Grade 4 Math Curriculum

Content Area: **Mathematics**
Course(s): **Math**
Time Period: **Full Year**
Length: **School Year**
Status: **Published**

Title Page

Grade 4 Mathematics

Required

Samsel Upper Elementary School

Full Year

Grade 4 Math Statement of Purpose

Content Area: **Mathematics**
Course(s): **Math**
Time Period: **Full Year**
Length: **School Year**
Status: **Published**

Summary of Course

Learning mathematics is a developing process in which work in the intermediate grades provides the building blocks for future success in math. Students will continue to build upon their prior knowledge while becoming familiar with new concepts. Throughout fourth grade, students will focus on concepts related to place value, multi-digit multiplication/division, problem solving involving the use of the four operations, factors & multiples, fractions & decimals, representing & interpreting data, patterns, angles, and measurement.

Throughout each lesson, students will engage in Problem-Based Learning, where they must think critically about a real-world math problem, evaluate options, collaborate, and present solutions. Additionally, students will engage in visual learning to solidify the underlying math concepts so that they can combine reasoning and critical thinking strategies, along with their knowledge of concepts, in order to problem solve both individually and cooperatively with others going forward.

The goal of fourth grade mathematics is to engage the learner and spark an interest in mathematics that will carry through to higher-grade levels. This can be achieved by using a variety of techniques including hands-on activities, projects, cooperative problem solving and games. It is important for learners at this level to see the relevancy of mathematics to everyday life and teaching strategies should make this connection as often as possible.

Students at this level are emerging as independent thinkers and problem-solvers and should be given the opportunity to express their knowledge and skills as they relate to various mathematical practices, including, making sense of problems and persevering in solving them, reasoning abstractly and quantitatively, constructing viable arguments and critiquing the reasoning of others, modeling with mathematics, using appropriate tools strategically, attending to precision, looking for and making use of structure, and expressing regularity in repeated reasoning. With the exposure to the practicality of math in everyday life through a variety of teaching strategies, it is the hope of the educator to build a sound foundation and a propensity toward mathematics.

In order to demonstrate a cohesive and complete implementation plan the following general suggestions are provided:

- The use of various formative assessments are encouraged in order to provide an ongoing method of determining the current level of understanding the students have of the material presented.
- Homework, when assigned should be relevant and reflective of the current teaching taking place in the classroom.
- Organizational strategies should be in place that allow the students the ability to take the information gained in the classroom and put in in terms that are relevant to them.
- Instruction should be differentiated to allow students the best opportunity to learn.
- Assessments should be varied and assess topics of instruction delivered in class.
- Modifications to the curriculum should be included that address students with Individualized Educational Plans (IEP), English Language Learners (ELL), and those requiring other modifications (504 plans).

Grade 4 Math Table of Contents

Content Area: **Mathematics**
Course(s): **Math**
Time Period: **Full Year**
Length: **School Year**
Status: **Published**

Table of Contents

Topic 01: Generalize Place Value Understanding

Content Area: **Mathematics**
Course(s): **Math**
Time Period: **1st Trimester**
Length: **5 Days**
Status: **Published**

Summary of the Unit

Topic 1 focuses on generalizing place value understanding. This topic extends understanding of place value from 1,000 to 1,000,000 through the introduction of period names, along with reading and writing multi-digit whole numbers using base-ten numerals, number names, and expanded form. Relationships between the values of digits in different places are developed and used to compare and round numbers.

Enduring Understandings

- Our number system is based on groups of ten. Whenever we get 10 in one place value, we move to the next greater place value.

- In a multi-digit whole number, a digit in one place represents ten times what it would represent in the place immediately to its right.

- Place value can be used to compare numbers.

- Rounding whole numbers is a process for finding the multiple of 10, 100, and so on closest to a given number.

- Good math thinkers use math to explain why they are right. They can talk about the math that others do, too.

Essential Questions

- How are greater numbers written?

- How can whole numbers be compared?

- How are place values related?

Summative Assessment and/or Summative Criteria

- Topic Test

- Performance Task

Resources

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enVision math series https://www.savvas.com/solutions/mathematics/core-programs/envision-mathematics-grades-k-5

ST Math is a visual instructional program that builds a deep conceptual understanding of math through rigorous learning and creative problem solving to engage, motivate and challenge PreK-8 students toward higher achievement. https://www.stmath.com/

IXL online learning, offering unlimited algorithmically generated questions, real-time analytical reports, and dynamic scoring to encourage mastery. https://www.ixl.com/

Discovery Education https://google.discoveryeducation.com/

National Council of Teachers of Mathematics - This website contains activities and lessons, and virtual manipulatives organized by strand. http://illuminations.nctm.org

The National Library of Virtual Manipulatives has tutorials and virtual manipulatives for the classroom. http://nlvm.usu.edu/en/nav/index.html

The Teaching Channel has two hundred math videos for professional development. http://www.theteachingchannel.org

K-5 Math Teaching Resources site contains free math teaching resources, games, activities, journal tasksand resources for centers arranged by grade level and standard. http://www.k-5mathteachingresources.com

Open Middle- This website contains 36 math reasoning scenarios arranged by CCSS. http://www.openmiddle.com/

Which One Doesn't Belong- This is a website dedicated to providing thought-provoking puzzles for math teachers and students alike. There are no answers provided as there are many different, correct ways of choosing which one doesn't belong. http://wodb.ca/

Estimation 180- This website contains hundreds of estimation challenges relative to real-world scenarios to assist in building strong connections with number sense and the real world. http://www.estimation180.com/

Unit Plan

Topic/Selection Timeframe	General Objectives	Instructional Activities	Benchmarks/Assessments	Standards
Numbers Through One Million

(1 Day) | Read and write numbers through one million in expanded form, with numerals, and using number names. | **Problem Based Learning:** Solve and share: *Students connect to their previous understanding of finding the value of a collection of $100 bills, to understand how the value of a digit is related to its place value.* (Students might draw a picture or write an equation to write problem.)

Visual Learning: Visual Learning Bridge- *What are some ways to write numbers to one million?* | Guided Practice

Independent Practice

Problem solving

Practice Buddy

Reteach

Build Mathematical Literacy

Enrichment | 4.NBT.A.2,

MP.K-12.2,

MP.K-12.7 |

| | | Convince Me! - *Look for Relationships: What pattern exists in the three places in each period?*

Guided Practice / Differentiated Instruction / Centers:

Teacher Led: <u>Intervention</u>: *Reteach to Build Understanding*

<u>On Level</u>: *Build Mathematical Literacy*

<u>Advanced</u>: *Enrichment*

Technology: Practice Buddy (PearsonRealize.com)

Independent: Independent Practice and Problem Solving

Additional Activities:

Math Games (PearsonRealize.com)

Visual Learning Animation Plus:

(PearsonRealize.com)

Additional Practice

Math Anytime: Daily Review and

Today's Challenge

Optional Activities: Students use place value charts (Teaching tool 3) to represent numbers in various ways including standard form, expanded form, and word form.

Closure: Lesson Self-Assessment: PearsonRealize.com | Additional Practice

Quick Check 1-1 | |
|---|---|---|---|---|
| Place Value Relationships

(1 Day) | Recognize the relationship between adjacent digits in a multi-digit number. | **Problem Based Learning:** <u>Solve and share</u>: *Students use place value to analyze the relationships between 1,10, and 100. (Students might discuss the relationships between each base-ten block being ten times more.)* | Guided Practice

Independent Practice

Problem solving

Practice Buddy

Reteach | 4.NBT.A.1,

MP.K-12.2,

MP.K-12.3,

MP.K- |

		Visual Learning: Visual Learning Bridge- *How are place values related to each other?*	Build Mathematical Literacy	12.8,
		Convince Me! -*Generalize: Use place value blocks to model 1 and 10, 10 and 100, 100 and 1,000. What do you see?*	Enrichment	
		Guided Practice / Differentiated Instruction / Centers:	Additional Practice	
		Teacher Led: Intervention: *Reteach to Build Understanding*	Quick Check 1-2	
		On Level: *Build Mathematical Literacy*		
		Advanced: *Enrichment*		
		Technology: Practice Buddy (PearsonRealize.com)		
		Independent: Independent Practice and Problem Solving		
		Additional Activities:		
		Math Games (PearsonRealize.com)		
		Visual Learning Animation Plus:		
		(PearsonRealize.com)		
		Additional Practice		
		Math Anytime: Daily Review and		
		Today's Challenge		
		Optional Activities: Students use base-ten blocks and place value charts (Teaching tool 3) to model and represent that the same digits next to each other in a multi-digit number are ten times more.		
		Closure: Lesson Self-Assessment: PearsonRealize.com		
Compare Whole Numbers	Use place value to compare multi-digit	**Problem Based Learning:** Solve and share: *Students use their knowledge of place value to compare ocean depths to the*	Guided Practice Independent Practice	4.NBT.A.2, MP.K-12.1,

	whole numbers.	*depth of a submarine. Students should be provided with Teaching Tool 3 to assist in solving.*	Problem solving	MP.K-12.2,
(1 Day)			Practice Buddy	MP.K-12.4,
		Visual Learning: Visual Learning Bridge- *How do you compare numbers?*	Reteach	
			Build Mathematical Literacy	
		Convince Me! -*Reasoning: Students use their knowledge of a place value to compare 4-digit numbers to 3-digit numbers.*	Enrichment	
			Additional Practice	
		Guided Practice / Differentiated Instruction / Centers:	Quick Check 1-3	
		Teacher Led: Intervention: *Reteach to Build Understanding*		
		On Level: *Build Mathematical Literacy*		
		Advanced: *Enrichment*		
		Technology: Practice Buddy (PearsonRealize.com)		
		Independent: Independent Practice and Problem Solving		
		Additional Activities:		
		Math Games (PearsonRealize.com)		
		Visual Learning Animation Plus:		
		(PearsonRealize.com)		
		Additional Practice		
		Math Anytime: Daily Review and		
		Today's Challenge		
		Optional Activities: Students use number flashcards cards to create inequalities.		
		Project-Based Learning: EnVision Stem Project: Cave Depths: Students will research the depths of the five deepest caves in the world and write these numbers using base-		

		ten, expanded form and inequality statements to compare and contrast. **Closure:** Lesson Self-Assessment: PearsonRealize.com		
Round Whole Numbers (1 Day)	Use place value to round multi-digit numbers.	**Problem Based Learning:** Solve and share: *Students use number sense and prior knowledge of rounding to list numbers that round to 300. Teaching tool 12 may be provided.)* **Visual Learning:** Visual Learning Bridge- *How can round numbers?* Convince Me! -*Critique Reasoning- Students use their knowledge of place value to explain how rounding the numbers to a different place value affects the answer.* **Guided Practice / Differentiated Instruction / Centers:** **Teacher Led:** Intervention: *Reteach to Build Understanding* On Level: *Build Mathematical Literacy* Advanced: *Enrichment* **Technology:** Practice Buddy (PearsonRealize.com) **Independent:** Independent Practice and Problem Solving **Additional Activities:** Math Games (PearsonRealize.com) Visual Learning Animation Plus: (PearsonRealize.com) Additional Practice Math Anytime: Daily Review and Today's Challenge	Guided Practice Independent Practice Problem solving Practice Buddy Reteach Build Mathematical Literacy Enrichment Additional Practice Quick Check 1-4	4.NBT.A.3, 4.MP.K-12.2, 4.MP.K-12.3, 4.MP.K-12.5

		Optional Activities: Students use base-ten blocks and place value charts (Teaching tool 3) to model and represent that the same digits next to each other in a multi-digit number are ten times more. **Closure:** Lesson Self-Assessment: PearsonRealize.com		
Problem Solving: Construct Arguments (1 Day)	Use previously learned concepts and skills to construct arguments about place value.	**Problem Based Learning:** Solve and share: *Students extend their understanding of place value by solving a problem relating land areas and constructing and argument to support their answers.* **Visual Learning:** Visual Learning Bridge- *How can you construct arguments?* Convince Me! *-Construct Arguments- Students will construct a math argument to support a conjecture.* **Guided Practice / Differentiated Instruction / Centers:** **Teacher Led:** Intervention: *Reteach to Build Understanding* On Level: *Build Mathematical Literacy* Advanced: *Enrichment* **Technology:** Practice buddy (PearsonRealize.com) **Independent:** Independent Practice and Problem Solving **Additional Activities:** Math Games (PearsonRealize.com) Visual Learning Animation Plus: (PearsonRealize.com) Additional Practice	Guided Practice Independent Practice Problem solving Practice Buddy Reteach Build Mathematical Literacy Enrichment Additional Practice Quick Check 1-5	4.NBT.A.1, 4.NBT.A.2, 4.NBT.A.3, 4.MP.K-12.1, 4.MP.K-12.2, 4.MP.K-12.3, 4.MP.K-12.6

		Math Anytime: Daily Review and Today's Challenge		
		Optional Activities: Build Mathematical Literacy Mat- "Big Zero"		
		Closure: Lesson Self-Assessment: PearsonRealize.com		

MATH.K-12.1	Make sense of problems and persevere in solving them
MATH.K-12.2	Reason abstractly and quantitatively
MATH.K-12.3	Construct viable arguments and critique the reasoning of others
MATH.K-12.4	Model with mathematics
MATH.K-12.5	Use appropriate tools strategically
MATH.K-12.6	Attend to precision
MATH.K-12.7	Look for and make use of structure
MATH.4.NBT.A.1	Recognize that in a multi-digit whole number, a digit in one place represents ten times what it represents in the place to its right.
MATH.K-12.8	Look for and express regularity in repeated reasoning
MATH.4.NBT.A.2	Read and write multi-digit whole numbers using base-ten numerals, number names, and expanded form. Compare two multi-digit numbers based on meanings of the digits in each place, using >, =, and < symbols to record the results of comparisons.
MATH.4.NBT.A.3	Use place value understanding to round multi-digit whole numbers to any place.

Suggested Modifications for Special Education, ELL and Gifted Students

Gifted Students

- If students have a strong understanding of place value through the millions, challenge them to extend the place-value chart and to write numbers in the millions, billions and trillions.

- Have pairs of students play a mystery number game. Have each partner write a write a series of clues describing a number. Example, the digit in the ten-thousands place is half of the digit in the thousands place. The digit in the thousands place is even, the digit in the ones place is equal to 3x2. Swap clues and try to correctly name one another's numbers.

Special Education Students

- Fluency review Activity

- Vocabulary Review

- Model various numbers on a hundredths grid or use base ten blocks to demonstrate whole number place value.

- To reinforce place-value meaning and understanding have students participate in teacher made hands-on centers or whole group activities such as place value concentration. Students match the place-value name to the corresponding number.

- Write up to a 5-digit number on index cards. Provide each student with one card. Have the students read the number on their card aloud and then students should line up in order of their cards from least to greatest.

English Language Learners

- Topic Vocabulary

- Visual Learning Bridge: Reading

- Solve & Share: Speaking

Suggested Technological Innovations/Use

- IXL

- ST Math

- Kahoot!

- Tools (Envision 2020)

- Game Center (Envision 2020)

- Create/Complete a Discovery Education Board

Cross Curricular/21st Century Connections

- Pick a Project Activity

- Envision Stem Project

- Problem Solving Reading Activity

- 3 ACT MATH Activity: Page Through

Topic 02: Fluently Add and Subtract Multi-Digit Whole Numbers

Content Area: **Mathematics**
Course(s):   **Math**
Time Period: **1st Semester**
Length: **8 Days**
Status: **Published**

Summary of the Unit

Topic 2 focuses on fluently adding and subtracting multi-digit whole numbers. In this topic students will use mental math to find sums and differences. Students will also use rounding to estimate sums and differences and check for the reasonableness of their answers. Additionally, students will be introduced to various properties, which they will use along with the standard algorithms to find sums and differences of multi-digit numbers.

Enduring Understandings

- The standard subtraction algorithm for multi-digit numbers is an efficient strategy that can be used to subtract any two numbers

- Subtraction calculations are done by place value starting with the ones, then the tens, and so on, regrouping as needed.

- The standard algorithm for subtraction breaks the calculation into simpler calculations using place value, starting with the ones, then the tens, and so on.

- Good math thinkers know how to think about words and numbers to solve problems.

Essential Questions

- How can sums and differences of whole numbers be estimated?

- What are standard procedures for adding and subtracting whole numbers?

Summative Assessment and/or Summative Criteria

- Topic Test

- Performance Task

Resources

enVision math series https://www.savvas.com/solutions/mathematics/core-programs/envision-mathematics-grades-k-5

ST Math is a visual instructional program that builds a deep conceptual understanding of math through rigorous learning and creative problem solving to engage, motivate and challenge PreK-8 students toward higher achievement. https://www.stmath.com/

IXL online learning, offering unlimited algorithmically generated questions, real-time analytical reports, and dynamic scoring to encourage mastery. https://www.ixl.com/

Discovery Education https://google.discoveryeducation.com/

National Council of Teachers of Mathematics - This website contains activities and lessons, and virtual manipulatives organized by strand. http://illuminations.nctm.org

The National Library of Virtual Manipulatives has tutorials and virtual manipulatives for the classroom. http://nlvm.usu.edu/en/nav/index.html

The Teaching Channel has two hundred math videos for professional development. http://www.theteachingchannel.org

K-5 Math Teaching Resources site contains free math teaching resources, games, activities, journal tasksand resources for centers arranged by grade level and standard. http://www.k-5mathteachingresources.com

Open Middle- This website contains 36 math reasoning scenarios arranged by CCSS. http://www.openmiddle.com/

Which One Doesn't Belong- This is a website dedicated to providing thought-provoking puzzles for math teachers and students alike. There are no answers provided as there are many different, correct ways of choosing which one doesn't belong. http://wodb.ca/

Estimation 180- This website contains hundreds of estimation challenges relative to real-world scenarios to assist in building strong connections with number sense and the real world. http://www.estimation180.com/

Unit Plan

Topic/Selection Timeframe	General Objectives	Instructional Activities	Benchmarks/Assessments	Standards
Finding Sums and Differences with Mental Math (1 Day)	Add and subtract whole numbers mentally using a variety of methods.	**Problem Based Learning:** Solve and share: *Students use mental math to add three 4-digit numbers.* **Visual Learning:** Visual Learning Bridge- *How can you use mental math to solve problems?* Convince Me! -*Construct Arguments- Students use the structure of the place-value system, think about how the make-ten strategy will help them break apart addends and add it to other addends to make ten.* **Guided Practice/ Differentiated**	Guided Practice Independent Practice Problem solving Practice Buddy Reteach Build Mathematical Literacy Enrichment Additional Practice Quick Check 2-1	4.NBT.B.4, MP.K-12.3, MP.K-12.6, MP.K-12.7

		Instruction/ Centers:		
		Teacher Led: Intervention: *Reteach to Build Understanding*		
		On Level: *Build Mathematical Literacy*		
		Advanced: *Enrichment*		
		Technology: Practice Buddy (PearsonRealize.com)		
		Independent: Independent Practice and Problem Solving		
		Additional Activities:		
		Math Games (PearsonRealize.com)		
		Visual Learning Animation Plus:		
		(PearsonRealize.com)		
		Additional Practice		
		Math Anytime: Daily Review and		
		Today's Challenge		
		Optional Activities: Students will match equations with the property that is best suited for finding the answer.		
		Closure: Lesson Self-Assessment: PearsonRealize.com		
Estimates Sums and Differences (1 Day)	Round greater numbers to estimate sums and differences.	**Problem Based Learning:** Solve and share: *Students estimate the sum of 3 weights to determine if it exceeds a maximum allowable weight.* **Visual Learning:** Visual Learning Bridge- *How can you estimate sums and*	Guided Practice Independent Practice Problem solving Practice Buddy Reteach Build Mathematical	4.NBT.B.4, 4.OA.A.3, MP.K-12.2, MP.K-12.3

| | | *differences of whole numbers?*

Convince Me! -*Construct Arguments- Students will construct a math argument to support a conjecture related to rounding whole numbers.*

Guided Practice/ Differentiated Instruction/ Centers:

Teacher Led: Intervention: *Reteach to Build Understanding*

On Level: *Build Mathematical Literacy*

Advanced: *Enrichment*

Technology: Practice Buddy (PearsonRealize.com)

Independent: Independent Practice and Problem Solving

Additional Activities:

Math Games (PearsonRealize.com)

Visual Learning Animation Plus:

(PearsonRealize.com)

Additional Practice

Math Anytime: Daily Review and

Today's Challenge

Optional Activities: Students use task cards to estimate sums and differences to grade level problems.

Closure: Lesson Self-Assessment: | Literacy

Enrichment

Additional Practice

Quick Check 2-2 | |

		PearsonRealize.com		
Add Whole Numbers (1 Day)	Add 3-digit numbers using place-value concepts and the standards algorithm.	**Problem Based Learning:** <u>Solve and share</u>: *Students use place value understanding to add 3-digit numbers.* **Visual Learning:** Visual Learning Bridge- *How do you add whole numbers efficiently?* <u>Convince Me!</u> *-Use Structure- Students will explain how and when it is necessary to regroup when adding using standard algorithm.* **Guided Practice/ Differentiated Instruction/ Centers:** **Teacher Led:** <u>Intervention</u>: *Reteach to Build Understanding* <u>On Level:</u> *Build Mathematical Literacy* <u>Advanced:</u> *Enrichment* **Technology:** Practice Buddy (PearsonRealize.com) **Independent:** Independent Practice and Problem Solving **Additional Activities:** Math Games (PearsonRealize.com) Visual Learning Animation Plus: (PearsonRealize.com) Additional Practice Math Anytime: Daily Review and	Guided Practice Independent Practice Problem solving Practice Buddy Reteach Build Mathematical Literacy Enrichment Additional Practice Quick Check 2-3	4.NBT.B.4, 4.OA.A.3, MP.K-12.3, MP.K-12.5, MP.K-12.7

		Today's Challenge		
		Closure: Lesson Self-Assessment: PearsonRealize.com		
Adds Greater Numbers (1 Day)	Add numbers to one million with and without regrouping using the standard algorithm.	**Problem Based Learning:** Solve and share: *Students will connect and build on prior knowledge by adding three 4-digit numbers.* **Visual Learning:** Visual Learning Bridge- *How do you add greater numbers?* Convince Me! -*Construct Arguments- Students will construct a math argument to support a conjecture related to regrouping whole numbers.* **Guided Practice / Differentiated Instruction / Centers:** **Teacher Led:** Intervention: *Reteach to Build Understanding* On Level: *Build Mathematical Literacy* Advanced: *Enrichment* **Technology:** Practice Buddy (PearsonRealize.com) **Independent:** Independent Practice and Problem Solving **Additional Activities:** Math Games (PearsonRealize.com) Visual Learning Animation Plus: (PearsonRealize.com)	Guided Practice Independent Practice Problem solving Practice Buddy Reteach Build Mathematical Literacy Enrichment Additional Practice Quick Check 2-4	4.NBT.B.4, 4.OA.A.3, MP.K-12.1, MP.K-12.3, MP.K-12.8

		Additional Practice Math Anytime: Daily Review and Today's Challenge **Closure:** Lesson Self-Assessment: PearsonRealize.com		
Subtract Whole Numbers (1 Day)	Use place value and the standard algorithm to subtract whole numbers.	**Problem Based Learning:** Solve and share: *Students use place-value blocks to subtract two 3-digit numbers.* **Visual Learning:** Visual Learning Bridge- *How can you subtract whole numbers efficiently?* Convince Me! -*Use Structure- Students can tell when they need to regroup if there is a place in which the digit in the minuend, or top number, is less than the digit in the subtrahend, or bottom number.* **Guided Practice / Differentiated Instruction / Centers:** **Teacher Led:** Intervention: *Reteach to Build Understanding* On Level: *Build Mathematical Literacy* Advanced: *Enrichment* **Technology:** Practice Buddy (PearsonRealize.com) **Independent:** Independent Practice and Problem Solving **Additional Activities:** Math Games (PearsonRealize.com)	Guided Practice Independent Practice Problem solving Practice Buddy Reteach Build Mathematical Literacy Enrichment Additional Practice Quick Check 2-5	4.NBT.B.4, 4.OA.A.3, MP.K-12.1, MP.K-12.5, MP.K-12.7

		Visual Learning Animation Plus: (PearsonRealize.com) Additional Practice Math Anytime: Daily Review and Today's Challenge **Closure:** Lesson Self-Assessment: PearsonRealize.com		
Subtract Greater Numbers (1 Day)	Use place value and an algorithm to subtract whole numbers	**Problem Based Learning:** Solve and share: *Students will connect and build on prior knowledge by subtracting two 6-digit numbers.* **Visual Learning:** Visual Learning Bridge- *How do you subtract whole numbers efficiently?* Convince Me! -*Critique Reasoning- Students will engage in an error analysis to identify and describe the error.* **Guided Practice / Differentiated Instruction / Centers:** **Teacher Led:** Intervention: *Reteach to Build Understanding* On Level: *Build Mathematical Literacy* Advanced: *Enrichment* **Technology:** Practice Buddy (PearsonRealize.com) **Independent:** Independent Practice and Problem Solving **Additional Activities:**	Guided Practice Independent Practice Problem solving Practice Buddy Reteach Build Mathematical Literacy Enrichment Additional Practice Quick Check 2-6	4.NBT.B.4, 4.OA.A.3, MP.K-12.2, MP.K-12.3, MP.K-12.7

		Math Games (PearsonRealize.com) Visual Learning Animation Plus: (PearsonRealize.com) Additional Practice Math Anytime: Daily Review and Today's Challenge **Closure:** Lesson Self-Assessment: PearsonRealize.com		
Subtract Across Zeros (1 Day)	Use number sense and regrouping to subtract across zeros.	**Problem Based Learning:** Solve and share: *Students will use standard algorithm to subtract numbers across zeros.* **Visual Learning:** Visual Learning Bridge- *How do you subtract across zeros?* Convince Me! *-Use Structure- Students will recognize and identify where regrouping should begin when subtracting across zeros.* **Guided Practice / Differentiated Instruction / Centers:** **Teacher Led:** Intervention: *Reteach to Build Understanding* On Level: *Build Mathematical Literacy* Advanced: *Enrichment* **Technology:** Practice Buddy (PearsonRealize.com) **Independent:** Independent Practice and Problem Solving	Guided Practice Independent Practice Problem solving Practice Buddy Reteach Build Mathematical Literacy Enrichment Additional Practice Quick Check 2-7	4.NBT.B.4, 4.OA.A.3, MP.K-12.2, MP.K-12.3, MP.K-12.7

		Additional Activities: Math Games (PearsonRealize.com) Visual Learning Animation Plus: (PearsonRealize.com) Additional Practice Math Anytime: Daily Review and Today's Challenge **Optional Activities:** Problem Based Learning: Students will research five vehicles that can go faster than 1,000 kilometers per hour. Using a table to gather data, they will identify where the vehicle moves (land, water, sea, space), the speed of each vehicle, identify the fastest and slowest vehicles, and calculate the difference between the two. **Closure:** Lesson Self-Assessment: PearsonRealize.com		
Problem Solving: Reasoning (1 Day)	Use previously learned concepts and skills to reason abstractly and make sense of quantities and their relationships in problem situations.	**Problem Based Learning:** Solve and share: *Students use reasoning to find the solution to multi-step problems involving addition and subtraction of multi-digit numbers.* **Visual Learning:** Visual Learning Bridge- *How can you use quantitative reasoning to solve problems?* Convince Me! -*Reasoning Quantitively- Students will write a word problem and equation for a*	Guided Practice Independent Practice Problem solving Practice Buddy Reteach Build Mathematical Literacy Enrichment Additional Practice Quick Check 2-8	4.NBT.B.4, 4.OA.A.3, MP.K-12.1, MP.K-12.2, MP.K-12.4

		corresponding bar diagram to develop problem-solving skills. **Guided Practice / Differentiated Instruction / Centers:** **Teacher Led:** Intervention: *Reteach to Build Understanding* On Level: *Build Mathematical Literacy* Advanced: *Enrichment* **Technology:** Practice Buddy (PearsonRealize.com) **Independent:** Independent Practice and Problem Solving **Additional Activities:** Math Games (PearsonRealize.com) Visual Learning Animation Plus: (PearsonRealize.com) Additional Practice Math Anytime: Daily Review and Today's Challenge **Optional Activities:** Build Mathematical Literacy Mat- Discovery at Saqqara **Closure:** Lesson Self-Assessment: PearsonRealize.com		

MATH.K-12.1   Make sense of problems and persevere in solving them

MATH.K-12.2   Reason abstractly and quantitatively

MATH.K-12.3	Construct viable arguments and critique the reasoning of others
MATH.4.OA.A.3	Solve multi-step word problems posed with whole numbers and having whole-number answers using the four operations, including problems in which remainders must be interpreted. 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.
MATH.K-12.4	Model with mathematics
MATH.K-12.5	Use appropriate tools strategically
MATH.K-12.6	Attend to precision
MATH.K-12.7	Look for and make use of structure
MATH.K-12.8	Look for and express regularity in repeated reasoning
MATH.4.NBT.B.4	With accuracy and efficiency, add and subtract multi-digit whole numbers using the standard algorithm.

Suggested Modifications for Special Education, ELL and Gifted Students

Gifted Students

- If students have a strong understanding of addition and subtraction processes, challenge them to take a census of the school. Students can then analyze this data and see what differences three are between class, team and grade level sizes, determine which grade level is the largest and smallest and how many total students attend the school.

- Have pairs of students work together to create a song to teach a friend about subtraction across zeros.

Special Education Students

- Fluency review Activity

- Vocabulary Review

- Use a mask to cover each place value within a problem until it is needed.

- Model various subtraction and addition problems with and without regrouping using base ten blocks to demonstrate regrouping and borrowing.

- To reinforce addition and subtraction processes, have students participate in teacher made hands-on centers or whole group activities such a bar model puzzle game. Students use addition or subtraction with the idea of "part-part-whole" to solve the bar models to find the missing pieces.

English Language Learners

- Topic Vocabulary

- Visual Learning Bridge: Reading

- Solve & Share: Speaking

Suggested Technological Innovations/Use

- IXL

- ST Math

- Kahoot!

- Tools (EnVision 2020)

- Game Center (EnVision 2020)

- Create/Complete a Discovery Education Board

Cross Curricular/21st Century Connections

- Pick a Project Activity

- Envision Stem Project

- Problem Solving Reading Activity

Topic 03: Use Strategies and Properties to Multiply by 1-Digit Numbers

Content Area: **Mathematics**
Course(s):   **Math**
Time Period: **1st Semester**
Length: **8 Days**
Status: **Published**

Summary of the Unit

Topic 3 focuses on using strategies and properties to multiply 1-digit numbers. In this topic students will develop an understanding of multiplying multi-digit numbers by 1-digit numbers using strategies based on place value and properties of operations. Such strategies covered throughout this topic include using rounding to estimate, using arrays, partial products and area models to multiply, and using properties and breaking apart to multiply mentally.

Enduring Understandings

- Basic facts and place-value patterns can be used to find products when one factor is 10, 100, or 1,000.

- Rounding is one way to estimate products.

- The expanded algorithm for multiplication can be represented with arrays.

- In the expanded algorithm, numbers are broken apart using place value, and the parts are used to find partial products, which are then added together to find the product.

- Area models and properties of multiplication can be used to simplify computation.

- Properties of multiplication and place-value understanding can be used to multiply without paper and pencil.

- Students can use the Distributive Property, area models and other methods to find a product.

- Good math thinkers apply math they know to show and solve problems from everyday life.

Essential Questions

- How can you multiply by multiples of 10, 100, and 1,000?

- How can you multiply whole numbers

Summative Assessment and/or Summative Criteria

- Topic Test

- Performance Task

Resources

enVision math series https://www.savvas.com/solutions/mathematics/core-programs/envision-mathematics-grades-k-5

ST Math is a visual instructional program that builds a deep conceptual understanding of math through rigorous learning and creative problem solving to engage, motivate and challenge PreK-8 students toward higher achievement. https://www.stmath.com/

IXL online learning, offering unlimited algorithmically generated questions, real-time analytical reports, and dynamic scoring to encourage mastery. https://www.ixl.com/

Discovery Education https://google.discoveryeducation.com/

National Council of Teachers of Mathematics - This website contains activities and lessons, and virtual manipulatives organized by strand. http://illuminations.nctm.org

The National Library of Virtual Manipulatives has tutorials and virtual manipulatives for the classroom. http://nlvm.usu.edu/en/nav/index.html

The Teaching Channel has two hundred math videos for professional development. http://www.theteachingchannel.org

K-5 Math Teaching Resources site contains free math teaching resources, games, activities, journal tasksand resources for centers arranged by grade level and standard. http://www.k-5mathteachingresources.com

Open Middle- This website contains 36 math reasoning scenarios arranged by CCSS. http://www.openmiddle.com/

Which One Doesn't Belong- This is a website dedicated to providing thought-provoking puzzles for math teachers and students alike. There are no answers provided as there are many different, correct ways of choosing which one doesn't belong. http://wodb.ca/

Estimation 180- This website contains hundreds of estimation challenges relative to real-world scenarios to assist in building strong connections with number sense and the real world. http://www.estimation180.com/

Unit Plan

Topic/Selection Timeframe	General Objectives	Instructional Activities	Benchmarks/Assessments	Standards
Multiply by Multiples of 10, 100, and 1,000 (1 Day)	Multiply multiples of 10, 100, and 1,000 using mental math and place-value strategies.	**Problem Based Learning:** Solve and share: *Students multiply 1 –digit numbers by a multiple of 10, 100, and 1,000. (Students may use place value blocks or Teaching tools 4 and 5.)* **Visual Learning:** Visual Learning Bridge- *How can you multiply by multiples of 10, 100 or 1,000.* Convince Me! -*Reasoning Students explain that in given examples, the number of zeros in the factor that is the multiple of 10, 100, or 1,000 is*	Guided Practice Independent Practice Problem solving Practice Buddy Reteach Build Mathematical Literacy Enrichment	4.NBT.B.5, MP.K-12.1, MP.K-12.2, MP.K-12.7

			Additional Practice	
		equal to the number of zeros in the product.	Quick Check 3-1	
		Guided Practice /Differentiated Instruction / Centers:		
		Teacher Led: <u>Intervention:</u> *Reteach to Build Understanding*		
		<u>On Level:</u> *Build Mathematical Literacy*		
		<u>Advanced:</u> *Enrichment*		
		Technology: Practice Buddy (PearsonRealize.com)		
		Independent: Independent Practice and Problem Solving		
		Additional Activities:		
		Math Games (PearsonRealize.com)		
		Visual Learning Animation Plus:		
		(PearsonRealize.com)		
		Additional Practice		
		Math Anytime: Daily Review and		
		Today's Challenge		
		Optional Activity: Students can model multiplying by multiples of 10, 100, or 1,000 using counters or objects to represent zeros in their products.		
		Closure: Lesson Self-Assessment: PearsonRealize.com		
Estimate Products (1 Day)	Use rounding to estimate products, and check if answers are reasonable.	**Problem Based Learning:** <u>Solve and share</u>: *Students use their prior understanding of rounding to estimate the product of a 2-digit number and a 1-digit number.* **Visual Learning:** Visual Learning Bridge- *How can you estimate when you multiply?* <u>Convince Me!</u> *-Construct Arguments- Students construct an argument to explain how to solve the problem a different way by first estimating to find the total.* **Guided Practice / Differentiated**	Guided Practice Independent Practice Problem solving Practice Buddy Reteach Build Mathematical Literacy Enrichment Additional Practice	4.NBT.B.5, 4.OA.A.2, 4.OA.A.3, MP.K-12.2, MP.K-12.3

		Instruction / Centers	Quick Check 3-2	
		Teacher Led: Intervention: *Reteach to Build Understanding*		
		On Level: *Build Mathematical Literacy*		
		Advanced: *Enrichment*		
		Technology: Practice Buddy (PearsonRealize.com)		
		Independent: Independent Practice and Problem Solving		
		Additional Activities:		
		Math Games (PearsonRealize.com)		
		Visual Learning Animation Plus:		
		(PearsonRealize.com)		
		Additional Practice		
		Math Anytime: Daily Review and		
		Today's Challenge		
		Optional Activities: Build Mathematical Literacy Mat- "Jaws"		
		Closure: Lesson Self-Assessment: PearsonRealize.com		
Use Arrays and Partial Products to Multiply (1 Day)	Use arrays and partial products to multiply 2- and 3-digit numbers by 1-digit numbers.	**Problem Based Learning:** Solve and share: *Students use previously learned mathematics to model a multiplication problem involving rows and columns.* **Visual Learning:** Visual Learning Bridge- *How can you use an array and partial products to multiply?* Convince Me! -*Use Structure- Students will use the distributive property to break apart larger numbers into smaller quantities to create simpler multiplication problems resulting in partial products.* **Guided Practice / Differentiated Instruction / Centers:** **Teacher Led:** Intervention: *Reteach to Build Understanding*	Guided Practice Independent Practice Problem solving Practice Buddy Reteach Build Mathematical Literacy Enrichment Additional Practice Quick Check 3-3	4.NBT.B.5, MP.K-12.4, MP.K-12.7

		On Level: *Build Mathematical Literacy* Advanced: *Enrichment* **Technology:** Practice Buddy (PearsonRealize.com) **Independent:** Independent Practice and Problem Solving **Additional Activities:** Math Games (PearsonRealize.com) Visual Learning Animation Plus: (PearsonRealize.com) Additional Practice Math Anytime: Daily Review and Today's Challenge **Optional Activities:** Students will use grid paper and crayons to model the distributive property for 2-digit and 3-digit by 1-digit multiplication equations. Partial products will be shaded various colors to show smaller quantities. **Closure:** Lesson Self-Assessment: PearsonRealize.com		
Use Area Models and Partial Products to Multiply (1 Day)	Use area models and the Distributive Property to multiply larger numbers.	**Problem Based Learning:** Solve and share: *Students analyze an area model and use the given numbers and operation symbols to show how to find the area of a given rectangle.* **Visual Learning:** Visual Learning Bridge- *How can you use an area model and partial products to multiply?* Convince Me! -*Use Structure- Students recognize why the distributive property does not apply to an expression that is not equal.* **Guided Practice / Differentiated Instruction / Centers:** **Teacher Led:** Intervention: *Reteach to Build Understanding*	Guided Practice Independent Practice Problem solving Practice Buddy Reteach Build Mathematical Literacy Enrichment Additional Practice Quick Check 3-4	4.NBT.B.5, MP.K-12.4, MP.K-12.7

		On Level: *Build Mathematical Literacy*		
		Advanced: *Enrichment*		
		Technology: Practice Buddy (PearsonRealize.com)		
		Independent: Independent Practice and Problem Solving		
		Additional Activities:		
		Math Games (PearsonRealize.com)		
		Visual Learning Animation Plus:		
		(PearsonRealize.com)		
		Additional Practice		
		Math Anytime: Daily Review and		
		Today's Challenge		
		Closure: Lesson Self-Assessment: PearsonRealize.com		
More Use Area Models and Partial Products to Multiply (1 Day)	Use place value and partial products to multiply 3- and 4-digit numbers by 1-digit numbers.	**Problem Based Learning:** Solve and share: *Students use an area model to find the value of an unknown. (Students may be provided with Teaching Tools 4 and 5.)* **Visual Learning:** Visual Learning Bridge- *How do you multiply with greater numbers?* Convince Me! -*Use Structure- Students should notice that all three expressions contain the same tens and ones places multiplied by the same number therefore making the process of solving the same for each equation.* **Guided Practice / Differentiated Instruction/Centers:** **Teacher Led:** Intervention: *Reteach to Build Understanding* On Level: *Build Mathematical Literacy* Advanced: *Enrichment* **Technology:** Practice Buddy (PearsonRealize.com) **Independent:** Independent Practice	Guided Practice Independent Practice Problem solving Practice Buddy Reteach Build Mathematical Literacy Enrichment Additional Practice Quick Check 3-5	4.NBT.B.5, 4.OA.A.3, MP.K-12.5, MP.K-12.6, MP.K-12.7

		and Problem Solving		
		Additional Activities:		
		Math Games (PearsonRealize.com)		
		Visual Learning Animation Plus:		
		(PearsonRealize.com)		
		Additional Practice		
		Math Anytime: Daily Review and		
		Today's Challenge		
		Optional Activities: Project-Based Learning: EnVision Stem Project: Cave Depths: Students will research three of Earth's features on a topographic map. In their journal report, they must include the height or depth of each feature and estimate to find 10 times the heights or depths researched.		
		Closure: Lesson Self-Assessment: PearsonRealize.com		
Mental Math Strategies for Multiplication (1 Day)	Use place value and properties of operations to multiply mentally.	**Problem Based Learning:** Solve and share: *Students find the values of three different multiplication expressions that can be solved mentally by applying a variety of mental math strategies.* **Visual Learning:** Visual Learning Bridge- *How can you multiply mentally?* Convince Me! -*Use Structure- Students use the structure of the properties of operations to make computations easier, so they can be done mentally.* **Guided Practice / Differentiated Instruction / Centers:** **Teacher Led:** Intervention: *Reteach to Build Understanding* On Level: *Build Mathematical Literacy* Advanced: *Enrichment* **Technology:** Practice Buddy (PearsonRealize.com)	Guided Practice Independent Practice Problem solving Practice Buddy Reteach Build Mathematical Literacy Enrichment Additional Practice Quick Check 3-6	4.NBT.B.5, MP.K-12.3, MP.K-12.7

		Independent: Independent Practice and Problem Solving Additional Activities: Math Games (PearsonRealize.com) Visual Learning Animation Plus: (PearsonRealize.com) Additional Practice Math Anytime: Daily Review and Today's Challenge Closure: Lesson Self-Assessment: PearsonRealize.com		
Choose a Strategy to Multiply (1 Day)	Choose an appropriate strategy to multiply 2-, 3-, and 4-digit numbers by 1-digit numbers.	Problem Based Learning: Solve and share: *Students solve a multi-step problem involving addition and multiplication.* Visual Learning: Visual Learning Bridge- *What strategy will you use to multiply?* Convince Me! *-Reasoning- Students reason about what the quantities in the calculations represent to determine if the results are reasonable in the context of the problem.* Guided Practice/ Differentiated Instruction / Centers: Teacher Led: Intervention: *Reteach to Build Understanding* On Level: *Build Mathematical Literacy* Advanced: *Enrichment* Technology: Practice Buddy (PearsonRealize.com) Independent: Independent Practice and Problem Solving Additional Activities: Math Games (PearsonRealize.com) Visual Learning Animation Plus: (PearsonRealize.com)	Guided Practice Independent Practice Problem solving Practice Buddy Reteach Build Mathematical Literacy Enrichment Additional Practice Quick Check 3-7	4.NBT.B.5, 4.OA.A.3, MP.K-12.1, MP.K-12.2, MP.K-12.6

		Additional Practice		
		Math Anytime: Daily Review and Today's Challenge		
		Closure: Lesson Self-Assessment: PearsonRealize.com		
Problem Solving: Model with Math (1 Day)	Use previously learned concepts and skills to represent and solve problems.	**Problem Based Learning:** Solve and share: *Students draw a bar diagram to solve a multi-step problem involving addition and multiplication. (Student work may include bar diagrams to model operations.)* **Visual Learning:** Visual Learning Bridge- *How can you represent a situation with a math model?* Convince Me! -*Model with Math- Students will assess their model and solution for reasonableness after solving.* **Guided Practice / Differentiated Instruction / Centers:** **Teacher Led:** Intervention: *Reteach to Build Understanding* On Level: *Build Mathematical Literacy* Advanced: *Enrichment* **Technology:** Practice buddy (PearsonRealize.com) **Independent:** Independent Practice and Problem Solving **Additional Activities:** Math Games (PearsonRealize.com) Visual Learning Animation Plus: (PearsonRealize.com) Additional Practice Math Anytime: Daily Review and Today's Challenge **Optional Activities:** Build Mathematical Literacy	Guided Practice Independent Practice Problem solving Practice Buddy Reteach Build Mathematical Literacy Enrichment Additional Practice Quick Check 3-8	4.NBT.B.5, 4.OA.A.3, MP.K-12.4

		mat - "How a Plant is Pollinated" **Closure:** Lesson Self-Assessment: PearsonRealize.com		

MATH.K-12.1	Make sense of problems and persevere in solving them
MATH.K-12.2	Reason abstractly and quantitatively
MATH.4.OA.A.2	Multiply or divide to solve word problems involving multiplicative comparison, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem, distinguishing multiplicative comparison from additive comparison.
MATH.K-12.3	Construct viable arguments and critique the reasoning of others
MATH.4.OA.A.3	Solve multi-step word problems posed with whole numbers and having whole-number answers using the four operations, including problems in which remainders must be interpreted. 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.
MATH.K-12.4	Model with mathematics
MATH.K-12.5	Use appropriate tools strategically
MATH.K-12.6	Attend to precision
MATH.K-12.7	Look for and make use of structure
MATH.K-12.8	Look for and express regularity in repeated reasoning
MATH.4.NBT.B.5	Multiply a whole number of up to four digits by a one-digit whole number, and multiply two two-digit numbers, using strategies based on place value and the properties of operations. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.

Suggested Modifications for Special Education, ELL and Gifted Students

Gifted Students

- Students are given a menu from a restaurant in Sayreville. They must compute how much it would cost their entire family to go out to dinner, including the tip. They will need to use extended math facts to multiply by .10 and double it, in order to calculate a 20% tip. (For additional enrichment: Have students calculate the tax, as well.)

Special Education Students

- Fluency review Activity

- Vocabulary Review

- Use a mask to cover each place value within a problem until it is needed.

- Model various multiplication problems by having students draw arrasys using small grid paper. The visual model will help students connect to multiplication as "groups of."

- To reinforce multiplying by multiples of 10, 100 and 1000, have students complete problems by first "boxing out" the basic fact then counting how many zeros are left over. Have students represent the basic fact in one color and then use counters for the zeros to visualize how to arrive at the answer.

English Language Learners

- Topic Vocabulary

- Visual Learning Bridge: Reading

- Solve & Share: Speaking

Suggested Technological Innovations/Use

- IXL

- ST Math

- Kahoot!

- Tools (EnVision 2020)

- Game Center (EnVision 2020)

- Create/Complete a Discovery Education Board

Cross Curricular/21st Century Connections

- Pick a Project Activity

- EnVision Stem Project

- EnVision Stem Activity

- Problem Solving Reading Activity

- 3 ACT MATH: Covered Up

Topic 04: Use Strategies and Properties to Multiply by 2-Digit Numbers

Content Area: **Mathematics**
Course(s):   **Math**
Time Period: **1st Semester**
Length: **7 days**
Status: **Published**

Summary of the Unit

Topic 4 focuses on developing understanding of multiplying multi-digit numbers by 2-digit numbers using strategies based on place value and properties of operations.

Enduring Understandings

- Basic facts and place-value patterns can be used to mentally multiply a 2-digit number by a multiple of 10.
- Place-value blocks, area models, and arrays provide ways to visualize and find products.
- Products of 2-digit by 2-digit numbers can be estimated by replacing factors with the closest multiple of 10, or other numbers that are close and easy to multiply mentally.
- The expanded algorithm for multiplying with 2-digit numbers is an extension of the expanded algorithm for multiplying with 1-digit numbers.
- The Distributive Property can be used to multiply two 2-digit numbers by breaking the computation down into four simpler products and adding the partial products together.
- The expanded algorithm for multiplication can be represented with arrays.
- In the expanded algorithm, numbers are broken apart using place value, and the parts are used to find the partial products.
- Good math thinkers make sense of problems and think of ways to solve them, even if they get stuck.

Essential Questions

- How can you use a model to multiply?
- How can you use the Distributive Property to multiply?
- How can you use multiplication to solve problems?

Summative Assessment and/or Summative Criteria

- Topic Test
- Performance Task

Resources

enVision math series https://www.savvas.com/solutions/mathematics/core-programs/envision-mathematics-grades-k-5

ST Math is a visual instructional program that builds a deep conceptual understanding of math through rigorous learning and creative problem solving to engage, motivate and challenge PreK-8 students toward higher achievement. https://www.stmath.com/

IXL online learning, offering unlimited algorithmically generated questions, real-time analytical reports, and dynamic scoring to encourage mastery. https://www.ixl.com/

Discovery Education https://google.discoveryeducation.com/

National Council of Teachers of Mathematics - This website contains activities and lessons, and virtual manipulatives organized by strand. http://illuminations.nctm.org

The National Library of Virtual Manipulatives has tutorials and virtual manipulatives for the classroom. http://nlvm.usu.edu/en/nav/index.html

The Teaching Channel has two hundred math videos for professional development. http://www.theteachingchannel.org

K-5 Math Teaching Resources site contains free math teaching resources, games, activities, journal tasksand resources for centers arranged by grade level and standard. http://www.k-5mathteachingresources.com

Open Middle- This website contains 36 math reasoning scenarios arranged by CCSS. http://www.openmiddle.com/

Which One Doesn't Belong- This is a website dedicated to providing thought-provoking puzzles for math teachers and students alike. There are no answers provided as there are many different, correct ways of choosing which one doesn't belong. http://wodb.ca/

Estimation 180- This website contains hundreds of estimation challenges relative to real-world scenarios to assist in building strong connections with number sense and the real world. http://www.estimation180.com/

Unit Plan

Topic/Selection Timeframe	General Objectives	Instructional Activities	Benchmarks/Assessments	Standards
Multiply Multiples of 10 (1 Day)	Use mental-math strategies to multiply 2-digit multiples of 10 by 2-digit multiples of 10.	**Problem Based Learning:** Solve and share- _Students use basic facts and place-value patterns to multiply multiples of 10._ (Teaching Tool 10 and grid paper may be incorporated.) **Visual Learning:** Visual Learning Bridge- _How can you multiply multiples of 10?_ Convince Me! -_Look for Relationships- Students will predict how many zeros will be in the answer using previous knowledge of multiplying 1-digit numbers by 10, 100 and 1,000._ **Guided Practice / Differentiated Instruction / Centers:** **Teacher Led:** Intervention: _Reteach to Build Understanding_ On Level: _Build Mathematical Literacy_ Advanced: _Enrichment_ **Technology:** Practice Buddy	Guided Practice Independent Practice Problem solving Practice Buddy Reteach Build Mathematical Literacy Enrichment Additional Practice Quick Check 4-1	4.NBT.B.5, MP.K-12.2, MP.K-12.7

		(PearsonRealize.com) **Independent:** Independent Practice and Problem Solving **Additional Activities:** Math Games (PearsonRealize.com) Visual Learning Animation Plus: (PearsonRealize.com) Additional Practice Math Anytime: Daily Review and Today's Challenge **Closure:** Lesson Self-Assessment: PearsonRealize.com		
Use Models to Multiply 2-Digit Numbers by Multiples of 10 (1 Day)	Use models and properties of operations to multiply 2-digit numbers by multiples of 10.	**Problem Based Learning:** Solve and share: *Students use previously learned strategies to multiply a 2-digit number by a multiple of 10 using tools such as place-value blocks or grid paper.* (Students may use teaching tool 10, grid paper, or teaching tools 4 and 5.) **Visual Learning:** Visual Learning Bridge- *How can you use an array or an area model to multiply?* Convince Me! -Reasoning- *Students will apply their knowledge of estimation to solve an equation. They will assess the reasonableness of the answer.* **Guided Practice / Differentiated Instruction / Centers:** **Teacher Led:** Intervention: Reteach to Build Understanding On Level: Build	Guided Practice Independent Practice Problem solving Practice Buddy Reteach Build Mathematical Literacy Enrichment Additional Practice Quick Check 4-2	4.NBT.B.5, MP.K-12.2, MP.K-12.4, MP.K-12.5

		Mathematical Literacy Advanced: Enrichment **Technology:** Practice Buddy (PearsonRealize.com) **Independent:** Independent Practice and Problem Solving **Additional Activities:** Math Games (PearsonRealize.com) Visual Learning Animation Plus: (PearsonRealize.com) Additional Practice Math Anytime: Daily Review and Today's Challenge **Optional Activities:** Students will use grid paper and crayons to model the distributive property for multiplying a 2-digit number by a multiple of 10. Partial products will be shaded various colors to show smaller quantities. **Closure:** Lesson Self-Assessment: PearsonRealize.com		
Estimate: Use Rounding or Compatible Numbers (1 Day)	Use rounding or compatible numbers to estimate products of two 2-digit numbers.	**Problem Based Learning:** Solve and share: *Students estimate solutions to multiplication problems involving two 2-digit numbers by using any prior numbers.* **Visual Learning:** Visual Learning Bridge- *What strategies can I use when estimating?* Convince Me! -*Reason Quantitatively- Students explain the steps involved in finding an estimate to show that the estimate to the provided equation is*	Guided Practice Independent Practice Problem solving Practice Buddy Reteach Build Mathematical Literacy Enrichment Additional Practice	4.NBT.B.5, 4.OA.A.3, MP.K-12.2, MP.K-12.3

		reasonable.		
		Guided Practice / Differentiated Instruction / Centers:	Quick Check 4-3	
		Teacher Led: <u>Intervention:</u> Reteach to Build Understanding		
		<u>On Level:</u> Build Mathematical Literacy		
		<u>Advanced:</u> Enrichment		
		Technology: Practice Buddy (PearsonRealize.com)		
		Independent: Independent Practice and Problem Solving		
		Additional Activities:		
		Math Games (PearsonRealize.com)		
		Visual Learning Animation Plus:		
		(PearsonRealize.com)		
		Additional Practice		
		Math Anytime: Daily Review and		
		Today's Challenge		
		Closure: Lesson Self-Assessment: PearsonRealize.com		
Arrays and Partial Products (1 Day)	Use arrays, place value, partial products, and properties of operations to multiply two 2-digit numbers.	**Problem Based Learning:** <u>Solve and share:</u> *Students use grid paper or an array to represent a problem that involves multiplying two 2-digit numbers.* (Students may use teaching tool 10 or grid paper.) **Visual Learning:** Visual Learning Bridge- *How can you multiply using an array?* <u>Convince Me!</u> *-Model with Math- Students write a symbolic representation to*	Guided Practice Independent Practice Problem solving Practice Buddy Reteach Build Mathematical Literacy Enrichment	4.NBT.B.5, 4.OA.A.3, MP.K-12.4, MP.K-12.7

		match the given array to show breaking apart a 2-digit by 2-digit multiplication problem into simpler calculations. **Guided Practice / Differentiated Instruction / Centers:** **Teacher Led:** Intervention: Reteach to Build Understanding On Level: Build Mathematical Literacy Advanced: Enrichment **Technology:** Practice Buddy (PearsonRealize.com) **Independent:** Independent Practice and Problem Solving **Additional Activities:** Math Games (PearsonRealize.com) Visual Learning Animation Plus: (PearsonRealize.com) Additional Practice Math Anytime: Daily Review and Today's Challenge **Optional Activities:** Students will use grid paper and crayons to create arrays demonstrating multiplication of a 2-digit number by a 2-digit number. Partial products will be shaded various colors to show smaller quantities. **Project Based Learning:** Students will research various sources of renewable energy. They will draw an array to represent a wind warm and use 2-digit multiplication to find out how much energy a wind farm	Additional Practice Quick Check 4-4	

		can produce in one year. **Closure:** Lesson Self-Assessment: PearsonRealize.com		
Area Models and Partial Products (1 Day)	Use the Distributive Property and an area model to multiply two 2-digit numbers.	**Problem Based Learning:** <u>Solve and share</u>: Students connect to their previous understanding of finding the area of a rectangle divided into four smaller sections and computing the partial products to find the area of the large rectangle. **Visual Learning:** Visual Learning Bridge- *How can you use the distributive property to multiply?* <u>Convince Me!</u> -Use Structure- Students will explain how breaking apart numbers by place value will create four simpler equations involving multiples of 10. **Guided Practice / Differentiated Instruction / Centers:** **Teacher Led:** <u>Intervention:</u> Reteach to Build Understanding <u>On Level:</u> Build Mathematical Literacy <u>Advanced:</u> Enrichment **Technology:** Practice Buddy (PearsonRealize.com) **Independent:** Independent Practice and Problem Solving **Additional Activities:** Math Games (PearsonRealize.com) Visual Learning Animation Plus: (PearsonRealize.com) Additional Practice Math Anytime: Daily Review and Today's Challenge **Optional Activities:** Students will use	Guided Practice Independent Practice Problem solving Practice Buddy Reteach Build Mathematical Literacy Enrichment Additional Practice Quick Check 4-5	4.NBT.B.5, MP.K-12.4, MP.K-12.7

		grid paper and crayons to create arrays demonstrating multiplication of a 2-digit number by a 2-digit number. Partial products will be shaded various colors to show smaller quantities. **Closure:** Lesson Self-Assessment: PearsonRealize.com		
Use Partial Products to Multiply by 2-Digit Numbers (1 Day)	Use place value and partial products to calculate products of 2-digit by 2-digit multiplication problems.	**Problem Based Learning:** <u>Solve and share</u>: *Students represent and solve a problem involving multiplication of 2-digit numbers.* (Grid paper may be used here.) **Visual Learning:** Visual Learning Bridge- *How can you record Multiplication?* <u>Convince Me!</u> *-Reason Quantitatively- Estimation is an important tool in determining whether a final result is correct or not. Estimation helps to assess reasonableness.* **Guided Practice / Differentiated Instruction / Centers:** **Teacher Led:** <u>Intervention:</u> Reteach to Build Understanding <u>On Level:</u> Build Mathematical Literacy <u>Advanced:</u> Enrichment **Technology:** Practice Buddy (PearsonRealize.com) **Independent:** Independent Practice and Problem Solving **Additional Activities:** Math Games (PearsonRealize.com) Visual Learning Animation Plus: (PearsonRealize.com) Additional Practice Math Anytime: Daily Review and	Guided Practice Independent Practice Problem solving Practice Buddy Reteach Build Mathematical Literacy Enrichment Additional Practice Quick Check 4-6	4.NBT.B.5, 4.OA.A.3, MP.K-12.2, MP.K-12.3, MP.K-12.7

		Today's Challenge **Closure:** Lesson Self-Assessment: PearsonRealize.com		
Problem Solving: Make Sense and Persevere (1 Day)	Make sense of problems and persevere in solving them.	**Problem Based Learning:** Solve and share: *Students extend their understanding of how to make sense and persevere in solving multi-step problems that involve multi-digit multiplication.* **Visual Learning:** Visual Learning Bridge- How can you make sense of problems and persevere in solving them? Convince Me! -*Make sense and persevere- Students will understand that there is more than one way to solve most problems.* **Guided Practice / Differentiated Instruction / Centers:** **Teacher Led:** Intervention: Reteach to Build Understanding On Level: Build Mathematical Literacy Advanced: Enrichment **Technology:** Practice Buddy (PearsonRealize.com) **Independent:** Independent Practice and Problem Solving **Additional Activities:** Math Games (PearsonRealize.com) Visual Learning Animation Plus: (PearsonRealize.com) Additional Practice Math Anytime: Daily Review and Today's Challenge **Closure:** Lesson Self-Assessment:	Guided Practice Independent Practice Problem solving Practice Buddy Reteach Build Mathematical Literacy Enrichment Additional Practice Quick Check 4-7	4.NBT.B.5, 4.M.A.3, MP.K-12.1, MP.K-12.2, MP.K-12.4, MP.K-12.6

MATH.K-12.1	Make sense of problems and persevere in solving them
MATH.K-12.2	Reason abstractly and quantitatively
MATH.K-12.3	Construct viable arguments and critique the reasoning of others
MATH.4.OA.A.3	Solve multi-step word problems posed with whole numbers and having whole-number answers using the four operations, including problems in which remainders must be interpreted. 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.
MATH.K-12.4	Model with mathematics
MATH.K-12.5	Use appropriate tools strategically
MATH.K-12.6	Attend to precision
MATH.K-12.7	Look for and make use of structure
MATH.K-12.8	Look for and express regularity in repeated reasoning
MATH.4.NBT.B.5	Multiply a whole number of up to four digits by a one-digit whole number, and multiply two two-digit numbers, using strategies based on place value and the properties of operations. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.
MATH.4.M.A.3	Apply the area and perimeter formulas for rectangles in real world and mathematical problems.

Suggested Modifications for Special Education, ELL and Gifted Students

Gifted Students

- Use a Venn diagram to compare/contrast the Partial-Products Algorithm and Standard Algorithm multiplication.

- Write a "How To" sheet for the Partial-Products Algorithm and the Standard Algorithm, which can be photo-copied for the kids in your class to use for reference.

- Have students create a menu for their own restaurant and include reasonable prices for each item. Then, students can use multiplication to figure out how much revenue you will make over the course of a week if 40 people eat at your restaurant each day for 7 days.

Special Education Students

- Fluency review Activity

- Vocabulary Review

- Create a multiplication reference page for notebooks/journals that describes and demonstrates the steps for multiplying the Partial-products algorithm and Standard algorithm to assist students in completing each process.

- Model the process for standard algorithm multiplication by playing math hopscotch. The teacher will create 2-digt by 2-digit multiplication problems on the classroom floor. Students will start in the appropriate bx and jump out the steps: ones by your ones, ones by your tens, etc.

English Language Learners

- Topic Vocabulary

- Visual Learning Bridge: Reading

- Solve & Share: Speaking

Suggested Technological Innovations/Use

- IXL

- ST Math

- Kahoot!

- Tools (EnVision 2020)

- Game Center (EnVision 2020)

- Create/Complete a Discovery Education Board

Cross Curricular/21st Century Connections

- Pick a Project Activity

- Envision STEM Project

- EnVision STEM Activity

- Problem Solving Reading Activity

Topic 05: Use Strategies and Properties to Divide by 1-Digit Numbers

Content Area: **Mathematics**
Course(s): **Math**
Time Period: **2nd Trimester**
Length: **10 days**
Status: **Published**

Summary of the Unit

Topic 5 focuses on developing understanding of finding whole-number quotients and remainders with up to four-digit dividends and 1-digit divisors, using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division.

Enduring Understandings

- Basic facts and place-value patterns can be used to divide multiples of 10 and 100 by 1-digit numbers.
- There is more than one way to estimate a quotient.
- Substituting compatible numbers is an efficient technique for estimating quotients.
- Using place-value patterns and compatible numbers are efficient techniques for estimating quotients.
- When dividing, the remainder must be less than the quotient.
- When solving a real-world problem, the kind of question asked determines how to interpret the remainder.
- Division with partial quotients involves breaking apart the dividend, dividing the parts, and adding the partial quotients.
- Sharing is one way to think about division.
- You can use estimation and place value to divide.
- There are many ways to perform division, including mental math, models, partial quotients, and sharing.
- Good math thinkers choose and apply math they know to show and solve problems in everyday life.

Essential Questions

- How can mental math be used to divide?
- How can quotients be estimated?
- How can the steps for dividing be explained?

Summative Assessment and/or Summative Criteria

- Topic Test

- Performance Task

Resources

enVision math series https://www.savvas.com/solutions/mathematics/core-programs/envision-mathematics-grades-k-5

ST Math is a visual instructional program that builds a deep conceptual understanding of math through rigorous learning and creative problem solving to engage, motivate and challenge PreK-8 students toward higher achievement. https://www.stmath.com/

IXL online learning, offering unlimited algorithmically generated questions, real-time analytical reports, and dynamic scoring to encourage mastery. https://www.ixl.com/

Discovery Education https://google.discoveryeducation.com/

National Council of Teachers of Mathematics - This website contains activities and lessons, and virtual manipulatives organized by strand. http://illuminations.nctm.org

The National Library of Virtual Manipulatives has tutorials and virtual manipulatives for the classroom. http://nlvm.usu.edu/en/nav/index.html

The Teaching Channel has two hundred math videos for professional development. http://www.theteachingchannel.org

K-5 Math Teaching Resources site contains free math teaching resources, games, activities, journal tasksand resources for centers arranged by grade level and standard. http://www.k-5mathteachingresources.com

Open Middle- This website contains 36 math reasoning scenarios arranged by CCSS. http://www.openmiddle.com/

Which One Doesn't Belong- This is a website dedicated to providing thought-provoking puzzles for math teachers and students alike. There are no answers provided as there are many different, correct ways of choosing which one doesn't belong. http://wodb.ca/

Estimation 180- This website contains hundreds of estimation challenges relative to real-world scenarios to assist in building strong connections with number sense and the real world. http://www.estimation180.com/

Unit Plan

Topic/Selection Timeframe	General Objectives	Instructional Activities	Benchmarks/Assessments	Standards
Mental Math: Find Quotients (1 Day)	Use mental math and place-value strategies to divide multiples of 10 and 100 by 1-digit divisors.	**Problem Based Learning:** Solve and share: *Students use previous experience with mental math and basic facts to solve a problem that involves dividing a 3-digit number by a 1-digit number* **Visual Learning:** Visual Learning Bridge- *How can you divide mentally?* Convince Me! -*Use Structure- Students explain how each quotient and divisor can be used to find the missing dividend. Since the dividend is missing in each equation, a basic multiplication fact and place value patterns are used to find the missing dividend.* **Guided Practice / Differentiated Instruction / Centers:** **Teacher Led:** Intervention: Reteach to Build Understanding On Level: Build Mathematical Literacy	Guided Practice Independent Practice Problem solving Practice Buddy Reteach Build Mathematical Literacy Enrichment Additional Practice Quick Check 5-1	4.NBT.B.6, MP.K-12.2, MP.K-12.4, MP.K-12.7

		Advanced: Enrichment **Technology:** Practice Buddy (PearsonRealize.com) **Independent:** Independent Practice and Problem Solving **Additional Activities:** Math Games (PearsonRealize.com) Visual Learning Animation Plus: (PearsonRealize.com) Additional Practice Math Anytime: Daily Review and Today's Challenge **Closure:** Lesson Self-Assessment: PearsonRealize.com		
Mental Math: Estimate Quotients (1 Day)	Use compatible numbers to estimate quotients.	**Problem Based Learning:** Solve and share: *Students connect to their previous understanding of compatible numbers, multiplication, and division to estimate a quotient.* **Visual Learning:** Visual Learning Bridge- *How can you estimate quotients to solve problems?* Convince Me! -*Construct Arguments- Students explain why rounding is not an effective estimation technique for this division problem.* **Guided Practice / Differentiated Instruction / Centers:** **Teacher Led:** Intervention: Reteach to Build Understanding On Level: Build Mathematical Literacy Advanced: Enrichment	Guided Practice Independent Practice Problem solving Practice Buddy Reteach Build Mathematical Literacy Enrichment Additional Practice Quick Check 5-2	4.NBT.B.5, 4.NBT.B.6 4.OA.A.3, MP.K-12.2, MP.K-12.3

		Technology: Practice Buddy (PearsonRealize.com) **Independent:** Independent Practice and Problem Solving **Additional Activities:** Math Games (PearsonRealize.com) Visual Learning Animation Plus: (PearsonRealize.com) Additional Practice Math Anytime: Daily Review and Today's Challenge **Closure:** Lesson Self-Assessment: PearsonRealize.com		
Mental Math: Estimate Quotients for Greater Dividends (1 Day)	Use place-value patterns and division facts to estimate quotients for 4-digit dividends.	**Problem Based Learning:** Solve and share: *Students connect to previous understanding of compatible numbers and use them to estimate the quotient.* **Visual Learning:** Visual Learning Bridge- *How can you estimate quotients using patterns and place value?* Convince Me! - *Construct Arguments- Students explain that there are multiples ways to estimate a quotient and explain which method is most reasonable.* **Guided Practice / Differentiated Instruction / Centers:** **Teacher Led:** Intervention: Reteach to Build Understanding On Level: Build Mathematical Literacy Advanced: Enrichment **Technology:** Practice Buddy	Guided Practice Independent Practice Problem solving Practice Buddy Reteach Build Mathematical Literacy Enrichment Additional Practice Quick Check 5-3	4.NBT.B.5, 4.NBT.B.6, 4.OA.A.3, MP.K-12.2, MP.K-12.3, MP.K-12.4

		(PearsonRealize.com) **Independent:** Independent Practice and Problem Solving **Additional Activities:** Math Games (PearsonRealize.com) Visual Learning Animation Plus: (PearsonRealize.com) Additional Practice Math Anytime: Daily Review and Today's Challenge **Optional Activities:** EnVision STEM Activity 5-3 **Closure:** Lesson Self-Assessment: PearsonRealize.com		
Interpret Remainders (1 Day)	Solve division problems and interpret remainders.	**Problem Based Learning:** Solve and share: *Students connect their understanding of finding quotients to find and interpret a remainder in order to solve a division problem.* **Visual Learning:** Visual Learning Bridge- *After dividing, what do you do with the remainder?* Convince Me! - *Critique Reasoning- Students analyze the relationship between the remainder and the divisor to find an error in the calculation. Students will recognize that the remainder should always be less than the divisor.* **Guided Practice / Differentiated Instruction / Centers:** **Teacher Led:** Intervention: Reteach to Build Understanding	Guided Practice Independent Practice Problem solving Practice Buddy Reteach Build Mathematical Literacy Enrichment Additional Practice Quick Check 5-4	4.NBT.B.6, 4.OA.A.3, MP.K-12.3, MP.K-12.4

		On Level: Build Mathematical Literacy		
		Advanced: Enrichment		
		Technology: Practice Buddy (PearsonRealize.com)		
		Independent: Independent Practice and Problem Solving		
		Additional Activities:		
		Math Games (PearsonRealize.com)		
		Visual Learning Animation Plus:		
		(PearsonRealize.com)		
		Additional Practice		
		Math Anytime: Daily Review and		
		Today's Challenge		
		Closure: Lesson Self-Assessment: PearsonRealize.com		
Use Partial Quotients to Divide (1 Day)	Use partial quotients to divide.	**Problem Based Learning:** Solve and share: *Students connect to their understanding of division as repeated subtraction in order to solve a real-world division problem.* **Visual Learning:** Visual Learning Bridge- *How can you divide mentally?* Convince Me! -*Use Structure- Students learn how they can check their work to division problems using the relationship between multiplication and division as inverse operations.* **Guided Practice / Differentiated Instruction / Centers:** **Teacher Led:** Intervention: Reteach to Build Understanding On Level: Build Mathematical	Guided Practice Independent Practice Problem solving Practice Buddy Reteach Build Mathematical Literacy Enrichment Additional Practice Quick Check 5-5	4.NBT.B.6, MP.K-12.2, MP.K-12.4, MP.K-12.7

		Literacy		
		Advanced: Enrichment		
		Technology: Practice Buddy (PearsonRealize.com)		
		Independent: Independent Practice and Problem Solving		
		Additional Activities:		
		Math Games (PearsonRealize.com)		
		Visual Learning Animation Plus:		
		(PearsonRealize.com)		
		Additional Practice		
		Math Anytime: Daily Review and		
		Today's Challenge		
		Optional Activities: Build Mathematical Literacy Reading Mat: "Energy and Transportation"		
		Closure: Lesson Self-Assessment: PearsonRealize.com		
Use Partial Quotients to Divide: Greater Dividends (1 Day)	Use partial quotients and place-value understandings to divide with greater dividends.	**Problem Based Learning:** Solve and share: *Students connect to their previous understanding of dividing 2-digit numbers by 1-digit numbers using partial quotients to divide 3-digit numbers by 1-digit numbers using partial quotients.* **Visual Learning:** Visual Learning Bridge- *How can you use partial quotients to divide greater dividends?* Convince Me! -Use Structure-*Students use the relationship between multiplication and division to check the quotient of their problem.* **Guided Practice / Differentiated Instruction /**	Guided Practice Independent Practice Problem solving Practice Buddy Reteach Build Mathematical Literacy Enrichment Additional Practice Quick Check 5-6	4.NBT.B.6, MP.K-12.2, MP.K-12.7

		Centers: **Teacher Led:** <u>Intervention:</u> Reteach to Build Understanding <u>On Level:</u> Build Mathematical Literacy <u>Advanced:</u> Enrichment **Technology:** Practice Buddy (PearsonRealize.com) **Independent:** Independent Practice and Problem Solving **Additional Activities:** Math Games (PearsonRealize.com) Visual Learning Animation Plus: (PearsonRealize.com) Additional Practice Math Anytime: Daily Review and Today's Challenge **Optional Activities:** Project Based Learning: Students will research various musical instruments as sources of energy. They will explain how each instrument uses energy to make a sound and how sounds are produced. Students will then explore the keys on a piano and how and why they can be separated into octaves using division. EnVision STEM Activity 5-6 **Closure:** Lesson Self-Assessment: PearsonRealize.com		
Use Sharing to Divide (1 Day)	Use place value and models to divide 2- and 3-digit numbers by 1-digit numbers.	**Problem Based Learning:** <u>Solve and share:</u> *Students solve a division problem that goes beyond basic facts and explore division by place value.* **Visual Learning:** Visual	Guided Practice Independent Practice Problem solving Practice Buddy	4.NBT.B.6, 4.OA.A.3, MP.K-12.4, MP.K-12.5

		Learning Bridge- *How can place value help you divide?*	Reteach	
			Build Mathematical Literacy	
		Convince Me! -Use *Appropriate Tools Strategically- Students explain how sharing can be used to describe division using real-world scenarios in comparison to math computations.*	Enrichment	
			Additional Practice	
			Quick Check 5-7	
		Guided Practice / Differentiated Instruction / Centers:		
		Teacher Led: Intervention: Reteach to Build Understanding		
		On Level: Build Mathematical Literacy		
		Advanced: Enrichment		
		Technology: Practice Buddy (PearsonRealize.com)		
		Independent: Independent Practice and Problem Solving		
		Additional Activities:		
		Math Games (PearsonRealize.com)		
		Visual Learning Animation Plus:		
		(PearsonRealize.com)		
		Additional Practice		
		Math Anytime: Daily Review and		
		Today's Challenge		
		Closure: Lesson Self-Assessment: PearsonRealize.com		
Continue Sharing to Divide (1 Day)	Continue to use place value and sharing to divide 2- and 3-digit numbers by 1-digit numbers.	**Problem Based Learning:** Solve and share: *Students use calculations or drawings to solve a real-world problem involving division.* **Visual Learning:** Visual Learning Bridge- *How can you*	Guided Practice Independent Practice Problem solving Practice Buddy	4.NBT.B.6, 4.OA.A.3, MP.K-12.2, MP.K-12.4,

		record division with a 1-digit divisor?	Reteach	MP.K-12.6
			Build Mathematical Literacy	
		<u>Convince Me!</u> *-Reason Quantitatively-* *Students use reasoning to connect the numerical remainder to the context of the problem.*	Enrichment	
			Additional Practice	
			Quick Check 5-8	
		Guided Practice / Differentiated Instruction / Centers:		
		Teacher Led: <u>Intervention:</u> Reteach to Build Understanding		
		<u>On Level:</u> Build Mathematical Literacy		
		<u>Advanced:</u> Enrichment		
		Technology: Practice Buddy (PearsonRealize.com)		
		Independent: Independent Practice and Problem Solving		
		Additional Activities:		
		Math Games (PearsonRealize.com)		
		Visual Learning Animation Plus:		
		(PearsonRealize.com)		
		Additional Practice		
		Math Anytime: Daily Review and		
		Today's Challenge		
		Optional Activities: Problem-Solving Leveled Reading Mats: Energy and Transportation		
		Closure: Lesson Self-Assessment: PearsonRealize.com		
Choose a Strategy to Divide (1 Day)	Choose a strategy to divide that follows a series of steps to break division into simpler calculations.	**Problem Based Learning:** <u>Solve and share</u>: *Students use previous knowledge of division strategies to solve two real-world problems.*	Guided Practice Independent Practice Problem solving Practice Buddy	4.NBT.B.6, MP.K-12.2, MP.K-12.7

| | | **Visual Learning:** Visual Learning Bridge- *How do you choose a strategy to divide?*

Convince Me! *-Reason Quantitatively-*
Students explain which division strategy is the best method for different division situations.

Guided Practice / Differentiated Instruction / Centers:

Teacher Led: Intervention: Reteach to Build Understanding
On Level: Build Mathematical Literacy Advanced: Enrichment

Technology: Practice Buddy (PearsonRealize.com)
 Independent: Independent Practice and Problem Solving

Additional Activities:
Math Games (PearsonRealize.com)
Visual Learning Animation Plus:
(PearsonRealize.com)
Additional Practice
Math Anytime: Daily Review and Today's Challenge

Closure: Lesson Self-Assessment: PearsonRealize.com | Reteach

Build Mathematical Literacy

Enrichment

Additional Practice

Quick Check 5-9 | |
| Problem Solving: Model with Math

(1 Day) | Use previously learned concepts and skills to model and solve problems. | **Problem Based Learning:** Solve and share: *Students use the Thinking Habits" (textbook page 205) to help them model with math in order to solve a real-world problem.*

Visual Learning: Visual Learning Bridge- *How do you choose a strategy to divide?*
Convince Me! *-Reason Quantitatively-*
Students reason about how the quantities given in the problem are related.
Guided Practice / Differentiated Instruction / Centers:

Teacher | Guided Practice

Independent Practice

Problem solving

Practice Buddy

Reteach

Build Mathematical Literacy

Enrichment

Additional Practice
Quick Check 5-10 | 4.NBT.B.6,

4.OA.A.3,

MP.K-12.1,

MP.K-12.2,

MP.K-12.4 |

		Led: <u>Intervention:</u> Reteach to Build Understanding ure: <u>On Level:</u> Build Mathematical Literacy <u>Advanced:</u> Enrichment **Technology:** Practice Buddy (PearsonRealize.com) **Independent:** Independent Practice and Problem Solving **Additional Activities:** Math Games (PearsonRealize.com) Visual Learning Animation Plus: (PearsonRealize.com) Additional Practice Math Anytime: Daily Review and Today's Challenge **Closure:** Lesson Self-Assessment: PearsonRealize.com		

MATH.K-12.1	Make sense of problems and persevere in solving them
MATH.K-12.2	Reason abstractly and quantitatively
MATH.K-12.3	Construct viable arguments and critique the reasoning of others
MATH.4.OA.A.3	Solve multi-step word problems posed with whole numbers and having whole-number answers using the four operations, including problems in which remainders must be interpreted. 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.
MATH.K-12.4	Model with mathematics
MATH.K-12.5	Use appropriate tools strategically
MATH.K-12.6	Attend to precision
MATH.K-12.7	Look for and make use of structure
MATH.K-12.8	Look for and express regularity in repeated reasoning
MATH.4.NBT.B.5	Multiply a whole number of up to four digits by a one-digit whole number, and multiply two two-digit numbers, using strategies based on place value and the properties of operations. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.
MATH.4.NBT.B.6	Find whole-number quotients and remainders with up to four-digit dividends and one-digit divisors, using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area model.

Suggested Modifications for Special Education, ELL and Gifted Students
Gifted Students

- Students will find the missing numbers to division equations by using inverse operations to help them fill in the blanks.

- Create a comic strip that explains the steps of using long division or using partial quotients to divide. It must be at least 6 frames long.

Special Education Students

- Fluency review Activity

- Vocabulary Review

- Create a silly acronym or phrase for remembering the steps to long division in order. Have students turn their phrase into a poster or journal page for their notebooks.

- Model the process of dividing 49 by 3 using place value blocks. Students should place 4 tens rods and 9 unit cubes in their workspace and draw three circle for the groups. Using prompting and questioning, guide students to break the 49 into 4 groups. Using the manipulatives to help visualize and model explain and discuss the answer.

English Language Learners

- Topic Vocabulary

- Visual Learning Bridge: Reading

- Solve & Share: Speaking

Suggested Technological Innovations/Use

- IXL

- ST Math

- Kahoot!

- Tools (EnVision 2020)

- Game Center (EnVision 2020)

- Create/Complete a Discovery Education Board

Cross Curricular/21st Century Connections

- Pick a Project Activity

- Envision STEM Project

- EnVision STEM Activity

- Problem Solving Reading Activity

- 3 ACT MATH Activity: Snack Attack

Topic 06: Use Operations with Whole Numbers to Solve Problems

Content Area: **Mathematics**
Course(s): **Math**
Time Period: **2nd Semester**
Length: **6 days**
Status: **Published**

Summary of the Unit

Topic 6 focuses on solving word problems using skills developed involving multi-digit whole-number addition, subtraction, multiplication, and division. As students solve word problems, they draw on previously learned meanings of the four operations, and they come to understand how multiplication can be used for comparison.

Enduring Understandings

- Both addition and multiplication can be used to make comparisons.
- Bar diagrams and equations can be used to show both situations and to distinguish between them.
- Bar diagrams can be used to solve problems involving multiplicative comparison.
- Bar diagrams and equations can be used to model and solve multi-step problems.
- Multi-step problems can be modeled and solved in more than one way.
- Equations can represent problems, and are helpful in answering both hidden questions and the original question in a problem.
- Good math thinkers make sense of problems and think of ways to solve them, even if they get stuck.

Essential Questions

- How is comparing with multiplication different from comparing with addition?
- How can you use equations to solve multi-step problems?

Summative Assessment and/or Summative Criteria

- Topic Test
- Performance Task

Resources

enVision math series https://www.savvas.com/solutions/mathematics/core-programs/envision-mathematics-grades-k-5

ST Math is a visual instructional program that builds a deep conceptual understanding of math through rigorous learning and creative problem solving to engage, motivate and challenge PreK-8 students toward higher achievement. https://www.stmath.com/

IXL online learning, offering unlimited algorithmically generated questions, real-time analytical reports, and dynamic scoring to encourage mastery. https://www.ixl.com/

Discovery Education https://google.discoveryeducation.com/

National Council of Teachers of Mathematics - This website contains activities and lessons, and virtual manipulatives organized by strand. http://illuminations.nctm.org

The National Library of Virtual Manipulatives has tutorials and virtual manipulatives for the classroom. http://nlvm.usu.edu/en/nav/index.html

The Teaching Channel has two hundred math videos for professional development. http://www.theteachingchannel.org

K-5 Math Teaching Resources site contains free math teaching resources, games, activities, journal tasksand resources for centers arranged by grade level and standard. http://www.k-5mathteachingresources.com

Open Middle- This website contains 36 math reasoning scenarios arranged by CCSS. http://www.openmiddle.com/

Which One Doesn't Belong- This is a website dedicated to providing thought-provoking puzzles for math teachers and students alike. There are no answers provided as there are many different, correct ways of choosing which one doesn't belong. http://wodb.ca/

Estimation 180- This website contains hundreds of estimation challenges relative to real-world scenarios to assist in building strong connections with number sense and the real world. http://www.estimation180.com/

Unit Plan

Topic/Selection Timeframe	General Objectives	Instructional Activities	Benchmarks/Assessments	Standards	
Solve Comparison Problems (1 Day)	Interpret comparisons as multiplication or addition equations.	**Problem Based Learning:** Solve and share: *Students use reasoning when solving a comparison problem (textbook page 225) involving multiplication or addition.* **Visual Learning:** Visual Learning Bridge- *How is comparing with multiplication different from comparing with addition?* Convince Me! -*Construct Arguments- Students will describe a scenario when they might use multiplication or addition to make a comparison. Key vocabulary should include "times as many" or "more than."* **Guided Practice / Differentiated Instruction / Centers:** Teacher Led: *Intervention: Reteach to Build Understanding* On Level: *Build Mathematical Literacy* Advanced: *Enrichment* **Technology:** Practice buddy (PearsonRealize.com)	Guided Practice Independent Practice Problem solving Practice Buddy Reteach Build Mathematical Literacy Enrichment Additional Practice Quick Check 6-1	4.OA.A.1, 4.OA.A.2, 4.NBT.B.5, MP.K-12.2, MP.K-12.3, MP.K-12.4	

		Independent: Independent Practice and Problem Solving **Additional Activities:** Math Games (PearsonRealize.com) Visual Learning Animation Plus: (PearsonRealize.com) Additional Practice Math Anytime: Daily Review and Today's Challenge **Closure:** Lesson Self-Assessment: PearsonRealize.com		
Continue to Solve Comparison Problems (1 Day)	Use multiplication and division to compare two quantities.	**Problem Based Learning:** <u>Solve and share</u>: *Students solve a real work problem involving a multiplicative comparison (Textbook page 229).* **Visual Learning:** Visual Learning Bridge- *How can you solve a problem involving multiplication as a comparison?* <u>Convince Me!</u> -*Use Structure- Students identify and explain key characteristics of a comparison situation that requires division to solve.* **Guided Practice / Differentiated Instruction / Centers:** **Teacher Led:** <u>Intervention</u>: *Reteach to Build Understanding* <u>On Level</u>: *Build Mathematical Literacy* <u>Advanced</u>: *Enrichment* **Technology:** Practice Buddy (PearsonRealize.com)	Guided Practice Independent Practice Problem solving Practice Buddy Reteach Build Mathematical Literacy Enrichment Additional Practice Quick Check 6-2	4.OA.A.1, 4.OA.A.2, 4.NBT.B.5, 4.NBT.B.6, MP.K-12.4, MP.K-12.7

		Independent: Independent Practice and Problem Solving **Additional Activities:** Math Games (PearsonRealize.com) Visual Learning Animation Plus: (PearsonRealize.com) Additional Practice Math Anytime: Daily Review and Today's Challenge **Closure:** Lesson Self-Assessment: PearsonRealize.com		
Model Multi-Step Problems (1 Day)	Model and solve multi-step problems by finding hidden questions and using bar diagrams and equations.	**Problem Based Learning:** <u>Solve and share-</u> *Students make sense of a real-world multi-step problem and persevere in solving it (textbook page 233).* **Visual Learning:** Visual Learning Bridge- *How can you use diagrams and equations to solve multi-step problems?* <u>Convince Me!</u> *-Construct Arguments- Students will relate the steps needed in the visual learning piece to agree or disagree with a provided scenario. Explanation is required.* **Guided Practice / Differentiated Instruction / Centers:** **Teacher Led:** <u>Intervention:</u> *Reteach to Build Understanding* <u>On Level:</u> *Build Mathematical Literacy* <u>Advanced:</u> *Enrichment* **Technology:** Practice	Guided Practice Independent Practice Problem solving Practice Buddy Reteach Build Mathematical Literacy Enrichment Additional Practice Quick Check 6-3	4.OA.A.2, 4.OA.A.3, 4.NBT.B.4, 4.NBT.B.5, 4.NBT.B.6, MP.K-12.1, MP.K-12.3, MP.K-12.4

| | | Buddy (PearsonRealize.com)

Independent: Independent Practice and Problem Solving

Optional Activities: Problem Solving Leveled Reading Mats: The Variety of Life

Additional Activities:

Math Games (PearsonRealize.com)

Visual Learning Animation Plus:

(PearsonRealize.com)

Additional Practice

Math Anytime: Daily Review and

Today's Challenge

Closure: Lesson Self-Assessment: PearsonRealize.com | | |
|---|---|---|---|---|
| More Model Multi-Step Problems

(1 Day) | Model and solve multi-step problems and check that answers are reasonable. | **Problem Based Learning:** Solve and share: *Students use math they have learned previously to model and solve a real-world multi-step problem. (Textbook page 237).*

Visual Learning: Visual Learning Bridge- *How can you model and solve a multi-step problem?* Convince Me! -*Model with Math- Students use bar diagrams to model problems in order to assist them in solving.*

Guided Practice / Differentiated Instruction / Centers:

Teacher Led: Intervention: *Reteach to Build Understanding* On Level: *Build Mathematical Literacy* | Guided Practice

Independent Practice

Problem solving

Practice Buddy

Reteach

Build Mathematical Literacy

Enrichment

Additional Practice

Quick Check 6-4 | 4.OA.A.2,

4.OA.A.3,

4.NBT.B.4,

4.NBT.B.5,

4.NBT.B.6,

MP.K-12.1,

MP.K-12.4 |

		Advanced: _Enrichment_ **Technology:** Practice Buddy (PearsonRealize.com) **Independent:** Independent Practice and Problem Solving **Additional Activities:** Math Games (PearsonRealize.com) Visual Learning Animation Plus: (PearsonRealize.com) Additional Practice Math Anytime: Daily Review and Today's Challenge **Closure:** Lesson Self-Assessment: PearsonRealize.com		
Solve Multi-Step Problems (1 Day)	Solve multi-step problems by writing and solving one or more equations.	**Problem Based Learning:** Solve and share: _Students use reasoning to determine relationships in a multi-step problem and use this understanding to solve. (Textbook page 241)._ **Visual Learning:** Visual Learning Bridge- _How can you use equations to solve multi-step problems?_ Convince Me! -_Construct Arguments – Students explain why the answer of 11 rows is reasonable using estimations and comparisons._ **Guided Practice / Differentiated Instruction / Centers:** **Teacher Led:** Intervention: _Reteach to Build Understanding_ On Level: _Build Mathematical Literacy_ Advanced: _Enrichment_ **Technology:** Practice Buddy (PearsonRealize.com)	Guided Practice Independent Practice Problem solving Practice Buddy Reteach Build Mathematical Literacy Enrichment Additional Practice Quick Check 6-5	4.OA.A.2, 4.OA.A.3, 4.NBT.B.4, 4.NBT.B.5, 4.NBT.B.6, MP.K-12.2, MP.K-12.3, MP.K-12.4

		Independent: Independent Practice and Problem Solving **Additional Activities:** Math Games (PearsonRealize.com) Visual Learning Animation Plus: (PearsonRealize.com) Additional Practice Math Anytime: Daily Review and Today's Challenge **Optional Activity:** Envision STEM 6-5: " A Breath of Fresh Air!" **Closure:** Lesson Self-Assessment: PearsonRealize.com		
Problem Solving: Make Sense and Persevere (1 Day)	Make sense of a multi-step problem and keep working until it is solved.	**Problem Based Learning:** Solve and share: *Students use reasoning to determine relationships in a multi-step problem and use this understanding to solve. (Textbook page 241).* **Visual Learning:** Visual Learning Bridge- *How can you use equations solve multi-step problems?* Convince Me! *-Construct Arguments – Students explain why the answer of 11 rows is reasonable using estimations and comparisons.* **Guided Practice / Differentiated Instruction / Centers:** **Teacher Led:** Intervention: *Reteach to Build Understanding* On Level: *Build Mathematical Literacy* Advanced: *Enrichment* **Technology:** Practice buddy (PearsonRealize.com) **Independent:** Independent	Guided Practice Independent Practice Problem solving Practice Buddy Reteach Build Mathematical Literacy Enrichment Additional Practice Quick Check 6-6	4.OA.A.2, 4.OA.A.3, 4.NBT.B.5, 4.NBT.B.6, MP.K-12.1, MP.K-12.5, MP.K-12.6

| | | Practice and Problem Solving

Additional Activities:
Math Games
(PearsonRealize.com)
Visual Learning Animation Plus:
(PearsonRealize.com)
Additional Practice
Math Anytime: Daily Review and
Today's Challenge

Optional Activity: Project Based Learning: Students will research 3 examples of renewable energy. They will explain the sources they found. Additionally, students will describe the makeup of a solar panel. This will include the number of cells, the number of cells on numerous panels together and the difference between various groups of panels using multiplication and addition.

Closure: Lesson Self-Assessment: PearsonRealize.com | | |
|---|---|---|---|---|

MATH.K-12.1	Make sense of problems and persevere in solving them
MATH.4.OA.A.1	Interpret a multiplication equation as a comparison, e.g., interpret 35 = 5 × 7 as a statement that 35 is 5 times as many as 7 and 7 times as many as 5. Represent verbal statements of multiplicative comparisons as multiplication equations.
MATH.K-12.2	Reason abstractly and quantitatively
MATH.4.OA.A.2	Multiply or divide to solve word problems involving multiplicative comparison, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem, distinguishing multiplicative comparison from additive comparison.
MATH.K-12.3	Construct viable arguments and critique the reasoning of others
MATH.4.OA.A.3	Solve multi-step word problems posed with whole numbers and having whole-number answers using the four operations, including problems in which remainders must be interpreted. 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.
MATH.K-12.4	Model with mathematics
MATH.K-12.5	Use appropriate tools strategically
MATH.K-12.6	Attend to precision
MATH.K-12.7	Look for and make use of structure
MATH.K-12.8	Look for and express regularity in repeated reasoning

MATH.4.NBT.B.4	With accuracy and efficiency, add and subtract multi-digit whole numbers using the standard algorithm.
MATH.4.NBT.B.5	Multiply a whole number of up to four digits by a one-digit whole number, and multiply two two-digit numbers, using strategies based on place value and the properties of operations. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.
MATH.4.NBT.B.6	Find whole-number quotients and remainders with up to four-digit dividends and one-digit divisors, using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area model.

Climate Change Activity

Project Based Learning: Students will begin by viewing the video "Solar Energy" from Discovery Education and discuss. https://google.discoveryeducation.com/learn/videos/72849902-271f-4735-b99f-c419a9f6f0bf

Students will research 3 examples of renewable energy. They will explain the sources they found. Additionally, students will describe the makeup of a solar panel. This will include the number of cells, the number of cells on numerous panels together and the difference between various groups of panels using multiplication and addition.

Suggested Modifications for Special Education, ELL and Gifted Students

Gifted Students

- Students will write equations with variables to represent multi-step problems as well as bar diagrams with multi-step problems.

- Students will create their own multi-step problems. They can use bar diagrams to help them model, and equations with variables to check their own understanding. Once completed, they can switch problems with a friend and try to solve.

Special Education Students

- Fluency review Activity

- Vocabulary Review

- Create a "Notice/Wonder" T- Chart to help identify hidden questions and patterns in multi-step scenarios. Remind students that there are no right or wrong answers when using this strategy as you are using it to be a detective to find important information before you solve.

- Write out equations to help identify which part of the multi-step problem is missing (i.e. $n + 4 = 9$)

English Language Learners

- Topic Vocabulary

- Visual Learning Bridge: Reading

- Solve & Share: Speaking

Suggested Technological Innovations/Use

- IXL

- ST Math

- Kahoot!

- Tools (EnVision 2020)

- Game Center (EnVision 2020)

- Create/Complete a Discovery Education Board

Cross Curricular/21st Century Connections

- Pick a Project Activity

- Envision STEM Project

- EnVision STEM Activity

- Problem Solving Reading Activity

Topic 07: Factors and Multiples

Content Area: **Mathematics**
Course(s): **Math**
Time Period: **2nd Trimester**
Length: **5 days**
Status: **Published**

Summary of the Unit

Topic 7 focuses on understanding the meaning of factors and multiples by building on students' understanding of multiplication. The concepts of prime and composite numbers are developed through an understanding of factors.

Enduring Understandings

- Factors of a number can be shown by arranging counters into rows with the same number of counters in each row. The number of rows and number of counters in each row are factors of that number.
- Factors of a number can be found in pairs by thinking about multiplication.
- Good math thinkers look for things that repeat, and make generalizations.
- Prime numbers have exactly 2 factors, and composite numbers have more than 2 factors.
- The products of any nonzero whole number, and a given nonzero whole number are a multiple of both.
- Factors and multiples are closely related.

Essential Questions

- How can you use arrays or multiplication to find the factors of a number?
- How can you identify prime and composite numbers?
- How can you find multiples of a number?

Summative Assessment and/or Summative Criteria

- Topic Test
- Performance Task

Resources

enVision math series https://www.savvas.com/solutions/mathematics/core-programs/envision-mathematics-grades-k-5

ST Math is a visual instructional program that builds a deep conceptual understanding of math through rigorous learning and creative problem solving to engage, motivate and challenge PreK-8 students toward higher achievement. https://www.stmath.com/

IXL online learning, offering unlimited algorithmically generated questions, real-time analytical reports, and dynamic scoring to encourage mastery. https://www.ixl.com/

Discovery Education https://google.discoveryeducation.com/

National Council of Teachers of Mathematics - This website contains activities and lessons, and virtual manipulatives organized by strand. http://illuminations.nctm.org

The National Library of Virtual Manipulatives has tutorials and virtual manipulatives for the classroom. http://nlvm.usu.edu/en/nav/index.html

The Teaching Channel has two hundred math videos for professional

development. http://www.theteachingchannel.org

 K-5 Math Teaching Resources site contains free math teaching resources, games, activities, journal tasksand resources for centers arranged by grade level and standard. http://www.k-5mathteachingresources.com

Open Middle- This website contains 36 math reasoning scenarios arranged by CCSS. http://www.openmiddle.com/

Which One Doesn't Belong- This is a website dedicated to providing thought-provoking puzzles for math teachers and students alike. There are no answers provided as there are many different, correct ways of choosing which one doesn't belong. http://wodb.ca/

Estimation 180- This website contains hundreds of estimation challenges relative to real-world scenarios to assist in building strong connections with number sense and the real world. http://www.estimation180.com/

Unit Plan

Topic/ Selection Timeframe	General Objectives	Instructional Activities	Benchmarks/ Assessments	Standards
Understand Factors (1 Day)	Use arrays to find the factors of a given whole number.	**Problem Based Learning:** <u>Solve and share:</u> *Students use understanding of multiplication to find all the arrays possible for 24 carpet squares. Grid paper can be provided as tool to visually model arrays. (Textbook page 261).* **Visual Learning:** Visual Learning Bridge- *How can you use arrays to find the factors pairs of a number?* <u>Convince Me!</u> *-Critique Reasoning – Students evaluate a statement made about factors and begin to explore properties of factors.* **Guided Practice / Differentiated Instruction / Centers:** **Teacher Led:** <u>Intervention:</u> *Reteach to Build Understanding* <u>On Level:</u> *Build Mathematical Literacy* <u>Advanced:</u> *Enrichment* **Technology:** Practice Buddy (PearsonRealize.com) **Independent:** Independent Practice and Problem Solving **Additional Activities:** Math Games (PearsonRealize.com) Visual Learning Animation Plus:	Guided Practice Independent Practice Problem solving Practice Buddy Reteach Build Mathematical Literacy Enrichment Additional Practice Quick Check 7-1	4.OA.B.4, 4.NBT.B.5, MP.K-12.2, MP.K-12.3, MP.K-12.7

		(PearsonRealize.com)		
		Additional Practice		
		Math Anytime: Daily Review and		
		Today's Challenge		
		Optional Activity: EnVision STEM Activity 7-1		
		Closure: Lesson Self-Assessment: PearsonRealize.com		
Factors (1 Day)	Use Multiplication to find all the factor pairs for a whole number.	**Problem Based Learning:** <u>Solve and share:</u> *Students use arrays or multiplication facts to find the factor pairs for a given whole number. Grid paper can be provided as tool to visually model arrays. (Textbook page 265).* **Visual Learning:** Visual Learning Bridge- *How can you use multiplication to find the factors of a number?* <u>Convince Me!</u> *-Construct Arguments – Students explain how an organized approach to finding factor pairs helps them determine whether they have found all of the possible factors of a given number.* **Guided Practice / Differentiated Instruction / Centers:** **Teacher Led:** <u>Intervention:</u> *Reteach to Build Understanding* <u>On Level:</u> *Build Mathematical Literacy* <u>Advanced:</u> *Enrichment* **Technology:** Practice Buddy (PearsonRealize.com) **Independent:** Independent Practice and Problem Solving **Optional Activities:** Problem Solving Leveled Reading Mats: Eggs, Nests, and Hatching "What is my fact?" game- Students will complete an Activity Card by determining a factor pair when given a product. **Additional Activities:** Math Games (PearsonRealize.com)	Guided Practice Independent Practice Problem solving Practice Buddy Reteach Build Mathematical Literacy Enrichment Additional Practice Quick Check 7-2	4.OA.B.4, 4.NBT.B.5, MP.K-12.1, MP.K-12.3, MP.K-12.4

		Visual Learning Animation Plus: (PearsonRealize.com) Additional Practice Math Anytime: Daily Review and Today's Challenge **Closure:** Lesson Self-Assessment: PearsonRealize.com		
Problem Solving: Repeated Reasoning (1 Day)	Use Repeated reasoning to generalize how to solve problems that are similar.	**Problem Based Learning:** <u>Solve and share:</u> *Students extend their understanding of how to find the factors of a number by building arrays. (Textbook page 269.)* **Visual Learning:** Visual Learning Bridge- *How can you use repeated reasoning to find all the factors for a number?* <u>Convince Me!</u> *-Construct Arguments – Students analyze a diagram of factors pairs and use it to justify the conclusion that when factors pairs begin to repeat, all factors' pairs have been determined.* **Guided Practice / Differentiated Instruction / Centers:** **Teacher Led:** <u>Intervention:</u> *Reteach to Build Understanding* <u>On Level:</u> *Build Mathematical Literacy* <u>Advanced:</u> *Enrichment* **Technology:** Practice Buddy (PearsonRealize.com) **Independent:** Independent Practice and Problem Solving **Additional Activities:** Math Games (PearsonRealize.com) Visual Learning Animation Plus: (PearsonRealize.com) Additional Practice Math Anytime: Daily Review and Today's Challenge **Optional Activity:** EnVision STEM Activity 7-3 **Closure:** Lesson Self-Assessment: PearsonRealize.com	Guided Practice Independent Practice Problem solving Practice Buddy Reteach Build Mathematical Literacy Enrichment Additional Practice Quick Check 7-3	4.OA.B.4, 4.NBT.B.5, MP.K-12.1, MP.K-12.2, MP.K-12.3, MP.K-12.6, MP.K-12.8

Prime and Composite Numbers (1 Day)	Use factors to determine whether a whole number greater than 1 is prime or composite	**Problem Based Learning:** *Solve and share- Students find all of the rectangular arrays that can be made using sets of tiles(Textbook page 273).* **Visual Learning:** Visual Learning Bridge- *How can you identify prime and composite numbers?* Convince Me! -*Generalize – Students use the definitions of prime and composite numbers to generalize that all whole numbers greater than 1 are classified as either prime or composite.* **Guided Practice / Differentiated Instruction / Centers:** **Teacher Led:** Intervention: *Reteach to Build Understanding* On Level: *Build Mathematical Literacy* Advanced: *Enrichment* **Technology:** Practice Buddy (PearsonRealize.com) **Independent:** Independent Practice and Problem Solving **Additional Activities:** Math Games (PearsonRealize.com) Visual Learning Animation Plus: (PearsonRealize.com) Additional Practice Math Anytime: Daily Review and Today's Challenge **Closure:** Lesson Self-Assessment: PearsonRealize.com	Guided Practice Independent Practice Problem solving Practice Buddy Reteach Build Mathematical Literacy Enrichment Additional Practice Quick Check 7-4	4.OA.B.4, 4.NBT.B.5, MP.K-12.2, MP.K-12.3, MP.K-12.8
Multiples (1 Day)	Use multiplication to find multiples of a given whole number.	**Problem Based Learning:** Solve and share: *Students connect to their previous understanding of factors to find multiples of a number. (Textbook page 277).* **Visual Learning:** Visual Learning Bridge- *How can you find multiples of a number?* Convince Me! -Reasoning – Students *connect to previous knowledge of multiplication facts in order to determine the set number of multiples needed to solve the problem.* **Guided Practice / Differentiated Instruction / Centers:** **Teacher Led:** Intervention: *Reteach to Build Understanding* On Level: *Build Mathematical Literacy*	Guided Practice Independent Practice Problem solving Practice Buddy Reteach Build Mathematical Literacy	4.OA.B.4, 4.NBT.B.5, MP.K-12.2, MP.K-12.3

		Advanced: *Enrichment* **Technology:** Practice Buddy (PearsonRealize.com) **Independent:** Independent Practice and Problem Solving **Additional Activities:** Math Games (PearsonRealize.com) Visual Learning Animation Plus: (PearsonRealize.com) Additional Practice Math Anytime: Daily Review and Today's Challenge **Closure:** Lesson Self-Assessment: PearsonRealize.com	Enrichment Additional Practice Quick Check 7-5	

MATH.K-12.1	Make sense of problems and persevere in solving them
MATH.K-12.2	Reason abstractly and quantitatively
MATH.K-12.3	Construct viable arguments and critique the reasoning of others
MATH.K-12.4	Model with mathematics
MATH.4.OA.B.4	Find all factor pairs for a whole number in the range 1–100. Recognize that a whole number is a multiple of each of its factors. Determine whether a given whole number the range 1–100 is a multiple of a given one-digit number. Determine whether a given whole number in the range 1–100 is prime or composite.
MATH.K-12.5	Use appropriate tools strategically
MATH.K-12.6	Attend to precision
MATH.K-12.7	Look for and make use of structure
MATH.K-12.8	Look for and express regularity in repeated reasoning
MATH.4.NBT.B.5	Multiply a whole number of up to four digits by a one-digit whole number, and multiply two two-digit numbers, using strategies based on place value and the properties of operations. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.

Suggested Modifications for Special Education, ELL and Gifted Students
Gifted Students

- Use a Venn diagram to compare/contrast factors and multiples.

- Students will have a factor race to find the factors of whole numbers. One player will begin by flipping a number card in the center. All students will list as many factors as they can of the number identified on the card as fast as they can. The first one to list all factors correctly earns a point. (2 or more players) Factor cards: http://yourmathwizard.weebly.com/uploads/1/3/0/7/13077390/factorracemathgame.pdf

- Using the same set of cards, students can explore what the greatest common factor is between two whole numbers. Students will have a factor race to find the greatest common factors between two numbers. One player will begin by flipping two number cards. All players will list as many factors as they

can for each number. The first player to correctly identify the greatest common factor wins the round and earns a point. (Challenge: Students can flip three, four or even five number cards to search for the GCF.)

Special Education Students

- Fluency review Activity

- Vocabulary Review

- Model arrays using grid paper or counters when demonstrating factors pairs of whole numbers.

- Students can be provided with a multiplication reference sheet in their math notebooks to reference for factors and multiples. References should include the differences between "factors" and "multiple" as well as basic fact information.

English Language Learners

- Topic Vocabulary

- Visual Learning Bridge: Reading

- Solve & Share: Speaking

Suggested Technological Innovations/Use

- IXL

- ST Math

- Kahoot!

- Tools (EnVision 2020)

- Game Center (EnVision 2020)

- Create/Complete a Discovery Education Board

Cross Curricular/21st Century Connections

- Pick a Project Activity

- EnVision STEM Project

- EnVision STEM Activity

- Problem Solving Reading Activity

- 3 ACT MATH Activity: Can- Do Attitude

Topic 08: Extend Understanding of Fraction Equivalence and Ordering

Content Area: **Mathematics**
Course(s): **Math**
Time Period: **2nd Semester**
Length: **7 days**
Status: **Published**

Summary of the Unit

Topic 8 focuses on recognizing and generating equivalent fractions and on comparing fractions with different numerators and different denominators.

Enduring Understandings

- Two fractions that represent the same part of the same whole are equivalent.
- Two equivalent fractions are different names for the same number.
- The same fractional amount can be represented by an infinite set of different but equivalent fractions.
- When the numerator and the denominator of a fraction are multiplied by the same whole number greater than 1, it is the same as multiplying the fraction by 1, as multiplying by 1 does not change the value of a number.
- When the numerator and denominator of a fraction are divided by a common factor greater than 1, the result is an equivalent fraction.
- One way to compare two fractions that are parts of the same whole is by comparing each to a benchmark fraction such as ½.
- When two fractions have the same denominator, the fraction with the greater numerator is greater.
- When two fractions have the same numerator, the fraction with the lesser denominator is greater.
- Good math thinkers use math to explain why they are right, and also discuss the math that others do, too.

Essential Questions

- What are some ways to name the same part of a whole?
- How can you compare fractions with unlike numerators and denominators?

Summative Assessment and/or Summative Criteria

- Topic Test
- Performance Task

Resources

enVision math series https://www.savvas.com/solutions/mathematics/core-programs/envision-mathematics-grades-k-5

ST Math is a visual instructional program that builds a deep conceptual understanding of math through rigorous learning and creative problem solving to engage, motivate and challenge PreK-8 students toward higher achievement. https://www.stmath.com/

IXL online learning, offering unlimited algorithmically generated questions, real-time analytical reports, and dynamic scoring to encourage mastery. https://www.ixl.com/

Discovery Education https://google.discoveryeducation.com/

National Council of Teachers of Mathematics - This website contains activities and lessons, and virtual

manipulatives organized by strand. http://illuminations.nctm.org

The National Library of Virtual Manipulatives has tutorials and virtual manipulatives for the classroom. http://nlvm.usu.edu/en/nav/index.html

The Teaching Channel has two hundred math videos for professional development. http://www.theteachingchannel.org

K-5 Math Teaching Resources site contains free math teaching resources, games, activities, journal tasksand resources for centers arranged by grade level and standard. http://www.k-5mathteachingresources.com

Open Middle- This website contains 36 math reasoning scenarios arranged by CCSS. http://www.openmiddle.com/

Which One Doesn't Belong- This is a website dedicated to providing thought-provoking puzzles for math teachers and students alike. There are no answers provided as there are many different, correct ways of choosing which one doesn't belong. http://wodb.ca/

Estimation 180- This website contains hundreds of estimation challenges relative to real-world scenarios to assist in building strong connections with number sense and the real world. http://www.estimation180.com/

Unit Plan

Topic/Selection Timeframe	General Objectives	Instructional Activities	Benchmarks/Assessments	Standards
Equivalent Fractions: Area Models

(1 Day) | Use area models to recognize and generate equivalent fractions. | **Problem Based Learning:** Solve and share: *Students find an equivalent fraction for ¼ using a method of their choosing. They might draw a picture or model using fraction tiles. (Textbook page 293).*

Visual Learning: Visual Learning Bridge- *What are some ways to name the same parts of a whole?* Convince Me! - *Reason Abstractly- Students reason that ¼ and 2/8 may or may not be equivalent, depending on the size of the whole.*

Guided Practice / Differentiated Instruction / Centers:

Teacher Led: Intervention: *Reteach to Build Understanding*

On Level: *Build Mathematical Literacy*

Advanced: *Enrichment*

Technology: Practice Buddy | Guided Practice

Independent Practice

Problem solving

Practice Buddy

Reteach

Build Mathematical Literacy

Enrichment

Additional Practice

Quick Check 8-1 | 4.NF.A.1,

MP.K-12.1,

MP.K-12.2,

MP.K-12.5 |

		(PearsonRealize.com) **Independent:** Independent Practice and Problem Solving **Additional Activities:** Math Games (PearsonRealize.com) Visual Learning Animation Plus: (PearsonRealize.com) Additional Practice Math Anytime: Daily Review and Today's Challenge **Closure:** Lesson Self-Assessment: PearsonRealize.com		
Equivalent Fractions: Number Lines (1 Day)	Use a number line to locate and identify equivalent fractions.	**Problem Based Learning:** <u>Solve and share:</u> *Students connect to their previous understanding of finding equivalent fractions to find equivalent fractions using a ruler. Number lines or teaching tool 12 may be provided. (Textbook page 297).* **Visual Learning:** Visual Learning Bridge- *How can you use a number line to explain why fractions are equivalent?* <u>Convince Me!</u> -*Students make connections to reason abstractly. In this specific case, they use reasoning to explain how number lines can show equivalent fractions.* **Guided Practice / Differentiated Instruction / Centers:** **Teacher Led:** <u>Intervention:</u> *Reteach to Build Understanding*	Guided Practice Independent Practice Problem solving Practice Buddy Reteach Build Mathematical Literacy Enrichment Additional Practice Quick Check 8-2	4.NF.A.1, MP.K-12.1, MP.K-12.4, MP.K-12.5

		On Level: *Build Mathematical Literacy* Advanced: *Enrichment* **Technology:** Practice Buddy (PearsonRealize.com) **Independent:** Independent Practice and Problem Solving **Additional Activities:** Math Games (PearsonRealize.com) Visual Learning Animation Plus: (PearsonRealize.com) Additional Practice Math Anytime: Daily Review and Today's Challenge **Closure:** Lesson Self-Assessment: PearsonRealize.com		
Generate Equivalent Fractions: Multiplication (1 Day)	Use multiplication to find equivalent fractions.	**Problem Based Learning:** Solve and share: *Students write equivalent fractions to 4/6. (Textbook page 301).* **Visual Learning:** Visual Learning Bridge- *How can you use multiplication to find equivalent fractions?* Convince Me! -*Critique Reasoning- Students get a chance to explain the relationship between using multiplication to find equivalent fractions and the Identity Property of Multiplication.* **Guided Practice / Differentiated Instruction / Centers:** **Teacher**	Guided Practice Independent Practice Problem solving Practice Buddy Reteach Build Mathematical Literacy Enrichment Additional Practice Quick Check 8-3	4.NF.A.1, 4.NBT.B.5, MP.K-12.2, MP.K-12.3, MP.K-12.4

		Led: Intervention: *Reteach to Build Understanding* On Level: *Build Mathematical Literacy* Advanced: *Enrichment* **Technology:** Practice Buddy (PearsonRealize.com) **Independent:** Independent Practice and Problem Solving **Additional Activities:** Math Games (PearsonRealize.com) Visual Learning Animation Plus: (PearsonRealize.com) Additional Practice Math Anytime: Daily Review and Today's Challenge **Closure:** Lesson Self-Assessment: PearsonRealize.com		
Generate Equivalent Fractions: Division (1 Day)	Use division to find equivalent fractions.	**Problem Based Learning:** Solve and share: Students extend their understanding of equivalent *fractions as they find fractions equivalent to a given fraction. Fraction strips or teaching tool 13 may be provided. (Textbook page 305).* **Visual Learning:** Visual Learning Bridge- *How can you use division to find equivalent fractions?* Convince Me! *-Model with Math- Students use a number line to model the problem and show that the fractions found*	Guided Practice Independent Practice Problem solving Practice Buddy Reteach Build Mathematical Literacy Enrichment Additional Practice Quick Check 8-4	4.NF.A.1, 4.OA.B.4, MP.K-12.4, MP.K-12.6, MP.K-12.7

		are equivalent. **Guided Practice / Differentiated Instruction / Centers:** **Teacher Led:** Intervention: *Reteach to Build Understanding* On Level: *Build Mathematical Literacy* Advanced: *Enrichment* **Technology:** Practice Buddy (PearsonRealize.com) **Independent:** Independent Practice and Problem Solving **Additional Activities:** Math Games (PearsonRealize.com) Visual Learning Animation Plus: (PearsonRealize.com) Additional Practice Math Anytime: Daily Review and Today's Challenge **Optional Activities:** Problem-Solving Leveled Reading Mats: What a gem! **Closure:** Lesson Self-Assessment: PearsonRealize.com		
Use Benchmarks to Compare Fractions (1 Day)	Use benchmarks, area models, and number lines to compare fractions.	**Problem Based Learning:** Solve and share: *Students use number sense and experience with fractions such as ¼, ½, and ¾ to make an estimate. (Textbook page 309).* **Visual Learning:** Visual Learning Bridge- *How can*	Guided Practice Independent Practice Problem solving Practice Buddy Reteach Build Mathematical Literacy	4.NF.A.2, MP.K-12.2. MP.K-12.3, MP.K-12.8

		you use benchmarks to compare fractions? <u>Convince Me!</u> *-Critique Reasoning- Students draw number lines to represent and support the thinking of a peer to help deepen their understanding of how to compare fractions.* **Guided Practice / Differentiated Instruction / Centers:** **Teacher Led:** <u>Intervention:</u> *Reteach to Build Understanding* <u>On Level:</u> *Build Mathematical Literacy* <u>Advanced:</u> *Enrichment* **Technology:** Practice Buddy (PearsonRealize.com) **Independent:** Independent Practice and Problem Solving **Additional Activities:** Math Games (PearsonRealize.com) Visual Learning Animation Plus: (PearsonRealize.com) Additional Practice Math Anytime: Daily Review and Today's Challenge **Optional Activity:** EnVision STEM Activity 8-5 **Closure:** Lesson Self-Assessment: PearsonRealize.com	Enrichment Additional Practice Quick Check 8-5	
Compare Fractions (1 Day)	Use models or rename fractions to compare.	**Problem Based Learning:** <u>Solve and share:</u> *Students compare fractions with unlike denominators using tools such as drawings, number lines, or fraction strips. Tools such as fraction strips or teaching tool 13 may be provided. (Textbook page 313).*	Guided Practice Independent Practice Problem solving Practice Buddy Reteach Build Mathematical Literacy Enrichment	4.NF.A.1, 4.NF.A.2, 4.NBT.B.5, MP.K-12.3, MP.K-12.5

		Visual Learning: Visual Learning Bridge- *How can you compare fractions with unlike denominators?* Convince Me! *-Critique Reasoning- Students explain a possible reason for Kelly's thinking to help deepen their understanding of how to compare fractions with unlike denominators. It should also be discussed that when two fractions have the same numerator, the one with the lesser denominator is always greater.* **Guided Practice / Differentiated Instruction / Centers:** **Teacher Led:** Intervention: Reteach to Build Understanding On Level: *Build Mathematical Literacy* Advanced: *Enrichment* **Technology:** Practice Buddy (PearsonRealize.com) **Independent:** Independent Practice and Problem Solving **Additional Activities:** Math Games (PearsonRealize.com) Visual Learning Animation Plus: (PearsonRealize.com) Additional Practice Math Anytime: Daily Review and Today's Challenge **Optional Activities:** Project based Learning- EnVision STEM Project: Students will research how animals use special senses. Their research will include information about where the animal lives and how	Additional Practice Quick Check 8-6	

		the senses are used. Additionally, students will research how spiders have eight eyes. They will model a spider with eight eyes by drawing a picture and writing a fraction and equivalent fractions demonstrating a spider's eyes. EnVision STEM Activity 8-6 **Closure:** Lesson Self-Assessment: PearsonRealize.com		
Problem Solving: Construct Arguments (1 Day)	Construct arguments about fractions.	**Problem Based Learning:** Solve and share: *Students construct a mathematical argument to compare fractions. (Textbook page 317).* **Visual Learning:** *Visual Learning Bridge- How can you construct arguments?* Convince Me! *-Critique Reasoning- Students find the mistake in Erin's thinking and explain why it is a mistake. Teachers might prompt students to correct this mistake.* **Guided Practice / Differentiated Instruction / Centers: Teacher Led:** Intervention: *Reteach to Build Understanding* On Level: *Build Mathematical Literacy* Advanced: *Enrichment* **Technology:** Practice Buddy (PearsonRealize.com) **Independent:** Independent Practice and Problem Solving **Additional Activities:** Math Games (PearsonRealize.com) Visual Learning Animation Plus: (PearsonRealize.com) Additional Practice Math Anytime: Daily	Guided Practice Independent Practice Problem solving Practice Buddy Reteach Build Mathematical Literacy Enrichment Additional Practice Quick Check 8-7	4.NF.A.1, 4.NF.A.2, MP.K-12.1, MP.K-12.2, MP.K-12.3, MP.K-12.5

		Review and *Today's Challenge* **Closure:** Lesson Self-Assessment: PearsonRealize.com		

MATH.K-12.1	Make sense of problems and persevere in solving them
MATH.K-12.2	Reason abstractly and quantitatively
MATH.K-12.3	Construct viable arguments and critique the reasoning of others
MATH.K-12.4	Model with mathematics
MATH.K-12.5	Use appropriate tools strategically
MATH.K-12.6	Attend to precision
MATH.K-12.7	Look for and make use of structure
MATH.K-12.8	Look for and express regularity in repeated reasoning
MATH.4.NBT.B.5	Multiply a whole number of up to four digits by a one-digit whole number, and multiply two two-digit numbers, using strategies based on place value and the properties of operations. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.
MATH.4.NF.A.1	Explain why a fraction a/b is equivalent to a fraction $(n \times a)/(n \times b)$ by using visual fraction models, with attention to how the number and size of the parts differ even though the two fractions themselves are the same size. Use this principle to recognize and generate equivalent fractions.
MATH.4.NF.A.2	Compare two fractions with different numerators and different denominators, e.g., by creating common denominators or numerators, or by comparing to a benchmark fraction such as 1/2. Recognize that comparisons are valid only when the two fractions refer to the same whole. Record the results of comparisons with symbols >, =, or <, and justify the conclusions, e.g., by using a visual fraction model.

Suggested Modifications for Special Education, ELL and Gifted Students
Gifted Students

- Students will complete an equivalent fraction jigsaw. They must try to put the pieces together without rotating any of them (all numbers should be right side up.) Two pieces may only be next to each other if the edges that touch have fractions that are equivalent. Find the puzzle here: https://nrich.maths.org/5467

Special Education Students

- Fluency review Activity

- Vocabulary Review

- Model equivalent fractions using fraction strips and drawings.

- Provide students with a reference sheet for math notebook that includes steps for multiplying and dividing to find equivalent fractions. Emphasis should be placed on the rule "what you do to the top, you do to the bottom and vice versa.

English Language Learners

- Topic Vocabulary

- Visual Learning Bridge: Reading

- Solve & Share: Speaking

Suggested Technological Innovations/Use

- IXL

- ST Math

- Kahoot!

- Tools (EnVision 2020)

- Game Center (EnVision 2020)

- Create/Complete a Discovery Education Board

Cross Curricular/21st Century Connections

- Pick a Project Activity

- Envision STEM Project

- EnVision STEM Activity

- Problem Solving Reading Activity

Topic 09: Understand Addition and Subtraction of Fractions

Content Area: **Mathematics**
Course(s): **Math**
Time Period: **2nd Semester**
Length: **10 days**
Status: **Published**

Summary of the Unit

Topic 9 focuses on the understanding of adding and subtracting fractions and mixed numbers with like denominators.

Enduring Understandings

- Tools can be used to show addition of fraction as joining parts of the same whole.
- A fraction that has a numerator greater than 1, can be decomposed into the sum of two or more unit or non-unit fractions in one or more ways where the sum of the fractions is equal to the original fraction.
- Two fractions can be joined or added to find the total.
- There is a general method for adding fractions with like denominators.
- Tools can be used to show subtraction of fractions as separating a part from the same whole.
- The difference between two fractions with like denominators can be found by separating one fractional amount from the other.
- There is a general method for subtracting fractions with like denominators.
- Fraction addition and subtraction can be thought about as joining and separating segments on the number line.
- Fraction addition and subtraction can be thought about as counting forward or backwards on the number line.
- Adding and subtracting mixed numbers is an extension of the ideas and procedures for adding and subtracting fractions.
- Two procedures for adding mixed numbers both involve changing the calculation into a simpler equivalent calculation.
- Good math thinkers choose and apply math they know to show and solve problems from everyday life.

Essential Questions

- How do you add and subtract fractions and mixed numbers with like denominators?
- How can fractions be added and subtracted on a number line?

Summative Assessment and/or Summative Criteria

- Topic Test

- Performance Task

Resources

enVision math series https://www.savvas.com/solutions/mathematics/core-programs/envision-mathematics-grades-k-5

ST Math is a visual instructional program that builds a deep conceptual understanding of math through rigorous learning and creative problem solving to engage, motivate and challenge PreK-8 students toward higher achievement. https://www.stmath.com/

IXL online learning, offering unlimited algorithmically generated questions, real-time analytical reports, and

dynamic scoring to encourage mastery. https://www.ixl.com/

Discovery Education https://google.discoveryeducation.com/

National Council of Teachers of Mathematics - This website contains activities and lessons, and virtual manipulatives organized by strand. http://illuminations.nctm.org

The National Library of Virtual Manipulatives has tutorials and virtual manipulatives for the classroom. http://nlvm.usu.edu/en/nav/index.html

The Teaching Channel has two hundred math videos for professional development. http://www.theteachingchannel.org

K-5 Math Teaching Resources site contains free math teaching resources, games, activities, journal tasksand resources for centers arranged by grade level and standard. http://www.k-5mathteachingresources.com

Open Middle- This website contains 36 math reasoning scenarios arranged by CCSS. http://www.openmiddle.com/

Which One Doesn't Belong- This is a website dedicated to providing thought-provoking puzzles for math teachers and students alike. There are no answers provided as there are many different, correct ways of choosing which one doesn't belong. http://wodb.ca/

Estimation 180- This website contains hundreds of estimation challenges relative to real-world scenarios to assist in building strong connections with number sense and the real world. http://www.estimation180.com/

Unit Plan

Topic/Selection Timeframe	General Objectives	Instructional Activities	Benchmarks/Assessments	Standards
Model Addition of Fractions (1 Day)	Use fraction strips and number lines to add fractions.	**Problem Based Learning:** Solve and share: *Students connect to their previous understanding of addition of whole numbers and the meaning of a fraction a/b as a number of unit fractions 1/b in order to add fractions with like denominators. Fraction strips or teaching tool 13 may be provided (Textbook page 333).* **Visual Learning:** Visual Learning Bridge- *How can you use tools to add fractions?* Convince Me! -*Make Sense and Persevere- To solve the canoe problem, students should connect two representations for fractions, fraction strips and a number line to show the sum of two fractions can be found by adding the numerators and keeping the denominators the*	Guided Practice Independent Practice Problem solving Practice Buddy Reteach Build Mathematical Literacy Enrichment Additional Practice Quick Check 9-1	4.NF.B.3a, 4.NF.B.3d, MP.K-12.1, MP.K-12.5

		same.		
		Guided Practice / Differentiated Instruction / Centers:		
		Teacher Led: <u>Intervention:</u> *Reteach to Build Understanding*		
		<u>On Level:</u> *Build Mathematical Literacy*		
		<u>Advanced:</u> *Enrichment*		
		Technology: Practice Buddy (PearsonRealize.com)		
		Independent: Independent Practice and Problem Solving		
		Additional Activities:		
		Math Games (PearsonRealize.com)		
		Visual Learning Animation Plus:		
		(PearsonRealize.com)		
		Additional Practice		
		Math Anytime: Daily Review and		
		Today's Challenge		
		Closure: Lesson Self-Assessment: PearsonRealize.com		
Decompose Fractions (1 Day)	Decompose a fraction or mixed number into a sum of fractions in more than one way.	**Problem Based Learning:** <u>Solve and share:</u> *Students connect to their previous understanding of decomposing a fraction a/b into the sum of a unit fraction 1/b in order to decompose an improper fraction into a sum of unit and non-unit fractions. Fraction strips or teaching tool 13 may be provided. (Textbook page 337).*	Guided Practice Independent Practice Problem solving Practice Buddy Reteach Build Mathematical Literacy Enrichment Additional Practice	4.NF.B.3b, MP.K-12.4, MP.K-12.5

		Visual Learning: Visual Learning Bridge- *How can you represent a fraction in a variety of ways?* Convince Me! *-Use appropriate tools strategically- Fraction strips provide a useful tool for decomposing fractions into sums. When the fraction is greater than one, the process is the same.* **Guided Practice / Differentiated Instruction / Centers:** **Teacher Led:** Intervention: *Reteach to Build Understanding* On Level: *Build Mathematical Literacy* Advanced: *Enrichment* **Technology:** Practice Buddy (PearsonRealize.com) **Independent:** Independent Practice and Problem Solving **Additional Activities:** Math Games (PearsonRealize.com) Visual Learning Animation Plus: (PearsonRealize.com) Additional Practice Math Anytime: Daily Review and Today's Challenge **Optional Activity:** EnVision STEM Activity 9-2 **Closure:** Lesson Self-Assessment: PearsonRealize.com	Quick Check 9-2	

Add Fractions with Like Denominators (1 Day)	Solve problems involving joining parts of the same whole by adding fractions with like denominators.	**Problem Based Learning:** <u>Solve and share</u>: *Students solve a problem by adding fractions with like denominators. Fraction strips or teaching tool 13 may be provided. (Textbook page 341).* **Visual Learning:** Visual Learning Bridge- *How can you add fractions with like denominators?* <u>Convince Me!</u> -*Critique Reasoning- Students will analyze a problem to find and explain the error.* **Guided Practice / Differentiated Instruction / Centers:** **Teacher Led:** <u>Intervention:</u> *Reteach to Build Understanding* <u>On Level:</u> *Build Mathematical Literacy* <u>Advanced:</u> *Enrichment* **Technology:** Practice Buddy (PearsonRealize.com) **Independent:** Independent Practice and Problem Solving **Additional Activities:** Math Games (PearsonRealize.com) Visual Learning Animation Plus: (PearsonRealize.com) Additional Practice Math Anytime: Daily Review and Today's Challenge **Closure:** Lesson Self-Assessment:	Guided Practice Independent Practice Problem solving Practice Buddy Reteach Build Mathematical Literacy Enrichment Additional Practice Quick Check 9-3	4.NF.B.3a, 4.NF.B.3d, MP.K-12.3, MP.K-12.4, MP.K-12.7

		PearsonRealize.com		
Model Subtraction of Fractions (1 Day)	Use tools such as fraction strips, area models and number lines to subtract fractions.	**Problem Based Learning:** <u>Solve and share</u>: *Students connect their previous understanding of subtracting whole numbers and decomposing of a fraction a/b into unit fractions 1/b, in order to subtract fractions with like denominators. Fraction strips or teaching tool 13 may be provided. (Textbook page 345).* **Visual Learning:** Visual Learning Bridge- *How can you use tools to subtract fractions?* <u>Convince Me!</u> -*Use Appropriate Tools Strategically- Students model problems using fraction strips.* **Guided Practice / Differentiated Instruction / Centers:** **Teacher Led:** <u>Intervention</u>: *Reteach to Build Understanding* <u>On Level:</u> *Build Mathematical Literacy* <u>Advanced:</u> *Enrichment* **Technology:** Practice Buddy (PearsonRealize.com) **Independent:** Independent Practice and Problem Solving **Additional Activities:** Math Games (PearsonRealize.com) Visual Learning Animation Plus: (PearsonRealize.com) Additional Practice	Guided Practice Independent Practice Problem solving Practice Buddy Reteach Build Mathematical Literacy Enrichment Additional Practice Quick Check 9-4	4.NF.B.3a, 4.NF.B.3d, MP.K-12.4, MP.K-12.5, MP.K-12.6

		Math Anytime: Daily Review and Today's Challenge **Closure:** Lesson Self-Assessment: PearsonRealize.com		
Subtract Fractions with Like Denominators (1 Day)	Solve problems involving separating parts of the same whole by subtracting fractions.	**Problem Based Learning:** Solve and share: *Students solve a problem by subtracting two fractions with the same denominator. Fraction strips or teaching tool 13 may be provided. (Textbook page 349).* **Visual Learning:** Visual Learning Bridge- *How can you subtract fractions with like denominators?* Convince Me! *-Reason Quantitatively- Students use reasoning to determine another way a problem can be solved.* **Guided Practice / Differentiated Instruction / Centers:** **Teacher Led:** Intervention: *Reteach to Build Understanding* On Level: *Build Mathematical Literacy* Advanced: Enrichment **Technology:** Practice Buddy (PearsonRealize.com) **Independent:** Independent Practice and Problem Solving **Additional Activities:** Math Games (PearsonRealize.com) Visual Learning Animation Plus: (PearsonRealize.com)	Guided Practice Independent Practice Problem solving Practice Buddy Reteach Build Mathematical Literacy Enrichment Additional Practice Quick Check 9-5	4.NF.B.3a, 4.NF.B.3d, MP.K-12.2, MP.K-12.4

		Additional Practice Math Anytime: Daily Review and Today's Challenge **Closure:** Lesson Self-Assessment: PearsonRealize.com		
Add and Subtract Fractions with Like Denominators (1 Day)	Count forward or backward on a number line to add or subtract.	**Problem Based Learning:** Solve and share: *Students represent and solve a problem involving addition and subtraction of fractions with like denominators. (Textbook page 353).* **Visual Learning:** Visual Learning Bridge- *How do you add and subtract fractions on a number line?* Convince Me! -*Use Appropriate Tools Strategically- Students demonstrate how a number line can be used to show addition and subtraction of fractions.* **Guided Practice / Differentiated Instruction / Centers:** **Teacher Led:** Intervention: *Reteach to Build Understanding* On Level: *Build Mathematical Literacy* Advanced: *Enrichment* **Technology:** Practice Buddy (PearsonRealize.com) **Independent:** Independent Practice and Problem Solving **Additional Activities:** Math Games (PearsonRealize.com) Visual Learning Animation	Guided Practice Independent Practice Problem solving Practice Buddy Reteach Build Mathematical Literacy Enrichment Additional Practice Quick Check 9-6	4.NF.B.3a, 4.NF.B.3d, MP.K-12.4, MP.K-12.5

		Plus: (PearsonRealize.com) Additional Practice Math Anytime: Daily Review and Today's Challenge **Optional Activity:** Problem-Solving Leveled Reading Mats: Tactics **Closure:** Lesson Self-Assessment: PearsonRealize.com		
Model Addition and Subtraction of Mixed Numbers (1 Day)	Use models and equivalent fractions to add and subtract mixed numbers.	**Problem Based Learning:** Solve and share: *Students use tools to add two mixed numbers with like denominators. Number lines (teaching tool 12) or fraction strips (teaching tool 13) may be provided. (Textbook page 357).* **Visual Learning:** Visual Learning Bridge- *How can you add or subtract mixed numbers?* Convince Me! -*Use Appropriate Tools Strategically- Students use fraction strips or number lines to model addition and subtraction properties with mixed numbers.* **Guided Practice / Differentiated Instruction / Centers:** **Teacher Led:** Intervention: *Reteach to Build Understanding* On Level: *Build Mathematical Literacy* Advanced: *Enrichment* **Technology:** Practice Buddy (PearsonRealize.com)	Guided Practice Independent Practice Problem solving Practice Buddy Reteach Build Mathematical Literacy Enrichment Additional Practice Quick Check 9-7	4.NF.B.3c, 4.NF.B.3d, MP.K-12.2, MP.K-12.5

		Independent: Independent Practice and Problem Solving **Additional Activities:** Math Games (PearsonRealize.com) Visual Learning Animation Plus: (PearsonRealize.com) Additional Practice Math Anytime: Daily Review and Today's Challenge **Optional Activity:** EnVision STEM Activity 9-7 **Closure:** Lesson Self-Assessment: PearsonRealize.com		
Add Mixed Numbers (1 Day)	Use equivalent fractions and properties of operations to add mixed numbers with like denominators.	**Problem Based Learning:** Solve and share: *Students solve a problem by generalizing what they what they know about adding fractions to add two mixed numbers. (Textbook page 361).* **Visual Learning:** Visual Learning Bridge- How can you add mixed numbers? Convince Me! *-Reason Quantitatively- After students use the Commutative and Associative Properties to rearrange the addends, the computation involves adding fractions and adding whole numbers.* **Guided Practice / Differentiated Instruction / Centers:** **Teacher Led:** Intervention: *Reteach to Build Understanding*	Guided Practice Independent Practice Problem solving Practice Buddy Reteach Build Mathematical Literacy Enrichment Additional Practice Quick Check 9-8	4.NF.B.3c, 4.NF.B.3d, MP.K-12.2, MP.K-12.8

		On Level: *Build Mathematical Literacy* Advanced: *Enrichment* **Technology:** Practice Buddy (PearsonRealize.com) **Independent:** Independent Practice and Problem Solving **Additional Activities:** Math Games (PearsonRealize.com) Visual Learning Animation Plus: (PearsonRealize.com) Additional Practice Math Anytime: Daily Review and Today's Challenge **Closure:** Lesson Self-Assessment: PearsonRealize.com		
Subtract Mixed Numbers (1 Day)	Use equivalent fractions, properties of operations, and the relationship between addition and subtraction to subtract mixed numbers with like denominators.	**Problem Based Learning:** Solve and share: *Students subtract mixed numbers with like deniminators. (Textbook page 365).* **Visual Learning:** Visual Learning Bridge- *How can you subtract mixed numbers?* Convince Me! *-Reason Quantitatively- Students recognize that when the fraction of the larger mixed number is less than the fraction of the smaller mixed number or fraction (I.e. 4 ¼ - ¾) the larger fraction must be renamed. Fraction strips can be used to demonstrate this concept.* **Guided Practice / Differentiated Instruction / Centers:** **Teacher Led:** Intervention: *Reteach to Build Understanding*	Guided Practice Independent Practice Problem solving Practice Buddy Reteach Build Mathematical Literacy Enrichment Additional Practice Quick Check 9-9	4.NF.B.3c, 4.NF.B.3d, MP.K-12.1, MP.K-12.2, MP.K-12.8

| | | On Level: *Build Mathematical Literacy*

Advanced: *Enrichment*

Technology: Practice Buddy (PearsonRealize.com)

Independent: Independent Practice and Problem Solving

Additional Activities:

Math Games (PearsonRealize.com)

Visual Learning Animation Plus:

(PearsonRealize.com)

Additional Practice

Math Anytime: Daily Review and

Today's Challenge

Closure: Lesson Self-Assessment: PearsonRealize.com | | |
| Problem Solving: Model with Math

(1 Day) | Use previously learned concepts and skills to represent and solve problems. | **Problem Based Learning:** <u>Solve and share:</u> *Students extend their understanding of solving problems involving addition and subtraction of whole numbers to solving problems with fractions and mixed numbers. (Textbook page 369).*

Visual Learning: Visual Learning Bridge- *How can you use math to model problems?*

<u>Convince Me!</u> *-Model with Math- Modeling with math involves translating a situation into mathematics such as an equation. Students use bar diagrams to decide of their answers make sense.*

Guided | Guided Practice

Independent Practice

Problem solving

Practice Buddy

Reteach

Build Mathematical Literacy

Enrichment

Additional Practice

Quick Check 9-10 | 4.NF.B.3a,

4.NF.B.3c,

4.NF.B.3d,

MP.K-12.1,

MP.K-12.2,

MP.K-12.4 |

		Practice / Differentiated Instruction / Centers: **Teacher Led:** <u>Intervention:</u> *Reteach to Build Understanding* <u>On Level:</u> *Build Mathematical Literacy* <u>Advanced:</u> *Enrichment* **Technology:** Practice Buddy (PearsonRealize.com) **Independent:** Independent Practice and Problem Solving **Additional Activities:** Math Games (PearsonRealize.com) Visual Learning Animation Plus: (PearsonRealize.com) Additional Practice Math Anytime: Daily Review and Today's Challenge **Closure:** Lesson Self-Assessment: PearsonRealize.com		

MATH.K-12.1	Make sense of problems and persevere in solving them
MATH.K-12.2	Reason abstractly and quantitatively
MATH.K-12.3	Construct viable arguments and critique the reasoning of others
MATH.K-12.4	Model with mathematics
MATH.K-12.5	Use appropriate tools strategically
MATH.K-12.6	Attend to precision
MATH.K-12.7	Look for and make use of structure
MATH.K-12.8	Look for and express regularity in repeated reasoning
MATH.4.NF.B.3.a	Understand addition and subtraction of fractions as joining and separating parts refer to the same whole.
MATH.4.NF.B.3.b	Decompose a fraction into a sum of fractions with the same denominator in more tha one way, recording each decomposition by an equation. Justify decompositions, e.g., using a visual fraction model.
MATH.4.NF.B.3.c	Add and subtract mixed numbers with like denominators, e.g., by replacing each mixe number with an equivalent fraction, and/or by using properties of operations and the relationship between addition and subtraction.

MATH.4.NF.B.3.d	Solve word problems involving addition and subtraction of fractions referring to the same whole and having like denominators, e.g., by using visual fraction models and equations to represent the problem.

Suggested Modifications for Special Education, ELL and Gifted Students

Gifted Students

- Students will research recipes on the internet or in other resources in preparation for a party. They will combine, double or triple the real-world recipes by adding fractions and mixed numbers.

Special Education Students

- Fluency review Activity

- Vocabulary Review

- Students can be provided with a four-square for adding mixed numbers and another for subtracting mixed numbers. These four squares can be laminated for reuse. Each square contains a step for completing the computation. Students are able to follow the steps accordingly while showing their work below.

English Language Learners

- Topic Vocabulary

- Visual Learning Bridge: Reading

- Solve & Share: Speaking

Suggested Technological Innovations/Use

- IXL

- ST Math

- Kahoot!

- Tools (EnVision 2020)

- Game Center (EnVision 2020)

- Create/Complete a Discovery Education Board

Cross Curricular/21st Century Connections

- Pick a Project Activity

- Envision STEM Project

- EnVision STEM Activity

- Problem Solving Reading Activity

- 3 ACT MATH Activity: Just Add Water

Topic 10: Extend Multiplication Concepts to Fractions

Content Area: **Mathematics**
Course(s): **Math**
Time Period: **3rd Trimester**
Length: **5 days**
Status: **Published**

Summary of the Unit

Topic 10 focuses on the understanding of multiplying fractions by whole numbers. It also focuses on using the four operations to solve time problems.

Enduring Understandings

- Any fraction *a/b* can be written as *a* times the unit fraction *1/b.*
- Models and equations can be used to represent problems and compute problems of whole numbers and fractions.
- The standard algorithms for adding, and subtracting, as well as various strategies for multiplying and dividing, can be used to solve time problems.
- Good math thinkers choose and apply math they know, to show and solve problems from everyday life.

Essential Questions

- How can you describe a fraction using a unit fraction?
- How can you multiply a fraction by a whole number?

Summative Assessment and/or Summative Criteria

- Topic Test

- Performance Task

Resources

enVision math series https://www.savvas.com/solutions/mathematics/core-programs/envision-mathematics-grades-k-5

ST Math is a visual instructional program that builds a deep conceptual understanding of math through rigorous learning and creative problem solving to engage, motivate and challenge PreK-8 students toward higher achievement. https://www.stmath.com/

IXL online learning, offering unlimited algorithmically generated questions, real-time analytical reports, and dynamic scoring to encourage mastery. https://www.ixl.com/

Discovery Education https://google.discoveryeducation.com/

National Council of Teachers of Mathematics - This website contains activities and lessons, and virtual manipulatives organized by strand. http://illuminations.nctm.org

The National Library of Virtual Manipulatives has tutorials and virtual manipulatives for the classroom. http://nlvm.usu.edu/en/nav/index.html

The Teaching Channel has two hundred math videos for professional development. http://www.theteachingchannel.org

K-5 Math Teaching Resources site contains free math teaching resources, games, activities, journal tasks and resources for centers arranged by grade level and standard. http://www.k-5mathteachingresources.com

Open Middle- This website contains 36 math reasoning scenarios arranged by CCSS. http://www.openmiddle.com/

Which One Doesn't Belong- This is a website dedicated to providing thought-provoking puzzles for math teachers and students alike. There are no answers provided as there are many different, correct ways of choosing which one doesn't belong. http://wodb.ca/

Estimation 180- This website contains hundreds of estimation challenges relative to real-world scenarios to assist in building strong connections with number sense and the real world. http://www.estimation180.com/

Unit Plan

Topic/Selection Timeframe	General Objectives	Instructional Activities	Benchmarks/ Assessments	Standards
Fractions as Multiples of Unit Fractions

(1 Day) | Use a model, repeated addition, and multiplication to understand a fraction as a multiple of a unit fraction. | **Problem Based Learning:** Solve and share: *Students use reasoning to determine that a fraction can be written as both a sum of unit fractions and as a multiple of a unit fraction. Fraction strips or teaching tool 13 may be provided (Textbook page 385).*

Visual Learning: Visual Learning Bridge- *How can you describe a fraction using a unit fraction?*

Convince Me! - *Reason Quantitatively- Students reason about what it means for a fraction to be a multiple of a unit fraction.*

Guided Practice / Differentiated Instruction / Centers:

Teacher Led: Intervention: *Reteach to Build Understanding*

On Level: *Build Mathematical Literacy*

Advanced: *Enrichment*

Technology: Practice Buddy (PearsonRealize.com)

Independent: Independent Practice and Problem Solving

Additional Activities:

Math Games (PearsonRealize.com)

Visual Learning Animation Plus:

(PearsonRealize.com) | Guided Practice

Independent Practice

Problem solving

Practice Buddy

Reteach

Build Mathematical Literacy

Enrichment

Additional Practice

Quick Check 10-1 | 4.NF.B.4a,

MP.K-12.2,

MP.K-12.4 |

		Additional Practice Math Anytime: Daily Review and Today's Challenge **Optional Activity:** Problem- Solving Leveled Reading Mats: The Daily Planet **Closure:** Lesson Self-Assessment: PearsonRealize.com		
Multiply a Fraction by a Whole Number: Use Models (1 Day)	Use models to multiply fractions by whole numbers.	**Problem Based Learning:** <u>Solve and share:</u> *Students solve a problem that involves finding multiple groups of two different fractions. Fraction strips or teaching tool 13 may be provided. (Textbook page 389).* **Visual Learning:** Visual Learning Bridge- *How do you multiply a fraction by a whole number?* <u>Convince Me!</u> *- Generalize- Students use the definition of multiplication as repeated addition to generalize about multiplying a unit fraction by a whole number.* **Guided Practice / Differentiated Instruction / Centers:** **Teacher Led:** <u>Intervention:</u> *Reteach to Build Understanding* <u>On Level:</u> *Build Mathematical Literacy* <u>Advanced:</u> *Enrichment* **Technology:** Practice Buddy (PearsonRealize.com) **Independent:** Independent Practice and Problem Solving **Additional Activities:** Math Games (PearsonRealize.com) Visual Learning Animation Plus: (PearsonRealize.com) Additional Practice Math Anytime: Daily Review and Today's Challenge	Guided Practice Independent Practice Problem solving Practice Buddy Reteach Build Mathematical Literacy Enrichment Additional Practice Quick Check 10-2	4.NF.B.4a, 4.NF.B.4b, 4.NF.B.4c, MP.K-12.4, MP.K-12.7, MP.K-12.8

		Optional Activities: Project- Based Learning: EnVision Stem Project: Together, discuss and explore the colors in the spectrum visible to the human eye. Using the internet or other resources, students will research words related to the transfer of light. They will then apply these terms to real-world examples. Using their findings, students will solve math problems involving fractions and multiplication of fractions. EnVision STEM Activity 10-2 **Closure:** Lesson Self-Assessment: PearsonRealize.com		
Multiply a Fraction by a Whole Number: Use Symbols (1 Day)	Use symbols and equations to multiply a fraction by a whole number.	**Problem Based Learning:** Solve and share: *Students solve a problem by multiplying a fraction by a whole number. (Textbook page 393).* **Visual Learning:** Visual Learning Bridge- *How can you use symbols to multiply a fraction by a whole number?* Convince Me! *- Look for and Make Use of Structure- Students use the Associative Property of Multiplication to multiply a fraction by a whole numbe*r. **Guided Practice / Differentiated Instruction / Centers:** **Teacher Led:** Intervention: *Reteach to Build Understanding* On Level: *Build Mathematical Literacy* Advanced: *Enrichment* **Technology:** Practice Buddy (PearsonRealize.com) **Independent:** Independent Practice and Problem Solving **Additional Activities:** Math Games (PearsonRealize.com) Visual Learning Animation Plus: (PearsonRealize.com) Additional Practice Math Anytime: Daily Review and Today's Challenge **Closure:** Lesson Self-Assessment: PearsonRealize.com	Guided Practice Independent Practice Problem solving Practice Buddy Reteach Build Mathematical Literacy Enrichment Additional Practice Quick Check 10-3	4.NF.B.4a, 4.NF.B.4b, 4.NF.B.4c, MP.K-12.4, MP.K-12.6, MP.K-12.7
Solve Time Problems	Use the four operations to	**Problem Based Learning:** Solve and	Guided Practice	4.M.A.1,

(1 Day)	solve problems involving time.	share: *Students find the difference between two times, given in hours and in minutes. A clock face or teaching tool 21 may be provided. (Textbook page 397).* **Visual Learning:** Visual Learning Bridge- *How can you solve problems involving time?* Convince Me! - *Construct Arguments- Students use their understanding of multiplication and their prior knowledge of the number of minutes in an hour to construct a mathematical argument that explains why the number of hours in multiplies by 60 to find the number of minutes.* **Guided Practice / Differentiated Instruction / Centers:** **Teacher Led:** Intervention: *Reteach to Build Understanding* On Level: *Build Mathematical Literacy* Advanced: *Enrichment* **Technology:** Practice Buddy (PearsonRealize.com) **Independent:** Independent Practice and Problem Solving **Additional Activities:** Math Games (PearsonRealize.com) Visual Learning Animation Plus: (PearsonRealize.com) Additional Practice Math Anytime: Daily Review and Today's Challenge **Optional Activity:** Problem- Solving Leveled Reading Mats: The Daily Planet **Closure:** Lesson Self-Assessment: PearsonRealize.com	Independent Practice Problem solving Practice Buddy Reteach Build Mathematical Literacy Enrichment Additional Practice Quick Check 10-4	4.M.A.2, 4.NF.B.3d, 4.NF.B.4c, MP.K-12.1, MP.K-12.3, MP.K-12.5
Problem Solving: Model with Math (1 Day)	Use previously learned concepts and skills to represent and solve problems.	**Problem Based Learning:** Solve and share: *Students connect to their previous understanding of using mathematical modeling to solve a problem involving multiplication of fractions by whole numbers. (Textbook page 401).* **Visual Learning:** Visual Learning Bridge- *How can you represent a*	Guided Practice Independent Practice Problem solving Practice Buddy	4.M.A.2, 4.NF.B.3d, 4.NF.B.4c, MP.K-12.2, MP.K-12.4

		situation with a math model? <u>Convince Me!</u> *- Reason Quantitatively-* Students use reasoning to determine another approach to the computations provided in order to recognize that they two amounts are equivalent. **Guided Practice / Differentiated Instruction / Centers:** **Teacher Led:** <u>Intervention:</u> *Reteach to Build Understanding* <u>On Level:</u> *Build Mathematical Literacy* <u>Advanced:</u> *Enrichment* **Technology:** Practice Buddy (PearsonRealize.com) **Independent:** Independent Practice and Problem Solving **Additional Activities:** Math Games (PearsonRealize.com) Visual Learning Animation Plus: (PearsonRealize.com) Additional Practice Math Anytime: Daily Review and Today's Challenge **Optional Activity:** EnVision STEM Activity 10-5 **Closure:** Lesson Self-Assessment: PearsonRealize.com	Reteach Build Mathematical Literacy Enrichment Additional Practice Quick Check 10-5	

MATH.K-12.1	Make sense of problems and persevere in solving them
MATH.K-12.2	Reason abstractly and quantitatively
MATH.K-12.3	Construct viable arguments and critique the reasoning of others
MATH.K-12.4	Model with mathematics
MATH.K-12.5	Use appropriate tools strategically
MATH.K-12.6	Attend to precision
MATH.K-12.7	Look for and make use of structure
MATH.K-12.8	Look for and express regularity in repeated reasoning
MATH.4.NF.B.3.d	Solve word problems involving addition and subtraction of fractions referrir same whole and having like denominators, e.g., by using visual fraction m and equations to represent the problem.
MATH.4.NF.B.4.a	Understand a fraction a/b as a multiple of $1/b$.

MATH.4.NF.B.4.b	Understand a multiple of a/b as a multiple of $1/b$, and use this understanding to multiply a fraction by a whole number.
MATH.4.NF.B.4.c	Solve word problems involving multiplication of a fraction by a whole number, e.g., by using visual fraction models and equations to represent the problem.
MATH.4.M.A.1	Know relative sizes of measurement units within one system of units including km, m, cm, mm; kg, g; lb, oz.; l, ml; hr, min, sec. Within a single system of measurement, express measurements in a larger unit in terms of a smaller unit. Record measurement equivalents in a two-column table.
MATH.4.M.A.2	Use the four operations to solve word problems involving distances, intervals of time, liquid volumes, masses of objects, and money, including problems involving simple fractions or decimals, and problems that require expressing measurements given in a larger unit in terms of a smaller unit. Represent measurement quantities using diagrams such as number line diagrams that feature a measurement scale.

Suggested Modifications for Special Education, ELL and Gifted Students

Gifted Students

- How would our world be different if time was no longer based on a sixty second minute? Sixty-minute hour? Etc.

- Find the area of a room to the nearest foot. Design a tile pattern to fit within the area. Describe the fraction of tiles being used (i.e. 5/6 are green, 19/30 are white).

Special Education Students

- Fluency review Activity

- Vocabulary Review

- Highlight to emphasize the two numbers being multiplied when multiplying a fraction by a whole number.

- Color code clock or clock templates to demonstrate elapsed time between numbers.

- Use number lines or t-charts to determine elapsed time between start and stop times.

English Language Learners

- Topic Vocabulary

- Visual Learning Bridge: Reading

- Solve & Share: Speaking

Suggested Technological Innovations/Use

- IXL

- ST Math

- Kahoot!

- Tools (EnVision 2020)

- Game Center (EnVision 2020)

- Create/Complete a Discovery Education Board

Cross Curricular/21st Century Connections
- Pick a Project Activity

- Envision STEM Project

- EnVision STEM Activity

- Problem Solving Reading Activity

Topic 11: Represent and Interpret Data on Line Plots

Content Area: **Mathematics**
Course(s): **Math**
Time Period: **3rd Trimester**
Length: **6 days**
Status: **Published**

Summary of the Unit

Topic 11 focuses on how to read, make, and interpret line plots that represent measurements given in halves, fourths, and eights of a unit.

Enduring Understandings

- A line plot organizes data on a number line and is useful for showing how data are distributed.
- A line plot organizes data on a number line and is useful for showing how data are distributed.
- Data from line plots can be used to solve problems.
- Good math thinkers use math to explain why they are right, and also discuss the math that others do, too

Essential Questions

- How can you solve problems using data on a line plot?
- How can you make a line plot?

Summative Assessment and/or Summative Criteria

- Topic Test

- Performance Task

Resources

enVision math series https://www.savvas.com/solutions/mathematics/core-programs/envision-mathematics-grades-k-5

ST Math is a visual instructional program that builds a deep conceptual understanding of math through rigorous learning and creative problem solving to engage, motivate and challenge PreK-8 students toward higher achievement. https://www.stmath.com/

IXL online learning, offering unlimited algorithmically generated questions, real-time analytical reports, and dynamic scoring to encourage mastery. https://www.ixl.com/

Discovery Education https://google.discoveryeducation.com/

National Council of Teachers of Mathematics - This website contains activities and lessons, and virtual manipulatives organized by strand. http://illuminations.nctm.org

The National Library of Virtual Manipulatives has tutorials and virtual manipulatives for the classroom. http://nlvm.usu.edu/en/nav/index.html

The Teaching Channel has two hundred math videos for professional

development. http://www.theteachingchannel.org

K-5 Math Teaching Resources site contains free math teaching resources, games, activities, journal tasksand resources for centers arranged by grade level and standard. http://www.k-5mathteachingresources.com

Open Middle- This website contains 36 math reasoning scenarios arranged by CCSS. http://www.openmiddle.com/

Which One Doesn't Belong- This is a website dedicated to providing thought-provoking puzzles for math teachers and students alike. There are no answers provided as there are many different, correct ways of choosing which one doesn't belong. http://wodb.ca/

Estimation 180- This website contains hundreds of estimation challenges relative to real-world scenarios to assist in building strong connections with number sense and the real world. http://www.estimation180.com/

Unit Plan

Topic/ Selection Timeframe	General Objectives	Instructional Activities	Benchmarks/Assessments	Standards
Introduction to Data Literacy (1-2 Days)	Define data literacy as the ability to explore, understand, and communicate with data in a meaningful way.	**Do Now** Students will complete survey poll questions on Kahoot about a topic of their choice. At the end of each question, the class will analyze the bar graphs showing how many voted for each option. As a whole group, discuss how easy it is to observe the results from the bar graphs. **Direct Instruction** What is data? What is data literacy? **https://www.youtube.com/watch?v=X5boB46yUKc** Watch video and review the following key idea: **Effective data collection provides the information that's needed to answer questions, predict future outcomes, and make smarter decisions.** All businesses need and collect data. For example, Dunkin Donuts might collect data about which type of latte is the most popular among its customers. With this information, they can make smarter decisions about how much of each flavor sweetener to purchase. Alternatively, teachers can collect and organize student test scores and determine whether to reteach a lesson or question or move on to the next skill. What are graphs and why are they useful? Graphs make data presentable and easy to understand. They help in summarizing and comparing data. There are many types of graphs, including bar graphs, pie charts, line	Google Sheets or Kahoot assignment - Google Sheets - Upon submissions, assess whether the students organized their results from greatest to least using the "sort column" feature. Assess whether students' digital graph accurately depicts the information in the columns. - Kahoot - Assess whether the students accurately answered questions about the automatically-generated bar graphs after each poll question	4.DL.A.1 4.DL.A.2 4.DL.A.3 4.DL.A.4

		plots, and line graphs.		
		Discuss data collection & analysis process:		
		(1) Choose a topic to study and create poll or survey questions about it using either Google Forms or Kahoot Creator (Questions in "poll format"). Make final revisions to questions based on predictions for results or previous outcomes.		
		(2) Once a Google form is completed by everyone, organize data digitally (Google Sheets/ Excel)		
		(3) Create a graph		
		(4) Analyze visual trends and subset categories.		
		Student Application		
		Students will work on creating and analyzing line plots in the future lessons. In this lesson, they will learn how to organize data in Google Sheets. Students will learn how to "sort" results from greatest to least by selecting a column and "Sort Data." If time allows, students can try to select the columns in their Google Sheets document and create a graph.		
		Extension: Students can create a Kahoot or Google form with survey questions about their own topic of choice, collect the data, then organize the data digitally and create a graph.		
		Closure		
		What did you learn today about graphs and data? How are graphs and data useful?		
Read Line Plots (1 Day)	Read and interpret data using line plots.	**Problem Based Learning:** Solve and share: *Students identify the smallest and greatest value on a line plot. (Textbook page 417).* **Visual Learning:** Visual Learning Bridge- *How can you read data in a line plot?* Convince Me! - *Model with Math- Students model the data from the line plot using an equation that is used to find the total distance walked.* **Guided Practice / Differentiated Instruction / Centers:** **Teacher Led:** Intervention: *Reteach to Build Understanding* On Level: *Build Mathematical Literacy*	Guided Practice Independent Practice Problem solving Practice Buddy Reteach Build Mathematical Literacy Enrichment Additional Practice Quick Check 11-1	4.DL.A.3 , 4.DL.A.4 , 4.DL.B.5 , 4.NF.B.3 d MP.K-12.2, MP.K-12.4, MP.K-

				12.6
		Advanced: _Enrichment_ **Technology:** Practice Buddy (PearsonRealize.com) **Independent:** Independent Practice and Problem Solving **Additional Activities:** Math Games (PearsonRealize.com) Visual Learning Animation Plus: (PearsonRealize.com) Additional Practice Math Anytime: Daily Review and Today's Challenge **Optional Activities:** EnVision STEM Project: Discuss how earth processes change the shape of Earth. Using the internet or other sources, students will research what causes an earthquake and how the power of an earthquake is measured. They will also explore earthquake safety. In a report, students will explain how the Richter scale is used. Additionally, they will research the magnitudes of at least 6 earthquakes that have occurred in their lifetime. Students will gather their data in a table consisting on the location, data and magnitude. Using data gathered, students will plot the magnitudes on a line plot. EnViSion STEM Activity 11-1 **Closure:** Lesson Self-Assessment: PearsonRealize.com		
Make Line Plots (1 Day)	Represent data using line plots and interpret data in line plots to solve problems.	**Problem Based Learning:** Solve and share: _Students apply their knowledge of making line plots with whole-number data to data with fractional measures. Number lines (teaching tool 12) may be provided. (Textbook page 421)._ **Visual Learning:** Visual Learning Bridge- _How can you make line plots?_ Convince Me! _- Model with Math- Students can use the line plot to find the two shortest pencil lengths, 4 1/8 in., and 4 4/8 in. Then they write and solve an equation to find the difference between these lengths._ **Guided Practice / Differentiated Instruction / Centers:**	Guided Practice Independent Practice Problem solving Practice Buddy Reteach Build Mathematical Literacy Enrichment Additional Practice Quick Check 11-2	4.DL.A.1, 4.DL.A.2, 4.DL.B.5, 4.NF.A.1, 4.NF.A.2, 4.NF.B.3d, MP.K-12.1, MP.K-12.4, MP.K-12.8

		Teacher Led: <u>Intervention:</u> *Reteach to Build Understanding* On Level: *Build Mathematical Literacy* Advanced: *Enrichment* **Technology:** Practice buddy (PearsonRealize.com) **Independent:** Independent Practice and Problem Solving **Additional Activities:** Math Games (PearsonRealize.com) Visual Learning Animation Plus: (PearsonRealize.com) Additional Practice Math Anytime: Daily Review and Today's Challenge **Optional Activity:** Problem-Solving Leveled Literacy Mats: Coral Reef **Closure:** Lesson Self-Assessment: PearsonRealize.com		
Use Line Plots to Solve Problems (1 Day)	Solve problems involving line plots and fractions.	**Problem Based Learning:** <u>Solve and share:</u> *Students are given data to make a line plot and then use the line plot to solve a subtraction problem with a fraction subtracted from a mixed number. Fraction strips (teaching tool 13) or number lines (teaching tool 12) may be provided. (Textbook page 425).* **Visual Learning:** Visual Learning Bridge- *How can you use line plots to solve problems involving fractions?* <u>Convince Me!</u> - *Make sense and Persevere-Students use each line plot to find the heaviest and lightest balloon, and then use those weights to find the difference between the heaviest and lightest water balloon Alma and Ben each filled.* **Guided Practice / Differentiated Instruction / Centers:** **Teacher Lead:** <u>Intervention:</u> *Reteach to Build Understanding* On Level: *Build Mathematical Literacy* Advanced: *Enrichment* **Technology:** Practice buddy (PearsonRealize.com) **Independent:** Independent Practice and Problem Solving **Additional Activities:**	Guided Practice Independent Practice Problem solving Practice Buddy Reteach Build Mathematical Literacy Enrichment Additional Practice Quick Check 11-3	4.DL.A.3 , 4.DL.A.4 , 4.DL.B.5 , 4.NF.B.3 d, MP.K-12.1, MP.K-12.5

		Math Games (PearsonRealize.com) Visual Learning Animation Plus: (PearsonRealize.com) Additional Practice Math Anytime: Daily Review and Today's Challenge **Closure:** Lesson Self-Assessment: PearsonRealize.com		
Problem Solving: Critique Reasoning (1 Day)	Critique the reasoning of others using an understanding of line plots.	**Problem Based Learning:** <u>Solve and share:</u> *Students use what they know about solving problems involving data in a line plot to decide whether a student's statement makes sense. (Textbook page 429).* **Visual Learning:** Visual Learning Bridge- *How can you critique the reasoning of others?* <u>Convince Me!</u> *- Critique Reasoning- Students critique another argument about the data shown in the line plots. They can refer to the example in the visual learning bridge for assistance.* **Guided Practice / Differentiated Instruction / Centers:** **Teacher Lead:** <u>Intervention:</u> *Reteach to Build Understanding* <u>On Level:</u> *Build Mathematical Literacy* <u>Advanced:</u> *Enrichment* **Technology:** Practice buddy (PearsonRealize.com) **Independent:** Independent Practice and Problem Solving **Additional Activities:** Math Games (PearsonRealize.com) Visual Learning Animation Plus: (PearsonRealize.com) Additional Practice Math Anytime: Daily Review and Today's Challenge **Closure:** Lesson Self-Assessment: PearsonRealize.com	Guided Practice Independent Practice Problem solving Practice Buddy Reteach Build Mathematical Literacy Enrichment Additional Practice Quick Check 11-4	4.DL.A.3 , 4.DL.A.4 , 4.DL.B.5 , 4.NF.B.3 c, 4.NF.B.3 d, MP.K-12.2, MP.K-12.3, MP.K-12.4

MATH.K-12.1	Make sense of problems and persevere in solving them
MATH.K-12.2	Reason abstractly and quantitatively
MATH.K-12.3	Construct viable arguments and critique the reasoning of others

MATH.K-12.4	Model with mathematics
MATH.K-12.5	Use appropriate tools strategically
MATH.K-12.6	Attend to precision
MATH.K-12.7	Look for and make use of structure
MATH.K-12.8	Look for and express regularity in repeated reasoning
MATH.4.NF.A.1	Explain why a fraction a/b is equivalent to a fraction $(n \times a)/(n \times b)$ by using visual fraction models, with attention to how the number and size of the parts differ even though the two fractions themselves are the same size. Use this principle to recognize and generate equivalent fractions.
MATH.4.NF.A.2	Compare two fractions with different numerators and different denominators, e.g., by creating common denominators or numerators, or by comparing to a benchmark fraction such as 1/2. Recognize that comparisons are valid only when the two fractions refer to the same whole. Record the results of comparisons with symbols >, =, or <, and justify the conclusions, e.g., by using a visual fraction model.
MATH.4.NF.B.3.c	Add and subtract mixed numbers with like denominators, e.g., by replacing each mixed number with an equivalent fraction, and/or by using properties of operations and the relationship between addition and subtraction.
MATH.4.NF.B.3.d	Solve word problems involving addition and subtraction of fractions referring to the same whole and having like denominators, e.g., by using visual fraction models and equations to represent the problem.
MATH.4.DL.A.1	Create data-based questions, generate ideas based on the questions, and then refine the questions.
MATH.4.DL.A.2	Develop strategies to collect various types of data and organize data digitally.
MATH.4.DL.A.3	Understand that subsets of data can be selected and analyzed for a particular purpose.
MATH.4.DL.A.4	Analyze visualizations of a single data set, share explanations and draw conclusions that the data supports.
MATH.4.DL.B.5	Make a line plot to display a data set of measurements in fractions of a unit (½, ¼, ⅛). Solve problems involving addition and subtraction of fractions by using information presented in line plots.

Climate Change Activity

Students will begin by viewing "Climate Change" from Discovery Education.
https://google.discoveryeducation.com/learn/videos/7072b9f2-da01-4285-a12d-c64195bc93f6/?embed=false&embed_origin=false

 Students will utilize the website below to work with a partner to research the average monthly temperature in New Jersey from a historical year of their choosing dating back to 1895. They will then compare the data they have analyzed with the average temperature from the current year. Students will work with their partner to create a bar graph of the data they have viewed. Students will write a brief summary of their findings, noting the difference in average monthly temperatures.

 Utilize the website:

https://climate.rutgers.edu/stateclim_v1/nclimdiv/index.php?stn=NJ00&elem=avgt

Suggested Modifications for Special Education, ELL and Gifted Students
Gifted Students

- Survey classmates to collect numerical data on a subject such as measurement of index finger in inches, the length of one's foot in inches or the length of one's pencil in inches. Gather data and create

a table. Create a line plot. Develop questions to ask your peers about your line plot such as "what is the difference between the shortest and greatest lengths?" Students will switch line plots with a peer and answer each other's questions.

Special Education Students

- Fluency review Activity

- Vocabulary Review

- Work together to develop an anchor chart identifying and labeling the components of a line plot and their purpose (i.e. one "x" or dot represents one value). Provide students with a copy for their reference in their math notebooks.

- Create a line plot together using data gathered from students. When interpreting data, emphasize the location of the numbers on the number line in reference to where zero might be to assist students with the concepts of greater than and less than when analyzing amounts.

English Language Learners

- Topic Vocabulary

- Visual Learning Bridge: Reading

- Solve & Share: Speaking

- Work together to develop an anchor chart identifying and labeling the components of a line plot and their purpose (i.e. one "x" or dot represents one value). Provide students with a copy for their reference in their math notebooks.

Suggested Technological Innovations/Use
- IXL

- ST Math

- Kahoot!

- Tools (EnVision 2020)

- Game Center (EnVision 2020)

- Create/Complete a Discovery Education Board

Cross Curricular/21st Century Connections

- Pick a Project Activity

- Envision STEM Project

- EnVision STEM Activity

- Problem Solving Reading Activity

- 3 ACT MATH: It's a Fine Line

Topic 12: Understand and Compare Decimals

Content Area: **Mathematics**
Course(s): **Math**
Time Period: **3rd Trimester**
Length: **6 days**
Status: **Published**

Summary of the Unit

Topic 12 focuses on developing an understanding of decimals and decimal notation through hundredths by connecting fractions and decimals. Students compare decimals by reasoning about their size. Students also use their understanding of equivalent fractions to add a fraction with a denominator of 10 and a fraction with a denominator of 100.

Enduring Understandings

- A decimal is another way to represent a fraction.
- Points on a number line can represent fractions and decimals.
- A fraction and a decimal tell the distance a point is from 0 on the number line.
- Place value can be used to compare decimals.
- Fractions with denominators of 10 can be written as equivalent fractions with denominators of 100.
- Fractions with like denominators can be added.
- Fractions and decimals can be used to represent amounts of money. Pictorial models and equations can represent problems involving money.
- Good math thinkers look for relationships in math to help solve problem.

Essential Questions

- How can you write a fraction as a decimal?
- How can you locate points on a number line?
- How do you compare decimals?

Summative Assessment and/or Summative Criteria

- Topic Test

- Performance Task

Resources

enVision math series https://www.savvas.com/solutions/mathematics/core-programs/envision-mathematics-grades-k-5

ST Math is a visual instructional program that builds a deep conceptual understanding of math through rigorous learning and creative problem solving to engage, motivate and challenge PreK-8 students toward higher achievement. https://www.stmath.com/

IXL online learning, offering unlimited algorithmically generated questions, real-time analytical reports, and dynamic scoring to encourage mastery. https://www.ixl.com/

Discovery Education https://google.discoveryeducation.com/

National Council of Teachers of Mathematics - This website contains activities and lessons, and virtual manipulatives organized by strand. http://illuminations.nctm.org

The National Library of Virtual Manipulatives has tutorials and virtual manipulatives for the classroom. http://nlvm.usu.edu/en/nav/index.html

The Teaching Channel has two hundred math videos for professional development. http://www.theteachingchannel.org

K-5 Math Teaching Resources site contains free math teaching resources, games, activities, journal tasksand resources for centers arranged by grade level and standard. http://www.k-5mathteachingresources.com

Open Middle- This website contains 36 math reasoning scenarios arranged by CCSS. http://www.openmiddle.com/

Which One Doesn't Belong- This is a website dedicated to providing thought-provoking puzzles for math teachers and students alike. There are no answers provided as there are many different, correct ways of choosing which one doesn't belong. http://wodb.ca/

Estimation 180- This website contains hundreds of estimation challenges relative to real-world scenarios to assist in building strong connections with number sense and the real world. http://www.estimation180.com/

Unit Plan

Topic/Selection Timeframe	General Objectives	Instructional Activities	Benchmarks/Assessments	Standards	
Fractions and Decimals (1 Day)	Relate fractions and decimals with denominators of 10 and 100.	**Problem Based Learning:** Solve and share: *Students use a drawing to represent the relationship for the result of 7 out of 10 in a survey. Decimal models (teaching tool 7) and two-color counters (teaching tool 15) may be provided. (Textbook page 445).* **Visual Learning:** Visual Learning Bridge- *How can you write a fraction as a decimal?* Convince Me! - *Reason Quantitatively- Students write a decimal and shade a model to represent a fractional situation.* **Guided Practice / Differentiated Instruction / Centers:** **Teacher Led:** Intervention: *Reteach to Build Understanding* On Level: *Build Mathematical Literacy* Advanced: *Enrichment* **Technology:** Practice Buddy	Guided Practice Independent Practice Problem solving Practice Buddy Reteach Build Mathematical Literacy Enrichment Additional Practice Quick Check 12-1	4.NF.C.6, MP.K-12.2, MP.K-12.3, MP.K-12.4	

| | | (PearsonRealize.com)

Independent: Independent Practice and Problem Solving

Additional Activities:

Math Games (PearsonRealize.com)

Visual Learning Animation Plus:

(PearsonRealize.com)

Additional Practice

Math Anytime: Daily Review and

Today's Challenge

Closure: Lesson Self-Assessment: PearsonRealize.com | | |
|---|---|---|---|---|
| Fractions and Decimals on the Number Line

(1 Day) | Locate and describe fractions and decimals on number lines. | **Problem Based Learning:** <u>Solve and share:</u> *Students give fraction and decimal names for points on a number line. (Textbook page 449).*

Visual Learning: Visual Learning Bridge- *How can you locate points on a number line?*

<u>Convince Me!</u> *- Attend to Precision- Students need to have a sense of how the value of a decimal relates to the nearest whole number. They should have a general sense of where a given decimal is approximately located on number line, even when the number line is not marked with tenths and hundredths. Just as with fractions, a decimal's location on a number line tells how far that point is from 0.*

Guided | Guided Practice

Independent Practice

Problem solving

Practice Buddy

Reteach

Build Mathematical Literacy

Enrichment

Additional Practice

Quick Check 12-2 | 4.NF.C.6,

4.M.A.2,

MP.K-12.1,

MP.K-12.6,

MP.K-12.7 |

		Practice / Differentiated Instruction / Centers: **Teacher Led:** <u>Intervention:</u> *Reteach to Build Understanding* <u>On Level:</u> *Build Mathematical Literacy* <u>Advanced:</u> *Enrichment* **Technology:** Practice Buddy (PearsonRealize.com) **Independent:** Independent Practice and Problem Solving **Additional Activities:** Math Games (PearsonRealize.com) Visual Learning Animation Plus: (PearsonRealize.com) Additional Practice Math Anytime: Daily Review and Today's Challenge **Optional Activity:** Problem- Solving Leveled Reading Mat: Winner Takes All **Closure:** Lesson Self-Assessment: PearsonRealize.com		
Compare Decimals (1 Day)	Compare decimals by reasoning about their size.	**Problem Based Learning:** <u>Solve and share:</u> *Students use what they know about decimals to compare two decimals. Decimals grids and/or place value charts (teaching tool 6) may be provided. (Textbook page 453).* **Visual Learning:** Visual Learning Bridge- *How do you compare decimals?*	Guided Practice Independent Practice Problem solving Practice Buddy Reteach Build Mathematical Literacy Enrichment	4.NF.C.7, 4.M.A.2, MP.2, MP.3, MP.5

		Convince Me! - *Reason Quantitatively- Students may shade a hundredths grid for each number to show that the numbers are not equal. Point out that the place farthest to the left (after the decimal) in all four numbers is the tenths place.*	Additional Practice Quick Check 12-3	
		Guided Practice / Differentiated Instruction / Centers:		
		Teacher Led: Intervention: *Reteach to Build Understanding*		
		On Level: *Build Mathematical Literacy*		
		Advanced: *Enrichment*		
		Technology: Practice Buddy (PearsonRealize.com)		
		Independent: Independent Practice and Problem Solving		
		Additional Activities:		
		Math Games (PearsonRealize.com)		
		Visual Learning Animation Plus:		
		(PearsonRealize.com)		
		Additional Practice		
		Math Anytime: Daily Review and		
		Today's Challenge		
		Optional Activities: EnVision STEM activity 12-3		
		Closure: Lesson Self-Assessment: PearsonRealize.com		
Add Fractions with Denominators	Add fractions with denominators	**Problem Based Learning:** Solve and share: *Students add*	Guided Practice Independent Practice	4.NF.C.5, MP.K-

of 10 and 100 (1 Day)	of 10 and 100 by using equivalent fractions.	*fractions with denominators of 10 and 100. Hundredths grids (teaching tool 8) may be provided. (Textbook page 457).* **Visual Learning:** Visual Learning Bridge- *How can you add fractions with denominators of 10 or 100?* Convince Me! - *Construct Arguments- Students explain why the rule for adding fractions includes keeping the same denominator and not adding denominators.* **Guided Practice / Differentiated Instruction / Centers:** **Teacher Led:** Intervention: *Reteach to Build Understanding* On Level: *Build Mathematical Literacy* Advanced: *Enrichment* **Technology:** Practice Buddy (PearsonRealize.com) **Independent:** Independent Practice and Problem Solving **Additional Activities:** Math Games (PearsonRealize.com) Visual Learning Animation Plus: (PearsonRealize.com) Additional Practice Math Anytime: Daily Review and Today's Challenge **Optional Activities:** EnVision STEM Project: Discuss various games where energy is transferred through collision. Emphasize how energy changes the speed of the objects as they collide. Students will research various sports or	Problem solving Practice Buddy Reteach Build Mathematical Literacy Enrichment Additional Practice Quick Check 12-4	12.1, MP.K-12.3, MP.K-12.5

		games where players transfer energy to cause collisions in order to score points and win. Specifically, they will examine "ends" of curling. Suppose a team wins 6 out of 10 ends of curling. Students will represent 6 out of 10 rounds of curling as a fraction with a denominator of ten, an equivalent fraction with a denominator of 100 and an equivalent decimal for each fraction. EnVision STEM activity 12-4 **Closure:** Lesson Self-Assessment: PearsonRealize.com		
Solve Word Problems Involving Money (1 Day)	Use fractions or decimals to solve word problems involving money.	**Problem Based Learning:** Solve and share: *Students use what they know about computing with whole numbers to solve a problem involving money with whole-number dollar amounts. Money (teaching tool 19) may be provided. (Textbook page 461).* **Visual Learning:** Visual Learning Bridge- *How can you solve word problems involving money?* Convince Me! - *Use Structure-Students analyze the relationships among place values to help add and subtract money. Students should relate their knowledge of fractions and decimals to money.* **Guided Practice / Differentiated Instruction / Centers:** **Teacher Led:** Intervention: *Reteach to Build Understanding* On Level: *Build*	Guided Practice Independent Practice Problem solving Practice Buddy Reteach Build Mathematical Literacy Enrichment Additional Practice Quick Check 12-5	4.M.A.2, MP.K-12.1, MP.K-12.7, MP.K-12.8

		Mathematical Literacy Advanced: *Enrichment* **Technology:** Practice buddy (PearsonRealize.com) **Independent:** Independent Practice and Problem Solving **Additional Activities:** Math Games (PearsonRealize.com) Visual Learning Animation Plus: (PearsonRealize.com) Additional Practice Math Anytime: Daily Review and Today's Challenge **Closure:** Lesson Self-Assessment: PearsonRealize.com		
Problem Solving: Look For and Use Structure (1 Day)	Use the structure of the place-value system for decimals to solve problems.	**Problem Based Learning:** Solve and share: *Students use structure to locate the 1-mile mark on three number lines with different scales. (Textbook page 465).* **Visual Learning:** Visual Learning Bridge- *How can you look for and make use of structure to solve problems?* Convince Me! - *Look for and Make Use of Structure- Students use knowledge of decimal meanings to locate a point on a number line beyond the points given instead of between given points.* **Guided Practice / Differentiated Instruction / Centers:**	Guided Practice Independent Practice Problem solving Practice Buddy Reteach Build Mathematical Literacy Enrichment Additional Practice Quick Check 12-6	4.NF.C.7, 4.M.A.2, MP.K-12.1, MP.K-12.2, MP.K-12.4, MP.K-12.6, MP.K-12.7

		Teacher Led: Intervention: *Reteach to Build Understanding* On Level: *Build Mathematical Literacy* Advanced: *Enrichment* **Technology:** Practice Buddy (PearsonRealize.com) **Independent:** Independent Practice and Problem Solving **Additional Activities:** Math Games (PearsonRealize.com) Visual Learning Animation Plus: (PearsonRealize.com) Additional Practice Math Anytime: Daily Review and Today's Challenge **Closure:** Lesson Self-Assessment: PearsonRealize.com		

MATH.K-12.1	Make sense of problems and persevere in solving them
MATH.K-12.2	Reason abstractly and quantitatively
MATH.K-12.3	Construct viable arguments and critique the reasoning of others
MATH.K-12.4	Model with mathematics
MATH.K-12.5	Use appropriate tools strategically
MATH.K-12.6	Attend to precision
MATH.K-12.7	Look for and make use of structure
MATH.K-12.8	Look for and express regularity in repeated reasoning
MATH.4.NF.C.5	Express a fraction with denominator 10 as an equivalent fraction with denominator 1 and use this technique to add two fractions with respective denominators 10 and 10(
MATH.4.NF.C.6	Use decimal notation for fractions with denominators 10 or 100.
MATH.4.NF.C.7	Compare two decimals to hundredths by reasoning about their size. Recognize that comparisons are valid only when the two decimals refer to the same whole. Record th results of comparisons with the symbols >, =, or <, and justify the conclusions, e.g., by using a visual model.
MATH.4.M.A.2	Use the four operations to solve word problems involving distances, intervals of time liquid volumes, masses of objects, and money, including problems involving simple fractions or decimals, and problems that require expressing measurements given in a larger unit in terms of a smaller unit. Represent measurement quantities using diagra such as number line diagrams that feature a measurement scale.

Suggested Modifications for Special Education, ELL and Gifted Students

Gifted Students

- Students will plan their future birthday party. They will decide on the number of invitees, theme, entertainment and food. They must stay within a $300 budget without going over! Students must research the cost of food invitations, paper goods, entertainment, favors, and decorations. They also must organize games to play, photography, and a playlist of their favorite music. Using sites such as www.orientaltrading.com, exploring ShopRite's website for food costs, and www.tinyprints.com for designing and ordering invitations are just some websites available as resources. The following Party Planning Sheets can be used: Party Planning Activity Sheets .

- Write a paragraph about whether fractions or decimals are more accurate and be sure to include your reasoning.

Special Education Students

- Fluency review Activity

- Vocabulary Review

- Specifically teach vocabulary words related to decimal place value (tenths, hundredths, thousandths) using models to aid in bridge understanding of fraction and decimal relationships.

- Use place value charts and tenths and hundredths grids to model amounts.

English Language Learners

- Topic Vocabulary

- Visual Learning Bridge: Reading

- Solve & Share: Speaking

- Specifically teach vocabulary words related to decimal place value (tenths, hundredths, thousandths) using models to aid in bridge understanding of fraction and decimal relationships.

- Use place value charts and tenths and hundredths grids to model amounts.

Suggested Technological Innovations/Use

- IXL

- ST Math

- Kahoot!

- Tools (EnVision 2020)

- Game Center (EnVision 2020)

- Create/Complete a Discovery Education Board

Cross Curricular/21st Century Connections

- Pick a Project Activity

- Envision STEM Project

- EnVision STEM Activity

- Problem Solving Reading Activity

Topic 13: Measurement: Find Equivalence in Units of Measure

Content Area: **Mathematics**
Course(s): **Math**
Time Period: **3rd Trimester**
Length: **7 days**
Status: **Published**

Summary of the Unit

Topic 13 focuses on converting measurements from larger to smaller units within one system of measurement, customary or metric. It also focuses on solving real-world problems involving distance or area and perimeter.

Enduring Understandings

- To convert from a larger unit of length to a smaller unit of length, multiply the number of larger units by the conversion factor, that is, the number of smaller units in each larger unit.
- To convert from a larger unit of capacity or mass to a smaller unit, multiply the number of larger units by the conversion factor, that is, the number of smaller units in each larger unit.
- To convert from a larger unit of weight to a smaller unit of weight, multiply the number of larger units by the conversion factor, that is, the number of smaller units in each larger unit.
- To convert from a larger unit of length to a smaller unit of length, multiply the number of larger units by the conversion factor, that is, the number of smaller units in each larger unit.
- Some problems can be solved by applying the formula for the perimeter of a rectangle, or by applying the formula for the area of a rectangle.
- Good math thinkers are careful about what they write and say, so their ideas about math are clear.

Summative Assessment and/or Summative Criteria

- Topic Test

- Performance Task

Essential Questions

- How can you convert from one unit to another?
- How can you be precise when solving math problems

Resources

enVision math series https://www.savvas.com/solutions/mathematics/core-programs/envision-mathematics-grades-k-5

ST Math is a visual instructional program that builds a deep conceptual understanding of math through rigorous learning and creative problem solving to engage, motivate and challenge PreK-8 students toward higher achievement. https://www.stmath.com/

IXL online learning, offering unlimited algorithmically generated questions, real-time analytical reports, and dynamic scoring to encourage mastery. https://www.ixl.com/

Discovery Education https://google.discoveryeducation.com/

National Council of Teachers of Mathematics - This website contains activities and lessons, and virtual manipulatives

organized by strand. http://illuminations.nctm.org

The National Library of Virtual Manipulatives has tutorials and virtual manipulatives for the classroom. http://nlvm.usu.edu/en/nav/index.html

The Teaching Channel has two hundred math videos for professional development. http://www.theteachingchannel.org

K-5 Math Teaching Resources site contains free math teaching resources, games, activities, journal tasksand resources for centers arranged by grade level and standard. http://www.k-5mathteachingresources.com

Open Middle- This website contains 36 math reasoning scenarios arranged by CCSS. http://www.openmiddle.com/

Which One Doesn't Belong- This is a website dedicated to providing thought-provoking puzzles for math teachers and students alike. There are no answers provided as there are many different, correct ways of choosing which one doesn't belong. http://wodb.ca/

Estimation 180- This website contains hundreds of estimation challenges relative to real-world scenarios to assist in building strong connections with number sense and the real world. http://www.estimation180.com/

Unit Plan

Topic/Selection Timeframe	General Objectives	Instructional Activities	Benchmarks/Assessments	Standards
Equivalence with Customary Units of Length

(1 Day) | Recognize the relative size of customary units of length and convert from a larger unit to a smaller unit. | **Problem Based Learning:** Solve and share: *Students convert a measurement given from yards to feet. Teachers may want to provide students with a reference sheet for customary units of length. (Textbook page 481).*

Visual Learning: Visual Learning Bridge- *How can you convert from one unit of length to another?*

Convince Me! *- Generalize- Students generalize about multiplying to get a greater number of units when converting from a larger unit to a smaller unit. It is important to point out that it takes more inches than feet to make a yard because inches are a smaller unit than feet.*

Guided Practice / Differentiated Instruction / Centers:

Teacher Led: Intervention: *Reteach to Build Understanding*

On Level: *Build Mathematical* | Guided Practice

Independent Practice

Problem solving

Practice Buddy

Reteach

Build Mathematical Literacy

Enrichment

Additional Practice

Quick Check 13-1 | 4.M.A.1,

4.M.A.2,

4.OA.A.3,

4.NF.B.3d,

4.NF.B.4c,

MP.K-12.6,

MP.K-12.7,

MP.K-12.8 |

		Literacy Advanced: *Enrichment* **Technology:** Practice buddy (PearsonRealize.com) **Independent:** Independent Practice and Problem Solving **Additional Activities:** Math Games (PearsonRealize.com) Visual Learning Animation Plus: (PearsonRealize.com) Additional Practice Math Anytime: Daily Review and Today's Challenge **Closure:** Lesson Self-Assessment: PearsonRealize.com		
Equivalence with Customary Units of Capacity (1 Day)	Recognize the relative size of customary units of capacity and convert from a larger unit to a smaller unit.	**Problem Based Learning:** Solve and share: *Students convert a half-gallon measurement to pints. Teachers may want to provide students with a reference sheet for customary units of capacity. (Textbook page 485).* **Visual Learning:** Visual Learning Bridge- *How can you convert from one unit of capacity to another?* Convince Me! - *Reason Quantitatively- Students use the conversion chart in Box A to fill in the blanks to relate gallons to quarts, pints, and cups.* **Guided Practice / Differentiated Instruction / Centers:** **Teacher Led:** Intervention: *Reteach to*	Guided Practice Independent Practice Problem solving Practice Buddy Reteach Build Mathematical Literacy Enrichment Additional Practice Quick Check 13-2	4.M.A.1, 4.M.A.2, 4.OA.A.3, 4.NF.B.3d, 4.NF.B.4c, MP.K-12.1, MP.K-12.2, MP.K-12.8

		Build Understanding		
		On Level: *Build Mathematical Literacy*		
		Advanced: *Enrichment*		
		Technology: Practice buddy (PearsonRealize.com)		
		Independent: Independent Practice and Problem Solving		
		Additional Activities:		
		Math Games (PearsonRealize.com)		
		Visual Learning Animation Plus:		
		(PearsonRealize.com)		
		Additional Practice		
		Math Anytime: Daily Review and		
		Today's Challenge		
		Optional Activity: EnVision STEM Activity 13-2		
		Closure: Lesson Self-Assessment: PearsonRealize.com		
Equivalence with Customary Units of Weight (1 Day)	Recognize the relative size of customary units of weight and convert from a larger unit to a smaller unit.	**Problem Based Learning:** Solve and share: *Students connect to previous understanding of converting customary units of length and capacity to convert customary units of weight. Teachers may want to provide students with a reference sheet for customary units of weight. (Textbook page 489).* **Visual Learning:** Visual Learning Bridge- *How can you convert from one unit of weight to another?* Convince Me! - Generalize- *Students generalize that you multiply when converting a larger unit of weight to a*	Guided Practice Independent Practice Problem solving Practice Buddy Reteach Build Mathematical Literacy Enrichment Additional Practice Quick Check 13-3	4.M.A.1, 4.M.A.2, 4.OA.A.3, 4.NF.B.3d, 4.NF.B.4c, MP.K-12.6, MP.K-12.8

		smaller unit of weight as you do for length and capacity. **Guided Practice / Differentiated Instruction / Centers:** **Teacher Led:** <u>Intervention:</u> *Reteach to Build Understanding* <u>On Level:</u> *Build Mathematical Literacy* <u>Advanced:</u> *Enrichment* **Technology:** Practice buddy (PearsonRealize.com) **Independent:** Independent Practice and Problem Solving **Additional Activities:** Math Games (PearsonRealize.com) Visual Learning Animation Plus: (PearsonRealize.com) Additional Practice Math Anytime: Daily Review and Today's Challenge **Optional Activity:** Problem Solving Leveled Reading Activity: The Metric System **Closure:** Lesson Self-Assessment: PearsonRealize.com		
Equivalence with Metric Units of Length (1 Day)	Recognize the relative size of metric units of length and convert from a larger unit to a smaller unit.	**Problem Based Learning:** <u>Solve and share:</u> *Students use what they know about measuring with a ruler to describe the relationship between centimeters and millimeters. Teachers may want to provide students with centimeter rulers or metersticks (teaching tool 17). Teachers may also want to provide students with a*	Guided Practice Independent Practice Problem solving Practice Buddy Reteach Build Mathematical Literacy	4.M.A.1, 4.M.A.2, 4.OA.A.3, 4.NF.C.7, MP.K-12.3, MP.K-12.5, MP.K-12.6

		reference sheet for metric units. (Textbook page 493). **Visual Learning:** Visual Learning Bridge- *How can you convert from one unit of metric length to another?* Convince Me! - *Critique Reasoning- Students critique the reasoning of a student who used the incorrect conversion unit of 100 to convert kilometers to meters.* **Guided Practice / Differentiated Instruction / Centers:** **Teacher Lead:** Intervention: *Reteach to Build Understanding* On Level: *Build Mathematical Literacy* Advanced: *Enrichment* **Technology:** Practice buddy (PearsonRealize.com) **Independent:** Independent Practice and Problem Solving **Additional Activities:** Math Games (PearsonRealize.com) Visual Learning Animation Plus: (PearsonRealize.com) Additional Practice Math Anytime: Daily Review and Today's Challenge **Closure:** Lesson Self-Assessment: PearsonRealize.com	Enrichment Additional Practice Quick Check 13-4	
Equivalence with Metric Units of Capacity and Mass	Recognize the relative size of metric units of capacity and	**Problem Based Learning:** Solve and share: *Students convert 3 liters to milliliters and 3 kilograms to grams. Teachers*	Guided Practice Independent Practice	4.M.A.1, 4.M.A.2, 4.OA.A.3,

(1 Day)	mass and convert from a larger unit to a smaller unit.	*may want to provide students with a reference sheet for metric units. (Textbook page 497).* **Visual Learning:** Visual Learning Bridge- How can you convert from one unit of metric capacity or mass to another? Convince Me! *- Attend to Precision- Students explain why they need to convert to appropriate units when solving a problem.* **Guided Practice / Differentiated Instruction / Centers:** **Teacher Led:** Intervention: *Reteach to Build Understanding* On Level: *Build Mathematical Literacy* Advanced: *Enrichment* **Technology:** Practice Buddy (PearsonRealize.com) **Independent:** Independent Practice and Problem Solving **Additional Activities:** Math Games (PearsonRealize.com) Visual Learning Animation Plus: (PearsonRealize.com) Additional Practice Math Anytime: Daily Review and Today's Challenge **Optional Activities:** EnVision STEM Project: As a whole class, develop a list of earth formations that were created by erosion. Explain that erosion can be caused by	Problem solving Practice Buddy Reteach Build Mathematical Literacy Enrichment Additional Practice Quick Check 13-5	MP.K-12.2, MP.K-12.6, MP.K-12.8

		natural forces such as wind, water, volcanic eruptions, glaciers, or even human forces such as mining or farming. Students will research the Colorado River, and which states it travels through as it has played a large part in shaping North America. Included in their report should be definitions for the terms "geology" and "geometry" and how the words are related. Lastly, they will engage in a scenario-based math question where they must convert the miles of a Grand Canyon tour to feet. EnVision STEM Activity 13-5 **Closure:** Lesson Self-Assessment: PearsonRealize.com		
Solve Perimeter and Area Problems (1 Day)	Find the unknown length or width of a rectangle using the known area or perimeter.	**Problem Based Learning:** Solve and share: *Students find the width and the perimeter of a wall given the area and the height. (Textbook page 501).* **Visual Learning:** Visual Learning Bridge- *How can you use perimeter and area to solve problems?* Convince Me! - *Make Sense and Persevere- Students use the formulas for the area and perimeter of a rectangle to solve a problem to show that they understand how to apply the formulas in real-world situations.* **Guided Practice / Differentiated Instruction / Centers:** **Teacher Led:** Intervention: *Reteach to Build Understanding* On Level: *Build Mathematical Literacy* Advanced: *Enrichment* **Technology:** Practice Buddy	Guided Practice Independent Practice Problem solving Practice Buddy Reteach Build Mathematical Literacy Enrichment Additional Practice Quick Check 13-6	4.M.A.2, 4.M.A.3, 4.OA.A.3, 4.NF.B.4c, MP.K-12.1, MP.K-12.2, MP.K-12.3

		(PearsonRealize.com)		
		Independent: Independent Practice and Problem Solving		
		Additional Activities:		
		Math Games (PearsonRealize.com)		
		Visual Learning Animation Plus:		
		(PearsonRealize.com)		
		Additional Practice		
		Math Anytime: Daily Review and		
		Today's Challenge		
		Closure: Lesson Self-Assessment: PearsonRealize.com		
Problem Solving: Precision (1 Day)	Be precise when solving measurement problems.	**Problem Based Learning:** Solve and share: *Students use math symbols to explain how to solve a problem involving measurement and area. (Textbook page 505).* **Visual Learning:** Visual Learning Bridge- *How can you be precise when solving math problems?* Convince Me! - *Attend to Precision- Students describe how math words and symbols made their explanation precise.* **Guided Practice / Differentiated Instruction / Centers:** **Teacher Led:** Intervention: *Reteach to Build Understanding* On Level: *Build Mathematical Literacy* Advanced: *Enrichment* **Technology:** Practice Buddy	Guided Practice Independent Practice Problem solving Practice Buddy Reteach Build Mathematical Literacy Enrichment Additional Practice Quick Check 13-7	4.M.A.2, 4.M.A.3, 4.OA.A.3, 4.NF.B.4c, MP.K-12.2, MP.K-12.4, MP.K-12.6

		(PearsonRealize.com) **Independent:** Independent Practice and Problem Solving **Additional Activities:** Math Games (PearsonRealize.com) Visual Learning Animation Plus: (PearsonRealize.com) Additional Practice Math Anytime: Daily Review and Today's Challenge **Closure:** Lesson Self-Assessment: PearsonRealize.com		

MATH.K-12.1	Make sense of problems and persevere in solving them
MATH.K-12.2	Reason abstractly and quantitatively
MATH.K-12.3	Construct viable arguments and critique the reasoning of others
MATH.4.OA.A.3	Solve multi-step word problems posed with whole numbers and having whole-number answers using the four operations, including problems in which remainders must be interpreted. 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.
MATH.K-12.4	Model with mathematics
MATH.K-12.5	Use appropriate tools strategically
MATH.K-12.6	Attend to precision
MATH.K-12.7	Look for and make use of structure
MATH.K-12.8	Look for and express regularity in repeated reasoning
MATH.4.NF.B.3.d	Solve word problems involving addition and subtraction of fractions referring to the same whole and having like denominators, e.g., by using visual fraction models and equations to represent the problem.
MATH.4.NF.B.4.c	Solve word problems involving multiplication of a fraction by a whole number, e.g., by using visual fraction models and equations to represent the problem.
MATH.4.NF.C.7	Compare two decimals to hundredths by reasoning about their size. Recognize that comparisons are valid only when the two decimals refer to the same whole. Record the results of comparisons with the symbols >, =, or <, and justify the conclusions, e.g., by using a visual model.

MATH.4.M.A.1	Know relative sizes of measurement units within one system of units including km, m, cm, mm; kg, g; lb, oz.; l, ml; hr, min, sec. Within a single system of measurement, express measurements in a larger unit in terms of a smaller unit. Record measurement equivalents in a two-column table.
MATH.4.M.A.2	Use the four operations to solve word problems involving distances, intervals of time, liquid volumes, masses of objects, and money, including problems involving simple fractions or decimals, and problems that require expressing measurements given in a larger unit in terms of a smaller unit. Represent measurement quantities using diagrams such as number line diagrams that feature a measurement scale.
MATH.4.M.A.3	Apply the area and perimeter formulas for rectangles in real world and mathematical problems.

Climate Change Activity

Students will view and discuss "Natural Resources" from Discovery Education :https://google.discoveryeducation.com/learn/videos/c8a1947a-6110-45b2-bfad-6e186c16055b/?embed=false&embed_origin=false

Students will write a word problem involving the four operations, measurement, and the use of natural resources. Student problems may include distance, time, liquid volume, and/or mass. Students will swap with a partner to solve each other's respective word problem.

Additional "Natural Resources" resources available at:

https://google.discoveryeducation.com/learn/channels/channel/eb25eafb-ce7c-4e8f-ae8d-9507fb1363d9?embed=false&embed_origin=false

Suggested Modifications for Special Education, ELL and Gifted Students

Gifted Students

- Create a new unit to add to the metric system. Explain how to make conversions using the new unit.

Special Education Students

- Fluency review Activity

- Vocabulary Review

- Using centimeter grid paper (teaching tool 9), ask students to outline or draw a rectangle that covers 18 squares. Now ask students to find the length and the width of the rectangle they drew. (Answers will vary based on drawings.) Proceed with asking students to find the perimeter by counting first and then applying the formulas for area and perimeter to check. Repeat using 24 squares. Drawings may vary. In doing this activity, students are able to visually model area and perimeter of rectangles while applying and connecting the appropriate formulas for each.

- Emphasize that Metric system conversions are multiplying or dividing by 10.

- Provide students with a metric system staircase chart for their notebook to assist with conversions.

- Provide students with customary system reference sheets for math notebooks.

English Language Learners

- Topic Vocabulary

- Visual Learning Bridge: Reading

- Solve & Share: Speaking

- Provide students with a metric system staircase chart for their notebook to assist with conversions.

- Provide students with customary system reference sheets for math notebooks. Consider including abbreviations on this reference sheet.

Suggested Technological Innovations/Use

- IXL

- ST Math

- Kahoot!

- Tools (EnVision 2020)

- Game Center (EnVision 2020)

- Create/Complete a Discovery Education Board

Cross Curricular/21st Century Connections

- Pick a Project Activity

- Envision STEM Project

- EnVision STEM Activity

- Problem Solving Reading Activity

- 3 ACT MATH: A Pint's a Pound

Topic 14: Algebra: Generate and Analyze Patterns

Content Area: **Mathematics**
Course(s):   **Math**
Time Period: **3rd Trimester**
Length: **4 days**
Status: **Published**

Summary of the Unit

Topic 14 focuses on generating and analyzing number and shape patterns.

Enduring Understandings

- Rules can be used to create or extend number sequences that form a pattern, which sometimes may have features not described by the rule.
- Rules can be used to create or extend patterns in tables.
- Patterns sometimes have features not described by the rule.
- It is possible to predict a shape in a repeating pattern of shapes.
- Good math thinkers look for relationships in math to help solve problems.

Essential Questions

- How can you use a rule to continue a pattern?
- How can you use a table to extend a pattern?
- How can you use a repeating pattern to predict a shape?

Summative Assessment and/or Summative Criteria

- Topic Test

- Performance Task

Resources

enVision math series https://www.savvas.com/solutions/mathematics/core-programs/envision-mathematics-grades-k-5

ST Math is a visual instructional program that builds a deep conceptual understanding of math through rigorous learning and creative problem solving to engage, motivate and challenge PreK-8 students toward higher achievement. https://www.stmath.com/

IXL online learning, offering unlimited algorithmically generated questions, real-time analytical reports, and dynamic scoring to encourage mastery. https://www.ixl.com/

Discovery Education https://google.discoveryeducation.com/

National Council of Teachers of Mathematics - This website contains activities and lessons, and virtual manipulatives organized by strand. http://illuminations.nctm.org

The National Library of Virtual Manipulatives has tutorials and virtual manipulatives for the classroom. http://nlvm.usu.edu/en/nav/index.html

The Teaching Channel has two hundred math videos for professional development. http://www.theteachingchannel.org

K-5 Math Teaching Resources site contains free math teaching resources, games, activities, journal tasksand resources for centers arranged by grade level and standard. http://www.k-5mathteachingresources.com

Open Middle- This website contains 36 math reasoning scenarios arranged by CCSS. http://www.openmiddle.com/

Which One Doesn't Belong- This is a website dedicated to providing thought-provoking puzzles for math teachers and students alike. There are no answers provided as there are many different, correct ways of choosing which one doesn't belong. http://wodb.ca/

Estimation 180- This website contains hundreds of estimation challenges relative to real-world scenarios to assist in building strong connections with number sense and the real world. http://www.estimation180.com/

Unit Plan

Topic/Selection Timeframe	General Objectives	Instructional Activities	Benchmarks/Assessments	Standards	
Number Sequences (1 Day)	Create or extend a number sequence based on a rule. Identify features of the pattern in the sequence that is not described by the rule.	**Problem Based Learning:** Solve and share: *Students use repeated addition or subtraction to generate the next 6 numbers in three patterns. (Textbook page 521).* **Visual Learning:** Visual Learning Bridge- *How can you use a rule to continue a pattern?* Convince Me! - *Generalize- Students generalize that if they start with an odd number and use the rule "add 4" the pattern will have all odd numbers.* **Guided Practice / Differentiated Instruction / Centers:** **Teacher Led:** Intervention: *Reteach to Build Understanding* On Level: *Build Mathematical Literacy* Advanced: *Enrichment* **Technology:** Practice Buddy (PearsonRealize.com) **Independent:** Independent Practice and Problem	Guided Practice Independent Practice Problem solving Practice Buddy Reteach Build Mathematical Literacy Enrichment Additional Practice Quick Check 14-1	4.OA.B.4, 4.OA.C.5, 4.NBT.B.4, MP.K-12.2, MP.K-12.7, MP.K-12.8	

		Solving **Additional Activities:** Math Games (PearsonRealize.com) Visual Learning Animation Plus: (PearsonRealize.com) Additional Practice Math Anytime: Daily Review and Today's Challenge **Optional Activity:** Problem-Solving Leveled Reading Mat: Square and Triangular Numbers using sentence strips, students can create their own numerical patterns for peers to complete and determine the rule. Students may also wish to use shapes or drawings to find which shape would appear later in the sequence with their peers. **Closure:** Lesson Self-Assessment: PearsonRealize.com		
Patterns: Number Rules (1 Day)	Use a rule to extend a number pattern and solve a problem. Identify features of the pattern.	**Problem Based Learning:** Solve and share: *Students connect to their previous understanding of finding a pattern for a given rule to generate a table of values. (Textbook page 525).* **Visual Learning:** Visual Learning Bridge-*What is the pattern?* Convince Me! - *Model with Math- Students write expressions to represent the number of cloverleaves and the number of leaflets.* **Guided Practice / Differentiated**	Guided Practice Independent Practice Problem solving Practice Buddy Reteach Build Mathematical Literacy Enrichment Additional Practice Quick Check 14-2	4.OA.B.4, 4.OA.C.5, 4.NBT.B.5, 4.NBT.B.6, MP.K-12.2, MP.K-12.4

| | | Instruction / Centers:

Teacher Led: <u>Intervention:</u> *Reteach to Build Understanding*

<u>On Level:</u> *Build Mathematical Literacy*

<u>Advanced:</u> *Enrichment*

Technology: Practice Buddy (PearsonRealize.com)

Independent: Independent Practice and Problem Solving

Additional Activities:

Math Games (PearsonRealize.com)

Visual Learning Animation Plus:

(PearsonRealize.com)

Additional Practice

Math Anytime: Daily Review and

Today's Challenge

Optional Activity: Problem-Solving Leveled Reading Mat: Square and Triangular Numbers

Closure: Lesson Self-Assessment: PearsonRealize.com | | |
| Patterns Repeating Shapes

(1 Day) | Generate a shape pattern that follows a given rule and predict a shape in the pattern. | **Problem Based Learning:** <u>Solve and share:</u> *Students extend a repeating shape pattern and predict the 37th shape. Teachers may provide students with pattern blocks or teaching tool 20. (Textbook page 529).*

Visual Learning: Visual Learning Bridge- *How can you use a repeating pattern to predict a* | Guided Practice

Independent Practice

Problem solving

Practice Buddy

Reteach

Build Mathematical Literacy

Enrichment | 4.OA.A.3,

4.OA.C.5,

4.NBT.B.6,

MP.K-12.3,

MP.K-12.6,

MP.K-12.7 |

		shape?	Additional Practice	
		Convince Me! *- Attend to Precision- Students give precise description of how to find the 26th shape in a pattern that consists of 4 shapes repeating.*	Quick Check 14-3	
		Guided Practice / Differentiated Instruction / Centers:		
		Teacher Led: Intervention: *Reteach to Build Understanding*		
		On Level: *Build Mathematical Literacy*		
		Advanced: *Enrichment*		
		Technology: Practice Buddy (PearsonRealize.com)		
		Independent: Independent Practice and Problem Solving		
		Additional Activities:		
		Math Games (PearsonRealize.com)		
		Visual Learning Animation Plus:		
		(PearsonRealize.com)		
		Additional Practice		
		Math Anytime: Daily Review and		
		Today's Challenge		
		Optional Activities: EnVision STEM Project: As a whole class, discuss when it might be important to study sound waves. Some examples include in medicine, in communication or when performing maintenance on equipment. Explain to students that to see sound waves, vibrations are converted to voltages and then displayed on an		

		oscilloscope. Students will research two industries where oscilloscopes can be used. They will name the industry and what can be observed using the oscilloscope. Included in their report should be the answer to the scenario-based question on textbook page 517 about a sound pattern. EnVision STEM Activity 14-3 **Closure:** Lesson Self-Assessment: PearsonRealize.com		
Problem Solving: Look For and Use Structure (1 Day)	Solve problems by using patterns.	**Problem Based Learning:** <u>Solve and share:</u> *Students use structure and patterns to find the number of blocks in the 6th stack of a pattern, given the number of blocks in the first three stacks and a rule. Teachers may provide students with centimeter grid paper (teaching tool 9). (Textbook page 533).* **Visual Learning:** Visual Learning Bridge-*How can I look for and Make use of structure?* <u>Convince Me!</u> *- Look for Relationships- Students describe a feature of the pattern that us not explicit in the rule. When students use patterns to solve problems, they are looking for and making use of structure.* **Guided Practice / Differentiated Instruction / Centers:** **Teacher Led:** <u>Intervention:</u> *Reteach to Build Understanding* <u>On Level:</u> *Build Mathematical Literacy* <u>Advanced:</u> *Enrichment*	Guided Practice Independent Practice Problem solving Practice Buddy Reteach Build Mathematical Literacy Enrichment Additional Practice Quick Check 14-4	4.OA.C.5, MP.K-12.1, MP.K-12.2, MP.K-12.7

		Technology: Practice Buddy (PearsonRealize.com) **Independent:** Independent Practice and Problem Solving **Additional Activities:** Math Games (PearsonRealize.com) Visual Learning Animation Plus: (PearsonRealize.com) Additional Practice Math Anytime: Daily Review and Today's Challenge **Closure:** Lesson Self-Assessment: PearsonRealize.com		

MATH.K-12.1	Make sense of problems and persevere in solving them
MATH.K-12.2	Reason abstractly and quantitatively
MATH.4.OA.A.3	Solve multi-step word problems posed with whole numbers and having whole-number answers using the four operations, including problems in which remainders must be interpreted. 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.
MATH.K-12.3	Construct viable arguments and critique the reasoning of others
MATH.K-12.4	Model with mathematics
MATH.4.OA.B.4	Find all factor pairs for a whole number in the range 1–100. Recognize that a whole number is a multiple of each of its factors. Determine whether a given whole number in the range 1–100 is a multiple of a given one-digit number. Determine whether a given whole number in the range 1–100 is prime or composite.
MATH.4.OA.C.5	Generate a number or shape pattern that follows a given rule. Identify apparent features of the pattern that were not explicit in the rule itself.
MATH.K-12.5	Use appropriate tools strategically
MATH.K-12.6	Attend to precision
MATH.K-12.7	Look for and make use of structure
MATH.K-12.8	Look for and express regularity in repeated reasoning
MATH.4.NBT.B.5	Multiply a whole number of up to four digits by a one-digit whole number, and multiply two two-digit numbers, using strategies based on place value and the properties of operations. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.

MATH.4.NBT.B.6	Find whole-number quotients and remainders with up to four-digit dividends and one-digit divisors, using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area model.

Suggested Modifications for Special Education, ELL and Gifted Students

Gifted Students

- Students explore the equations to the pattern images provided. http://www.visualpatterns.org/

Special Education Students

- Fluency review Activity

- Vocabulary Review

- Emphasize the importance of identifying the pattern or rule first before continuing. You might consider having students circle or highlight a visual pattern to isolate it from the sequence.

- When working with a rule, writing it into the table can assist students when computing.

English Language Learners

- Topic Vocabulary

- Visual Learning Bridge: Reading

- Solve & Share: Speaking

Suggested Technological Innovations/Use

- IXL

- ST Math

- Kahoot!

- Tools (EnVision 2020)

- Game Center (EnVision 2020)

- Create/Complete a Discovery Education Board

Cross Curricular/21st Century Connections

- Pick a Project Activity

- Envision STEM Project

- EnVision STEM Activity

- Problem Solving Reading Activity

Topic 15: Geometric Measurement: Understand Concepts of Angles and Angle Measurement

Content Area: **Mathematics**
Course(s): **Math**
Time Period: **3rd Trimester**
Length: **7 days**
Status: **Published**

Summary of the Unit

Topic 15 focuses on developing understanding of angle concepts including angle measurement.

Enduring Understandings

- Line segments and rays are sets of points that describe parts of lines and angles.
- Angles are classified by their measure.
- The measure of an angle depends upon the fraction of a circle that the angle turns through.
- The unit for measuring angles is 1 degree, the unit angle.
- A protractor can be used to measure angles.
- Angle measures can be added and subtracted.
- Good math thinkers know how to pick the right tools to solve math problems.

Essential Questions

- What are some common geometric terms?
- How can you measure angles?

Summative Assessment and/or Summative Criteria

- Topic Test

- Performance Task

Resources

enVision math series https://www.savvas.com/solutions/mathematics/core-programs/envision-mathematics-grades-k-5

ST Math is a visual instructional program that builds a deep conceptual understanding of math through rigorous learning and creative problem solving to engage, motivate and challenge PreK-8 students toward higher achievement. https://www.stmath.com/

IXL online learning, offering unlimited algorithmically generated questions, real-time analytical reports, and dynamic scoring to encourage mastery. https://www.ixl.com/

Discovery Education https://google.discoveryeducation.com/

National Council of Teachers of Mathematics - This website contains activities and lessons, and virtual manipulatives organized by strand. http://illuminations.nctm.org

The National Library of Virtual Manipulatives has tutorials and virtual manipulatives for the

classroom. http://nlvm.usu.edu/en/nav/index.html

The Teaching Channel has two hundred math videos for professional development. http://www.theteachingchannel.org

K-5 Math Teaching Resources site contains free math teaching resources, games, activities, journal tasksand resources for centers arranged by grade level and standard. http://www.k-5mathteachingresources.com

Open Middle- This website contains 36 math reasoning scenarios arranged by CCSS. http://www.openmiddle.com/

Which One Doesn't Belong- This is a website dedicated to providing thought-provoking puzzles for math teachers and students alike. There are no answers provided as there are many different, correct ways of choosing which one doesn't belong. http://wodb.ca/

Estimation 180- This website contains hundreds of estimation challenges relative to real-world scenarios to assist in building strong connections with number sense and the real world. http://www.estimation180.com/

Unit Plan

Topic/Selection Timeframe	General Objectives	Instructional Activities	Benchmarks/Assessments	Standards	
Lines, Rays, and Angles (1 Day)	Recognize and draw lines, rays, and angles with different measures.	**Problem Based Learning:** Solve and share: *Students use what they know about right angles to draw two angles that are open less than a right angle. (Textbook page 549).* **Visual Learning:** Visual Learning Bridge-*What are some common geometric terms?* Convince Me! - Look for Relationships- Students *use their knowledge of the different types of angles to draw an example of each one. It should be pointed out to students that a right angle can be used as a reference when drawing other angles.* **Guided Practice / Differentiated Instruction / Centers:** **Teacher Led:** Intervention: *Reteach to Build Understanding* On Level: *Build Mathematical Literacy* Advanced: *Enrichment* **Technology:** Practice Buddy	Guided Practice Independent Practice Problem solving Practice Buddy Reteach Build Mathematical Literacy Enrichment Additional Practice Quick Check 15-1	4.M.B.4a, 4.G.A.1, MP.K-12.2, MP.K-12.6, MP.K-12.7	

		(PearsonRealize.com)		
		Independent: Independent Practice and Problem Solving		
		Additional Activities:		
		Math Games (PearsonRealize.com)		
		Visual Learning Animation Plus:		
		(PearsonRealize.com)		
		Additional Practice		
		Math Anytime: Daily Review and		
		Today's Challenge		
		Closure: Lesson Self-Assessment: PearsonRealize.com		
Understand Angles and Unit Angles (1 Day)	Find the Measure of an angle that turns through a fraction of a circle.	**Problem Based Learning:** <u>Solve and share:</u> *Students use what they know about telling time and about right angles to describe the smaller angle formed by the hands of a clock at 3:00. Clock faces may be provided (Teaching tool 21). (Textbook page 553).* **Visual Learning:** Visual Learning Bridge- *What is the unit used to measure angles?* <u>Convince Me!</u> *- Critique Reasoning- Students Construct an argument that shows why the measure of the angles is the same even though the sizes of the circles are different.* **Guided Practice / Differentiated Instruction / Centers:** **Teacher Led:** <u>Intervention:</u> *Reteach to Build Understanding* <u>On Level:</u> *Build*	Guided Practice Independent Practice Problem solving Practice Buddy Reteach Build Mathematical Literacy Enrichment Additional Practice Quick Check 15-2	4.M.B.4a, 4.NF.A.1, 4.NF.B.3b, MP.K-12.1, MP.K-12.3

		Mathematical Literacy Advanced: *Enrichment* **Technology:** Practice Buddy (PearsonRealize.com) **Independent:** Independent Practice and Problem Solving **Additional Activities:** Math Games (PearsonRealize.com) Visual Learning Animation Plus: (PearsonRealize.com) Additional Practice Math Anytime: Daily Review and Today's Challenge **Closure:** Lesson Self-Assessment: PearsonRealize.com		
Measure with Unit Angles (1 Day)	Use known angle measures to measure unknown angles.	**Problem Based Learning:** Solve and share: *Students use their understanding of angle measures to find the measure of an angle using a pattern block. Pattern blocks may be provided (Teaching tool 20). (Textbook page 557).* **Visual Learning:** Visual Learning Bridge-*How can you measure angles?* Convince Me! - *Generalize-Students generalize that the measure of an angle is equal to the number of 1-degree angles that it turns through.* **Guided Practice / Differentiated Instruction / Centers:** **Teacher**	Guided Practice Independent Practice Problem solving Practice Buddy Reteach Build Mathematical Literacy Enrichment Additional Practice Quick Check 15-3	4.M.B.4a, 4.M.B.4b, MP.K-12.1, MP.K-12.5, MP.K-12.8

		Led: <u>Intervention:</u> *Reteach to Build Understanding* <u>On Level:</u> *Build Mathematical Literacy* <u>Advanced:</u> *Enrichment* **Technology:** Practice Buddy (PearsonRealize.com) **Independent:** Independent Practice and Problem Solving **Additional Activities:** Math Games (PearsonRealize.com) Visual Learning Animation Plus: (PearsonRealize.com) Additional Practice Math Anytime: Daily Review and Today's Challenge **Optional Activity:** Problem-Solving Leveled Reading Mat: Early and Unusual Strings **Closure:** Lesson Self-Assessment: PearsonRealize.com		
Measure and Draw Angles (2 Days)	Use a protractor to measure and draw angles.	**Problem Based Learning:** <u>Solve and share:</u> *Students connect to their previous understanding of a unit angle and measuring angles using pattern blocks to measure an angle using a protractor. Protractors should be provided (Teaching tool 22). (Textbook page 561).* **Visual Learning:** Visual Learning Bridge-*How do you use a protractor?* <u>Convince Me!</u> *- Attend to Precision- Students explain*	Guided Practice Independent Practice Problem solving Practice Buddy Reteach Build Mathematical Literacy Enrichment Additional Practice Quick Check 15-4	4.M.B.4b, 4.M.B.5, MP.K-12.3, MP.K-12.5, MP.K-12.6

| | | *how they know that 60-degrees is a reasonable measure for the angle shown. Teachers should point out that when measuring an acute or obtuse angle with a protractor, one scale will give an acute measure and the other scale an obtuse measure. Remind students to analyze the type of angle first before deciding which scale is the most reasonable.*

Guided Practice / Differentiated Instruction / Centers:

Teacher Led: Intervention: *Reteach to Build Understanding*

On Level: *Build Mathematical Literacy*

Advanced: *Enrichment*

Technology: Practice buddy (PearsonRealize.com)

Independent: Independent Practice and Problem Solving

Additional Activities:

Math Games (PearsonRealize.com)

Visual Learning Animation Plus:

(PearsonRealize.com)

Additional Practice

Math Anytime: Daily Review and

Today's Challenge

Optional Activity: EnVision STEM Activity 15-4. With a partner, students can practice measuring and drawing angles with a protractor. Each student | | |

		will draw an angle using a protractor and write the measurement of the angle on the back of their paper. Students will switch paper and measure each other's drawn angles. They will check their work for accuracy and discuss their findings. **Closure:** Lesson Self-Assessment: PearsonRealize.com		
Add and Subtract Angle Measures (1 Day)	Use addition and subtraction to solve problems with unknown angle measures.	**Problem Based Learning:** Solve and share: *Students draw a ray to divide an angle into two angles and draw a conclusion about the measures of the angles formed. Protractors or rulers may be provided (Teaching tool 22). (Textbook page 561).* **Visual Learning:** Visual Learning Bridge-*How can you add or subtract to find unknown angle measures?* Convince Me! - *Make Sense and Persevere-Students should find the measure of angle ABE without using a protractor, and then explain how they got their answer.* **Guided Practice / Differentiated Instruction / Centers:** **Teacher Led:** Intervention: *Reteach to Build Understanding* On Level: *Build Mathematical Literacy* Advanced: *Enrichment* **Technology:** Practice Buddy (PearsonRealize.com) **Independent:** Independent Practice and Problem	Guided Practice Independent Practice Problem solving Practice Buddy Reteach Build Mathematical Literacy Enrichment Additional Practice Quick Check 15-5	4.M.B.6, 4.NBT.B.4, MP.K-12.1, MP.K-12.4, MP.K-12.7

		Solving		
		Additional Activities:		
		Math Games (PearsonRealize.com)		
		Visual Learning Animation Plus:		
		(PearsonRealize.com)		
		Additional Practice		
		Math Anytime: Daily Review and		
		Today's Challenge		
		Optional Activities: EnVision STEM Project: Begin by having students model how collisions can cause toy cars to transfer energy by changing direction, starting or stopping motion. Discuss how energy can be transferred from place to place by light heat sound or even electricity. Students will research the area of the world's largest bumper car floor. They will find where it is located and when it was built. In their report they will include a diagram of a bumper car collision using an angle to show how the car might change directions after it collides with something. They will measure, label and describe the angle they drew. EnVision STEM Activity 15-5		
		Closure: Lesson Self-Assessment: PearsonRealize.com		
Problem Solving: Use Appropriate Tools (1 Day)	Use appropriate tools, such as protractor, and rule, to solve problems.	**Problem Based Learning:** Solve and share: *Students use a tool to measure angles and describe relationships between them. Provide a variety of tools for students: centimeter grid paper, fraction strips, centimeter rulers,*	Guided Practice Independent Practice Problem solving Practice Buddy Reteach	4.M.B.4a, 4.M.B.4b, 4.M.B.5, 4.M.B.6, 4.OA.A.3,

		metersticks, inch rulers, yard sticks, pattern blocks, protractors, etc. (Teaching tools 9, 13, 17, 18, 20 and 22.) (Textbook page 569). **Visual Learning:** Visual Learning Bridge- *How can you select the appropriate tools to solve problems?*	Build Mathematical Literacy Enrichment Additional Practice Quick Check 15-6	MP.K-12.1, MP.K-12.2, MP.K-12.4, MP.K-12.5

Convince Me! - *Use Appropriate Tools Strategically- Students name other tools that could be used to solve the problem and explain why the protractor and meterstick are more appropriate than other tools.*

Guided Practice / Differentiated Instruction / Centers:

Teacher Led: Intervention: *Reteach to Build Understanding*

On Level: *Build Mathematical Literacy*

Advanced: *Enrichment*

Technology: Practice Buddy (PearsonRealize.com)

Independent: Independent Practice and Problem Solving

Additional Activities:

Math Games (PearsonRealize.com)

Visual Learning Animation Plus:

(PearsonRealize.com)

Additional Practice

Math Anytime: Daily Review and

Today's Challenge

Closure: Lesson Self-

		Assessment: PearsonRealize.com		

MATH.K-12.1	Make sense of problems and persevere in solving them
MATH.K-12.2	Reason abstractly and quantitatively
MATH.K-12.3	Construct viable arguments and critique the reasoning of others
MATH.4.OA.A.3	Solve multi-step word problems posed with whole numbers and having whole-number answers using the four operations, including problems in which remainders must be interpreted. 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.
MATH.K-12.4	Model with mathematics
MATH.K-12.5	Use appropriate tools strategically
MATH.K-12.6	Attend to precision
MATH.K-12.7	Look for and make use of structure
MATH.K-12.8	Look for and express regularity in repeated reasoning
MATH.4.NBT.B.4	With accuracy and efficiency, add and subtract multi-digit whole numbers using the standard algorithm.
MATH.4.NF.A.1	Explain why a fraction a/b is equivalent to a fraction $(n \times a)/(n \times b)$ by using visual fraction models, with attention to how the number and size of the parts differ even though the two fractions themselves are the same size. Use this principle to recognize and generate equivalent fractions.
MATH.4.NF.B.3.b	Decompose a fraction into a sum of fractions with the same denominator in more than one way, recording each decomposition by an equation. Justify decompositions, e.g., by using a visual fraction model.
MATH.4.M.B.4.a	An angle is measured with reference to a circle with its center at the common endpoint of the rays, by considering the fraction of the circular arc between the points where the two rays intersect the circle. An angle that turns through 1/360th of a circle is called a "one-degree angle," and can be used to measure angles.
MATH.4.M.B.4.b	An angle that turns through n one-degree angles is said to have an angle measure of n degrees.
MATH.4.M.B.5	Measure angles in whole-number degrees using a protractor. Sketch angles of specified measure.
MATH.4.M.B.6	Recognize angle measure as additive. When an angle is decomposed into non-overlapping parts, the angle measure of the whole is the sum of the angle measures of the parts. Solve addition and subtraction problems to find unknown angles on a diagram in real world and mathematical problems, e.g., by using an equation with a symbol for the unknown angle measure.
MATH.4.G.A.1	Draw points, lines, line segments, rays, angles (right, acute, obtuse), and perpendicular and parallel lines. Identify these in two-dimensional figures.

Suggested Modifications for Special Education, ELL and Gifted Students
Gifted Students

- Using centimeter grid paper, instruct students to use a ruler to write their name in pencil on the grid paper, without any curved edges. Next, students trace over their name with a pen or thin marker, then find the measure of each of the angles in their name. If their first name is short, they may use their last name.

Special Education Students

- Fluency review Activity

- Vocabulary Review

- Have students use their arms to model the type of line or angle named. Fists can represent end points and straight palms can represent arrows. This can be turned into a Simon says game or charades.

- Develop the steps for measuring an angle together. Create an anchor chart for students to follow as they practice. Provide them with a copy for their math notebook.

- Develop the steps for drawing an angle together. Create an anchor chart for students to follow as they practice. Provide them with a copy for their math notebook.

English Language Learners

- Topic Vocabulary

- Visual Learning Bridge: Reading

- Solve & Share: Speaking

- Have students use their arms to model the type of line or angle named. Fists can represent end points and straight palms can represent arrows. This can be turned into a Simon says game or charades.

Suggested Technological Innovations/Use

- IXL

- ST Math

- Kahoot!

- Tools (EnVision 2020)

- Game Center (EnVision 2020)

- Create/Complete a Discovery Education Board

Cross Curricular/21st Century Connections

- Pick a Project Activity

- Envision STEM Project

- EnVision STEM Activity

- Problem Solving Reading Activity

- 3 ACT MATH: Game of Angles

Topic 16: Lines, Angles, and Shapes

Content Area: **Mathematics**
Course(s):   **Math**
Time Period: **3rd Trimester**
Length: **6 days**
Status: **Published**

Summary of the Unit

Topic 16 focuses on understanding how shapes can be analyzed, described, and classified, with attention to properties of sides, angles, and lines of symmetry.

Enduring Understandings

- Lines can be classified as parallel, intersecting, or perpendicular.
- Triangles are classified by their sides and by their angles.
- Quadrilaterals are classified by their sides and by their angles.
- A shape that can fold along a line into matching parts is line symmetric.
- Good math thinkers use math to explain why they are right, and can talk about the math that other do, too.

Essential Questions

- How can you classify triangles and quadrilaterals?
- What is line symmetry?

Summative Assessment and/or Summative Criteria

- Topic Test

- Performance Task

Resources

enVision math series https://www.savvas.com/solutions/mathematics/core-programs/envision-mathematics-grades-k-5

ST Math is a visual instructional program that builds a deep conceptual understanding of math through rigorous learning and creative problem solving to engage, motivate and challenge PreK-8 students toward higher achievement. https://www.stmath.com/

IXL online learning, offering unlimited algorithmically generated questions, real-time analytical reports, and dynamic scoring to encourage mastery. https://www.ixl.com/

Discovery Education https://google.discoveryeducation.com/

National Council of Teachers of Mathematics - This website contains activities and lessons, and virtual manipulatives organized by strand. http://illuminations.nctm.org

The National Library of Virtual Manipulatives has tutorials and virtual manipulatives for the classroom. http://nlvm.usu.edu/en/nav/index.html

The Teaching Channel has two hundred math videos for professional development. http://www.theteachingchannel.org

K-5 Math Teaching Resources site contains free math teaching resources, games, activities, journal tasksand resources

for centers arranged by grade level and standard. http://www.k-5mathteachingresources.com

Open Middle- This website contains 36 math reasoning scenarios arranged by CCSS. http://www.openmiddle.com/

Which One Doesn't Belong- This is a website dedicated to providing thought-provoking puzzles for math teachers and students alike. There are no answers provided as there are many different, correct ways of choosing which one doesn't belong. http://wodb.ca/

Estimation 180- This website contains hundreds of estimation challenges relative to real-world scenarios to assist in building strong connections with number sense and the real world. http://www.estimation180.com/

Unit Plan

Topic/Selection Timeframe	General Objectives	Instructional Activities	Benchmarks/Assessments	Standards
Lines (1 Day)	Draw and identify perpendicular, parallel, and intersecting lines.	**Problem Based Learning:** Solve and share: *Students draw pairs of lines that have specific attributes.(Textbook page 585).* **Visual Learning:** Visual Learning Bridge- *How can you describe pairs of lines?* Convince Me! *- Attend to Precision- Students connect their understanding of three different types of lines to real-world objects.* **Guided Practice / Differentiated Instruction / Centers:** **Teacher Led:** Intervention: *Reteach to Build Understanding* On Level: *Build Mathematical Literacy* Advanced: *Enrichment* **Technology:** Practice buddy (PearsonRealize.com) **Independent:** Independent Practice and Problem Solving **Additional Activities:** Math Games (PearsonRealize.com) Visual Learning Animation	Guided Practice Independent Practice Problem solving Practice Buddy Reteach Build Mathematical Literacy Enrichment Additional Practice Quick Check 16-1	4.G.A.1, MP.K-12.3, MP.K-12.6,

		Plus: (PearsonRealize.com) Additional Practice Math Anytime: Daily Review and Today's Challenge **Closure:** Lesson Self-Assessment: PearsonRealize.com		
Classify Triangles (1 Day)	Classify triangles by line segments and angles.	**Problem Based Learning:** Solve and share: *Students sort triangles into groups using any attributes of their choosing. Crayons or markers may be provided. (Textbook page 589).* **Visual Learning:** Visual Learning Bridge- How can you classify triangles? Convince Me! - *Attend to Precision- Students may want to draw pictures to help them understand the problem and justify their answer. Students may not know that the total angle measure of a triangle is 180-degrees. Since an obtuse angle measure is greater than 90-degrees, there can only be one obtuse angle in a triangle, and thus the other two angle measures will be less than 90-degrees.* **Guided Practice / Differentiated Instruction / Centers:** **Teacher Led:** Intervention: *Reteach to Build Understanding* On Level: *Build Mathematical Literacy* Advanced: *Enrichment* **Technology:** Practice buddy (PearsonRealize.com)	Guided Practice Independent Practice Problem solving Practice Buddy Reteach Build Mathematical Literacy Enrichment Additional Practice Quick Check 16-2	4.G.A.1, 4.G.A.2, 4.OA.C.5, 4.M.B.4a, 4.M.B.4b, MP.K-12.2, MP.K-12.6, MP.K-12.8

		Independent: Independent Practice and Problem Solving **Additional Activities:** Math Games (PearsonRealize.com) Visual Learning Animation Plus: (PearsonRealize.com) Additional Practice Math Anytime: Daily Review and Today's Challenge **Closure:** Lesson Self-Assessment: PearsonRealize.com		
Classify Quadrilaterals (1 Day)	Classify quadrilaterals by lines and angles.	**Problem Based Learning:** <u>Solve and share:</u> *Students draw three different four-sided shapes with opposite sides that are parallel.(Textbook page 593).* **Visual Learning:** Visual Learning Bridge- *How can you classify quadrilaterals?* <u>Convince Me!</u> *- Look for and Make Use of Structure- Students use their knowledge of the attributes of a rectangle and parallelogram to explain how the shapes are related. Remind students that quadrilaterals such as parallelograms and rectangles can be described and classified by their angles and sides.* **Guided Practice / Differentiated Instruction / Centers:** **Teacher Led:** <u>Intervention:</u> *Reteach to Build Understanding* On Level: *Build*	Guided Practice Independent Practice Problem solving Practice Buddy Reteach Build Mathematical Literacy Enrichment Additional Practice Quick Check 16-3	4.G.A.1, 4.G.A.2, MP.K-12.3, MP.K-12.7, MP.K-12.8

		Mathematical Literacy		
		Advanced: *Enrichment*		
		Technology: Practice buddy (PearsonRealize.com)		
		Independent: Independent Practice and Problem Solving		
		Additional Activities:		
		Math Games (PearsonRealize.com)		
		Visual Learning Animation Plus:		
		(PearsonRealize.com)		
		Additional Practice		
		Math Anytime: Daily Review and		
		Today's Challenge		
		Optional Activity: Problem-Solving Leveled Reading Mat: Shapes		
		Closure: Lesson Self-Assessment: PearsonRealize.com		
Line Symmetry (1 Day)	Recognize and draw lines of symmetry. Identify line symmetric figures.	**Problem Based Learning:** Solve and share: *Students use what they know about attributes of a square and a letter to find lines of symmetry. (Textbook page 597).* **Visual Learning:** Visual Learning Bridge- *What is line symmetry?* Convince Me! - *Look for Relationships-Students find capital letters with a certain number of lines of symmetry. Point out that some letters will have multiple lines of symmetry while others will have no lines of symmetry.* **Guided Practice / Differentiated**	Guided Practice Independent Practice Problem solving Practice Buddy Reteach Build Mathematical Literacy Enrichment Additional Practice Quick Check 16-4	4.G.A.3, MP.K-12.1, MP.K-12.3, MP.K-12.4

		Instruction / Centers:		
		Teacher Led: Intervention: *Reteach to Build Understanding* On Level: *Build Mathematical Literacy* Advanced: *Enrichment* **Technology:** Practice buddy (PearsonRealize.com) **Independent:** Independent Practice and Problem Solving **Additional Activities:** Math Games (PearsonRealize.com) Visual Learning Animation Plus: (PearsonRealize.com) Additional Practice Math Anytime: Daily Review and Today's Challenge **Optional Activities:** EnVision STEM Activity 16-4 **Closure:** Lesson Self-Assessment: PearsonRealize.com		
Draw Shapes with Line Symmetry (1 Day)	Draw Figures that have line symmetry.	**Problem Based Learning:** Solve and share: *Students use what they know about attributes of a square and a letter to find lines of symmetry. (Textbook page 597).* **Visual Learning:** Visual Learning Bridge- *What is line symmetry?* Convince Me! - *Look for Relationships- Students find captial letters with a certain number of lines of symmetry.*	Guided Practice Independent Practice Problem solving Practice Buddy Reteach Build Mathematical Literacy Enrichment Additional Practice	4.G.A.3, MP.K-12.1, MP.K-12.3, MP.K-12.4

		Point out that some letters will have multiple lines of symmetry while others will have no lines of symmetry. **Guided Practice / Differentiated Instruction / Centers:** **Teacher Led:** <u>Intervention:</u> *Reteach to Build Understanding* <u>On Level:</u> *Build Mathematical Literacy* <u>Advanced:</u> *Enrichment* **Technology:** Practice Buddy (PearsonRealize.com) **Independent:** Independent Practice and Problem Solving **Additional Activities:** Math Games (PearsonRealize.com) Visual Learning Animation Plus: (PearsonRealize.com) Additional Practice Math Anytime: Daily Review and Today's Challenge **Optional Activities:** EnVision STEM Project: Together with students, brainstorm a list of animal senses and how it helps them respond to their environment. Explain to students that animals process the information received from their senses and use that information to guide their actions. Students will research why some animals have eyes on the sides of their heads while others have eyes on the front. In their report they will include a drawing of their	Quick Check 16-5	

		favorite animal's face. The face must include a line of symmetry and show that both sides are the same. An explanation should be included explaining how one knows the drawing is symmetrical. EnVision STEM Activity 16-5 **Closure:** Lesson Self-Assessment: PearsonRealize.com		
Problem Solving: Critique Reasoning (1 Day)	Use understanding of two-dimensional shapes to critique the reasoning of others.	**Problem Based Learning:** Solve and share: *Students use what they know about analyzing two-dimensional shapes to critique a student's statement about right triangles. (Textbook page 605).* **Visual Learning:** Visual Learning Bridge- *How can you critique the reasoning of others?* Convince Me! *-Attend to Precision- Students examine two statements with precision and interpret the difference between using the words "some" and "every" when making a statement.* **Guided Practice / Differentiated Instruction / Centers:** **Teacher Led:** Intervention: *Reteach to Build Understanding* On Level: *Build Mathematical Literacy* Advanced: *Enrichment* **Technology:** Practice Buddy (PearsonRealize.com) **Independent:** Independent Practice and Problem Solving **Additional Activities:** Math Games	Guided Practice Independent Practice Problem solving Practice Buddy Reteach Build Mathematical Literacy Enrichment Additional Practice Quick Check 16-6	4.G.A.1, 4.G.A.2, 4.M.A.3, MP.K-12.2, MP.K-12.3, MP.K-12.6

		(PearsonRealize.com) Visual Learning Animation Plus: (PearsonRealize.com)		

MATH.K-12.1	Make sense of problems and persevere in solving them
MATH.K-12.2	Reason abstractly and quantitatively
MATH.K-12.3	Construct viable arguments and critique the reasoning of others
MATH.K-12.4	Model with mathematics
MATH.K-12.5	Use appropriate tools strategically
MATH.4.OA.C.5	Generate a number or shape pattern that follows a given rule. Identify apparent features of the pattern that were not explicit in the rule itself.
MATH.K-12.6	Attend to precision
MATH.K-12.7	Look for and make use of structure
MATH.K-12.8	Look for and express regularity in repeated reasoning
MATH.4.M.A.3	Apply the area and perimeter formulas for rectangles in real world and mathematical problems.
MATH.4.M.B.4.a	An angle is measured with reference to a circle with its center at the common endpoint of the rays, by considering the fraction of the circular arc between the points where the two rays intersect the circle. An angle that turns through 1/360th of a circle is called a "one-degree angle," and can be used to measure angles.
MATH.4.M.B.4.b	An angle that turns through n one-degree angles is said to have an angle measure of n degrees.
MATH.4.G.A.1	Draw points, lines, line segments, rays, angles (right, acute, obtuse), and perpendicular and parallel lines. Identify these in two-dimensional figures.
MATH.4.G.A.2	Classify two-dimensional figures based on the presence or absence of parallel or perpendicular lines, or the presence or absence of angles of a specified size. Recognize right triangles as a category and identify right triangles.
MATH.4.G.A.3	Recognize a line of symmetry for a two-dimensional figure as a line across the figure such that the figure can be folded along the line into matching parts. Identify line-symmetric figures and draw lines of symmetry.

Suggested Modifications for Special Education, ELL and Gifted Students

Gifted Students

- Wilson A. Bentley, nick-named "Snowflake Bentley," spent his life taking photographs of snowflakes. Have students examine the symmetry of snowflakes by viewing photographs. A collection of his snowflake photos can be found online at http://www.bentley.sciencebuff.org/collection.asp or https://snowflakebentley.com/WBsnowflakes.htm Also view photo galleries on www.SnowCrystals.com at: http://www.its.caltech.edu/~atomic/snowcrystals/photos/photos.htm. The students should be able to figure out that, most snowflakes symmetry but, they do not all have the same number of lines of symmetry. Also, snowflakes sometimes have reflection symmetry (only 1 line of symmetry).

- Bentley's photographs include information about the weather conditions for each snowflake. Have the students study the weather conditions for various snowflakes to determine if weather conditions affect the number of lines of symmetry of snowflakes. Some answers can be found online at "A Guide to

Snowflakes": http://www.its.caltech.edu/~atomic/snowcrystals/class/class.htm

Special Education Students

- Fluency review Activity

- Vocabulary Review

- Have students use their arms to model the type of line or angle named. Fists can represent end points and straight palms can represent arrows. This can be turned into a Simon says game or charades.

- Use various markers or highlighters to place an emphasis on multiple lines in context.

- Have students use their arms to act out parallel lines, perpendicular and intersecting lines to kinesthetically and visually internalize the differences and similarities.

- Have students cut out pattern blocks and fold them to see how many lines of symmetry each block has.

English Language Learners

- Topic Vocabulary

- Visual Learning Bridge: Reading

- Solve & Share: Speaking

- Have students use their arms to act out parallel lines, perpendicular and intersecting lines to kinesthetically and visually internalize the differences and similarities.

- Have students cut out pattern blocks and fold them to see how many lines of symmetry each block has.

Suggested Technological Innovations/Use

- IXL

- ST Math

- Kahoot!

- Tools (EnVision 2020)

- Game Center (EnVision 2020)

- Create/Complete a Discovery Education Board

Cross Curricular/21st Century Connections

- Pick a Project Activity

- Envision STEM Project

- EnVision STEM Activity

- Problem Solving Reading Activity