BLOOMFIELD PUBLIC SCHOOLS
Bloomfield, New Jersey 07003

Curriculum Guide

Mathematics
Grade 5

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Conforms to the New Jersey Student Learning Standards

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Title of Unit	Operations & Algebraic Thinking	Grade Level	5
Curriculum Area	Mathematics	Time Frame	9-12 days

Desired Results (Stage 1)

Established Goals/Standards

5.OA.A.1 Use parentheses, brackets, or braces in numerical expressions, and evaluate expressions with these symbols.

5.OA.A.2 Write simple expressions that record calculations with numbers, and interpret numerical expressions without evaluating them. *For example, express the calculation "add 8 and 7, then multiply by 2" as 2 × (8 + 7). Recognize that 3 × (18932 + 921) is three times as large as 18932 + 921, without having to calculate the indicated sum or product.*

Primary Interdisciplinary Connections

LAL: Connect math and literacy through reading books
SCIENCE: Use beans and a pan-balance to balance variables
ART: Use colors to represent variables of different parts of your face to create a facial-feature self-portrait
MUSIC: Write functions to figure out how much an entire inventory of CDs would be worth
SOCIAL STUDIES: Determine how you would form a school government to fairly represent the student population

21st Century Interdisciplinary Themes:

_X Global Awareness **_X Financial, economic, business, and entrepreneurial literacy**
___Civic Literacy **___Health Literacy**

Transfer

Students will be able to independently use their learning to write and interpret numerical expressions.

Meaning

Understandings Students will understand that...	Essential Questions Students will keep considering...
U1 - the order of operations affects the value of the answer.	**Q1 -** Why is there an order to follow to compute answers?
Knowledge Students will know...	**Skills** Students will be able to...
K1 - the order of operations is as follows: • parentheses • exponents • multiplication and division, left to right • addition and subtraction, left to right.	**S1 -** use the order of operations to find answers to expressions. **S2 -** write simple expressions that record calculations with numbers. **S3 -** interpret numerical expressions without evaluating them.

Evidence (Stage 2)

Checks for Alignment	***Evaluation Criteria*** **Performance is judged in terms of…**	***Assessment Evidence***
U1 **Q1** **K1**	Formative • question-answer in class • homework • portfolio Summative • periodic assessment tasks/checklists	**Transfer Task(s)** • Write numerical expressions • Interpret numerical expressions **S1 – S3**

Learning Plan (Stage 3)

Checks for alignment and best practice

Summary of Key Learning Events and Instruction

The teaching and learning needed to achieve the unit goals.

	Required Activities	Required Resources
	• Ten-Minute Math (TMM) • Activity • Discussion • Math Workshop • Assessment • Session Follow-Up • Games	• Investiations3 **Unit 1:** 1.1, 1.2, 1.4, 1.5, TMM 2.1, TMM 2.2, TMM 2.3, 2.3, TMM 2.4, 2.4, 2.5, 2.7, 3.2, TMM 3.4, 3.4, TMM 3.5, TMM 3.6, 3.6, TMM 3.7, 3.7 **Unit 3:** TMM 2.3, TMM 2.4, TMM 2.5, 3.3 **Unit 5:** TMM 1.5, TMM 1.6, TMM 1.7, TMM 2.4, TMM 2.5, 2.5, TMM 2.6, TMM 2.7 **Unit 8:** TMM Investigation 2 • Grade 5 Mathematics Curriculum Binder
	Suggested Activities	Suggested Resources
	• Illuminations lessons	• http://illuminations.nctm.org • http://nlvm.usu.edu

Title of Unit	Operations & Algebraic Thinking	Grade Level	5
Curriculum Area	Mathematics	Time Frame	1-3 days

Desired Results (Stage 1)

Established Goals/Standards

5.OA.B.3 Generate two numerical patterns using two given rules. Identify apparent relationships between corresponding terms. Form ordered pairs consisting of corresponding terms from the two patterns, and graph the ordered pairs on a coordinate plane. *For example, given the rule "Add 3" and the starting number 0, and given the rule "Add 6" and the starting number 0, generate terms in the resulting sequences, and observe that the terms in one sequence are twice the corresponding terms in the other sequence. Explain informally why this is so.*

Primary Interdisciplinary Connections

LAL: Connect math and literacy through reading books
SCIENCE: Use a box of sand to explore coordinates and ordered pairs
ART: Color Block Game
WRITING: Write a detective story where all the clues can be found using coordinates on a map
HEALTH: Multiplication Race
SOCIAL STUDIES: Turn your classroom into a coordinate plane

21st Century Interdisciplinary Themes:

_X Global Awareness **_X Financial, economic, business, and entrepreneurial literacy**
___Civic Literacy **_X_ Health Literacy**

Transfer

Students will be able to independently use their learning to analyze patterns and relationships.

Meaning

Understandings Students will understand that...	Essential Questions Students will keep considering...
U1 - patterns can be put together to generate new patterns.	**Q1 -** How are the coordinate points related to patterns?
Knowledge Students will know...	**Skills** Students will be able to...
K1 - that to determine if there is a pattern present in a set of numbers, one can look for constant change between the variables.	**S1 -** generate patterns from other patterns. **S2 -** graph ordered pairs generated by the pattern on a coordinate plane.

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Title of Unit	Number and Operations in Base Ten	Grade Level	5
Curriculum Area	Mathematics	Time Frame	11-13 days

Desired Results (Stage 1)

Established Goals/Standards

5.NBT.A.1 Recognize that in a multi-digit number, a digit in one place represents 10 times as much as it represents in the place to its right and 1/10 of what it represents in the place to its left.

5.NBT.A.2 Explain patterns in the number of zeros of the product when multiplying a number by powers of 10, and explain patterns in the placement of the decimal point when a decimal is multiplied or divided by a power of 10. Use whole-number exponents to denote powers of 10.

5.NBT.A.3 Read, write, and compare decimals to thousandths.

a. Read and write decimals to thousandths using base-ten numerals, number names, and expanded form, e.g., 347.392 = 3 × 100 + 4 × 10 + 7 × 1 + 3 × (1/10) + 9 × (1/100) + 2 × (1/1000).
b. Compare two decimals to thousandths based on meanings of the digits in each place, using >, =, and < symbols to record the results of comparisons.

5.NBT.A.4 Use place value understanding to round decimals to any place.

Primary Interdisciplinary Connections

LAL: Connect math and literacy through reading books
SCIENCE: Make a group presentation of animals, ordered by population
ART: Create a beaded necklace that represents a number
HEALTH: Go for a run with a number cube and record who has the fastest time
MUSIC: Count how many beats your favorite song has
SOCIAL STUDIES: Compare prices of at least 5 items from today's real price to the past/future price

21st Century Interdisciplinary Themes:

_X_ Global Awareness **_X_ Financial, economic, business, and entrepreneurial literacy**
___ Civic Literacy **_X_ Health Literacy**

Transfer

Students will be able to independently use their learning to understand the place value system.

Meaning

Understandings Students will understand that…	Essential Questions Students will keep considering…
U1 - each place in the place-value system has a limit to the value which can be placed there. **U2 -** the same relationship exists between any two adjacent places in the place-value system. **U3 -** placement of a number into a place in the place-value system has a significant effect on its value.	**Q1 -** How does the location of a number in a place-value system affect the value of the number? **Q2 -** How is place value used to round numbers? **Q3 -** What is the significance of the decimal point?

Knowledge Students will know...	**Skills** Students will be able to...
K1 - when the value in a place exceeds the limit, it must change places. **K2 -** in a multi-digit number, a digit in one place represents 10 times as much as it represents in the place to its right and 1/10 of what it represents in the place to its left. **K3 -** place-value understanding is needed to round decimals to any place. **K4 -** the place to examine in order to round numbers, including decimals.	**S1 -** read and write decimals to thousandths using base-ten numerals, number names, and expanded form. **S2 -** compare two decimals to thousandths. **S3 -** use >, =, and < symbols to record the results of comparisons.

Evidence (Stage 2)

Checks for Alignment	***Evaluation Criteria*** **Performance is judged in terms of...**	***Assessment Evidence***
U1 – U3 **Q1 – Q3** **K1 – K4**	Formative • question-answer in class • homework • portfolio Summative • periodic assessment tasks/checklists	**Transfer Task(s)** • Understand the place value system **S1 – S3**

Learning Plan (Stage 3)

Checks for alignment and best practice

Summary of Key Learning Events and Instruction

The teaching and learning needed to achieve the unit goals.

	Required Activities	Required Resources
	• Ten-Minute Math (TMM) • Activity • Discussion • Math Workshop • Assessment • Session Follow-Up • Games	• Investigations3 **Unit 1:** 2.3, 2.4, 2.5, 3.6, 3.7 **Unit 4:** 1.4, TMM 1.5, TMM 2.1, TMM 2.2, TMM 2.6, TMM 2.7, TMM 3.1, TMM 3.4, TMM 3.5 **Unit 6:** 1.1, 1.2, 1.3, 1.4, 1.5, 1.6, TMM 1.7, 1.7, TMM 1.8, 1.8, TMM Investigation 2, 2.3, 2.5, 2.6, 2.7, 2.8, 2.9, **Unit 7:** TMM 1.1, TMM 1.2, TMM 1.3, TMM 1.4, TMM 2.1, TMM 2.2, 2.2, TMM 2.3, 2.3, TMM 2.4, 2.4, TMM 3.1, 3.1, TMM 3.2, 3.2, TMM 3.3, 3.3, TMM 3.4, 3.4, 3.5, 3.6, TMM 3.7, 3.7, TMM 3.8, TMM 3.9, TMM 3.10, TMM 3.11 • Grade 5 Mathematics Curriculum Binder
	Suggested Activities	**Suggested Resources**
	• Illuminations lessons	• http://illuminations.nctm.org • http://nlvm.usu.edu

Title of Unit	Number and Operations in Base Ten	Grade Level	5
Curriculum Area	Mathematics	Time Frame	30-32 days

Desired Results (Stage 1)

Established Goals/Standards

5.NBT.B.5 Fluently multiply multi-digit whole numbers using the standard algorithm.

5.NBT.B.6 Find whole-number quotients of whole numbers with up to four-digit dividends and two-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 models.

5.NBT.B.7 Add, subtract, multiply, and divide decimals to hundredths, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used.

Primary Interdisciplinary Connections

LAL: Connect math and literacy through reading books
SCIENCE: Choose a type of apple and weight it in grams, using the balance scale and gram weights; using multiplication, figure out how much weight your apple cart would have to hold if you put enough of your apples in it to feed the entire class
ART: Four-Square Art
HEALTH: Form groups of three and count your calories
MUSIC: Count up the CDs and find out how much they are worth
SOCIAL STUDIES: What if you had $100,000 to spend on computer equipment for your school?

21st Century Interdisciplinary Themes:

_X_ Global Awareness **_X_ Financial, economic, business, and entrepreneurial literacy**
___ Civic Literacy **_X_ Health Literacy**

Transfer

Students will be able to independently use their learning to perform operations with multi-digit whole numbers and with decimals to hundredths.

Meaning

Understandings Students will understand that…	Essential Questions Students will keep considering…
U1 - rectangles have an area that represents the product of the two dimensions.	**Q1 -** How are products and quotients related?

Knowledge Students will know…	**Skills** Students will be able to…
K1 - multi-digit computation is just an extension of single-digit computations.	**S1 -** fluently multiply multi-digit whole numbers using the standard algorithm. **S2 -** find whole-number quotients of whole numbers with up to four-digit dividends and two-digit divisors. **S3** - illustrate and explain calculations by using equations, rectangular arrays, and/or area models. **S4 -** add, subtract, multiply, and divide decimals to hundredths.

Evidence (Stage 2)

Checks for Alignment	***Evaluation Criteria*** **Performance is judged in terms of…**	***Assessment Evidence***
U1 **Q1** **K1**	Formative • question-answer in class • homework • portfolio Summative • periodic assessment tasks/checklists	**Transfer Task(s)** • Perform operations with multi-digit whole numbers • Perform operations with decimals to hundredths **S1 – S4**

Learning Plan (Stage 3)

Checks for alignment and best practice

Summary of Key Learning Events and Instruction

The teaching and learning needed to achieve the unit goals.

	Required Activities	Required Resources
	• Ten-Minute Math (TMM) • Activity • Discussion • Math Workshop • Assessment • Session Follow-Up • Games	• Investigations3 **Unit 1:** TMM 2.5, TMM 2.6, TMM 2.7, 3.1, 3.2, TMM 3.3, 3.4, 3.5, 3.6, 3.7 **Unit 2:** TMM 1.5, TMM 1.6, TMM 2.1, TMM 2.2, TMM 2.3, TMM 2.4 **Unit 3:** TMM 2.1, TMM 2.2, TMM 2.3, TMM 2.4, TMM 2.5 **Unit 4:** Investigation 1, Investigation 2, Investigation 3 **Unit 5:** TMM 2.1, TMM 2.2, TMM 2.3 **Unit 6:** 1.3, TMM 1.4, 1.4, TMM 1.5, TMM 1.6, Investigation 2 **Unit 7:** TMM 1.1, TMM 1.2, TMM 1.3, TMM 1.4, TMM 2.1, TMM 2.2, TMM 2.3, TMM 2.4, Investigation 3 **Unit 8:** 2.2, 2.3, 2.4, 2.5 • Bits and Pieces I Investigation 3 • Bits and Pieces III Investigations 1, 2, 3 • Grade 5 Mathematics Curriculum Binder
	Suggested Activities	Suggested Resources
	• Illuminations lessons	• http://illuminations.nctm.org • http://nlvm.usu.edu

Title of Unit	Number and Operations - Fractions	Grade Level	5
Curriculum Area	Mathematics	Time Frame	11-14 days

Desired Results (Stage 1)

Established Goals/Standards

5.NF.A.1 Add and subtract fractions with unlike denominators (including mixed numbers) by replacing given fractions with equivalent fractions in such a way as to produce an equivalent sum or difference of fractions with like denominators. *For example, 2/3 + 5/4 = 8/12 + 15/12 = 23/12. (In general, a/b + c/d = (ad + bc)/bd.)*

5.NF.A.2 Solve word problems involving addition and subtraction of fractions referring to the same whole, including cases of unlike denominators, e.g., by using visual fraction models or equations to represent the problem. Use benchmark fractions and number sense of fractions to estimate mentally and assess the reasonableness of answers. *For example, recognize an incorrect result 2/5 + 1/2 = 3/7, by observing that 3/7 < 1/2.*

Primary Interdisciplinary Connections

LAL: Connect math and literacy through reading books
SCIENCE: Measure a variety of leaves to the nearest ½ inch, and then order them from least to greatest
ART: Make fraction necklaces
HEALTH: Toss a coin into two baskets containing mixed numbers and improper fractions and play "Numbers Match-Up"
SOCIAL STUDIES: Take a census of the students' exact (year and month) ages in your class and sort them on a number line

21st Century Interdisciplinary Themes:

_X Global Awareness **_X Financial, economic, business, and entrepreneurial literacy**
___Civic Literacy **_X__Health Literacy**

Transfer

Students will be able to independently use their learning to use equivalent fractions as a strategy to add and subtract fractions.

Meaning

Understandings Students will understand that…	Essential Questions Students will keep considering…
U1 - fractions must have common denominators in order to be added or subtracted.	**Q1 -** When would one use addition or subtraction of fractions?
Knowledge Students will know…	**Skills** Students will be able to…
K1 - that a common denominator is a common multiple of the two denominators (usually the least common one). **K2 -** that when adding fractions, the common denominators do not get added together, only the numerators do.	**S1 -** Add and subtract fractions with unlike denominators (including mixed numbers). **S2 -** solve word problems involving addition and subtraction of fractions referring to the same whole, including cases of unlike denominators. **S3 -** use benchmark fractions and number sense of fractions to estimate mentally and assess the reasonableness of answers.

Evidence (Stage 2)

Checks for Alignment	***Evaluation Criteria*** **Performance is judged in terms of…**	***Assessment Evidence***
U1 **Q1** **K1 – K2**	Formative • question-answer in class • homework • portfolio Summative • periodic assessment tasks/checklists	**Transfer Task(s)** • Use equivalent fractions as a strategy to add fractions • Use equivalent fractions as a strategy to subtract fractions **S1 – S3**

Learning Plan (Stage 3)

Checks for alignment and best practice

Summary of Key Learning Events and Instruction

The teaching and learning needed to achieve the unit goals.

	Required Activities	Required Resources
	• Ten-Minute Math (TMM) • Activity • Discussion • Math Workshop • Assessment • Session Follow-Up • Games	• Investigations3 **Unit 3:** 2.1, 2.2, 2.3, 2.5, 2.6, 2.7, Investigation 3 **Unit 4:** TMM 1.1, TMM 1.2, TMM 1.3, TMM 1.4 **Unit 5:** TMM 1.1, TMM 1.2, TMM 1.3, TMM 1.4 **Unit 6:** TMM 1.1, TMM 1.2, TMM 1.3 **Unit 8:** 2.3, 2.4, 2.5 • Bits and Pieces II Investigations 1, 2 • Grade 5 Mathematics Curriculum Binder
	Suggested Activities	Suggested Resources
	• Illuminations lessons	• http://illuminations.nctm.org • http://nlvm.usu.edu

Title of Unit	Number and Operations – Fractions	Grade Level	5
Curriculum Area	Mathematics	Time Frame	19-20 days

Desired Results (Stage 1)

Established Goals/Standards

5.NF.B.3 Interpret a fraction as division of the numerator by the denominator ($a/b = a \div b$). Solve word problems involving division of whole numbers leading to answers in the form of fractions or mixed numbers, e.g., by using visual fraction models or equations to represent the problem. *For example, interpret 3/4 as the result of dividing 3 by 4, noting that 3/4 multiplied by 4 equals 3, and that when 3 wholes are shared equally among 4 people each person has a share of size 3/4. If 9 people want to share a 50-pound sack of rice equally by weight, how many pounds of rice should each person get? Between what two whole numbers does your answer lie?*

5.NF.B.4 Apply and extend previous understandings of multiplication to multiply a fraction or whole number by a fraction.

a. Interpret the product (a/b) × q as a parts of a partition of q into b equal parts; equivalently, as the result of a sequence of operations $a \times q \div b$. *For example, use a visual fraction model to show (2/3) × 4 = 8/3, and create a story context for this equation. Do the same with (2/3) × (4/5) = 8/15. (In general, (a/b) × (c/d) = ac/bd.)*

b. Find the area of a rectangle with fractional side lengths by tiling it with unit squares of the appropriate unit fraction side lengths, and show that the area is the same as would be found by multiplying the side lengths. Multiply fractional side lengths to find areas of rectangles, and represent fraction products as rectangular areas.

5.NF.B.5 Interpret multiplication as scaling (resizing), by:

a. Comparing the size of a product to the size of one factor on the basis of the size of the other factor, without performing the indicated multiplication.

b. Explaining why multiplying a given number by a fraction greater than 1 results in a product greater than the given number (recognizing multiplication by whole numbers greater than 1 as a familiar case); explaining why multiplying a given number by a fraction less than 1 results in a product smaller than the given number; and relating the principle of fraction equivalence $a/b = (n \times a)/(n \times b)$ to the effect of multiplying a/b by 1.

5.NF.B.6 Solve real world problems involving multiplication of fractions and mixed numbers, e.g., by using visual fraction models or equations to represent the problem.

5.NF.B.7 Apply and extend previous understandings of division to divide unit fractions by whole numbers and whole numbers by unit fractions.[1]

a. Interpret division of a unit fraction by a non-zero whole number, and compute such quotients. *For example, create a story context for (1/3) ÷ 4, and use a visual fraction model to show the quotient. Use the relationship between multiplication and division to explain that (1/3) ÷ 4 = 1/12 because (1/12) × 4 = 1/3.*

b. Interpret division of a whole number by a unit fraction, and compute such quotients. *For example, create a story context for 4 ÷ (1/5), and use a visual fraction model to show the quotient. Use the relationship between multiplication and division to explain that 4 ÷ (1/5) = 20 because 20 × (1/5) = 4.*

c. Solve real world problems involving division of unit fractions by non-zero whole numbers and division of whole numbers by unit fractions, e.g., by using visual fraction models and equations to represent the problem. *For example, how much chocolate will each person get if 3 people share 1/2 lb of chocolate equally? How many 1/3-cup servings are in 2 cups of raisins?*

_____

[1] Students able to multiply fractions in general can develop strategies to divide fractions in general, by reasoning about the relationship between multiplication and division. But division of a fraction by a fraction is not a requirement at this grade.

Primary Interdisciplinary Connections

LAL: Connect math and literacy through reading books
SCIENCE: If you and your partner were directors of medical aid programs, how would you figure out how many flu vaccines you could buy?
ART: Make a puzzle by drawing a picture on a hundredths grid
HEALTH: Roll a number cube to find the total distance you will walk during a week-long walking plan, and then divide to see how far you need to walk each day
SOCIAL STUDIES: Departmental Division-you and your partner are each in charge of a department in the same organization

21st Century Interdisciplinary Themes:

_X Global Awareness **_X Financial, economic, business, and entrepreneurial literacy**
___Civic Literacy **_X_ Health Literacy**

Transfer

Students will be able to independently use their learning to apply and extend previous understandings of multiplication and division to multiply and divide fractions.

Meaning

Understandings Students will understand that…	**Essential Questions** Students will keep considering…
U1 - a fraction is division of the numerator by the denominator ($a/b = a \div b$). **U2 -** when multiplying by a fraction less than one, the product will be smaller than the first factor. **U3 -** when multiplying by a fraction greater than one, the product will be larger than the first factor.	**Q1 -** What does it mean to divide by a fraction? **Q2 -** Why would one need to divide by a fraction?
Knowledge Students will know…	**Skills** Students will be able to…
K1 - the relative size of the answer based on the sizes of the factors.	**S1 -** solve word problems involving division of whole numbers. **S2 -** multiply a fraction or whole number by a fraction. **S3 -** find the area of a rectangle with fractional side lengths by tiling it with unit squares of the appropriate unit fraction side lengths. **S4 -** show that the area from tiles is the same as would be found by multiplying the side lengths. **S5 -** multiply fractional side lengths to find areas of rectangles, and represent fraction products as rectangular areas. **S6 -** solve real world problems involving multiplication of fractions and mixed numbers. **S7 -** divide unit fractions by whole numbers and whole numbers by unit fractions. **S8 -** interpret division of a unit fraction by a non-zero whole number. **S9 -** interpret division of a whole number by a unit fraction. **S10 -** solve real world problems involving division of unit fractions by non-zero whole numbers and division of whole numbers by unit fractions.

Evidence (Stage 2)

Checks for Alignment	***Evaluation Criteria*** **Performance is judged in terms of…**	***Assessment Evidence***
U1 – U3 **Q1 – Q2** **K1**	Formative • question-answer in class • homework • portfolio Summative • periodic assessment tasks/checklists	**Transfer Task(s)** • Apply previous understandings of multiplication to multiply fractions • Apply previous understandings of division to divide with fractions • Extend previous understandings of multiplication to multiply fractions • Extend previous understandings of division to divide fractions **S1 – S10**

Learning Plan (Stage 3)

Checks for alignment and best practice

Summary of Key Learning Events and Instruction

The teaching and learning needed to achieve the unit goals.

	Required Activities	Required Resources
	• Ten-Minute Math (TMM) • Activity • Discussion • Math Workshop • Assessment • Session Follow-Up • Games	• Investigations3 **Unit 7:** 1.1, 1.2, 1.3, 1.4, 1.5, TMM 1.6, 1.6, TMM 1.7, 1.7, TMM 1.8, 1.8, TMM 1.9, 1.9, TMM 1.10, 1.10, TMM 1.11, 1.11, Investigation 2, 3.9, 3.10, 3.11 **Unit 8:** 2.3, 2.4, 2.5 • Bits and Pieces II Investigations 3, 4 • Grade 5 Mathematics Curriculum Binder
	Suggested Activities	Suggested Resources
	• Illuminations lessons	• http://illuminations.nctm.org • http://nlvm.usu.edu

Title of Unit	Measurement & Data	Grade Level	5
Curriculum Area	Mathematics	Time Frame	6-9 days

Desired Results (Stage 1)

Established Goals/Standards

5.MD.A.1 Convert among different-sized standard measurement units within a given measurement system (e.g., convert 5 cm to 0.05 m), and use these conversions in solving multi-step, real world problems.

Primary Interdisciplinary Connections

LAL: Connect math and literacy through reading books
SCIENCE: See if the capacity label on different containers is correct
ART: Measuring Mosaics
HEALTH: Customary Limbo
MUSIC: How Long Is That Song?
SOCIAL STUDIES: Hop Across Town using graph paper

21st Century Interdisciplinary Themes:

_X Global Awareness **_X Financial, economic, business, and entrepreneurial literacy**
___Civic Literacy **_X__Health Literacy**

Transfer

Students will be able to independently use their learning to convert like measurement units within a given measurement system.

Meaning

Understandings Students will understand that…	Essential Questions Students will keep considering…
U1 - measurement units vary in the customary system differently than in the metric system. **U2 -** understanding place value helps one to understand the metric system.	**Q1 -** Why would one need to convert measurements from one unit to another? **Q2 -** How does one know whether the new answer should be a bigger or smaller number of units?
Knowledge Students will know…	**Skills** Students will be able to…
K1 - every step in the metric system involves a power of 10, e.g. 10 cm = 1 decimeter, 10 mm = 1 cm, etc.) **K2 -** customary equivalents.	**S1 -** convert among different-sized standard measurement units within a given measurement system. **S2 -** solve real-world problems involving conversions.

Evidence (Stage 2)

Checks for Alignment	***Evaluation Criteria*** **Performance is judged in terms of…**	***Assessment Evidence***
U1 – U2 **Q1 – Q2** **K1 – K2**	Formative • question-answer in class • homework • portfolio Summative • periodic assessment tasks/checklists	**Transfer Task(s)** • Convert like measurement units within a given measurement system **S1 – S2**

Learning Plan (Stage 3)

Checks for alignment and best practice

Summary of Key Learning Events and Instruction

The teaching and learning needed to achieve the unit goals.

	Required Activities	Required Resources
	• Ten-Minute Math (TMM) • Activity • Discussion • Math Workshop • Assessment • Session Follow-Up • Games	• Investigations3 **Unit 7:** 3.8, 3.9, 3.10, 3.11 • Grade 5 Mathematics Curriculum Binder
	Suggested Activities	Suggested Resources
	• Illuminations lessons	• http://illuminations.nctm.org • http://nlvm.usu.edu

Title of Unit	Measurement & Data	Grade Level	5
Curriculum Area	Mathematics	Time Frame	1-3 days

Desired Results (Stage 1)

Established Goals/Standards

5.MD.B.2 Make a line plot to display a data set of measurements in fractions of a unit (1/2, 1/4, 1/8). Use operations on fractions for this grade to solve problems involving information presented in line plots. *For example, given different measurements of liquid in identical beakers, find the amount of liquid each beaker would contain if the total amount in all the beakers were redistributed equally.*

Primary Interdisciplinary Connections

LAL: Connect math and literacy through reading books
SCIENCE: Measure the height, in feet and inches, of each person in your group. Post this data on a line plot so that you can compare heights. Find the landmarks
ART: Research the collection of a museum, such as the National Gallery of Art. Use visual display to describe their collections
HEALTH: Think of an exercise you can do, such as running, sit-ups, basketball, push-ups, fast walking, or even stretching. Plan 30 days worth of exercise and display the plan visually in a table or graph
MUSIC: Take a poll to see what kind of music the teachers in your school like and use a tally chart to record the data. Create a graph of your data
SOCIAL STUDIES: Create a frequency table on how many siblings your classmates each have. Create a line plot of this data to display in the classroom

21st Century Interdisciplinary Themes:

_X_ Global Awareness **_X_ Financial, economic, business, and entrepreneurial literacy**
___ Civic Literacy **_X_ Health Literacy**

Transfer

Students will be able to independently use their learning to represent and interpret data.

Meaning

Understandings Students will understand that...	Essential Questions Students will keep considering...
U1 - data entries do not have to be only whole numbers. **U2 -** the scale on a line plot must be evenly spaced.	**Q1 -** What types of data can be graphed on a line plot with a fractional scale?
Knowledge Students will know...	**Skills** Students will be able to...
K1 - there will still be a whole number of pieces of data even though there is a fractional scale.	**S1 -** make a line plot to display a data set of measurements in fractions of a unit (1/2, 1/4, 1/8). **S2 -** use operations on fractions for this grade to solve problems involving information presented in line plots.

Evidence (Stage 2)

Checks for Alignment	***Evaluation Criteria*** **Performance is judged in terms of…**	***Assessment Evidence***
U1 – U2 **Q1** **K1**	Formative • question-answer in class • homework • portfolio Summative • periodic assessment tasks/checklists	**Transfer Task(s)** • Represent and interpret data **S1 – S2**

Learning Plan (Stage 3)

Checks for alignment and best practice

Summary of Key Learning Events and Instruction

The teaching and learning needed to achieve the unit goals.

	Required Activities	Required Resources
	• Ten-Minute Math (TMM) • Activity • Discussion • Math Workshop • Assessment • Session Follow-Up • Games	• Investigations3 **Unit 3:** 3.4, 3.5, 3.6 • Grade 5 Mathematics Curriculum Binder
	Suggested Activities	Suggested Resources
	• Illuminations lessons	• http://illuminations.nctm.org • http://nlvm.usu.edu

Title of Unit	Measurement & Data	Grade Level	5
Curriculum Area	Mathematics	Time Frame	3-6 days

Desired Results (Stage 1)

Established Goals/Standards

5.MD.C.3 Recognize volume as an attribute of solid figures and understand concepts of volume measurement.

a. A cube with side length 1 unit, called a "unit cube," is said to have "one cubic unit" of volume, and can be used to measure volume.
b. A solid figure which can be packed without gaps or overlaps using *n* unit cubes is said to have a volume of *n* cubic units.

5.MD.C.4 Measure volumes by counting unit cubes, using cubic cm, cubic in, cubic ft, and improvised units.

5.MD.C.5 Relate volume to the operations of multiplication and addition and solve real world and mathematical problems involving volume.

a. Find the volume of a right rectangular prism with whole-number side lengths by packing it with unit cubes, and show that the volume is the same as would be found by multiplying the edge lengths, equivalently by multiplying the height by the area of the base. Represent threefold whole-number products as volumes, e.g., to represent the associative property of multiplication.
b. Apply the formulas $V = l \times w \times h$ and $V = b \times h$ for rectangular prisms to find volumes of right rectangular prisms with whole-number edge lengths in the context of solving real world and mathematical problems.

Recognize volume as additive. Find volumes of solid figures composed of two non-overlapping right rectangular prisms by adding the volumes of the non-overlapping parts, applying this technique to solve real world problems

Primary Interdisciplinary Connections

LAL: Connect math and literacy through reading books
SCIENCE: Draw an amoeba on graph paper and imagine that each square on the graph paper represents a micrometer. Estimate the area of the amoeba
ART: Measure a Masterpiece and/or find the volume of a 3-D Masterpiece
WRITING: Make a perimeter of poetry around your classroom
HEALTH: Using an empty pint, quart, half gallon carton, use measuring cups to find which carton will hold 64 oz. of drinking water
SOCIAL STUDIES: How much farmland can you accumulate?

21st Century Interdisciplinary Themes:

_X Global Awareness **_X Financial, economic, business, and entrepreneurial literacy**
___Civic Literacy **_X_ Health Literacy**

Transfer

Students will be able to independently use their learning to geometric measurement: understand concepts of volume and relate volume to multiplication and to addition.

Meaning

Understandings Students will understand that…	Essential Questions Students will keep considering…
U1 - volume is an attribute of solid figures. **U2 -** the concept of volume measurement involves filling up space. **U3 -** volume is related to the operations of multiplication and addition. **U4 -** volume is additive.	**Q1 -** For what types of items can we measure volume?

Knowledge Students will know…	**Skills** Students will be able to…
K1 - a cube with side length 1 unit, called a "unit cube," is said to have "one cubic unit" of volume, and can be used to measure volume. **K2 -** a solid figure which can be packed without gaps or overlaps using *n* unit cubes is said to have a volume of *n* cubic units.	**S1 -** measure volumes by counting unit cubes, using cubic cm, cubic in, cubic ft, and improvised units. **S2 -** solve real world and mathematical problems involving volume. **S3 -** apply the formulas $V = l \times w \times h$ and $V = b \times h$ for rectangular prisms to find volumes of right rectangular prisms with whole-number edge lengths in the context of solving real world and mathematical problems. **S4 -** find volumes of solid figures composed of two non-overlapping right rectangular prisms by adding the volumes of the non-overlapping parts.

Evidence (Stage 2)

Checks for Alignment	***Evaluation Criteria*** **Performance is judged in terms of…**	***Assessment Evidence***
U1 – U4 **Q1** **K1 – K2**	Formative • question-answer in class • homework • portfolio Summative • periodic assessment tasks/checklists	**Transfer Task(s)** • Understand concepts of volume • Relate volume to multiplication • Relate volume to addition **S1 – S4**

Learning Plan (Stage 3)

Checks for alignment and best practice

Summary of Key Learning Events and Instruction

The teaching and learning needed to achieve the unit goals.

	Required Activities	Required Resources
	• Ten-Minute Math (TMM) • Activity • Discussion • Math Workshop • Assessment • Session Follow-Up • Games	• Investigations3 **Unit 2:** 1.1, 1.2, 1.3, 1.4, 1.5, 1.6, 1.7, 1.8, Investigation 2 • Grade 5 Mathematics Curriculum Binder
	Suggested Activities	Suggested Resources
	• Illuminations lessons	• http://illuminations.nctm.org • http://nlvm.usu.edu

Title of Unit	Geometry	Grade Level	5
Curriculum Area	Mathematics	Time Frame	2-5 days

Desired Results (Stage 1)

Established Goals/Standards

5.G.A.1 Use a pair of perpendicular number lines, called axes, to define a coordinate system, with the intersection of the lines (the origin) arranged to coincide with the 0 on each line and a given point in the plane located by using an ordered pair of numbers, called its coordinates. Understand that the first number indicates how far to travel from the origin in the direction of one axis, and the second number indicates how far to travel in the direction of the second axis, with the convention that the names of the two axes and the coordinates correspond (e.g., *x*-axis and *x*-coordinate, *y*-axis and *y*-coordinate).

5.G.A.2 Represent real world and mathematical problems by graphing points in the first quadrant of the coordinate plane, and interpret coordinate values of points in the context of the situation.

Primary Interdisciplinary Connections

LAL: Connect math and literacy through reading books

21st Century Interdisciplinary Themes:

_X Global Awareness **_X Financial, economic, business, and entrepreneurial literacy**
___Civic Literacy **___Health Literacy**

Transfer

Students will be able to independently use their learning to graph points on the coordinate plane to solve real-world and mathematical problems.

Meaning

Understandings Students will understand that...	Essential Questions Students will keep considering...
U1 - the first number in an ordered pair indicates how far to travel from the origin in the direction of one axis, and the second number indicates how far to travel in the direction of the second axis.	**Q1 -** Why would one graph on a coordinate plane?
Knowledge Students will know...	**Skills** Students will be able to...
K1 - a pair of perpendicular number lines, called axes, define a coordinate system, with the intersection of the lines (the origin) arranged to coincide with the 0 on each line. **K2 -** a given point in the plane is located by using an ordered pair of numbers, called its coordinates. **K3 -** the names of the two axes and the coordinates correspond (e.g., *x*-axis and *x*-coordinate, *y*-axis and *y*-coordinate).	**S1 -** graph points in the coordinate plane. **S2 -** represent real world and mathematical problems by graphing points in the first quadrant of the coordinate plane.

Evidence (Stage 2)

Checks for Alignment	***Evaluation Criteria*** **Performance is judged in terms of…**	***Assessment Evidence***
U1 **Q1** **K1 – K3**	Formative • question-answer in class • homework • portfolio Summative • periodic assessment tasks/checklists	**Transfer Task(s)** • Graph points on the coordinate plane to solve real-world mathematical problems **S1 – S2**

Learning Plan (Stage 3)

Checks for alignment and best practice

Summary of Key Learning Events and Instruction

The teaching and learning needed to achieve the unit goals.

	Required Activities	Required Resources
	• Ten-Minute Math (TMM) • Activity • Discussion • Math Workshop • Assessment • Session Follow-Up • Games	• Investigations3 **Unit 5:** Investigation 1, 2.3, 2.4, 2.5, 2.6, 2.7 • Grade 5 Mathematics Curriculum Binder
	Suggested Activities	Suggested Resources
	• Illuminations lessons	• http://illuminations.nctm.org • http://nlvm.usu.edu

Title of Unit	Geometry	Grade Level	5
Curriculum Area	Mathematics	Time Frame	2-5 days

Desired Results (Stage 1)

Established Goals/Standards

5.G.B.3 Understand that attributes belonging to a category of two-dimensional figures also belong to all subcategories of that category. For example, all rectangles have four right angles and squares are rectangles, so all squares have four right angles.

5.G.B.4 Classify two-dimensional figures in a hierarchy based on properties.

Primary Interdisciplinary Connections

LAL: Connect math and literacy through reading books
SCIENCE: Animal Rotations
ART: Perspective using landscape paintings and angles
HEALTH: Play "Turn Your Health Around"
SOCIAL STUDIES: Is There an Architect in the House?

21st Century Interdisciplinary Themes:

_X_ Global Awareness **_X_ Financial, economic, business, and entrepreneurial literacy**
___ Civic Literacy **_X_ Health Literacy**

Transfer

Students will be able to independently use their learning to classify two-dimensional figures into categories based on their properties.

Meaning

Understandings Students will understand that...	Essential Questions Students will keep considering...
U1 - attributes belonging to a category of two-dimensional figures also belong to all subcategories of that category.	**Q1 -** How does one classify two-dimensional figures? **Q2 -** Why would one need to classify a two-dimensional figure?
Knowledge Students will know...	**Skills** Students will be able to...
K1 - the characteristics of figures.	**S1 -** classify two-dimensional figures in a hierarchy based on properties.

Evidence (Stage 2)

Checks for Alignment	***Evaluation Criteria*** **Performance is judged in terms of…**	***Assessment Evidence***
U1 **Q1 – Q2** **K1**	Formative • question-answer in class • homework • portfolio Summative • periodic assessment tasks/checklists	**Transfer Task(s)** • Classify two-dimensional figures into categories based on their properties **S1**

Learning Plan (Stage 3)

Checks for alignment and best practice

Summary of Key Learning Events and Instruction

The teaching and learning needed to achieve the unit goals.

	Required Activities	Required Resources
	• Ten-Minute Math (TMM) • Activity • Discussion • Math Workshop • Assessment • Session Follow-Up • Games	• Investigations3 **Unit 8:** Investigation 1 • Grade 5 Mathematics Curriculum Binder
	Suggested Activities	**Suggested Resources**
	• Illuminations lessons	• http://illuminations.nctm.org • http://nlvm.usu.edu

Title of Unit	Factors, Multiples, Prime Numbers, Composite Numbers	Grade Level	5
Curriculum Area	Mathematics	Time Frame	10-13 days

Desired Results (Stage 1)

Established Goals/Standards

- Students will apply number theory concepts.
- Students will use factors and multiples to solve real-world problems.

Prepares for **6.NS.4** find the greatest common factor of two whole numbers less than or equal to 100 and the least common multiple of two whole numbers less than or equal to 12. Use the distributive property to express a sum of two whole numbers 1-100 with a common factor as a multiple of a sum of two whole numbers with no common factor.

Primary Interdisciplinary Connections

LAL: Connect math and literacy through reading books
SCIENCE: Make your own Archeological dig-site on the classroom floor and find different items using different coordinates
ART: Using an eyedropper and two colors of paint, make a painted gradation color string using decimal mixtures
HEALTH: Challenge each other to figure out exactly how many servings of each food group you had for dinner
MUSIC: Make up four musical codes and challenge each other to crack them
SOCIAL STUDIES: Explore Eratosthenes' Sieve

21st Century Interdisciplinary Themes:

_X_ Global Awareness **_X_ Financial, economic, business, and entrepreneurial literacy**
___ Civic Literacy **_X_ Health Literacy**

Transfer

Students will be able to independently use their learning to solve real-world problems using factors and multiples.

Meaning

Understandings Students will understand that…	Essential Questions Students will keep considering…
U1 - there are relationships among factors, multiples, divisors, and products. **U2 -** every counting number is divisible by 1 and itself, and some counting numbers are also divisible by other numbers. **U3 -** there is a relationship between two factors of a product and the dimensions of a rectangle **U4 -** there are relationships among factors, multiples, divisors, and products **U5 -** the multiplicative structure of numbers, includes the concepts of prime and composite numbers, evens, odds, and prime factorizations	**Q1 -** Will finding the factors help me solve the problem? **Q2 -** What do the factors and multiples of the numbers tell me about the situation? **Q3 -** What problems could be solved by finding the common factors and common multiples of numbers?

Knowledge Students will know…	**Skills** Students will be able to…
K1 - a prime number has only 2 factors, 1 and itself; a composite number has more than 2 factors. **K2 -** a rectangular array (the area) may be used to represent the product of factor pairs. **K3 -** how to find the factors and multiples of a number. **K4 -** strategies for finding least common multiples, and greatest common factors. **K5 -** every whole number can be written in exactly one way as a product of prime numbers	**S1 -** apply number theory concepts, including prime factorization, greatest common factor and least common multiple, to the solution of problems. **S2 -** recognize and use properties of prime and composite numbers, even and odd numbers, and square numbers. **S3 -** recognize and use the fact that every whole number can be written in exactly one way as a product of prime numbers. **S4 -** use factors and multiples to solve problems and to explain some numerical facts of everyday life. **S5 -** fluently divide multi-digit numbers using the standard algorithm. **S6 -** fluently add, subtract, multiply, and divide multi-digit decimals using the standard algorithm for each operation.

Evidence (Stage 2)

Checks for Alignment	***Evaluation Criteria*** **Performance is judged in terms of…**	***Assessment Evidence***
U1 – U5 **Q1 – Q3** **K1 – K5**	Formative • question-answer in class • homework • portfolio Summative • periodic assessment tasks/checklists	**Transfer Task(s)** • Solve real-world problems using factors • Solve real-world problems using multiples **S1 – S6**

Learning Plan (Stage 3)

Checks for alignment and best practice

Summary of Key Learning Events and Instruction

The teaching and learning needed to achieve the unit goals.

	Required Activities	Required Resources
	• Ten-Minute Math (TMM) • Activity • Discussion • Math Workshop • Assessment • Session Follow-Up • Games	• Prime Time Investigations 1, 3, 4 • Grade 5 Mathematics Curriculum Binder
	Suggested Activities	**Suggested Resources**
	• Illuminations lessons	• http://illuminations.nctm.org • http://nlvm.usu.edu