Unit Summary

In this unit, TLW use place value understanding and properties of operations to perform multi-digit addition and subtraction. TLW also use place value understanding to round whole numbers to the nearest 10 or 100.

Duration

4 weeks, including 1 week of review

Unit Title	Subject Area
Unit 1: Add, Subtract, Round Whole Numbers Using Place Value	3rd Grade Math

Common Core State Standards

3.NBT.1: Use place value understanding to round whole numbers to the nearest 10 or 100.

3.NBT.2: Fluently add and subtract within 1000 using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction

3.OA.9: Identify arithmetic patterns (including patterns in the addition table or multiplication table), and explain them using properties o operations. For example, the patterns in a 100 chart, or even numbers end with 0,2,4,6, or 8.

Essential Questions/Student Targets	I Can Statements
How can I determine the value of a digit in relation to its place in a number? What is an effective way to estimate numbers?	**3. NBT.1:** I can define "round or rounding" in relation to place value I can round a whole number to the nearest 10. I can round a whole number to

What is an effective way to round numbers to the nearest 10 or 100.

How does an understanding of place value help with fluency in computations involving addition and subtraction?

How does place value connect with regrouping in addition and subtraction?

How are addition and subtraction related?

How can I learn to quickly calculate sums in my head?

What strategies can be used to add and subtract within 1000?

Can decomposing numbers help with addition and subtraction of two-digit numbers?

Can more than one strategy be used?

How can I use addition and subtraction to solve real world problems?

How do properties work in addition problems?

How does knowing the associative property help us add numbers easily and

the nearest 100.

3.NBT.2:
I can indentify strategies for adding within 1000.

I can identify strategies for subtract-
Ing within 1000.

I can fluently add within 1000.

I can fluently subtract within 1000.

3.OA.9
I can identify patterns.

I can explain rules for a pattern using the properties of operations.

I can explain relationships between the numbers in a pattern.

	Mathematical Practices emphasized in unit
quickly? How does knowing the commutative property help us add numbers easily and quickly? How does knowing the identity property help us add numbers easily and quickly? How is zero different from any other whole number you might add or subtract? How do properties work in subtraction problems?	MP.1 Make sense of problems and persevere in solving them. MP.2 Reason abstractly and quantitatively MP.7 Look for and make use of structure MP.8 Look for and express regularity in repeated reasoning
Academic Vocabulary Addition (sum) (addend) Algorithm Greater than >, less than <, equal = Equation Estimate Round (to the nearest..) Place Value Associative Property of Addition Commutative Property of Addition Subtraction (difference)(subtrahend)(minuend) Standard Form Expanded Form	**Student Vocabulary** Addition (sum) (addend) Algorithm Greater than >, less than <, equal = Equation Estimate Round (to the nearest..) Place Value Associative Property of Addition Commutative Property of Addition Subtraction (difference)(subtrahend)(minuend) Standard Form Expanded Form

Key Ideas/Learning Objectives

Place Value and Rounding
- Use mental math to add and subtract
- Demonstrate place value understanding beyond the algorithms or procedure for rounding
- Estimate sum and/or difference of numbers
- Apply estimations and rounding to solve real world problems
- Explain and reason about the answers which are the result of rounding
- Utilize a number line and hundreds chart as tools to support their work in rounding

Addition and Subtraction
- Add and subtract numbers within 1000 fluently, accurately, and efficiently. Using a variety o strategies BEYOND the standard algorithms
- Add and subtract both vertically and horizontally, and apply the commutative and associative properties
- Understand regrouping in subtraction
- Understand how the inverse operation of addition and subtraction and how it can verify computation accuracy

Formative Assessment	Summative Assessment
Observation-using learned strategies Identify patterns in the addition table Show different strategies (algorithms) of add/subtraction – number lines on white boards Use base ten blocks to add/subtract Use rounding to solve problems Use rounding to estimate word problems – look for reasonableness of answers Explain the answer using combinations of words/numbers/diagrams/symbols	Pre/Post Unit 1 Test • Part A Place Value • Part B Rounding • Part C Addition • Part D Subtraction Intermittent Quizzes • Part A Place Value • Part B Rounding • Part C Addition • Part D Subtraction

Individual White Boards
Exit Tickets-After students debrief, instruct students to review their work – assess students' understanding of the concept presented.
Math Journaling – students writing "how" they understand a certain concept and explaining their thoughts
Think, Pair, and Share
Post-it notes – on numbered poster board
Quick Fist to 5

Lesson Sequence	Resources
1.1 Introduce Math Tools, Base 10 Blocks, Number line, and Math Folder	Atlas – Oakland Smarter Balance Curriculum Crafter Connecticut Curriculum EngageNY Curriculum Arizona Curriculum Georgia Curriculum Tennessee Curriculum Everyday Math CoreCurriculumworksheets.com Superteachers.com Dadsworksheets Teacherspayteachers Pinterest
1.2 Pre-Assessment of Unit 1	
1.3 Place Value using Blocks	
1.4 Place Value Flip Chart -2 days	
1.5 Number Top-It Game (Place-Value)	
1.6 Expanded Form/Standard Form/Word Form	
1.7 Addition strategies up to 1000-3 days	**Literature Connections**
1.8 Subtraction strategies up to 1000– 3 days	Hong, Lily Toy. *Two of Everything*. Albert Whitman and Company. ISBN 978-0-8075-8157-5.1993. In this Chinese folktale a magic pot creates two of everything that explores the mathematical concept of doubling
1.9 Round to the nearest 10	
2.0 Round to the nearest 100	
2.1 Real world problems with addition and subtraction, using rounding to estimate	Tang, Greg. *Math-terpieces the Art of Problem-Solving*. Scholastic Press. ISBN 0-439-44388-1. 2003. The author

2.2
Review/Addition/Subtraction/Estimation games – 2 days

2.3 Unit 1 Test

Resources – Websites

🌐Links to a variety of Place Value and addition and subtraction Websites
🌐"Addition + 10"
🌐"Place Value Models"
🌐Determine the # for the place-value model shown
🌐Students solve place value word problems
🌐Solve addition problems of up to three digits
🌐"Function Machine"
🌐Solve subtraction problems of up to three digits
🌐Solve subtraction problems over increasing place value
🌐Subtract numbers up to three digits
🌐Solve for the unknown in a 3-digit subtraction problem using input/output tables
🌐Balance addition equations up to three digits
🌐Multiply one digits numbers by multiples of 10
🌐Students round to the nearest 10 or 100
🌐"Estimation and Rounding"

challenges students to solve problems creatively while introducing art history.

Leedy, Loreen. *Subtraction Action*. Holiday House, Inc. ISBN 0-8234-1454-X.2000. Introduces subtraction through the activities of animal students.

Tang, Greg. *The Grapes of Math: Mind Stretching Math Riddles*. Scholastic. ISBN 0-439-21033-X. 2001. This book shares techniques that help students solve problems creatively.

Murphy, Stuart. *Shark Swimathon*. Harper Collins. ISBN 0-06-446735-X. 2001. A swim team has to swim 75 laps by the end of the week. Students must calculate every day how many laps they have left.

Murphy, Stuart. *Earth Day-Hooray!* Harper Collins. ISBN 0-06-000129-1. 2004. A drive to recycle cans on Earth Day focuses on place value.

Demi. *One Grain of Rice*. Scholastic Press. ISBN 0-590-93998-X. 1997. Through the surprising power of doubling, *One Grain of Rice* grows into more than one billion grains of rice — and Rani teaches the raja a lesson.

Burch, David. *The King's Chessboard*. Puffin Books. ISBN 0-14-054880-7. 1988. Introduces the power of doubling as the wise man outsmarts the king by asking for just one grain of rice.

Schwartz, David M. *How Much Is a Million?*. Lothrop. ISBN 0-688-04050-0. 1985.

Unit Summary

In this unit, TLW generate categorical data and represent it in a variety of ways, e.g., tally marks, a variety of graphs (including scaled graphs), charts and tables. TLW be able to interpret and analyze sets of organized data to solve one and two step problems.

Duration

3 weeks, including 1 week of review

Unit Title	Subject Area
Unit 2: Collect, Interpret and Represent Data	3rd Grade Math

Common Core State Standards

3.MD.3 Draw a scaled picture graph and a scaled bar graph to represent a data set with several categories. Solve one- and two-step "how many more" and "how many less" problems using information presented in scaled bar graphs. *For example, draw a bar graph in which each square in the bar graph might represent 5 pets.*

3.MD.4 Show the data by making a line plot, where the horizontal scale is marked off in appropriate units— whole numbers, halves, or quarters.

Essential Questions/Student Targets	I Can Statements
What everyday experiences or objects can be used to create a data set for visual display? How can a graph be used to answer questions about the data?	**3. MD.3** I Can identify or create the title of a graph? I CAN define horizontal and vertical axis on graphs. I Can identify the sets of data that

How can you use graphs to answer a question? How can data can be organized and displayed? How can data displayed in tables and graphs be used to inform? How can surveys be used to gather information? How can I change the scale of a graph to represent my data? How do I decide what increments to use for my scale? .	are being represented and communicate their relevance to the title? I Can create a scaled graph that accurately represents the data set? I CAN use addition and subtraction to compute relevant information in the graph? **3.MD.4** I CAN define horizontal axis. I CAN identify each plot on the line as data or a number of objects. I CAN determine appropriate scale for a line plot. **Mathematical Practices emphasized in unit** MP.1 Make sense of problems and persevere in solving them. MP.2 Reason abstractly and quantitatively MP.7 Look for and make use of structure MP.8 Look for and express regularity in repeated reasoning
Academic Vocabulary	**Student Vocabulary**

Axis Data or Data set Vertical Horizontal Tally Marks Bar Graph Picture Graph Line Graph Frequency Table Interpret Analyze "How many less" "How many more" Scale Scaled Picture Graph Scaled Bar Graph Scaled Line Graph Two-step problem	Axis Data or Data set Vertical Horizontal Tally Marks Bar Graph Picture Graph Line Graph Frequency Table Interpret Analyze "How many less" "How many more" Scale Scaled Picture Graph Scaled Bar Graph Scaled Line Graph Two-step problem

Key Ideas/Learning Objectives

Data and Graphing:
- Understand, create, read, and solve problems using scaled graphs using different intervals
- Solve one-step and two-step world problems using graphs
- Solve "how many more" and "how many less" questions from interpreting different types of charts, tables, and graphs

Formative Assessment	**Summative Assessment**
Observation-using learned strategies revealing understanding number lines on white boards Explain the answer using combinations of words/numbers/diagrams/symbols	Pre/Post Unit 2 Test Intermittent Quizzes

Individual White Boards – quick graph – what parts are needed in a graph? Horizontal/vertical? Exit Tickets-After students debrief, instruct students to review their work – assess students' understanding of the concept presented. Math Journaling –Explaining what data is important to display in their graph? How do you use your data to explain questions? What increments will you use to label your graph? Think, Pair, and Share Post-it notes – on numbered poster board Quick Fist to 5	

Lesson Sequence	Resources
2.1 Pre-Assessment of Unit 2 2.2 Tally Charts and Frequency Tables – 2/3 days 2.3 Picture Graphs and Line Graphs 2.4 More Picture Graphs/Tally Charts/Frequency Tables/Line Graphs 2.5 Making surveys and organizing the data - 2 days 2.6 Scaled graphs – 2 days 2.7 Graphing word problems- 1-step/ 2-step problems 2.8 Unit review/reinforce in small group stations **2.9 Unit 2 Test**	Atlas – Oakland Smarter Balance Curriculum Crafter Connecticut Curriculum EngageNY Curriculum Arizona Curriculum Georgia Curriculum Tennessee Curriculum Everyday Math CoreCurriculumworksheets.com Superteachers.com Dadsworksheets Teacherspayteachers Pinterest **Literature Connections** Dusling, Jennifer. *Fair is Fair*. ISBN-10: 1575651319. This series entry explores the concept of bar graphs. A boy says his allowance is not fair and gets his friends to lobby his dad for an increase.

Resources – Websites

🌐 Learnzillions.com

🌐 commoncoresheets.com/LinePlots

🌐 http://nces.ed.gov/nceskids/graphing/classic/

🌐 http://illuminations.nctm.org/Activity.aspx?id=4098

🌐 http://softschools.com/math/data_analysis/pictograph/make_your_own_pictograph/

🌐 www.basic-mathematics.com/types-of-graphs

🌐 www/brainpopjr.com/math/data/tallychartsandbargraphs

🌐 http://www.ixl.com/math/grade-3

Inspired by a school lesson, the boy presents his dad with two bar graphs to show his chores a need for a "fair" amount for his allowance.

Bader, Bonnie. *Graphs.* ISBN-10:0448428962. Gary Graff doesn't want to got to his family's boring reunion, but when he surveys his family members to finish his math homework-a graphing assignment. Gary learns a lot about graphing and his family.

Murphy, Stuart J. *Lemonade for Sale.* ISBN-10: 0064467155. Four kids and their sidekick, Petey the parrot, run a sometimes thriving lemonade stand who patrons include all kinds of wacky neighbors – even a juggler. They create a bar graph to track the rise and fall of their lemonade sales.

Leedy, Loreen. *The Great Graph Contest.* ISBN-10: 0823420299. Two comical creatures go crazy with graphs in an imaginative look at organizaing information. Kids can learn about bar graphs, pie charts, Venn diagrams, and more.

Unit Summary
In this unit, TLW develop understanding of multiplication and strategies for multiplication within 100. TLW develop an understanding of the meanings of multiplication of whole numbers through activities and problems involving equal-sized groups, arrays, and area models. By comparing a variety of solution strategies, students learn the relationships and attributes of multiplication.

Duration
4 weeks, including 1 week of review

Unit Title	Subject Area
Unit 3: Multiplication	3rd Grade Math

Common Core State Standards

3.OA.1: Interpret products of whole numbers.
3.OA.3: Use multiplication within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities.
3.OA.4: Determine the unknown whole number in a multiplication equation relating three whole numbers.
3.OA.5: Apply properties of operations [the Commutative Property of Multiplication] as strategies[a stategy] to multiply.
3.OA.7: Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division.
3.OA.8: Solve two-step word problems using the four operations. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.
3.OA.9: Identify arithmetic patterns (including patterns in the addition table or multiplication table), and explain them using properties of operations
3.NBT.4: Multiply one-digit whole numbers by multiples of 10.

Essential Questions/Student Targets	I Can Statements

How can I use a multiplication problem to find an unknown? Using the four operations, can I build relationships between the numbers? How can a letter be used to represent the unknown? How is it possible to determine if an answer makes sense? Where do patterns show up in Math? Which operations will be used to solve problems? How can knowing a multiplication fact help you solve; another multiplication fact? How can we represent multiplication using a variety of models (e.g. array and number line)? How can we use what we know about addition and subtraction to help us make sense of multiplication? How does repeated addition correlate to multiplication?	**3.OA.1** I CAN multiply to find a product. I CAN show products using equal groups, arrays, and repeated addition. I CAN relate skip counting to multiplication. **3.OA.3** I CAN multiply to solve word problems. **3.OA.4** I CAN find the missing number in a multiplication problem. **3.OA.5** I CAN use the Commutative Property of Multiplication to solve problems. I CAN explain the commutative property, the associative proper-ty, and the distributive property of multiplication. **3.OA.7** I CAN memorize all products within 100. I CAN use strategies to solve a multiplication problem. I CAN multiply to solve word problems. I CAN use drawing to solve a multiplication word problem.

	3.OA.8 I CAN identify different strategies for estimating. I CAN construct an equation with a letter standing for the unknow quantitiy. I CAN justify my answer using estimation strategies and mental computation. 3.NBT.3 I CAN identify strategies to multiply one-digit numbers by multiples of 10. I CAN use place value to multiply one-digit whole numbers by multiples of 10. **Mathematical Practices emphasized in unit** **MP1. Make sense of problems and persevere in solving them.** Students make sense of problems involving multiplication. **MP2. Reason abstractly and quantitatively.** Students demonstrate abstract reasoning by connecting arrays with multiplication problems. **MP3. Construct viable arguments and critique the reasoning of others.** Students construct and critique arguments regarding mental math

strategies focusing on multiplication.

MP4. Model with mathematics. Students are asked to use tiles to model various understandings of multiplication by creating arrays or groups. They record their thinking using words, pictures, and numbers to further explain their reasoning.

MP7. Look for and make use of structure. Students use the distributive property of multiplication as a strategy to multiply.

MP8. Look for and express regularity in repeated reasoning. Students use the distributive property of multiplication to solve for products they do not know.

Academic Vocabulary	**Student Vocabulary**
Array	Array
Associative Property	Associative Property
Commutative Property	Commutative Property
Digit	Digit
Distributive Property	Distributive Property
Equation	Equation
Groups	Groups
Multiplication	Multiplication
Operations	Operations
Pattern	Pattern
Products	Products
Repeated Addition	Repeated Addition
Rows/Columns	Rows/Columns
Symbol	Symbol
Unknown	Unknown

Key Ideas/Learning Objectives
Multiplication

- It is critical that learning opportunities be included that help students make connections and distinctions between their understandings of addition and subtraction and their understandings of multiplication and division.

- apply properties of operations (commutative, associative, and distributive) as strategies to multiply and divide

- fluently multiply and divide within 100, using strategies such as the patterns and relationships between multiplication and division

- understand multiplication and division as inverse operations

- solve problems and explain their processes of solving division problems that can also be represented as unknown factor multiplication problems.

Formative Assessment	**Summative Assessment**
Mad Minutes (multiplication) Geoboard showing arrays Journal questions – for example: • What are two strategies you used to solve the problems? • How can the same problem be represented by two different arrays? • How does an array model show repeated addition? • Can you think of a more efficient way to work out how many _____ there are? • How many ____ are there in one row? • What if _____ had 9 rows of _____ and there were 8 _____ in each row? • You used adding to work that out. How could you have used mulitiplication? • If 2 x 6 = 12, what does 3 x 6 =? How could you work out 6 x 6 from this?	Unit 3 Pre/Post Assessment Intermittent Quizzes

Observation-using learned strategies revealing understanding number lines on white boards Explain the answer using combinations of words/numbers/diagrams/symbols Individual White Boards – making arrays, diagrams, showing products Exit Tickets-After students debrief, instruct students to review their work – assess students' understanding of the concept presented. Think, Pair, and Share Post-it notes – on numbered poster board Quick Fist to 5	
Lesson Sequence 3.1 Pre-Test 3.2 What does multiplication mean? What do you know? 3.3 How is multiplication like repeated addition? How does skip counting relate to multiplication? (2 days) 3.4 What is an array? How does it Relate to the Commutative Prop. of Multiplication? (2 days) 3.5 Problem Solving with different strategies (2 days) 3.6 Learning Fact Power and	**Resources** **Literature Connections** Akers, Suzanne. *What Come's in 2's,3's, & 4's*. Simon &Schuster. ISBN 9780671792473. 1990. Calvert, Pam. *Multiplying Menace:The Revenge of Rumpelstiltskin (A Math Adventure)*. Charlesbridge. ISBN 10:1-57091 889-9. 2006. Hutchins, Pat. *The Doorbell Rang*. Mulberry Books. ISBN 0-688-09234-9.1986. Neushwander,Cindy. *Amanda Bean's Amazing Dream, A Mathematical Story*. Scholastic Press. ISBN 0-590-30012-1.1998.

Shortcuts 3.7 Identity Property of Multiplication and Zero Property of Mult. 3.8 Arrays 3.9 Multiplication word problems using different strategies 3.10 Multiply one-digit numbers by multiples of 10 using strategies based on place value 3.11 Multiplication stations – including games/differentiation 3.12 Review **3.13 Unit 1 Test** _____ **Resources – Websites** Learn zillion websites Learning Channel Youtube IXL SUMDOG http://www.multiplication.com/games/play/cone-crazy Cone Crazy" Students solve multiplication fact problems by choosing the right scoop of ice cream. http://www.multiplication.com/games/	Clement, Rod. *Counting on Frank*. Garret Stevens Publishing. ISBN 0-8368-0358-2. 1990.

play/flyinghigh

"Flying High" Students customize their plane and choose the fact families they want to practice.

http://www.multiplication.com/games/play/fish-shop

"Fish Shop" Students solve multiplication fact problems by choosing the correct fish tank to solve the problem.

http://www.multiplication.com/games/play/farm-freak-out

"Farm Freak Out" Students choose the fact families they want to practice and then click on the sheep that solves the problem.

http://www.multiplication.com/games/play/dynamite-multiplication

"Dynamite Multiplication" Students choose a fact family and then solve the problems that appear.

http://www.gamequarium.org/dir/Gamequarium/Math/Multiplication/Laws_of_Multiplication/

This site provides strategies about learning basic the facts that can be easily figured out without memorizing them.

http://pbskids.org/go/video/?category=Cyberchase&pid=lXkUFSyWzcVFwWpmh7jqQd0WmbnynBhE

Unit Summary

In this unit, TLW develop understanding of division and strategies for division within 100. TLW develop an understanding of the meanings of division of whole numbers through activities and problems involving equal-sized groups, arrays, and area models. By comparing a variety of solution strategies, students learn the relationships and attributes of division.

Duration

3 weeks, including 1 week of review

Unit Title	Subject Area
Unit 4: Division	3rd Grade Math

Common Core State Standards

3.OA.2: Interpret whole number quotients of whole numbers.

3.OA.3: Use division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities.

3.OA.4: Determine the unknown whole number in a division equation relating three whole numbers.

3.OA.5: Apply properties of operations [the Commutative Property of Division] as strategies[a stategy] to divide.

3.OA.6: Understand division as an unknown-factor problem.

3.OA.7: Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division.

3.OA. 8: Solve two-step word problems using the four operations. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.

3.OA.9: Identify arithmetic patterns (including patterns in the addition table or multiplication table), and explain them using properties of operations

Essential Questions/Student Targets	I Can Statements

How can knowing a multiplication fact help you solve: a related division problem? How can we represent division using a variety of models (e.g. array and number line)? What does it mean when we say that multiplication and division are inverse operations and how does this connect to fact families? How can we use what we know about subtraction to help us make sense of division?	**3.OA.2** I CAN divide to find a quotient. **3.OA.3** I CAN show quotients using equal groups, arrays, and repeated subtraction. **3.OA.5** I CAN use the Commutative Property of Division. **3.OA.8** I CAN divide to solve word problems. I CAN use drawing to solve a division word problem. **Mathematical Practices emphasized in unit** **MP3. Critique viable arguments and critique the reasoning of others** when describing the relationships that exist between operations. **MP4. Model with mathematics** Multiplication and division problems using arrays and number lines to show the concept of equal-sized groups and equal-sized columns/rows **MP7. Look for and make use of structure** when considering how multiplication is like and unlike addition and like and unlike

	division

Academic Vocabulary	**Student Vocabulary**
Array Associative Property Commutative Property Digit Distributive Property Dividend Division Equal-Sized Group Equation Groups Inverse Relationship Operations Pattern Rows/Columns	Array Associative Property Commutative Property Digit Distributive Property Dividend Division Equal-Sized Group Equation Groups Inverse Relationship Operations Pattern Rows/Columns

Key Ideas/Learning Objectives

- Deepening the knowledge of division and finding the unknown factor
- Understanding of situations involving equal-sized groups and place value
- Representing division pictorially, graphically, and symbolically
- Solving real-world problems and using estimation
- Using several strategies in solving division problesm

Formative Assessment	**Summative Assessment**
Mad Minutes (division) Geoboard showing arrays Journal questions – for example: • What are two strategies you used to solve the problems? • How does an array model show	Unit 4 Pre/Post Assessment Intermittent Quizzes

repeated subtraction?
• Can you think of a more efficient way to work out how many groups there are?
If 12/6 = 2, what does 12/2 =? How could you work using fact families?
Observation-using learned strategies revealing understanding using equal groups to understand division.
Explain the answer using combinations of words/numbers/diagrams/symbols
Individual White Boards – making arrays, diagrams, showing products
Exit Tickets-After students debrief, instruct students to review their work – assess students' understanding of the concept presented.
Think, Pair, and Share
Post-it notes – on numbered poster board
Quick Fist to 5

Lesson Sequence	Resources
4.1 Pre-Test	**Literature Connections**
4.2 What is division?	Murphy, Stuart. *Divide and Ride*. Harper Trophy.ISBN-13: 978-0060267773. 1997.
4.3 More equal groups	
4.4 Modeling the inverse of mult/division (2 days)	Murphy, Stuart. *Too Many Kangaroo Things to Do*. Harper Collins.ISBN-0-06-025884-5. 1996.
4.5 Problem solving – real world problems (2 days)	Froman,Robert. *The Greatest Guessing Game A Book About Division*. Thomas Y. Crowell. ISBN

4.6 What are the rules for dividing 1 and 0? 4.7 Division stations 4.8 Unit review **4.9 Unit 4 Test**	0690013764. 1978. Giganti, Paul. *Each Orange Has Eight Slices*. Mulberry Books. ISBN 0-688-13985-x. 1992. Hulme, Jay. *Sea Squares.*Hyperion. ISBN 1-56282-520-8. 1991.

Resources – Websites

Learn zillions website:
http://learnzillion.com/lessons/1477-understand-division-with-0-and-1

Illuminations website

http://www.primaryresources.co.uk/maths/maths.htm#numbers

http://www.aplusmath.com/Games/HiddenPicture/HiddenPicture.php?gametype=Multiplication This site gives multiplication fact practice.

http://www.aplusmath.com/Games/Concentration/Multiplication_Concentration.html

"Multiplication Concentration" Students match multiplication problem with the correct solution.

http://www.aplusmath.com/Games/PlanetBlasterBasics/index.html

http://www.primaryresources.co.uk/maths/maths.htm#numbers

This site provides an opportunity to practice math facts with challenges like Timed Math Challenges, Multiplication

Pinczes, Elinor. *A Remainder of One*. Houghton Miflin. ISBN 0-618-25077-8. 1995.

Pinczes, Elinor. *One Hundred Hungry Ants.*Houghton Miflin. ISBN 0-395-97123-3. 1993.

Burns, Marilyn. *Amanda Bean's Amazing Dream.*Scholastic.ISBN 0-590-30012. 1998.

Hutchins, Pat. *The Doorbell Rang*. Green Willow Books. ISBN 0-68

Jeopardy, Bingo, etc. http://www.aplusmath.com/Games/HiddenPicture/HiddenPicture.php?gametype=Multiplication This site gives multiplication fact practice. http://www.aplusmath.com/Games/Concentration/Multiplication_Concentration.html	

Unit Summary

In this unit, TLW develop an understanding of fractions, especially unit fractions, (fractions with numerator of 1); use fractions along with visual fraction models to represent parts of a whole. TLW understand that the size of a fractional part is relative to the size of the whole. TLW use fractions to represent numbers equal to, less than, and greater than one and solve problems that involve comparing fractions by using visual fractions models and strategies based on noticing equal numerators or denominators.

Duration
4 weeks, including 1 week for review

Unit Title	**Subject Area**
Unit 5: Develop Understanding Of Fractions As Numbers	3rd Grade Math

Common Core State Standards

3.NF.1 – Understand a fraction 1/b as the quantity formed by 1 part when a whole is partitioned into b equal parts: understand a fraction a/b as the quantity formed by parts of size 1/b.

3.NF.2 – Understand a fraction as a number on the number line; represent fractions on a number line diagram.

3.NF.2a.   Represent a fraction 1/*b* on a number line diagram by defining the interval from 0 to 1 as the whole and partitioning it into *b* equal parts. Recognize that each part has size 1/*b* and that the endpoint of the part based at 0 locates the number 1/*b* on the number line.

3.NF.2.b Represent a fraction *a/b* on a number line diagram by marking off a lengths 1/*b* from 0. Recognize that the resulting interval has size *a/b* and that its endpoint locates the number *a/b* on the number line.

3.NF.3
Explain equivalence of fractions in special cases, and compare fractions by reasoning about their size.

3.NF.3a.   Understand two fractions as equivalent (equal) if they are the same size, or the same point on a number line.

3.NF.3b
Recognize and generate simple equivalent fractions, e.g., 1/2 = 2/4, 4/6 = 2/3. Explain why the fractions are equivalent, e.g., by using a visual fraction model.

3.NF.3c – Express whole numbers as fractions, and recognize fractions that are equivalent to whole numbers.

3.NF.3d
Compare two fractions with the same numerator or the same denominator by reasoning about their size. Recognize that comparisons are valid only when the two fractions refer to the same whole. Record the results of comparisons with the symbols >, =, or <, and justify the conclusions, e.g., by using a visual fraction model.

Essential Questions/Student Targets	I Can Statements
How can a fraction be used to represent parts of a whole?	**3.NF.1** I CAN show and explain that a fraction is part of a whole.
How can a number line be used to represent a fraction?	I CAN explain that a fraction is the same as a division problem.
How can equivalent fractions be expressed?	**3.NF.2** I CAN identify and label fractions on a number line because I know the space between any two numbers can be thought of as a whole.
How can equivalent fractions be used to compare the same whole number?	
What is a fraction?	
How can fractions be represented visually and symbolically?	**3.NF.3** I CAN explain in words or pictures how two fractions can sometimes be equal.
How can understanding unit fractions help us make sense of, build, and use other fractions.	I CAN compare fractions by reasoning their size using objects and drawings.
How can we use the size of the unit to reason about fractions?	I CAN explain that a whole unit divided into equal parts creates unit fractions, and the sum of all fractions equals one (4/4 = 1.)
How can understanding equivalent fractions help us solve problems?	**3.G.2** I CAN divide shapes into equal parts.
Are there fractions equal to and/or greater than one? If yes, why? If no, why not?	
	Mathematical Practices emphasized in unit

	MP3. Construct viable arguments and critique the reasoning of others. MP7. Look for and make use of structure MP8. Look for and express regularity in repeated reasoning.
Academic Vocabulary Comparing numbers Denominator Equal Intervals/Distance Equal Parts Equivalent Parts Fraction Number Line Numerator Ordering Numbers Unit Fraction Whole Whole Number	**Student Vocabulary** Comparing numbers Denominator Equal Intervals/Distance Equal Parts Equivalent Parts Fraction Number Line Numerator Ordering Numbers Unit Fraction Whole Whole Number

Key Ideas/Learning Objectives

- Work to make sense of fractions as numbers that have characteristics both like *and* unlike whole numbers.
- Develop an understanding of fractions as numbers
- Making sense that a fraction is part of a given whole
- Beginning with unit fractions as one part of a given whole
- Build fractions by repeating the unit fraction
- Representing equivalent and non-equivalent fractions with continuous visual models (like number lines)
- Comparing and ordering fractions with equivalent numerators and denominators
- Representing and recognizing fractions as greater than, less than, or equal to one

Formative Assessment	**Summative Assessment**
Geoboard – showing equal parts White board – show models of fractions Journal writing – for e.g. - When do we use fractions in real life? Would you rather have 2/5 of a pizza or 4/12 of a pizza and why? Why is it so important to compare fractions as representations of equal parts of a whole or of a set? Why is it so important to understand and be able to use equivalent fractions in real life? Observations-using learned strategies revealing understanding number lines on white boards Explain the answer using combinations of words/numbers/diagrams/symbols Exit Tickets-After students debrief, instruct students to review their	Pre/Post Unit 5 Test Intermittent Quizzes

work – assess students' understanding of the concept presented. Think, Pair, and Share Post-it notes – on numbered poster board Quick Fist to 5 Fraction games – EDM Fraction Top-it, Fraction Barrier Game, Congruent Eighths Make Fraction posters	
Lesson Sequence 5.1 Pre-Assessment of Unit 5 5.2 Naming parts with fractions – 2 days 5.3 Where do fractions live? 5.4 Number Line Posters for Fractions – 2 days 5.5 Equivalent fractions – 2 days 5.6 Equivalent fractions - including area of two or more equivalent fractions 5.7 Ordering fractions – using different numerators and denominators – 2 days 5.8 Unit Fractions and comparing them 5.9 Fraction stations – 2/3 days 5.10 Review with practice guide **5.11 Unit 1 Test** **Resources – Websites** Learn Zillion websites	**Resources** **Literature Connections** Adler, David. *Fraction Fun*. Holiday House. ISBN 10:0823413411. 1997. Murphy,Stuart J.. *Jump, Kangaroo, Jump!* HarperCollins Publishers. ISBN 006446721X. 1999. Speed, Trisha and Shaskan, Carabelli, *If You Were A Fraction* ISBN-13: 9781404847903 McMillan, *Eating Fractions*. Uses food to introduce fractions. ISBN- Pallotta, Jerry. *Apple Fractions*. Pallotta, Jerry *The Hershey's Milk Chocolate Bar Fraction Book* Journal The Reading Teacher Picture Book Power: Connecting Children's Literature and Mathematics **Resources – Websites** http://www.visualfractions.com/compare.ht

1. Solve fraction word problems: using key words and pictures
2. Write fractions of a set (2)
3. Write fractions: using shapes (1)
4. Count fractions to make 1 whole
5. Understand fractions: create mini-stories
6. Understand why the larger the denominator, the smaller the fractional parts using models and real world examples
7. Understand fractions as fair shares
8. Write fractions of a set (1)
9. Represent fractions in different ways
10. Write fractions with a numerator other than one
11. Write fractions with numerator and denominator
12. Recognize fractions: breaking shapes into equal parts

NCTM Illuminations websites

1. Another Look at Fractions of a Set
2. Another Look at the Set Model Using Attribute Pieces
3. Calculation Nation
4. Class Attributes
5. Communicating about Mathematics Using Games
6. Communicating about Mathematics Using Games: Playing Fraction Tracks
7. Describing Designs
8. Eggsactly Equivalent
9. Eggsactly with Eighteen Eggs
10. Eggsactly with a Dozen Eggs
11. Equivalent Fractions

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This website gives practice in comparing fractions.

http://www.mathgoodies.com/lessons/fractions/order.html

Ordering fractions with like denominators.

http://webmath.com/k8cf.html

Students type in two fractions and a pictorial representation of the two fractions helps to show visually which is larger.

http://www.mathplayground.com/fractions_compare.html

Students use <, >, or = to compare fractions.

http://www.aaamath.com/B/fra16_x2.htm#section2

Students have to click on the correct fraction to identify the shaded fraction.

http://www.oswego.org/ocsd-web/games/fractionflags/ffthirds.html

This website gives students practice identifying fractions of halves, thirds, and fourths.

http://www.learn-with-math-games.com/fractions-for-kids.html

This site has the directions to a game that the class can play related to fractions.

http://www.sheppardsoftware.com/mathgames/fractions/Balloons_fractions1.htm

Ordering fractions from least to greatest.

12. Expanding Our Pattern Block Fraction Repertoire
13. Exploring the Value of the Whole
14. Fraction Game
15. Fraction Models
16. Fun with Fractions
17. Fun with Fractions
18. Fun with Fractions
19. Inch by Inch
20. Investigating Equivalent Fractions with Relationship Rods
21. Investigating Fraction Relationships with Relationship Rods
22. Investigating with Pattern Blocks
23. Making and Investigating Fraction Strips
24. More Fun with Fraction Strips
25. Numbers and Language
26. Parts of a Square
27. Pattern Block Fractions
28. Playing Fraction Track
29. Post-Office Numbers
30. Sports Numbers
31. Virtual Pattern Blocks

Online Practice from IXL:

1. Fractions: Fraction word problems

Unit Summary

In this unit, TLW solve problems involving measurement and estimation of intervals of time, liquid volumes, and masses of objects.

Duration

3 weeks, including 1 week of review

Unit Title	**Subject Area**
Unit 6: Time, Length, Liquid Volume, Measurement, and Mass	3rd Grade Math

Common Core State Standards

3.MD.1: Tell and write time to the nearest minute and measure time intervals in minutes. Solve word problems involving addition and subtraction of time intervals in minutes.

3.MD.2: Measure and estimate liquid volumes and masses of objects using standard units of grams (g), kilograms (kg), and liters (l).1 Add, subtract, multiply, or divide to solve one-step word problems involving masses or volumes that are given in the same units.

3MD.4: Generate measurement data by measuring lengths using rulers marked with halves and fourths of an inch. Show the data by making a line plot, where the horizontal scale is marked off in appropriate units-- whole numbers, halves, or quarters.

Essential Questions/Student Targets	I Can Statements
What do the hands represent on a clock? How many hours on a clock face? How many minutes? *Why is it important to have a way to measure time?*	**3.MD.1** I can read, write, and tell time to the nearest minute on analog and digital clocks. I can distinguish between clockwise and counterclockwise, and explain that the numbers on the face of a clock increase in a clockwise direction. I can understand time as a continuous unit of measurement. I can solve word problems using addition and subtraction of time in minutes. I can understand the amount of time that passes from the start of an activity to the end of that activity is called elapsed time. **3.MD.2** I can estimate and measure liquid volume using liters. I can solve one-step problems involving volume. I can estimate and measure masses of objects using grams and kilograms. I can solve one-step problems involving mass. I can use a ruler to measure lengths in whole, half, and quarter inches I can gather and record measurement data using whole, half, and quarter inches

Academic Vocabulary	Student Vocabulary
Beaker	Beaker
Diagram	Diagram
Divide	Divide
Grams	Grams
Intervals	Intervals
Kilograms	Kilograms
Liquid	Liquid
Liters	Liters
Mass	Mass
Measurement	Measurement
Scale	Scale
Multiply	Multiply
Standard Units	Standard Units
Volume	Volume

Key Ideas/Learning Objectives

- The measurement data students encounter includes time, weight, length, liquid volume, capacity, and temperature. Selecting appropriate measurement tools (e.g., type of scale to use, beaker, etc.) and learning to use these tools to measure with an appropriate level of precision are also features of this unit. In addition to collecting and using measurement data, students practice telling time to the nearest minute and finding elapsed time using number line models and other solution strategies. They also learn about benchmark temperatures (e.g., the freezing point and the boiling point of water on both the Fahrenheit and Celsius scales).

Formative Assessment	**Summative Assessment**
Exit Slips or Post-it notes..show what you know Observation Individual white boards Quick Quiz Think Pair and Share Math Journaling Showing liquid volumes using different size beakers, graduated cylinders, and other size containers Fist to 5	Pre/Post Unit 6 Test Intermittent Quizzes

Lesson Sequence
Lessons:
After Pre-Assessment
Day 1: Time to the Minute
Day 2: Elapsed time
Day 3: Elapsed time word problems
 	
Lessons From Everyday Math
1.2   Pattern Blocks
1.15 Shape Cards
2.1 Shape collages
2.2 Shapes by feel
2.3 Which Way do I GO
4.3 Pattern Block Template
4.13 Attribute Blocks
5.3 Find the Block Game
 	
Worksheets/Activities
  1. TV log activity
 	
  2. Time lapse story problems
 	
  3. Check the Clock worksheet
 	
  4. Anchor charts – Pinterest
 	
  5. Liquid Volume measurement
	Literature Connections
	
	Clement, Rod. *Counting on Frank*. Harper Collins. ISBN 13: 978-0395703939. 1991.
	
	Jenkins, Steve. *Big and Little*. Houghton Miflin. ISBN 0-395-72664-6. 1996.
	
	Jenkins, Steve. *Biggest, Strongest, Fastest*. Houghton Miflin. ISBN 0-395-86136-5. 1996.

activity

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Resources – Websites

http://illuminations.nctm.org/LessonDetail.aspx?ID=L651

http://users.netrover.com/~kingskids/season/seasonmain.htm

The Season Transporter will take you into full interactive screen movies with animation and sound but you must first enter a season and a proper temperature for that season.

http://www.time-for-time.com/swf/myclox.swf

Shows different times on an analog and digital clock and allows students to change the time in various increments.

http://www.acs.ac/staffdev/curricu/lp_3_mv_mwnsuic.htm

This is a whole class activity that deals with measuring with non-standard units in cylinders and rectangular prisms.

http://www.teachervision.fen.com/measuring-space/video/57054.html?detoured=1

Video showing students ordering containers from least to greatest.

http://www.k-5mathteachingresources.com/support-files/capacitylineup.pdf

Students sort various containers into three groups to determine their volume.

http://www.aaamath.com/g316_ax1.htm #section2

Students convert hours into minutes.

http://illuminations.nctm.org/LessonDetail. aspx?id=L863

http://www.oswego.org/ocsd-web/games/StopTheClock/sthec3.html

Students need to match the digital time with the correct analog clock. Times shown are to the nearest five minutes.