figurative, connotative, and technical meanings.
LA.RI.6.10	By the end of the year read and comprehend literary nonfiction at grade level text-complexity or above, with scaffolding as needed.
LA.W.6.1	Write arguments to support claims with clear reasons and relevant evidence.

Instructional Strategies & Learning Activities

- Guided Practice

- Do Now

- Extra Practice & Puzzle Time (Resources)

- Scavenger Hunts

- Coloring Activities

- Task Cards (Around the World)

- Maze Activities

- Quizizz Online Assignments

- Kahoot! Online Games

- GimKit Online Games

Differentiation

- Understand that gifted students, just like all students, come to school to learn and be challenged.
- Pre-assess your students. Find out their areas of strength as well as those areas you may need to address before students move on.
- Consider grouping gifted students together for at least part of the school day.
- Plan for differentiation. Consider pre-assessments, extension activities, and compacting the curriculum.
- Use phrases like "You've shown you don't need more practice" or "You need more practice" instead of words like "qualify" or "eligible" when referring to extension work.
- Encourage high-ability students to take on challenges. Because they're often used to getting good grades, gifted students may be risk averse.

- **Definitions of Differentiation Components**:

    o Content – the specific information that is to be taught in the lesson/unit/course of instruction.
    o Process – how the student will acquire the content information.
    o Product – how the student will demonstrate understanding of the content.
    o Learning Environment – the environment where learning is taking place including physical location and/or student grouping

    Differentiation occurring in this unit:

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    o Challenges will be presented to students as the need arises.

       Struggling students will get additional personalized instruction, and modifications as needed.

Benchmark Assessments

Benchmark Assessments are given periodically (e.g., at the end of every trimester or as frequently as once per month) throughout a school year to establish baseline achievement data and measure progress toward a standard or set of academic standards and goals.

Schoolwide Benchmark assessments:

IXL benchmarks 2X a year

Linkit Benchmarks 3X a year

End of year testing (NJSLA)

Formative Assessments

Assessment allows both instructor and student to monitor progress towards achieving learning objectives, and can be approached in a variety of ways. **Formative assessment** refers to tools that identify misconceptions, struggles, and learning gaps along the way and assess how to close those gaps. It includes effective tools for helping to shape learning, and can even bolster students' abilities to take ownership of their learning when they understand that the goal is to improve learning, not apply final marks (Trumbull and Lash, 2013). It can include students assessing themselves, peers, or even the instructor, through writing, quizzes, conversation, and more. In short, formative assessment occurs throughout a class or course, and seeks to improve student achievement of learning objectives through approaches that can support specific student needs (Theal and Franklin, 2010, p. 151).

Formative Assessments used in this unit:

- Kahoot! Games
- Quizizz Games
- Homework
- Q & A
- Scavenger Hunts
- Coloring Activities
- Task Cards
- Partner Activities

Summative Assessments

Summative assessments evaluate student learning, knowledge, proficiency, or success at the conclusion of an instructional period, like a unit, course, or program. Summative assessments are almost always formally graded and often heavily weighted (though they do not need to be). Summative assessment can be used to great effect in conjunction and alignment with formative assessment, and instructors can consider a variety of ways to combine these approaches.

Summative assessments for this unit:

- Chapter Tests
- Quizzes

Instructional Materials

1. Math & You: 6th Grade Edition
2. Quizizz
3. Kahoot
4. Scavenger Hunts
5. Task Cards
6. Coloring Activities

Standards

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.6.EE.A.1	Write and evaluate numerical expressions involving whole-number exponents.