Unit # 1: Operation on Whole Numbers

Content Area: **Mathematics**
Course(s):
Time Period: **September**
Length: **12 days**
Status: **Published**

Unit Overview

Students will effectively apply addition, subtraction, multiplication, and division to solve complex mathematical problems. Students will demonstrate the "estimate, calculate, check" problem-solving approach.

Enduring Understandings

Write whole numbers in words.

Write, in numerical form, whole numbers that are spoken or written in words.

Round Whole numbers.

Add Whole numbers.

Subtract Whole numbers.

Multiply Whole numbers.

Divide Whole numbers.

Solve practical applications involving whole numbers

Determine factors and prime numbers.

Use the correct order of operations.

- Operations with whole numbers are life skills needed no matter how much access we have to various technology.
- Order of operations must always be applied when simplifying any mathematical expression.
- Rounding and estimation of whole numbers is a skill every consumer should be able to perform.

Essential Questions

- How can I identify the relevant information and operations needed to solve a trade-related problem?
- How can I use addition, subtraction, multiplication, and division to solve real-world problems in my trade?
- How will the skills of rounding and estimating whole numbers help me in everyday life ?

- What are the simplest and most accurate methods to use when performing numerical operations with whole numbers?
- What is it necessary to use order of operations when simplifying an expression?

Lesson Titles:

- Addition of Whole Numbers
- Division of Whole Numbers
- Multiplication of Whole Numbers
- Order of Operations
- Rounding, Estimating, and Ordering Whole Numbers
- Subtraction of whole Numbers

Career Readiness, Life Literacies & Key Skills

WRK.K-12.P.4	Demonstrate creativity and innovation.
WRK.K-12.P.5	Utilize critical thinking to make sense of problems and persevere in solving them.

Inter-Disciplinary Connections

LA.RH.11-12.4	Determine the meaning of words and phrases as they are used in a text, including analyzing how an author uses and refines the meaning of a key term over the course of a text (e.g., how Madison defines faction in Federalist No. 10).
LA.RI.11-12.7	Integrate and evaluate multiple sources of information presented in different media or formats (e.g., visually, quantitatively) as well as in words in order to address a question or solve a problem.
LA.WHST.11-12.2.E	Provide a concluding paragraph or section that supports the argument presented.
LA.L.11-12.6	Acquire and use accurately general academic and domain-specific words and phrases, sufficient for reading, writing, speaking, and listening at the college and career readiness level; demonstrate independence in gathering vocabulary knowledge when considering a word or phrase important to comprehension or expression.

Instructional Strategies, Learning Activities, and Blooms/DOK:

- Problems with real life applications will be covered with each concept in this unit.
- Review, examples, and practice with addition of whole numbers.
- Review, examples, and practice with division of whole numbers.
- Review, examples, and practice with exponential notation and the order of operations with whole numbers.
- Review, examples, and practice with multiplication of whole numbers.
- Review, examples, and practice with rounding, estimating, and ordering whole numbers.
- Review, examples, and practice with subtraction of whole numbers.

- Review, examples, and practice with the decimal place-value system
- Tutoring during Delsea One

Modifications

ELL Modifications

- Use manipulatives where possible
- Assess ELL students continuously using formative assessment methods
- Tap prior knowledge
- Use real objects when possible

IEP & 504 Modifications

- Allowing student to correct mistakes or answer wrong questions correctly for additional credit if failed the first test (another way to re-teach material)
- Allowing student to take notes in class for reinforcement but also providing a copy of completed/correct notes to study from
- Less questions per page (so not visually overwhelming)
- Providing study guides that don't lead the student to study too much extraneous information (less unnecessary details)/scaffolded study guides

G & T Modifications

- Additional reinforcement activities soliciting a deeper understanding of curriculum.
- Different test items.
- Peer leadership or mentoring.
- Provide additional rigorous challenge problems for advanced students

At Risk Modifications

- Additional help during tutoring/Delsea One/Academic Enrichment
- Guided notes
- Hands-on Instruction
- Modeling and showing lots of examples
- Review, restate, reword directions
- Study guides
- Tutoring during Delsea One

- Visuals

Equity Considerations

Asian American and Pacific Islander Mandate

Students will engage in different AAPI mathematicians that have contributed to mathematical processes and developments.

https://www.ngpf.org/blog/math/math-monday-celebrating-aapi-mathematicians/

https://ideas.ted.com/8-asian-americans-and-pacific-islanders-whose-innovations-have-changed-your-life-really/

LGBTQ and Disabilities Mandate

STEM

LGBTQ:

Sir Francis Bacon (1561–1626)

Florence NightingaleFrancis Bacon | Philosophy, Scientific Method, & Facts | Britannica(1820-1910)

George Washington Carver (1861-1943)

Sara Josephine Baker (1873-1945)

Alan Turing (1912-1954)

Allan Cox (1926-1987)

Sally Ride (1951-2012)

Ben Barres (1954-2017)

Ruth Gates (1962-2018)

Tim Cook (1960)

Disabilities:

Leonardo da Vinci (1452-1519)- Dyslexia

Isaac Newton (1664-1727)- Epilepsy

Thomas Edison (1847-1931)- Hearing

Charles Darwin (1809-1882)- Stutter, Dyslexia

Alexander Graham Bell (1847-1922)- Deaf

Albert Einstein (1879-1955)- Aspergers

Florence B. Seibert (1897-1991)- Mobility

Stephen Hawking (1942-2019)- ALS

John Forbes Nash (1928-2015)- Schizophrenia

Temple Grandin (1947)- Autism

Climate Change

Connection to math and STEM processes: Students will be able to build on previously taught science material particularly carbon footprints in regards to the mathematically processes centered around it.

https://teachers-climate-guide.fi/mathematics/#:~:text=Climate%20Change%20and%20Mathematics,contributing%20to%20the%20climate%20debate.

SCI.HS-ESS2-1	Develop a model to illustrate how Earth's internal and surface processes operate at different spatial and temporal scales to form continental and ocean-floor features.

Formative Assessment

- Begin the homework assignment and periodically check answers together
- Class discussions
- Graded classwork
- Graded homework
- Guided practice

- Individual practice
- Oral questioning
- Oral response
- Teacher observation
- Warm up - "Check Yourself" problems on Adding and Subtracting Whole Numbers
- Warm up - "Check Yourself" problems on Decimal Place Value
- Warm up - "Check Yourself" problems on Dividing by Zero and Dividing into Zero
- Warm up - "Check Yourself" problems on Estimating Quotients of Word Problems
- Warm up - "Check Yourself" problems on Evaluating expressions Using Oder of Operations
- Warm up - "Check Yourself" problems on Evaluating numbers raised to powers (including the zero power)
- Warm up - "Check Yourself" problems on Finding the Area of Irregular Polygons
- Warm up - "Check Yourself" problems on Finding the Perimeter of Various Polygons
- Warm up - "Check Yourself" problems on Interpreting Word Problems and applying the appropriate operations
- Warm up - "Check Yourself" problems on Multiplying and Dividing whole Numbers
- Warm up - "Check Yourself" problems on Rounding Whole Numbers and estimating Sums
- Warm up - Accuplacer practice problem
- Written work

Alternate Assessments

Performance tasks

Project-based assignments

Problem-based assignments

Presentations

Benchmark Assessment

Skills-based assessment- math practice

Summative Assessment

- Unit Test on Operations with Whole Numbers

- Accuplacer Practice Test
- Accuplacer Test
- Quiz on basic operation with whole numbers

Resources & Materials

- Computer Generated Warm Ups
- Internet worksheets (see formative assessment section for specific topics)
- Teacher made worksheets (see formative assessment section for specific topics)
- Text: Basic Mathematical Skills with Geometry (2008)
- Warm up problems (see formative assessment section)

Technology

- Chrome book
- Internet Sources: http://accuplacer.collegeboard.org/students
- Math XL
- Smart Board

TECH.8.1.12.C	Communication and Collaboration: Students use digital media and environments to communicate and work collaboratively, including at a distance, to support individual learning and contribute to the learning of others.
TECH.8.1.12.D.CS2	Demonstrate personal responsibility for lifelong learning.