3 Math Unit 10: Use Properties and Strategies to Multiply and Divide

Content Area: **Mathematics**
Course(s):
Time Period: **Marking Period 3**
Length: **10 Days**
Status: **Published**

Unit Overview

Multiplication Patterns and Two-Step Word Problems

As students progress through this unit, they use their previous knowledge of patterns to lay the foundation for their work with identifying multiplication patterns. Students learn about how place value, patterns, and properties can be used to help multiply. Students discover that when multiplying with three or more factors, they can group the factors in any order and the product will be the same.

Students can use previously-learned place-value concepts to help them multiply larger numbers. Students write an equation to determine the number of cards there are in an album: 8 cards per page x 60 pages = ? Because 60 is a multiple of 10 and 8 x 6 = 48 is a basic fact, students are encouraged to think about the problem as 8 x 6 tens. Students place a zero in the ones column as a placeholder and shift the other numbers left to get the product of 480.

Students discover how to solve two-step word problems involving multiplication and division, using representations and equations to solve the problem. Then they progress to solving two-step word problems that involve any of the four operations. Students solve one equation at a time and use a letter to represent the unknown in each equation, even when the problem includes more that just multiplication and division.

Finally, students determine whether an answer is reasonable. They learn that mental math and estimation strategies can be used to find an approximate answer. If the given answer is close to their approximation, then the answer is reasonable.

What Students Are Learning

- Students multiply one-digit numbers by multiples of 10 using strategies based on place value and properties of operations.
- Students identify patterns in the multiplication fact table and explain them using properties of multiplication.
- Students solve two-step word problems involving the four operations and assess the reasonableness of the solution.

Number Routines

- About How Much?
- Greater Than or Less Than
- Which Doesn't Belong?
- Is It Always True?
- Notice & Wonder
- Numberless Word Problem

Standards

3.OA.B.5	Apply properties of operations as strategies to multiply and divide.
3.OA.D.8	Solve two-step word problems, including problems involving money, using the four operations. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.
3.OA.D.9	Identify arithmetic patterns (including patterns in the addition table or multiplication table) and explain them using properties of operations.
MA.3.NBT.A.3	Multiply one-digit whole numbers by multiples of 10 in the range 10–90 (e.g., 9 × 80, 5 × 60) using strategies based on place value and properties of operations.

Materials

Core Materials:

Reveal Math

10.1 Patterns with Multiples of 10

10.2 More Multiplication Patterns

10.3 Understand the Associative Property

10.4 Two-Step Problems Involving Multiplication and Division

10.5 Solve Two-Step Problems

10.6 Explain the Reasonableness of a Solution

Supplemental Materials:

- ST Math
- Happy Numbers
- 3 Act Lessons
- Building Fact Fluency Kit
- Brainingcamp Manipulatives
- Nearpod Lessons
- Brainpop Resources
- Online Resources

Technology

DA	Data & Analysis
	Data can be organized, displayed, and presented to highlight relationships.
8.1.5.DA.1	Collect, organize, and display data in order to highlight relationships or support a claim.
	Individuals can select, organize, and transform data into different visual representations and communicate insights gained from the data.

8.1.5.DA.3	Organize and present collected data visually to communicate insights gained from different views of the data.
8.1.5.DA.4	Organize and present climate change data visually to highlight relationships or support a claim.
8.2.5.ED.2	Collaborate with peers to collect information, brainstorm to solve a problem, and evaluate all possible solutions to provide the best results with supporting sketches or models.
8.2.5.ED.3	Follow step by step directions to assemble a product or solve a problem, using appropriate tools to accomplish the task.

Assessment

Formative Assessment

- Unit Readiness Diagnostics
- Lesson Checks
- Exit Tickets
- Teacher Observation

Summative Assessment

- Unit Assessment Performance Task
- Benchmark Tests
- Alternative Assessments: Performance Tasks & Projects

Accommodations & Modifications

Special Education

Differentiated Instruction			
Accommodate Based on Students Individual Needs: Strategies			
Time/General • Extra time for assigned tasks • Adjust length of assignment • Timeline with due dates for reports and projects • Communication system between home and school • Provide lecture	**Processing** • Extra response time • Have students verbalize steps • Repeat, clarify, or reword directions • Mini-breaks between tasks • Provide a warning for transitions	**Comprehension** • Precise step-by-step directions • Short manageable tasks • Brief and concrete directions • Provide	**Recall** • Teacher-made checklist • Use visual graphic organizers • Reference resources to promote independence

notes/outline	• Reading partners	immediate feedback • Small group instruction • Emphasize multi-sensory learning	• Visual and verbal reminders • Graphic organizers
Assistive Technology • Computer/whiteboard • Tape recorder • Spell-checker • Audio-taped books	**Tests/Quizzes/Grading** • Extended time • Study guides • Focused/chunked tests • Read directions aloud	**Behavior/Attention** • Consistent daily structured routine • Simple and clear classroom rules • Frequent feedback	**Organization** • Individual daily planner • Display a written agenda • Note-taking assistance • Color code materials

504

- In class/pull out support with special ed teacher Additional time during intervention time
- Preferred seating
- Questions read aloud
- Extended time for completing tasks Graphic organizers
- Vocabulary support Mnemonic devices
- Songs/videos to reinforce concepts Limit number of questions
- Scribe Manipulatives Calculators Reteach pages Leveled homework
- Lesson intervention activities
- Math Diagnosis & Intervention System Another look homework video
- Practice buddy

ELL

- Translation device/dictionary
- In class/pull out support with ESL teacher
- Preferred seating
- Questions read aloud
- Extended time for completing tasks
- Graphic organizers
- Vocabulary support
- Mnemonic devices
- Songs/videos to reinforce concepts
- Manipulatives

- Math Diagnosis & Intervention System

At-risk of Failure

- Additional time during intervention time
- Questions read aloud
- Graphic organizers
- Vocabulary support
- Mnemonic devices
- Songs/videos to reinforce concepts
- Manipulatives
- Calculators
- Reteach pages
- Leveled homework
- Lesson intervention activities
- Math Diagnosis & Intervention System
- Another look homework video
- Practice buddy

Gifted & Talented

- Independent projects
- Enrichment pages
- Online games
- Leveled Homework
- Extension Activities
- Today's Challenge

Interdisciplinary Connections

Climate Change:

- Climate Change Example: Students may solve multiplication and division word problems involving measurement quantities related to glacier retreat.
- Climate Change Example: Students may use the four operations to solve two-step word problems related to glacier retreat.

3-5-ETS1-2	Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.
RL.CR.3.1	Ask and answer questions and make relevant connections to demonstrate understanding of a literary text, referring explicitly to textual evidence as the basis for the answers.
RL.TS.3.4	Utilize and reference features of a text when writing or speaking about a text, referring to parts of stories, dramas, and poems, using terms such as chapter, scene, and stanza; describe how each successive part builds on earlier sections.
W.IW.3.2	Write informative/explanatory texts to examine a topic and convey ideas and information

	clearly.
3-ESS2-1	Represent data in tables and graphical displays to describe typical weather conditions expected during a particular season.

Career Readiness, Life Literacies & Key Skills

9.2.5.CAP.3	Identify qualifications needed to pursue traditional and non-traditional careers and occupations.
9.2.5.CAP.4	Explain the reasons why some jobs and careers require specific training, skills, and certification (e.g., life guards, child care, medicine, education) and examples of these requirements.
	The ability to solve problems effectively begins with gathering data, seeking resources, and applying critical thinking skills.
9.4.5.CT.1	Identify and gather relevant data that will aid in the problem-solving process (e.g., 2.1.5.EH.4, 4-ESS3-1, 6.3.5.CivicsPD.2).
9.4.5.CT.3	Describe how digital tools and technology may be used to solve problems.
9.4.5.CT.4	Apply critical thinking and problem-solving strategies to different types of problems such as personal, academic, community and global (e.g., 6.1.5.CivicsCM.3).
9.1.5.FI	Financial Institutions
	People can choose to save money in many places such as home in a piggy bank, bank, or credit union.
9.1.5.FI.1	Identify various types of financial institutions and the services they offer including banks, credit unions, and credit card companies.
	There are specific steps associated with creating a budget.
9.1.5.PB.1	Develop a personal budget and explain how it reflects spending, saving, and charitable contributions.

Career Ready Practices

STEM in Action

STEM Career: Ocean Engineer: Hiro talks about the work of ocean engineers.

Hiro Tracks Sea Turtles: Students see how Hiro uses multiplication and division to help identify how far sea turtles travel.

- CRP1. Act as a responsible and contributing citizen and employee.
- CRP2. Apply appropriate academic and technical skills.
- CRP4. Communicate clearly and effectively and with reason.
- CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.
- CRP12. Work productively in teams while using cultural global competence.