4th Grade: Unit 1
Curriculum Map: September 9th – October 25th

REVIEW OF GRADE 3 FLUENCIES	
3.OA.7	Fluently add and subtract within 20 using mental strategies. By end of Grade 2, know from memory all sums of two one-digit numbers.
3.NBT.2	Fluently add and subtract within 100 using strategies based on place value, properties of operations, and/or the relationship between addition and subtraction.

EXPECTED GRADE 4 FLUENCIES	
4.NBT.4	Fluently add and subtract multi-digit whole numbers using the standard algorithm. Add and Subtract within 1,000,000

GRADE 4 GEOMETRY	
4.G.1	Draw points, lines, line segments, rays, angles (right, acute, obtuse), and perpendicular and parallel lines. Identify these in two-dimensional figures.
	Examples of points, line segments, lines, angles, parallelism, and perpendicularity can be seen daily. Students do not easily identify lines and rays because they are more abstract.
4.G.2	**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.*
	Two-dimensional figures may be classified using different characteristics such as, parallel or perpendicular lines or by angle measurement. Parallel or Perpendicular Lines: Students should become familiar with the concept of parallel and perpendicular lines. Two lines are parallel if they never intersect and are always equidistant. Two lines are perpendicular if they intersect in right angles (90º). Students may use transparencies with lines to arrange two lines in different ways to determine that the 2 lines might intersect in one point or may never intersect. Further investigations may be initiated using geometry software. These types of explorations may lead to a discussion on angles.

GRADE 4 NUMBERS AND OPERATIONS IN BASE TEN	
4.NBT.1	**Use place value understanding to round whole numbers to the nearest 10 or 100.**
	Students should be familiar with and use place value as they work with numbers. Some activities that will help students develop understanding of this standard are: • Investigate the product of 10 and any number, then justify why the number now has a 0 at the end. (7 x 10 = 70 because 70 represents 7 tens and no ones, 10 x 35 = 350 because the 3 in 350 represents 3 hundreds, which is 10 times as much as 3 tens, and the 5 represents 5 tens, which is 10 times as much as 5 ones.) While students can easily see the pattern of adding a 0 at the end of a number when multiplying by 10, they need to be able to justify why this works. • Investigate the pattern, 6, 60, 600, 6,000, 60,000, 600,000 by dividing each number by the previous number.
4.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.**
	The expanded form of 275 is 200 + 70 + 5. Students use place value to compare numbers. For example, in comparing 34,570 and 34,192, a student might say, both numbers have the same value of 10,000s and the same value of 1000s however, the value in the 100s place is different so that is where I would compare the two numbers.
4.NBT.4	**Fluently add and subtract multi-digit whole numbers using the standard algorithm.**
	Students build on their understanding of addition and subtraction, their use of place value and their flexibility with multiple strategies to make sense of the standard algorithm. They continue to

	use place value in describing and justifying the processes they use to add and subtract. When students begin using the standard algorithm their explanation may be quite lengthy. After much practice with using place value to justify their steps, they will develop fluency with the algorithm. Students should be able to explain why the algorithm works.

Model Curriculum Student Learning Objectives

SLO	Description	CCSS
1	Draw points, lines, line segments, rays, angles (right, acute, obtuse), and perpendicular and parallel lines. Identify these in two dimensional figures.	**4.G.1**
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.	**4.G.2**
3	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. *For example, recognize that 700 ÷ 70 = 10 by applying concepts of place value and division.*	**4.NBT.1**
4	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.	**4.NBT.2**
5	Fluently add and subtract multi-digit whole numbers using the standard algorithm.	**4.NBT.4**

Vocabulary

Term	Definition
Addition/Add	the process of finding the sum or total value
Angle	The space between the meeting of two lines
Base ten	The base 10 system is a number system based on 10. It is also known as the Decimal System
Congruent	said of figures with the same size and shape
Degree	measurement unit used for temperature, angles
Digit	a single numeral
End Point	An End Point is a point at which a line segment or a ray ends.
Equilateral Triangle	a triangle in which all three sides are equal.
Expanded Notation	way of expressing each place value of a number
Intersecting	dividing by meeting or crossing at some point
Isosceles	referring to a triangle with two equal sides
Line	*A geometrical object that is straight, infinitely long and infinitely thin.*
Line Segment	a straight mark with two fixed end points
Obtuse	measuring more than ninety degrees
Parallel	being an equal distance apart, not crossing
Pentagon	a closed figure with five sides and angles
Perpendicular	the relationship between two lines meet at a <u>right angle</u>.
Place Value	The value of where the digit is in a number, such as unit, tens, hundreds etc.
Properties	defining characteristics or attributes
Quadrilateral	any four sided figure
Ray	A line with a starting point but no end point. http://www.mathsisfun.com/definitions/ray.html
Rectangle	four-sided shape with two sets of equal sides
Right Angle	A right angle is an internal angle which is equal to 90°
Right Triangle	A 3 sided polygon with 1 90 degree angle.
Scalene	referring to a triangle with all different sides
Square	a shape of four equal sides and right angles
Straight Angle	angle measuring 180° and forming a perfect line
Subtraction/Subtract	the process of reducing a number by another number
Symmetry	an exact correspondence in position or form
Trapezoid	four-sided figure with at least one pair of parallel sides
Triangle	a geometric shape with three sides
Vertex/Vertices	The *vertex* of an angle is the point where two rays begin or meet A vertex is a corner point of a polygon

Potential Student Misconceptions

Geometry

Students believe an obtuse angle with short rays is a smaller angle than an acute angle with long rays.
Students can compare two angles by tracing one and placing it over the other. Students will then realize that the length of the rays does not determine whether one angle is larger or smaller than another angle. Also use straws that bend to model angles of different degrees. As students hinge the straw to open and close, they model the fact that angles are two rays that share a common endpoint, and the distance between the rays is what degrees measure.

Students may think that when you double the two dimensions of the rectangle, the area is doubled.
In fact, doubling both dimensions quadruples a rectangle's area. Students must investigate the patterns that emerge when both dimensions are doubled or tripled. Students must describe and defend their findings in order to understand this conceptual idea. (Simply telling students about this relationship does not build their conceptual understanding.)

Students confuse area and perimeter
Introduce the ideas separately. Create real world connections for these ideas; e.g., your belt is a perimeter of your waist, the metal frame around the white board is the perimeter of the white board; the concrete slab of the basketball court is the area of the court, the area of the floor is illustrated by the floor tiles. Use the vocabulary of area and perimeter in the context of the school day. For example, have students sit on the "perimeter" of the rug.

Students may incorrectly classify shapes.
Students may not realize that a square is a special type of rectangle. Clarify properties that define different categories. Offer students many chances to classify shapes, and use and apply the classification systems that mathematics uses.

Numbers and Operations in Base Ten

Students misinterpret the value of digits in multi-digit numbers.
Students need to understand that when you have ten of one unit, you also have one unit of the next higher value. Frequently refer to a place value chart and connect the digits to conceptual models, i.e., place value blocks and pictorial representations. Have students create multiple ways to represent numbers, such as 132 can be made of 1 hundred, 3 tens and 2 ones, or 1 hundred, 1 ten and 22 ones, or 12 tens and 12 ones. When explaining strategies used, students must identify the unit value; e.g., when adding 492 and 265, they state that they are adding "two hundred" to "four hundred", i.e., the 2 in 265 is named "two hundred," rather than "two."

Students may not distribute for every value in the equation when applying the distributive property with multi-digit factors.
Student may solve 13 x 25 by only multiplying 10 x 20 (the tens place values) and 3 x 5 (the ones place values) missing that 10 x 5 and 20 x 3 (tens place times ones place values) are necessary. Encourage students to use visual models, such as open arrays or base ten blocks, that help students visually keep track of all the partial products.

EDM Section	Common Core Standards/SLO	Estimated Time
1-1 Introduction to the Student Reference Book	4.NBT.2 SMP 5	
1-2 Points, Line Segments, Lines and Rays	4.G.1 SMP 2	
1-3 Angles, Triangles, and Quadrangles	4.G.1, 4.G.2 SMP 2	
1-4 Parallelograms	4.G.1, 4.G.2 SMP 8	
1-5 Polygons	4.G.2 SMP 8	
Illuminations: Rectangles and Parallelograms *Print Lesson from this link:* http://illuminations.nctm.org/LessonDetail.aspx?id=L350	4.G.1 , 4.G.2	
1-6 Part 2**, 1.7** math boxes**, 1.8** part 2 (Polygon Bits and Pieces)	4.G.1 , 4.G.2	
Illuminations: Building with Triangles *Print Lesson from this link:* http://illuminations.nctm.org/LessonDetail.aspx?id=U191	4.G.2	
1-9 **Progress Check**		
2-2 Many names for Numbers	SMP 2	
2-3 Place Value in Whole Numbers	4.NBT.1, 4.NBT.2 SMP 7	
2-4 Place Value with a Calculator	4.NBT.1, 4.NBT.2 SMP 7	
2-5 boxes only, Assess Multiplication Facts	4.NBT.5	
Illuminations: All about Multiplication EDM Math Boxes	4.NBT.5	
2-7 Addition of Multi-digit numbers	4.NBT.2 SMP 3	
2-8 Displaying Data with Graphs	4MD.4 SMP 4	
2-9 Subtraction of Multi-digit numbers	4.NBT.4 SMP 3	
2-10 Progress Check 2		
3-1 What's my rule?	4.OA.5 SMP 2	
3-2 Multiplication Facts	4.OA.1, 4.OA.2 SMP 2, SMP 5	
3-3 Multiplication Facts Practice	4.OA.4, 4.OA.5 SMP 4, SMP 7	
3-4 More Multiplication Facts Practice	4.OA.1	

Timed test and Math Boxes	SMP 2, SMP 6	
3-5 Multiplication and Division	4.OA.1, 4.NBT.6 SMP 1, SMP 5	
3-6 World Tour: Flying to Africa	4.NBT.3, 4.MD.2	
3-8 A guide for Solving Number Stories	4.OA.3, 4.MD.2 SMP 1	
3-9 True or False number stories	4.NBT.2 SMP 2, AMP 7	
3-10 Parentheses in Number Sentences	SMP 1, SMP 6	
3-11 Open Sentences	4.OA.1, 4.MD.2 SMP 1, SMP 3	
3-12 Progress Check 3		

Assessment Checks –

These are meant to be quick assessments at the beginning or end of class to check for understanding.

4.G.1

| Problem:
 Are the following lines parallel or intersecting?

 Answer:
 Parallel | Things to Remember:
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 _____
 _____
 _____
 _____
 _____
 _____
 _____
 _____
 _____ |

Instructions: Solve the following problems.

1. Draw an obtuse angle.
    Answer:

2. Draw two intersecting lines.
    Answer:

4.G.2

Problem:
What is the name of the following figure?

Things to Remember:

_____
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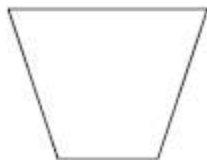
Answer:
Trapezoid

Instructions: Solve the following problems.

1. Is the following triangle a right triangle?

   Answer:

2. Draw a right triangle.
   Answer:

4.NBT.1

Problem:

5 x 50 =

Answer:
250

Things to Remember:

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Instructions: Solve the following problems.

1. 75 x 10 =
   Answer:

2. 900 ÷ 10 =
   Answer:

3. 100 x 10 =
   Answer:

4.NBT.2

Problem:
Round 76,398 to the nearest 1000.

Answer:
76,000

Things to Remember:
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Instructions: Solve the following problems.

1. Round 25,283 to the nearest one hundredth.
     Answer:

2. Round 1,223 to the nearest tenth.
     Answer:

3. Round 52,893 to the nearest 1000.
     Answer:

4.NBT.4

Problem:

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  9  3  2  7
-     2  2  6
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Answer:
9101

Things to Remember:

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Instructions: Solve the following problems.

1.
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    6  4  2  9
-   1  3  1  9
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Answer:

2.
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    2  1  2  9
+   1  3  7  6
```
Answer:

3.
```
    1  1  2  9
+   3  5  6  1
```
Answer:

Extensions
Online Resources

4.G.1

The Geometry of Letters
http://s3.amazonaws.com/illustrativemathematics/illustration_pdfs/000/001/263/original/illustrative_mathematics_1263.pdf?1372632208

What's the Point?
http://s3.amazonaws.com/illustrativemathematics/illustration_pdfs/000/001/272/original/illustrative_mathematics_1272.pdf?1377006879

Measuring angles
http://s3.amazonaws.com/illustrativemathematics/illustration_pdfs/000/000/909/original/illustrative_mathematics_909.pdf?1378650429

4.G.2

Finding an unknown angle
http://s3.amazonaws.com/illustrativemathematics/illustration_pdfs/000/001/168/original/illustrative_mathematics_1168.pdf?1372632216

Are These Right?
http://s3.amazonaws.com/illustrativemathematics/illustration_pdfs/000/001/273/original/illustrative_mathematics_1273.pdf?1372632200

What Shape Am I?
http://s3.amazonaws.com/illustrativemathematics/illustration_pdfs/000/001/274/original/illustrative_mathematics_1274.pdf?1372632212

4.NBT.1
https://docs.google.com/document/d/1_AfUMty9stj-O0LJBaf3HjnOVg-B2pzK2wMlfPGmnL8/edit?hl=en_US

4.NBT.2

Ordering 4 digit Numbers
http://s3.amazonaws.com/illustrativemathematics/illustration_pdfs/000/000/459/original/illustrative_mathematics_459.pdf?1372632225

4.NBT.4

To regroup or not to regroup
http://s3.amazonaws.com/illustrativemathematics/illustration_pdfs/000/001/189/original/illustrative_mathematics_1189.pdf?1372632226

Assessment Resources

4.G.1

- Geometry: Acute, right, obtuse, and straight angles (Fourth grade - P.11)
- Geometry: Lines, line segments, and rays (Fourth grade - P.26)
- Geometry: Parallel, perpendicular, intersecting (Fourth grade - P.27)

4.G.2

- Geometry: Identify planar and solid figures (Fourth grade - P.1)
- Geometry: Types of triangles (Fourth grade - P.2)
- Geometry: Which 2-dimensional shape is being described? (Fourth grade - P.4)
- Geometry: Classify quadrilaterals (Fourth grade - P.6)

4.NBT.1

- Number sense: Place values (Fourth grade - A.1)
- Number sense: Convert between place values (Fourth grade - A.2)

4.NBT.2

- Number sense: Place values
- Number sense: Word names for numbers
- Number sense: Compare numbers up to billions
- Addition: Addition patterns over increasing place values (Fourth grade - B.6)
- Multiplication: Inequalities with multiplication (Fourth grade - D.20)
- Division: Inequalities with division (Fourth grade - E.20)
- Mixed operations: Inequalities involving addition, subtraction, multiplication, and division (Fourth grade - F.9)

4.NBT.4

- Addition: Add numbers up to millions (Fourth grade - B.1)
- Addition: Add numbers up to millions: word problems (Fourth grade - B.2)
- Addition: Addition: fill in the missing digits (Fourth grade - B.3)
- Addition: Add 3 or more numbers up to millions (Fourth grade - B.5)
- Addition: Choose numbers with a particular sum (Fourth grade - B.7)
- Subtraction: Subtract numbers up to millions (Fourth grade - C.1)
- Subtraction: Subtract numbers up to millions: word problems (Fourth grade - C.2)
- Subtraction: Subtraction: fill in the missing digits (Fourth grade - C.3)
- Subtraction: Choose numbers with a particular difference (Fourth grade - C.5)