HILLSBOROUGH TOWNSHIP SCHOOL DISTRICT

MATHEMATICS CURRICULUM

Grade 4

July, 2020

Course Overview
Grade 4

The fourth grade mathematics program emphasizes the following content strands as they align with the New Jersey Student Learning Standards (NJSLS) in mathematics: operations and algebraic thinking, number and operations in base 10, number and operations in fractions, measurement and data, and geometry. The New Jersey State Standards for Mathematical Practice: make sense of problems and persevere in solving them; reason abstractly and quantitatively; construct viable arguments and critique the reasoning of others; model with mathematics; use appropriate tools strategically; attend to precision; look for and make use of structure; and look for and express regularity in repeated reasoning are embedded in the daily teaching and learning. The content is presented using a problem solving approach designed to develop critical thinking skills while embedding the mathematical processes into the daily teaching and learning. Practice of basic skills is ongoing through a variety of program routines and activities. Topics are revisited regularly and practice is distributed over time to facilitate full concept development. Activities explore a wide variety of content with opportunities for students to apply basic fact skills, geometry, measurement and algebra. Program implementation and assessment offers enrichment and reinforcement based on individual student needs. The fourth grade mathematics program helps prepare students to take the New Jersey Student Learning Assessment for grade four or any other next generation assessment. Successful completion of the grade four mathematics program prepares students for entry into the grade five mathematics program.

Hillsborough Township Public Schools
Grade 4 Mathematics Curriculum

Unit Title: Unit 1 Place Value and Multidigit Addition and Subtraction	**Time Frame/Pacing:** 24 days

Essential Questions

- How do we use place value understanding and properties of operations to perform multi-digit number addition and subtraction?

Enduring Understandings

- The value of the numbers affects the outcome of the operations on them.
- A quantity can be represented numerically in various ways. Problem solving depends upon choosing wise ways.

Standards Taught and Assessed

■ Major Cluster

- **4.OA.A** Use the four operations with whole numbers to solve problems.
- **4.NBT.A** Generalize place value understanding for multi-digit numbers
- **4.NBT.B** Use place value understanding and properties of operations to perform multi-digit arithmetic.

□ Supporting Cluster

- **4.MD.A** Solve problems involving measurement and conversion of measurements from a larger unit to a smaller unit.
- **4.G.A** Draw and identify lines and angles, and classify shapes by properties of their lines and angles.

Highlighted Interdisciplinary Connections

ELA

- **SL.4.1** -Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 4 topics and texts, building on others' ideas and expressing their own clearly.

SCIENCE

- **3-5-ETS1-2** - Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.

Highlighted Career Ready Practices and 21st Century Themes and Skill

- **9.1.4.D.1** - Use effective oral and written communication in face-to face and online interactions and when

Key: ■ Major Cluster □ Supporting Cluster ◎ Additional Cluster

presenting to an audience.
- **9.1.4.D.1** - Use effective oral and written communication in face-to-face and online interactions and when presenting to an audience.

Social Emotional Learning Competencies
- **2.1.4.E.4** - Summarize the causes of stress and explain ways to deal with stressful situations.

Pre-Assessment
- **4.OA.A, 4.NBT.A, 4.NBT.B**

Modifications/Accommodations (ELL, Special Education, Gifted, At-Risk of Failure, 504)
- Large group instruction, small group instruction, modeling, reteaching, partner work, review/reread directions, etool kits, and use of appropriate manipulatives (number cards, place value tool, geoboards, base-10 blocks, geometry template, math word wall). Provide appropriate modifications according to student IEP/504 plans.

Student Learning Objectives: We are learning to/that...	Student Strategies (Mathematical Practices)	Formative Assessment	Activities and Resources	Modifications/Accommodations (ELL, Special Education, Gifted, At-Risk of Failure, 504)
■ **4.OA.3** Assess the reasonableness of a solution to a multi step word problem using estimation strategies.	**SMP1** Make sense of problems and persevere in solving them. **SMP6** Attend to precision.	Create a number story where estimation is used to check the reasonableness of your answer.	Practice estimating strategies by solving word problems to check the accuracy answers.	Modification: Use a rounding chart to help students round numbers to the nearest 10 or 100. Enrichment: Have students practice estimating in everyday life.

Key: ■ Major Cluster □ Supporting Cluster ◎ Additional Cluster

■ **4.OA.5** Generate a number or shape pattern that follows a given rule.	**SMP1** Make sense of problems and persevere in solving them. **SMP7** Look for and make use of structure.	Decipher mathematical codes using place value.	Students solve a problem about codes based on place value structures.	Modifications: Use commands, models or drawings to explain and support patterns and coding. Use centimeter cubes to represent objects in the pattern. Enrichment: Students create their own codes following place value structures.
■ **4.NBT.1** Recognize that in a multi-digit whole number, a digit in one place represents ten times what it represents in the place to its right.	**SMP5** Use appropriate tools strategically. **SMP7** Look for and make use of structure.	Identify digits by place, value and describe the relationship between the places. Write the numbers in expanded form. 321,090 61,447.	Explore place value using a place value chart. Read and write big numbers using standard form and written form.	Modifications: Use a place value tool. Use a diagram for students to record the number. Ex: _ _ _, _ _ _ Enrichment: Solve number grid puzzles.
■ **4.NBT.2** Read, write, and compare multi-digit whole numbers using base-ten numerals, number names, and expanded form.	**SMP2** Reason abstractly and quantitatively. **SMP6** Attend to precision. **SMP7** Look for and make use of structure.	In 9,027 what is the value of 9?, 0?, 2?	To practice working with place-value concepts, students use number cards to create 6-digit numbers. Then compare them using comparison symbols.	Modifications: Write 2 numbers, one under the other, with the same-place digits aligned. Draw lines to connect pairs of digits as you compare their values, starting with the

Key: ■ Major Cluster □ Supporting Cluster ◎ Additional Cluster

				first pair on the left. 274,906 273,881 Enrichment: Collect large numbers by looking in an atlas, newspaper, or magazines and make a list of any large numbers they find.
■ **4.NBT.3** Use place value to round multi-digit whole numbers through hundred-thousands.	**SMP2** Reason abstractly and quantitatively. **SMP6** Attend to precision.	In the number 271,009 round to the nearest hundred-thousand, ten-thousand and thousand.	Practice rounding multi-digit numbers by using number lines. Plot lower, halfway and higher numbers on number lines to help round multi-digit numbers.	Modifications: Suggest a place-value flip book to help solve the problems. Students can also practice with finding the halfway point on number lines. Provide visual support for understanding the concept of rounding using a number line. Enrichment: Have students use data on a bar graph to practice visually rounding numbers.
■ **4.NBT.4** Fluently add and subtract multi-digit whole	**SMP1** Make sense of problems and persevere in solving them.	Use U.S. traditional addition and subtraction to solve 49+33 and	Students compare partial sums addition, column addition, and	Modifications: Use base-ten blocks to model each step.

Key: ■ Major Cluster □ Supporting Cluster ◎ Additional Cluster

numbers using the standard algorithm.	**SMP2** Reason abstractly and quantitatively. **SMP6:** Use clear labels, units and mathematical language. **SMP7** Look for and make use of structure.	88-39.	U.S. traditional addition. Play addition Top-It.	For 376+146 think: 376=3(100's)+7(10s)+6(1's) 146 =1(100)+4(10)+6(1's) Enrichment: Solve Number-Tile Addition Problems
☐ **4.MD.1** Know relative sizes of measurement units within one system of units.	**SMP1** Make sense of problems and persevere in solving them. **SMP2** Reason abstractly and quantitatively. **SMP6:** Use clear labels, units and mathematical language.	How many inches are in 2 feet? 3 feet? 5 feet? How many feet are in 2 yards? 4 yards? 5 yards? How many feet is 120 inches? How many yards is 27 feet?	Examine measurement scales and convert from larger to smaller units. Solve number stories involving units of length.	Modifications: Use several rulers or yardsticks lined up to physically count. Enrichment: Provide problems to convert feet to yards and inches to feet.
☐ **4.MD.3** Apply the area and perimeter formulas for rectangles in real world and mathematical problems.	**SMP2** Reason abstractly and quantitatively. **SMP8** Look for and express regularity in repeated reasoning.	Find the perimeter of a rectangle with a length of 3 inches and a width of 2 inches.	Students select and measure the perimeter of objects.	Modifications: Record and label all four side lengths and use their finger to trace around the perimeter of the rectangle. Enrichment: Have students create polygons

Key: ■ Major Cluster ☐ Supporting Cluster ◎ Additional Cluster

				using pattern blocks and discuss perimeters.
☐ **4.G.1** Draw points, lines, line segments, rays, angles, and perpendicular and parallel lines. Identify these in two-dimensional figures.	**SMP2:** Create mathematical representations using words, pictures, symbols and concrete objects.	Give an example of a line, line segment, and ray in the real world and explain the difference between the two. Identify angles as either right, acute, or obtuse.	Identify points, lines, line segments, and rays. Name them using appropriate symbols. Draw each one using a straightedge.	Modifications: Find alternate names for lines, line segments, and rays. Students use their fingers to trace the angle and compare it to real world examples or teacher models. Enrichment: Students solve puzzles involving collinear points.
☐ **4.G.2** Classify two-dimensional figures based on their properties.	**SMP6:** Use clear labels, units and mathematical language.	Draw and label two different quadrangles: *with one pair of parallel sides. *with two pairs of parallel sides. Draw and label right angles.	Build angles using straws and pipe cleaners. Create examples of right, acute, and obtuse angles. Use straws to build quadrilaterals.	Modifications: Focus on right angles (not distinguishing between obtuse/acute). Tape straw models to an anchor chart and label the name of the figure for future reference. Enrichment: Students create polygon puzzles.
Benchmark Assessment • Benchmark 1		**Modifications/Accommodations (ELL, Special Education, Gifted, At-Risk of Failure, 504)** • Provide appropriate modifications according to student IEP/504 plans.		

Key: ■ Major Cluster ☐ Supporting Cluster ◎ Additional Cluster

Summative Assessment(s)	**Modifications/Accommodations (ELL, Special Education, Gifted, At-Risk of Failure, 504)**
• Unit 1 Checking Progress • Unit 1 Open Constructive Response	• Provide appropriate modifications according to student IEP/504 plans.

Key: ■ Major Cluster □ Supporting Cluster ◎ Additional Cluster

Hillsborough Township Public Schools
Grade 4 Mathematics Curriculum

Unit Title: Unit 2 Multiplication and Geometry	**Time Frame/Pacing:** 22 Days

Essential Questions

- How do operations affect numbers?
- How do mathematical ideas interconnect and build on one another to produce a coherent whole?

Enduring Understandings

- Computational fluency includes understanding the meaning and the appropriate use of numerical operations.
- A quantity can be represented numerically in various ways.

Standards Taught and Assessed

■ Major Cluster

- **4.OA.A** Use the four operations with whole numbers to solve problems.
- **4.OA.B** Gain familiarity with factors and multiples.
- **4.NBT.B** Use place value understanding and properties of operations to perform multi-digit arithmetic.

□ Supporting Cluster

- **4.MD.A** Solve problems involving measurement and conversion of measurement from a larger unit to a smaller unit.
- **4.G.A** Draw and identify lines and angles, and classify shapes by their properties of their lines and shapes.

Highlighted Interdisciplinary Connections

ELA

- **RI.4.7**- Interpret information presented visually, orally, or quantitatively (e.g., in charts, graphs, diagrams, time lines, animations, or interactive elements on Web pages) and explain how the information contributes to an understanding of the text in which it appears.
- **W.4.2 -** Write informative/explanatory texts to examine a topic and convey ideas and information clearly.

Highlighted Career Ready Practices and 21st Century Themes and Skill

- **9.1.4.A.5** - Apply critical thinking and problem solving skills in classroom and family settings.
- **9.1.4.D.1** - Use effective oral and written communication in face-to face and online interactions and when presenting to an

Key: ■ Major Cluster □ Supporting Cluster ◎ Additional Cluster

audience.

Social Emotional Learning Competencies

- **2.1.4.E.4** - Summarize the causes of stress and explain ways to deal with stressful situations.

Pre-Assessment • **4.OA.A, 4.OA.B, 4.NBT.B**		**Modifications/Accommodations (ELL, Special Education, Gifted, At-Risk of Failure, 504)** • Large group instruction, small group instruction, modeling, reteaching, partner work, review/reread directions, etool kits, and use of appropriate manipulatives. Provide appropriate modifications according to student IEP/504 plans.		
Student Learning Objectives: We are learning to/that...	**Student Strategies (Mathematical Practices)**	**Formative Assessment**	**Activities and Resources**	**Modifications/Accommodations (ELL, Special Education, Gifted, At-Risk of Failure, 504)**
■ **4.OA.1** Interpret a multiplication equation as a comparison.	**SMP1** Make sense of problems and persevere in solving them. **SMP2** Reason abstractly and quantitatively. **SMP4** Model with mathematics.	Write a multiplicative comparison. 42 is 6 times as much as 7. Record an equation. What number is 4 times as much as 9? Record as an equation.	Explore additive and multiplicative comparisons, students play How Much More? (observe students) Students create and interpret multiplicative comparison statements and equations.	Modifications: Practice with the "harder" facts, students cut out and practice with the Fact Triangles. Enrichment: Extend work with multiplicative comparisons in real-life contexts.
■ **4.OA.2** Multiply or divide to solve word problems involving	**SMP1** Make sense of problems and persevere in solving them.	Write a multiplicative comparison number story and solve it.	Make predictions conjectures to solve what's my rule problems open ended tasks	Modifications: Use concrete manipulatives to solve problems vocabulary poster

Key: ■ Major Cluster □ Supporting Cluster ◎ Additional Cluster

multiplicative comparisons.	**SMP3** Construct viable arguments and critique the reasoning of others. **SMP7** Look for and make use of structure.		Make arguments to justify answers.	Enrichment: Solve real world multicative comparison number stories.
■ **4.OA.4** Find all factor pairs for a whole number in the range 1-100 and recognize that it is a multiple of each of its factors. Determine whether a given whole number in the range 1-100 is a multiple of a given one-digit number. Determine whether a given whole number in the range 1-100 is prime or composite.	**SMP2** Reason abstractly and quantitatively. **SMP6** Attend to precision. **SMP7** Look for and make use of structure.	Create arrays to find possible factors. Observe students playing Factor Captor.	Find factor pairs of a given number using multiplication facts. Find multiples. Define and classify prime and composite numbers.	Modifications: Use counters and centimeter cubes to create arrays to find factor pairs Give students examples of factors and multiples to refer back to when completing problems Play Factor Captor or Factor Bingo. Enrichment: Extend Factor Captor game Explore Goldbach's Conjecture activity.
■ **4.NBT.4** Fluently add and subtract multi-digit whole numbers using the standard algorithm.	**SMP 7** Look for and make use of structure. **SMP8** Look for and express regularity in repeated reasoning.	Solve the multi-digit problems. 2,748 + 6, 679 = 9, 598 - 5,359 =	Complete multi-digit adding and subtracting practice problems.	Modifications: Use grid paper, base ten blocks. Enrichment: Solve larger number computation problems.

Key: ■ Major Cluster □ Supporting Cluster ◎ Additional Cluster

■ **4.NBT.5** Multiply a whole number of up to four digits by a one-digit whole number, and multiply two two-digit numbers.	**SMP2** Reason abstractly and quantitatively. **SMP4** Model with mathematics. **SMP5** Use appropriate tools strategically. **SMP6** Attend to precision.	Draw a rectangle on a grid with a length of 5 and a width of 8. Write an equation to find the area.	Draw rectangles on grids. Use the length and width to determine a formula for the area. Multiply and solve for area.	Modification: Help students distinguish between area, perimeter, length and width.. Display visual support. Enrichment: Students apply understanding to determine the area and perimeter of irregular figures.
□ **4.MD.1** Know relative sizes of measurement units within one system of units.	**SMP1** Make sense of problems and persevere in solving them. **SMP5** Use appropriate tools strategically.	Convert hours to minutes and minutes to seconds when given the relationship 1 hour= 60 minutes.	Use a measurement scale to convert from hours to minutes and minutes to seconds.	Modifications: Display a clock and show how it takes 60 seconds for the second hand to go around the clock. Enrichment: Extend the measurement of time to days, weeks, months, and years. Construct their own 2-column conversion chart.
□ **4.MD.3** Apply the area and perimeter formulas for rectangles in real world and mathematical problems.	**SMP2** Reason abstractly and quantitatively. **SMP8** Look for and express regularity in	Find the area of a rectangle with length of 6cm and a width of 4cm.	Use a strategy to find the area of rectangles while playing Rugs and Fences.	Modifications: Provide students with a 2 x 2 array and write the word AREA to reinforce.

Key: ■ Major Cluster □ Supporting Cluster ◎ Additional Cluster

	repeated reasoning.			Enrichment: Students can create their own rectangle area problems.
☐ **4.G.2** Classify two-dimensional figures based on their properties.	**SMP6:** Use clear labels, units and mathematical language. **SMP 7** Look for and make use of structure.	Show students a right triangle and make sure students can identify the right angle in it. Have students select one of the polygon cards and identify one or more of its properties.	Have students play the Polygon Capture game.	Modifications: Give students a list or pictures of particular attributes so they can identify them in a polygon. Enrichment: Have students work in partners, one naming properties for a shape and the other drawing a shape that fits those properties.
☐ **4.G.3** Recognize and draw a line of symmetry for a two-dimensional figure.	**SMP6:** Use clear labels, units and mathematical language. **SMP 7** Look for and make use of structure.	Give students a shape and make sure they can identify at least one line of symmetry in the shape.	Students choose shapes on their geometry template and draw all possible lines of symmetry.	Modification: Help students cut shapes along a line of symmetry then lay the two sides on top of each other and pull them apart to see that the two sides match. Enrichment: Have students draw shapes for a partner to find lines of symmetry; they can start

Key: ■ Major Cluster ☐ Supporting Cluster ◎ Additional Cluster

				with half a shape and use a mirror to draw the other half if necessary.
Benchmark Assessment • Unit 2 Cumulative Assessment		**Modifications/Accommodations (ELL, Special Education, Gifted, At-Risk of Failure, 504)** • Provide appropriate modifications according to student IEP/504 plans.		
Summative Assessment(s) • Unit 2 Checking Progress		**Modifications/Accommodations (ELL, Special Education, Gifted, At-Risk of Failure, 504)** • Provide appropriate modifications according to student IEP/504 plans.		

Key: ■ Major Cluster □ Supporting Cluster ◎ Additional Cluster

Hillsborough Township Public Schools
Grade 4 Mathematics Curriculum

Unit Title: Unit 3 Fractions and Decimals	**Time Frame/Pacing:** 22 Days

Essential Questions

- How can measurements be used to solve problems?
- How can we compare and contrast numbers?
- How do mathematical ideas interconnect and build on one another to produce a coherent whole?
- How do operations affect numbers?

Enduring Understandings

- Measurements can be used to describe, compare, and make sense of phenomena.
- A quantity can be represented numerically in various ways. Problem solving depends upon choosing wise ways.

Standards Taught and Assessed

■ Major Cluster

- **4.NF.A** Extend understanding of fraction equivalence and ordering.
- **4.NF.C** Understand decimal notation for fractions, and compare decimal fractions.

Highlighted Interdisciplinary Connections

ELA

- **W.4.2 -** Write informative/explanatory texts to examine a topic and convey ideas and information clearly.
- **SL.4.1** - Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 4 topics and texts, building on others' ideas and expressing their own clearly.
- **RI.4.7** - Interpret information presented visually, orally, or quantitatively (e.g., in charts, graphs, diagrams, time lines, animations, or interactive elements on Web pages) and explain how the information contributes to an understanding of the text in which it appears.

Highlighted Career Ready Practices and 21st Century Themes and Skill

- **9.1.4.A.2** - Evaluate available resources that can assist in solving problems.
- **9.1.4.D.1** - Use effective oral and written communication in face-to-face and online interactions and when presenting to an audience.

Key: ■ Major Cluster □ Supporting Cluster ◎ Additional Cluster

Social Emotional Learning Competencies

- **2.1.4.E.4** - Summarize the causes of stress and explain ways to deal with stressful situations.
- **2.1.5.EH.4** - Identify behaviors that help to deal with difficult situations that can occur at home, in school, and/or in the community and where to go for assistance.

Pre-Assessment

- **4.NF.A, 4.NF.C**

Modifications/Accommodations (ELL, Special Education, Gifted, At-Risk of Failure, 504)

- Large group instruction, small group instruction, modeling, reteaching, partner work, review/reread directions, etool kits, and use of appropriate manipulatives. Provide appropriate modifications according to student IEP/504 plans.

Student Learning Objectives: We are learning to/that...	Student Strategies (Mathematical Practices)	Formative Assessment	Activities and Resources	Modifications/Accommodations (ELL, Special Education, Gifted, At-Risk of Failure, 504)
■ **4. NF. 1** Explain why a fraction a/b is equivalent to a fraction (nxa)/(nxb)	**SMP2** Reason abstractly and quantitatively. **SMP4** Model with mathematics. **SMP5** Use appropriate tools strategically. **SMP7** Look for and make use of structure.	Subdivide shared quantities into equal fractional pieces in at least one way. Use fraction circle pieces to find all equivalencies for ¼ from eighths through twelfths. Find pairs of equivalent fractions.	Fill in equivalent fraction chart using fraction circles. Fill in equivalent fractions on a number line using a fraction poster resource. Model equivalent fractions using drawings and representations.	Modifications: Use fraction circles, strips, and number lines to find and write equivalent fractions. Enrichment: Use a clock face to model equivalent fractions with denominators that are factors of 60.
■ **4.NF.2** Compare two	**SMP2** Construct viable arguments and critique	Compare ⅔ and ⅖. Use	Explore fraction comparisons using	Modifications: Create

Key: ■ Major Cluster □ Supporting Cluster ◎ Additional Cluster

fractions with different numerators and different denominators	the reasoning of others. **SMP3** Construct viable arguments and critique the reasoning of others. **SMP4** Model with mathematics.	a visual model to show understanding. Order 1/10, 2/10, 4/10, 7/10 and 8/10 on a number line using the benchmark ½.	fraction circles and number lines. Compare and solve fractions in number stories. Order fractions.	equivalent fractions using fraction circles. Sort fractions and give benchmarks on number lines. Play Fraction Top-It. Enrichment: Write and solve fraction number stories. Create fractions for a given benchmark.
■ **4.NF.6** Use decimal notation for fractions with denominators 10 or 100.	**SMP2** Reason abstractly and quantitatively. **SMP3** Construct viable arguments and critique the reasoning of others. **SMP4** Model with mathematics.	Students should change a model from fractions with 10 in the denominator to decimals. For example, 8/10= 0.8. Students should represent decimals to the	Use fraction circle tenths to represent decimals (tenths). Use base ten blocks (longs and cubes) to represent tenths and hundredths.	Modifications: Have students use base-10 blocks and/or shade in a grid then count how many they have. Enrichment: Students can explore the concept of a whole based on

Key: ■ Major Cluster □ Supporting Cluster ◎ Additional Cluster

		tenths. 8 shaded base 10 blocks should be written as 0.08 Complete a chart counting longs and cubes and length in decimals (0 longs, 3 cubes= 0.03 m).	Record tenths and hundredths in decimal notation on a number line using 0 wholes before the decimal.	different tenths and hundredths or determine the whole given a fractional part.
■ **4.NF.7** Compare two decimals to hundredths by reasoning about their size.	**SMP3** Construct viable arguments and critique the reasoning of others. **SMP4** Model with mathematics. **SMP5** Use appropriate tools strategically. **SMP6** Attend to precision.	Show 2 decimal grids and have students write the decimals and compare. Write an explanation about how they compared the 2 decimals.	Have students model decimals by filling in decimal grids and write the decimals. Compare the decimals by writing relation symbols (>, <, =). Have students explain why a decimal is greater or less than another decimal.	Modifications: Students practice writing decimals using coin amounts and compare the amounts. Use base ten blocks to practice modeling and ring decimals. Enrichment: Students plot decimal amounts between whole numbers on a number line.
Benchmark Assessment • Not applicable		**Modifications/Accommodations (ELL, Special Education, Gifted, At-Risk of Failure, 504)** • Provide appropriate modifications according to student IEP/504 plans.		
Summative Assessment(s) • Unit 3 Checking Progress • Unit 3 Open Constructive Response		**Modifications/Accommodations (ELL, Special Education, Gifted, At-Risk of Failure, 504)** • Provide appropriate modifications according to student IEP/504 plans.		

Key: ■ Major Cluster □ Supporting Cluster ◎ Additional Cluster

Key: ■ Major Cluster □ Supporting Cluster ◎ Additional Cluster

Hillsborough Township Public Schools
Grade 4 Mathematics Curriculum

Unit Title: Unit 4 Multi-Digit Multiplication	**Time Frame/Pacing:** 23 days

Essential Questions

- What makes a computational strategy both effective and efficient?
- How do operations affect numbers?

Enduring Understandings

- The magnitude of numbers affects the outcome of operations on them.
- Computational fluency includes understanding the meaning and the appropriate use of numerical operations.

Standards Taught and Assessed

■ Major Cluster

- **4.OA.A** Use the four operations with whole numbers to solve problems.
- **4.NBT.B** Use place value understanding and properties of operations to perform multi-digit arithmetic.

□ Supporting Cluster

- **4.OA.B** Gain familiarity with with factors and multiples
- **4.MD.A** Solve problems involving measurement and conversions of measurements from a larger unit to a smaller unit

Highlighted Interdisciplinary Connections

ELA

- **W.4.2 -** Write informative/explanatory texts to examine a topic and convey ideas and information clearly.
- **SL.4.1 -** Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 4 topics and texts, building on others' ideas and expressing their own clearly.

Highlighted Career Ready Practices and 21st Century Themes and Skill

- **9.1.4.D.1** - Use effective oral and written communication in face-to-face and online interactions and when presenting to an audience.
- **9.1.4.A.1** - Recognize a problem and brainstorm ways to solve the problem individually or collaboratively.

Key: ■ Major Cluster □ Supporting Cluster ◎ Additional Cluster

Social Emotional Learning Competencies

- **2.1.5.EH.3**: Identify different feelings and emotions that people may experience and how they might express these emotions (e.g., anger, fear, happiness, sadness, hopelessness, anxiety).
- **2.1.5.EH.4:** Identify behaviors that help to deal with difficult situations that can occur at home, in school, and/or in the community and where to go for assistance.

Pre-Assessment • **4.OA.A, 4.NBT.**	**Modifications/Accommodations (ELL, Special Education, Gifted, At-Risk of Failure, 504)** • Large group instruction, small group instruction, modeling, reteaching, partner work, review/reread directions, etool kits, and use of appropriate manipulatives. Provide appropriate modifications according to student IEP/504 plans.

Student Learning Objectives: We are learning to/that...	**Student Strategies (Mathematical Practices)**	**Formative Assessment**	**Activities and Resources**	**Modifications/Accommodations (ELL, Special Education, Gifted, At-Risk of Failure, 504)**
■ **4.OA.3** Assess the reasonableness of a solution to a multi-step word problem using estimation strategies.	**SMP1** Make sense of problems and persevere in solving them.	Create a multi step number story where students generate appropriate number model and estimate to check the reasonableness of their answer.	Students read number stories, write estimates and number models for each problem. Then solve.	Modifications: Scaffold and ask questions to guide students .Guide student estimation strategies. Provide a visual display of questions. Support ELL learners using signal words and sequential language: first...next...finally...

Key: ■ Major Cluster □ Supporting Cluster ◎ Additional Cluster

■ **4.NBT.2** Read, write, and compare multi-digit whole numbers using base-ten numerals, number names, and expanded form.	**SMP1** Make sense of problems and persevere in solving them. **SMP2** Reason abstractly and quantitatively. **SMP7** Look for and make use of structure.	Solve this problem: 6*392 Explain how 6 is distributed over the 300,90, and 2.	Solve multi-digit multiplication problems using the distributive property.	Modifications: Students play Dollar Exchange. Students play Multiplication Top-It (Extended-Facts Version). Enrichment: Create multistep number stories involving real-life situations. Students play Multiplication Wrestling.
■ **4.NBT.5** Multiply a whole number of up to four digits by a one-digit whole number, and multiply two two-digit numbers.	**SMP1** Make sense of problems and persevere in solving them. **SMP 2** Reason abstractly and quantitatively. **SMP7** Look for and make use of structure.	Use basic facts to calculate extended facts. Estimate an answer. Use the estimate to assess the reasonableness of the actual answer. Partition rectangles so solve digit-multiplication problems. Make connections between the processes of partial products and	Practice multi-digit multiplication using different strategies including partitioning rectangles, partial products, and lattice.	Modification: Use grid paper to solve problems multiplication table math strategy wall for displaying procedures. Enrichment: Find missing digit in multi-digit multiplication number sentences. Learn additional multiplication strategies.

Key: ■ Major Cluster □ Supporting Cluster ◎ Additional Cluster

		rectangle partition. Decompose 2-digit into tens and ones. Use the lattice method to solve multi-digit problems.		
☐ **4.MD.1** Know relative sizes of measurement units within one system of units.	**SMP1** Make sense of problems and persevere in solving them. **SMP6:** Use clear labels, units and mathematical language.	How many milliliters are in 3 liters? 10 liters? 22 liters? How many milliliters are in 4.4 liters? 7.5 liters? 8.8 liters?	Use a Measurement Scale to convert liters and milliliters. Record these conversions in an In and Out box.	Modification: Suggest that students show how 1L=1,000mL using a graduated cylinder and a beaker. Enrichment: Pose problems involving conversion of milliliters to liters.
☐ **4.MD.3** Apply the area and perimeter	**SMP3** Construct viable arguments and critique	What is the area of a 15cm by 25cm rectangle? Write an equation. Divide a rectilinear figure into rectangles, then find the area.	Have students play Expanding Rugs and	Modifications: Identify lengths and widths and label each figure. Write about formula words, area= length * width, or on index card. . Use calculators to check computation. Enrichment: Students create their own rectilinear figure and

Key: ■ Major Cluster ☐ Supporting Cluster ◎ Additional Cluster

formulas for rectangles in real world and mathematical problems.	the reasoning of others. **SMP 7** Look for and make use of structure.		Fences to find the area of rectilinear figures.	have other students find area by measuring sides with a ruler.
Benchmark Assessment • Mid-Year Assessment		**Modifications/Accommodations (ELL, Special Education, Gifted, At-Risk of Failure, 504)** • Provide appropriate modifications according to student IEP/504 plans.		
Summative Assessment(s) • Unit 4 Checking Progress		**Modifications/Accommodations (ELL, Special Education, Gifted, At-Risk of Failure, 504)** • Provide appropriate modifications according to student IEP/504 plans.		

Key: ■ Major Cluster □ Supporting Cluster ◎ Additional Cluster

Hillsborough Township Public Schools
Grade 4 Mathematics Curriculum

Unit Title: Unit 5 Fraction and Mixed-Number Computation; Measurement	**Time Frame/Pacing:** 22 days

Essential Questions

- How do mathematical ideas interconnect and build on one another to produce a coherent whole?
- How do operations affect numbers?
- How can we decide when to use an exact answer and when to use an estimate?

Enduring Understandings

- One representation may sometimes be more helpful than another; used together, multiple representations give a fuller understanding of a problem.
- The magnitude of numbers affects the outcome of operations on them.
- Algorithms can effectively and efficiently be used to quantify and interpret discrete information.
- Context is critical when using estimation.

Standards Taught and Assessed

■ Major Cluster

- **4.OA.A** Use the four operations with whole numbers to solve problems.
- **4.NBT.B** Use place value understanding and properties of operations to perform multi-digit arithmetic
- **4.NF.B** Build fractions from unit fractions by applying and extending previous understandings of operations on whole numbers.

□ Supporting Cluster

- **4.G.A** Draw and identify lines and angles, and classify shapes by their properties of their lines and angles.

◎ Additional Cluster

- **4.MD.C** Geometric measurement: understand concepts of angle and measure angles.

Highlighted Interdisciplinary Connections

ELA

- **SL.4.1.C** - Pose and respond to specific questions to clarify or follow up on information, and make comments that contribute

Key: ■ Major Cluster □ Supporting Cluster ◎ Additional Cluster

to the discussion and link to the remarks of others.

- **SL.4.1.D** - Review the key ideas expressed and explain their own ideas and understanding in light of the discussion.
- **RI.4.7** - Interpret information presented visually, orally, or quantitatively (e.g., in charts, graphs, diagrams, time lines, animations, or interactive elements on Web pages) and explain how the information contributes to an understanding of the text in which it appears.

Computer Science and Design Thinking:

- **8.1.5.DA.1** - Collect, organize, and display data in order to highlight relationships or support a claim

Highlighted Career Ready Practices and 21st Century Themes and Skill

- **9.1.4.A.5** - Apply critical thinking and problem-solving skills in classroom and family settings.
- **9.1.4.D.1** - Use effective oral and written communication in face-to-face and online interactions and when presenting to an audience.
- **9.1.4.A.1** - Recognize a problem and brainstorm ways to solve the problem individually or collaboratively.
- **9.1.4.B.1** - Participate in brainstorming sessions to seek information, ideas, and strategies that foster creative thinking.

Social Emotional Learning Competencies

- **2.1.5.EH.4** - Identify behaviors that help to deal with difficult situations that can occur at home, in school, and/or in the community and where to go for assistance.
- **2.1.4.E.4** - Summarize the causes of stress and explain ways to deal with stressful situations.

Pre-Assessment

- **4.OA.A, 4.NBT.B, 4.NF.B**

Modifications/Accommodations (ELL, Special Education, Gifted, At-Risk of Failure, 504)

- Large group instruction, small group instruction, modeling, reteaching, partner work, review/reread directions, etool kits, and use of appropriate manipulatives. Provide appropriate modifications according to student IEP/504 plans.

Key: ■ Major Cluster □ Supporting Cluster ◎ Additional Cluster

Student Learning Objectives: We are learning to/that...	Student Strategies (Mathematical Practices)	Formative Assessment	Activities and Resources	Modifications/Accommodations (ELL, Special Education, Gifted, At-Risk of Failure, 504)
■ **4.NF.3a** - Understand addition and subtractions of fractions as joining and separating parts referring to the same whole.	**SMP2** Reason abstractly and quantitatively. **SMP5** Use appropriate tools strategically.	Use fraction circles to name the whole. Record the name of the whole and then write an addition equation to represent the problem. Solve the number stories by subtracting mixed numbers.	Students use geometry templates to practice drawing the whole given a fractional part of a region. Practice mixed-number subtraction, students complete Frames and Arrows diagrams.	Modifications: Use geometry templates to draw figures representing the whole when given a fractional part of a region. Use fraction pieces of the same color to make a whole. Then use single pieces that are the same size as their whole.. Explore mixed numbers subtraction concepts, students decompose mixed numbers. Enrichment: To further explore mixed-number subtraction, students solve number stories involving unlike denominators.
■ **4.NF.3b** - Decompose a fraction into a sum of fractions with the	**SMP2** Reason abstractly and quantitatively.	A yellow fraction circle piece is ½ of the whole. What fraction circle	Students use fraction circles to practice finding the whole and	Modifications: Use colored tiles to build different rectangles

Key: ■ Major Cluster □ Supporting Cluster ◎ Additional Cluster

same denominator in more than one way.	**SMP6** Attend to precision.	piece is the whole? Write an equation to represent the problem.	write equations to represent the problems.	divided into the same fractional parts (ex. ½ blue and ½ red). Use pattern blocks to practice fractional parts of the whole Enrichment: Have students take a whole (ex. flag) and divide it into different fractional parts. Write an equation to represent the whole and explain how it equals a whole.
■ **4.NF.3c** - Add and subtract mixed numbers with like denominators.	**SMP2** Reason abstractly and quantitatively. **SMP4** Model with mathematics.	A line segment is 2 1/4 inches long. It is made 1 2/4 inches longer. How long is it now? Solve using a strategy.	Students use fraction circles, drawings, and number lines to solve fraction addition and subtraction problems.	Modifications: Decompose mixed numbers into the sum of whole and fraction. Use one strategy to solve, and a second to check work. Enrichment: Write a number story and number model to solve two ways.
■ **4.NF.3d** - Solve word problems involving addition and	**SMP2** Reason abstractly and quantitatively.	Add fractions Subtract fractions	Adding fractions and adding fractions in number stories.	Modifications: Use fraction circle sand/ or number lines to add and

Key: ■ Major Cluster □ Supporting Cluster ◎ Additional Cluster

subtraction of fractions.			Subtract fractions in number stories using fraction circles and number lines.	subtract fractions. Write the number models in words. Use "What's My Rule" tables. Enrichment: Investigate Egyptian Fractions. Write adding and subtracting fraction number stories.
■ **4.NF.5** - Express a fraction with denominator 10 as an equivalent fraction with denominator 100, and use this technique to add two fractions with respective denominators 10 and 100.	**SMP2** Reason abstractly and quantitatively.	Add: 8/100 + 6/10 5/10 + 41/100	Students create equivalent fractions when working with tenths and hundredths. Students will generate addition equations and solve.	Modifications: Use base ten blocks to model finding equivalent fractions and converting tenths to hundredths. Use sequential language (first, next, last..) to support explanations. Enrichment: Students use clocks to determine angle rotations. They will use clock hands to determine benchmark rotations.
◎ **4.MD.4** - Make a line plot to display a data set of measurements in fractions of a unit (1/2,	**SMP2** Reason abstractly and quantitatively. **SMP4** Model with	Create a line plot using a collection of data containing whole numbers and mixed	Use sticky notes on a whiteboard to create a large line plot with students.	Modifications: Have students who are struggling to add and subtract mixed numbers

Key: ■ Major Cluster □ Supporting Cluster ◎ Additional Cluster

1/4, 1/8). Solve problems involving addition and subtraction of fractions by using information presented in line plots.	mathematics.	numbers (for example, backpack weights). Answer questions such as: "How many students had a backpack weighing X pounds?", "What were the heaviest and lightest weights?", or "What is the combined weight of all the backpacks?"		use manipulatives to help them. Enrichment: Have students divide line plot data into two categories, create two different line plots, then answer questions comparing the data.
◎ **4.MD.5a -** An angle is measured with reference to a circle with its center at the common endpoint of the rays,	**SMP2** Reason abstractly and quantitatively. **SMP 5** Use appropriate tools strategically. **SMP6** Attend to precision.	Given angle rotations, properly determine angle rotations as full-turn, half-turn, quarter-turn, or three-quarter-turn.	Students can identify items in the classroom that can be used to form angles. Students can use straws to create angles.	Modification: For students who struggle, suggest using straws to model the rotation in each angle. Students start with both straws positioned on one ray of the angle and then rotate one straw in the direction indicated by the arc until it aligns with the other ray. Ask guiding questions like: "How far did you rotate the straw? What part of a full turn was it?" Enrichment: Students use a clock to make

Key: ■ Major Cluster □ Supporting Cluster ◎ Additional Cluster

				angles, relating the position of the clock hands to benchmark angles.
◎ **4.MD.5b -** An angle that turns through n one-degree angles is said to have an angle measure of n degrees.	**SMP5** Use appropriate tools strategically. **SMP6** Attend to precision.	Identify angles as acute, right, or obtuse and produce estimates for the corresponding range. (i.e. acute angle is between 0-89 degrees).	Use straws and pipe cleaners to create a chart on full circle. Create benchmark angles such as 90°, 180°, 270°, 360°. Students model these angles.	Modifications: Create a class chart on a full circle. Label benchmark angles such as 90°, 180°, 270°, 360°. Trace arc with your finger. Enrichment: Use these to estimate others for comparison (45°, 135°, etc) Students estimate angles created by hands of the clock at various times.
Benchmark Assessment • Benchmark 2		**Modifications/Accommodations (ELL, Special Education, Gifted, At-Risk of Failure, 504)** • Provide appropriate modifications according to student IEP/504 plans.		
Summative Assessment(s) • Unit 5 Checking Progress • Unit 5 Constructive Open Response		**Modifications/Accommodations (ELL, Special Education, Gifted, At-Risk of Failure, 504)** • Provide appropriate modifications according to student IEP/504 plans.		

Key: ■ Major Cluster □ Supporting Cluster ◎ Additional Cluster

Hillsborough Township Public Schools
Grade 4 Mathematics Curriculum

Unit Title: Unit 6 Division and Angles	**Time Frame/Pacing:** 23 days

Essential Questions

- What makes a computational strategy both effective and efficient?
- How do operations affect numbers?
- How can we decide when to use an exact answer and when to use an estimate?
- How can change be best represented mathematically?
- How do mathematical ideas interconnect and build on one another to produce a coherent whole?

Enduring Understandings

- The magnitude of numbers affects the outcome of operations on them.
- Computational fluency includes understanding the meaning and the appropriate use of numerical operations.
- Context is critical when using estimation.

Standards Taught and Assessed

■ Major Cluster

- **4.OA.A** Use the four operations with whole numbers to solve problems.
- **4.NBT.B** Use place value understanding and properties of operations to perform multi-digit arithmetic.
- **4.NF.B** Build fractions from unit fractions by applying and extending previous understandings of operations on whole numbers.

□ Supporting Cluster

- **4.OA.B** Gain familiarity with with factors and multiples
- **4.OA.C** Generate and analyze patterns
- **4.MD.C** Geometric measurement: understand concepts of angle and measure angles.

Highlighted Interdisciplinary Connections
ELA

Key: ■ Major Cluster □ Supporting Cluster ◎ Additional Cluster

- **SL.4.1.D -** Review the key ideas expressed and explain their own ideas and understanding in light of the discussion.
- **RI.4.7 -** Interpret information presented visually, orally, or quantitatively (e.g., in charts, graphs, diagrams, time lines, animations, or interactive elements on Web pages) and explain how the information contributes to an understanding of the text in which it appears.
- **W.4.2. -** Write informative/explanatory texts to examine a topic and convey ideas and information clearly.

Highlighted Career Ready Practices and 21st Century Themes and Skill

- **9.1.4.D.1 -** Use effective oral and written communication in face-to-face and online interactions and when presenting to an audience.
- **9.1.4.A.1 -** Recognize a problem and brainstorm ways to solve the problem individually or collaboratively.
- **9.1.4.B.1 -** Participate in brainstorming sessions to seek information, ideas, and strategies that foster creative thinking.
- **9.1.4.A.5** - Apply critical thinking and problem-solving skills in classroom and family settings.

Social Emotional Learning Competencies

- **2.1.4.E.4 -** Summarize the causes of stress and explain ways to deal with stressful situations.
- **2.1.5.EH.2** - Explain how to cope with rejection, loss, difficult learning situations and/or separation from family or others

Pre-Assessment

- **4.OA.A, 4.NBT.B, 4.NF.B**

Modifications/Accommodations (ELL, Special Education, Gifted, At-Risk of Failure, 504)

- Large group instruction, small group instruction, modeling, reteaching, partner work, review/reread directions, etool kits, and use of appropriate manipulatives. Provide appropriate modifications according to student IEP/504 plans.

Key: ■ Major Cluster □ Supporting Cluster ◎ Additional Cluster

Student Learning Objectives: We are learning to/that...	Student Strategies (Mathematical Practices)	Formative Assessment	Activities and Resources	Modifications/Accommodations (ELL, Special Education, Gifted, At-Risk of Failure, 504)
■ **4.OA.3** Assess the reasonableness of a solution to a multi step word problem using estimation strategies.	**SMP1** Make sense of problems and persevere in solving them. **SMP2** Reason abstractly and quantitatively. **SMP4** Model with mathematics.	Completing division problems involving partial quotients with estimation.	Introduce and model dividing by parts. Introduce and model partial quotients. Solve division number stories and interpret remainders.	Modifications: Use easy multiples for finding divisors. Draw pictures Express aloud what they want to write before writing it. Enrichment: Solve a Ring Riddle.
■ **4.NBT.5** Multiply a whole number of up to four digits by a one-digit whole number, and multiply two two-digit numbers.	**SMP2** Reason abstractly and quantitatively.	Using the recipe provided, how many teaspoons of almond oil would be used in 2 batches of lemon lip balm? 3 +3= 6	Students use pictures and repeated addition number models to add fractions as posed in a number story.	Modification: Complete a multiplication/division diagram to assist in computation. Enrichment Explore finding the unknown in a number sentence that

Key: ■ Major Cluster □ Supporting Cluster ◎ Additional Cluster

		2 * 3= 6 (two groups of 3)		involves multiplying fraction by a whole number.
■ **4.NBT.6** Find whole-number quotients and remainders with up to four-digit dividends and one-digit divisors.	**SMP2** Reason abstractly and quantitatively.	Solve the following division problems and give an estimate. 96/6 = _____ 184/8 = _____ 1,326/6 = _____	Students solve multi-digit division problems using the partial quotient strategy. An estimate is given for each problem to check the reasonableness of answers.	Modification: List multiples of 10 or 100 for the divisor when working on the partial quotients strategy. Draw visual representation or use concrete objects to help interpret remainders. Enrichment: solve multi-step open ended division tasks
■ **4.NF.3c** - Add and subtract mixed numbers with like denominators.	**SMP2** Reason abstractly and quantitatively. **SMP4** Model with mathematics.	Number model with unknown 11-10 ¼=U	Students add and subtract fractions and mixed numbers with like denominators. Students find the difference between two mixed numbers.	Modifications: To reinforce work with addition and subtraction of fractions and mixed numbers, students decompose 2 ⅗ in as many ways as they can and write equations to represent their work. Play a Fraction Match game. Enrichment: Explore computation involving

Key: ■ Major Cluster □ Supporting Cluster ◎ Additional Cluster

				unlike denominators, students solve number stories in which halves, fourths, tenths, and hundredths are added and subtracted.
■ **4.NF.3d** - Solve word problems involving addition and subtraction of fractions.	**SMP2** Reason abstractly and quantitatively. **SMP4** Model with mathematics.	A full backpack weighs 10 1/4 pounds. After adding a one subject notebook, the backpack weighs 11 pounds. How much does the notebook weigh?	Students decompose whole fractions in order to subtract. Model strategies that show a whole number as a fraction, using fraction circles and pictures.	Modification: Reinforce skill by having students decompose 2 3/5 as many ways as possible. Enrichment: Students solve a variety of stories using unlike denominators such as halves, fourths, tenths, and hundredths.
□ **4.MD.6** - Measure angles in whole-number degrees using a protractor. Sketch angles of specified measure.	**SMP5** Use appropriate tools strategically. **SMP6** Attend to precision.	Measure a right angle and a straight angle. Identify angles as acute, obtuse, or right angles. Measure angles.	Students play Angle Race. Model angles with a rope so students can practice estimating angle measures. Students play Angle Tangle. Students practice using a protractor to find	Modification: Look for students who have difficulty lining up the 0° mark with the side of the angle where the arc begins. Have them trace their fingers along the arc that denotes the rotation prior to using the angle measurer. For students using the wrong measurement scale, review benchmark

Key: ■ Major Cluster □ Supporting Cluster ◎ Additional Cluster

			angle measurements.	angles to help guide their measurements. Enrichment: To extend understanding of benchmark angles, students are given a specific set of attributes and see how many different shapes they can draw meeting the criteria.
☐ **4.MD.7** - Recognize angle measure as additive.	**SMP6** Attend to precision. **SMP7** Look for and make use of structure.	Given subdivided angles, identify the larger angle and find the measure of the whole angle.	Students find unknown angle measurements without using a protractor. Students use information in angle diagrams to generate equations to find missing measurements.	Modifications:build students' understanding of angle measures being additive by using manipulatives to take apart and recombine angles. Enrichment: students explore angle measurements of a triangle. Students measure angles, add them together and/or determine missing angle measurements.

Key: ■ Major Cluster ☐ Supporting Cluster ◎ Additional Cluster

Benchmark Assessment • Unit 6 Cumulative Assessment	**Modifications/Accommodations (ELL, Special Education, Gifted, At-Risk of Failure, 504)** • Provide appropriate modifications according to student IEP/504 plans.
Summative Assessment(s) • Unit 6 Checking Progress	**Modifications/Accommodations (ELL, Special Education, Gifted, At-Risk of Failure, 504)** • Provide appropriate modifications according to student IEP/504 plans.

Key: ■ Major Cluster □ Supporting Cluster ◎ Additional Cluster

Hillsborough Township Public Schools
Grade 4 Mathematics Curriculum

Unit Title: Unit 7 Fraction/Whole Number Multiplication	**Time Frame/Pacing:** 22 days

Essential Questions

- What makes a computational strategy both effective and efficient?
- How do operations affect numbers?
- How can we compare and contrast numbers?
- How do mathematical ideas interconnect and build on one another to produce a coherent whole?

Enduring Understandings

- Algorithms can effectively and efficiently be used to quantify and interpret discrete information.
- Problem solving depends upon choosing wise ways.
- One representation may sometimes be more helpful than another; used together, multiple representations give a fuller understanding of a problem.
- Multiple representations give a fuller understanding of a problem.
- In many cases, there are multiple algorithms for finding a mathematical solution, and those algorithms are frequently associated with different cultures.

Standards Taught and Assessed

■ Major Cluster

- **4.NBT.B** Use place value understanding and properties of operations to perform multi-digit arithmetic.
- **4.NF.B** Build fractions from unit fractions by applying and extending previous understandings of operations on whole numbers.
- **4.NF.C** Understand decimal notations for fractions, and compare decimal fractions.

□ Supporting Cluster

- **4.OA.C** Generate and analyze patterns

Key: ■ Major Cluster □ Supporting Cluster ◎ Additional Cluster

- **4.MD.A** Solve problems involving measurement and conversion of measurements from a larger unit to a smaller unit.
- **4.MD.B** Represent and interpret data.

Highlighted Interdisciplinary Connections.

ELA

- **SL.4.1.D** - Review the key ideas expressed and explain their own ideas and understanding in light of the discussion.
- **SL.4.1** - Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 4 topics and texts, building on others' ideas and expressing their own clearly.

COMPUTER SCIENCE AND DESIGN THINKING

- **8.1.5.DA.1**: Collect, organize, and display data in order to highlight relationships or support a claim.

Highlighted Career Ready Practices and 21st Century Themes and Skill

- **9.1.4.A.5** - Apply critical thinking and problem-solving skills in classroom and family settings.
- **9.1.4.B.1** - Participate in brainstorming sessions to seek information, ideas, and strategies that foster creative thinking.
- **9.1.4.A.1** - Recognize a problem and brainstorm ways to solve the problem individually or collaboratively.
- **9.1.4.D.1** - Use effective oral and written communication in face-to-face and online interactions and when presenting to an audience.

Social Emotional Learning Competencies

- **2.1.4.E.4** Summarize the causes of stress and explain ways to deal with stressful situations.
- **2.1.5.EH.2**: Explain how to cope with rejection, loss, difficult learning situations and/or separation from family or others

Pre-Assessment

- **4.NBT.B, 4.NF.B, 4.NF.C**

Modifications/Accommodations (ELL, Special Education, Gifted, At-Risk of Failure, 504)

- Large group instruction, small group instruction, modeling, reteaching, partner work, review/reread directions, etool kits, and use of appropriate manipulatives (number cards, place value tool, geoboards, base-10 blocks, geometry template, math word wall). Provide appropriate modifications according to student IEP/504 plans.

Key: ■ Major Cluster □ Supporting Cluster ◎ Additional Cluster

Student Learning Objectives: We are learning to/that...	Student Strategies (Mathematical Practices)	Formative Assessment	Activities and Resources	Modifications/Accommodations (ELL, Special Education, Gifted, At-Risk of Failure, 504)
■ **4.NBT.5** Multiply a whole number of up to four digits by a one-digit whole number, and multiply two two-digit numbers.	**SMP2** Reason abstractly and quantitatively. **SMP5** Use Appropriate tools strategically.	Convert accurately between units of capacity and explain how they converted between the units using multiplication. Multiply a mixed number by a whole number successfully.	Students solve number stories involving conversions. Use representations and share strategies to model the problem both ways: multiplying both numerator and the denominator by the whole number and multiplying just the numerator by the whole number.	Modifications: Review partial products by solving 6 *92 using the partial-products method. Guide students as they work emphasizing the Distributive Property by modeling the following: 6 * 92= 6 *(90 +2) 6 * 92= (6*90) + (6 * 2) 6 * 92=540 +12 6 * 92=552 Enrichment: To extend work multiplying mixed numbers by whole numbers, students change multiplication equations to increase or decrease the product. (Play Increasing and Decreasing Products)
■ **4.NBT.6** Find whole number quotients and remainders with up to four-digit dividends and	**SMP1** Make sense of problems and persevere in solving them.	Solve multi-step division number stories including measurement and apply the partial quotient	Students will solve multi-step division word problems by applying the partial quotients	Modification: Use a guide for solving number stories to help students plan a solution.

Key: ■ Major Cluster □ Supporting Cluster ◎ Additional Cluster

one-digit divisors.	**SMP5** Use appropriate tools strategically.	algorithm to solve	algorithm to solve. Students will organize information and develop a plan to find a solution.	Enrichment: Write multi-step division number stories.
■ **4.NF.4a** Understand a fraction a/b as a multiple of 1/b. For example, use a visual fraction model to represent 5/4 as the product 5 × (1/4), recording the conclusion by the equation 5/4 = 5 × (1/4).	**SMP2** Reason abstractly and quantitatively. **SMP5** Use appropriate tools strategically.	Use fraction circles to model multiplying a whole number by a fraction.	Students work to find the whole using the fraction circle pieces. Students create addition and multiplication number models to represent representations. Students will solve number stories using a multiplication number model with unknown.	Modifications: Use fraction circles. Work in partnerships. Use a multiplication/ division diagram. Students can skip count unit fractions. Enrichment: Play Multiplication Wrestling Write missing groups number stories.
■ **4.NF.4b** Understand a multiple of a/b as a multiple of 1/b, and use this understanding to multiply a fraction by a whole number.	**SMP2** Reason abstractly and quantitatively. **SMP8** Look for and express regularity in repeated reasoning.	⅞ is a multiple of what unit fraction? ⅘ is the fourth multiple of what unit fraction? 10/2 is a multiple of what unit fraction? 6/4 is a multiple of what unit fraction? Have students write fractions as multiples of unit fractions. For example, ⅘ = ___ * ___	Use fraction circles to model problems. Have students draw pictures to represent problems. Use a number line to find multiples of unit fractions.	Modification: For students who struggle, suggest they model the problem with fraction circles or draw a picture and use repeated addition to solve. Enrichment: To explore working with missing group number stories,

Key: ■ Major Cluster □ Supporting Cluster ◎ Additional Cluster

			Skip count by unit fractions.	have students write two number stories for given number models involving fractions. Partners trade papers, solve, and discuss answers.
■ **4.NF.4c** Solve word problems involving multiplication of a fraction by a whole number, e.g., by using visual fraction models and equations to represent the problem.	**SMP1** Make sense of problems and persevere in solving them. **SMP2** Reason abstractly and quantitatively. **SMP5** Use appropriate tools strategically. **SMP8** Look for and express regularity in repeated reasoning.	Suma and her sister need ¼ teaspoon of salt for a muffin recipe. If they want to triple the recipe, how much salt would they need? Jack walks ⅜ miles each day. How far will he walk after 4 days? Each flute player in Briar Woods Elementary School practiced for 2 ⅗ hours each day of the week. If there are 5 flute players, how many total hours did they practice?	Display number stories. Students will develop number models to support each problem. Students will use various strategies to model and solve. Students will use pictures (number lines, fraction circles, fraction bars) to represent each problem.	Modifications: Use fraction circles or fraction manipulatives. Use fraction number lines to ask questions and model the number of hops/jumps in each problem. Encourage students to use a measurement scale when solving measurement related problems. Enrichment: Extend student understanding of multiples of fractions by playing *Multiplying by Groups*. Students extend their understanding of multiplying mixed numbers by whole numbers by playing *Increasing and Decreasing Products.*

Key: ■ Major Cluster ☐ Supporting Cluster ◎ Additional Cluster

☐ **4.OA.5** Generate a number or shape pattern that follows a given rule.	**SMP7** Look for and make use of structure. **SMP8** Look for and express regularity in repeated reasoning.	Look at a rectangular pattern. What pattern do you notice about the number of addends and the rectangular number?	Introduce rectangular numbers by using base-10 blocks to build arrays. Discuss the patterns and find a rule for rectangular numbers.	Modifications: Highlight numbers that are key to each pattern such as consecutive addends. Use sentence frames to explain, review types of rules and patterns. Enrichment: To further explore patterns, students build rectangular pyramids with different size bases.
☐ **4.MD.1** Know relative sizes of measurement units. Within a single system of measurement, express measurement in larger unit in terms of smaller unit.	**SMP1** Make sense of problems and persevere in solving them. **SMP5** Use appropriate tools strategically.	If the yellowhammer bird weighs 1/4 pound, what is the weight of 6 yellowhammers? Is that more or less than 30 ounces?	Create a two column chart of pounds to ounces. Create a measurement scale to show the conversions between pounds and ounces. Use to solve measurement number stories.	Modifications: Draw a picture (or use fraction circles) to represent the weights of each bird. Break the problem down into whole pounds and fractions of a pound. Use 16 centimeter cubes to represent an ounce in each pound. Enrichment: Students find a combination of dairy products that take a total of 2,000 pounds, 8 ounces of milk to produce.

Key: ■ Major Cluster ☐ Supporting Cluster ◎ Additional Cluster

☐ **4.MD.4** Make a line plot to display a data set of measurements in fractions of a unit (1/2, 1/4, 1/8). Solve problems involving addition and subtraction of fractions.	**SMP4** Model with mathematics. **SMP6** Attend to precision.	Create a line plot based on measurement of objects to the nearest ⅛ of an inch. Answer questions to interpret the line plot involving adding and subtracting of fractions.	Students will measure objects to the nearest ⅛ of an inch and create a line plot. Students will answer questions based on the line plot to practice adding and subtracting fractions.	Modifications: Use fraction circles or sentence frames. Use a paper ruler with every other eighth colored in. Extra copy of chart to transfer data. Enrichment: Students can plot straw lengths. Plot data involving dog walking distances.
Benchmark Assessment • Benchmark 3		**Modifications/Accommodations (ELL, Special Education, Gifted, At-Risk of Failure, 504)** • Provide appropriate modifications according to student IEP/504 plans.		
Summative Assessment(s) • Unit 7 Checking Progress • Unit 7 Constructive Open Response		**Modifications/Accommodations (ELL, Special Education, Gifted, At-Risk of Failure, 504)** • Provide appropriate modifications according to student IEP/504 plans.		

Key: ■ Major Cluster ☐ Supporting Cluster ◎ Additional Cluster

Hillsborough Township Public Schools
Grade 4 Mathematics Curriculum

Unit Title: Unit 8 Fraction Operations; Applications	**Time Frame/Pacing:** 22 days

Essential Questions

- How do operations affect numbers?
- What makes a computational strategy both effective and efficient?
- How do mathematical ideas interconnect and build on one another to produce a coherent whole?

Enduring Understandings

- Algorithms can effectively and efficiently be used to quantify and interpret discrete information.
- One representation may sometimes be more helpful than another; used together, multiple representations give a fuller understanding of a problem.
- A quantity can be represented numerically in various ways.
- Problem solving depends upon choosing wise ways.

Standards Taught and Assessed

■ Major Cluster

- **4.OA.A** Use the four operations with whole numbers to solve problems.
- **4.NBT.A** Generalize place value understanding for multi-digit whole numbers.
- **4.NBT.B** Use place value understanding and properties of operations to perform multi-digit arithmetic.
- **4.NF.B** Build fractions from unit fractions by applying and extending previous understandings of operations on whole numbers.

□ Supporting Cluster

- **4.MD.A** Solve problems involving measurement and conversion of measurements from a larger unit to a smaller unit.
- **4.MD.B** Represent and interpret data.
- **4.G.A** Draw and identify lines and angles, and classify shapes by properties of their lines and angles.

Key: ■ Major Cluster □ Supporting Cluster ◎ Additional Cluster

Highlighted Interdisciplinary Connections

ELA

- **W.4.2.D**: Use precise language and domain specific vocabulary to inform about or explain the topic.
- **W.4.2**: Write informative/explanatory texts to examine a topic and convey ideas and information clearly.

SCIENCE

- **3-5-ETS1-2**: Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.

COMPUTER SCIENCE AND DESIGN THINKING

- **8.1.5.DA.1**: Collect, organize, and display data in order to highlight relationships or support a claim.

Highlighted Career Ready Practices and 21st Century Themes and Skill

- **9.1.4.A.1**: Recognize a problem and brainstorm ways to solve the problem individually or collaboratively.

Social Emotional Learning Competencies

- **2.1.4.E.4**: Summarize the causes of stress and explain ways to deal with stressful situations.
- **2.1.5.EH.4**: Identify behaviors that help to deal with difficult situations that can occur at home, in school, and/or in the community and where to go for assistance.

Pre-Assessment

- **4.OA.A, 4.NBT.A, 4.NBT.B, 4.NF.B**

Modifications/Accommodations (ELL, Special Education, Gifted, At-Risk of Failure, 504)

- Large group instruction, small group instruction, modeling, reteaching, partner work, review/reread directions, etool kits, and use of appropriate manipulatives (number cards, place value tool, geoboards, base-10 blocks, geometry template, math word wall). Provide appropriate modifications according to student IEP/504 plans.

Key: ■ Major Cluster □ Supporting Cluster ◎ Additional Cluster

Student Learning Objectives: We are learning to/that...	Student Strategies (Mathematical Practices)	Formative Assessment	Activities and Resources	Modifications/Accommodations (ELL, Special Education, Gifted, At-Risk of Failure, 504)
■ **4.NF.3c -** Add and subtract mixed numbers with like denominators, by replacing each mixed number with an equivalent fraction, and/or by using properties of operations and the relationship between addition and subtraction.	**SMP1** Make sense of problems and persevere in solving them. **SMP3** Construct viable arguments and critique the reasoning of others. **SMP4** Model with mathematics.	A punch recipe calls for 1 ¼ cups of orange juice, but only serves 6 people. How many cups would you need if you wanted to make enough to serve 16 people?	Have students use fraction circles, bar models, number lines, or pictures to represent problems. Solve measurement word problems involving addition and subtraction of fractions and mixed numbers. Have students complete "What's My Rule?" tables to practice adding and subtracting mixed numbers.	Modification: For students struggling, use fraction circles, bar models, pictures, or number lines. Enrichment: Students can extend their knowledge of adding and subtracting fractions by creating word problems that require fractions and mixed numbers to be added or subtracted, then trading with a partner to solve.
■ **4.NF.3d -** Solve word problems involving addition and subtraction of fractions.	**SMP4** Model with mathematics. **SMP6** Attend to precision.	Use data from a line plot to solve. What is the difference between the largest and the smallest heights? 6- 3 1/2= 2 1/2 inches	Complete a line plot of envelope heights to the nearest 1/8 of an inch. Students collect data and complete their own line plot. Students discuss how they will determine whether they	Modifications: As students label their line plots they should write equivalent fractions in 1/8 before plotting data. Enrichment: Based on their line plots students write several problems

Key: ■ Major Cluster □ Supporting Cluster ◎ Additional Cluster

		How many envelopes sold are larger than 4 1/8? Smaller than 4 1/8? How much larger is the largest than the smallest? How much smaller is the height of the #10 envelopes than the largest one sold?	will record their measurements in 1/2, 1/4, or 1/8 inches.	involving adding and subtracting mixed numbers. Trade questions with classmates and solve.
■ **4.NF.4b** Understand a multiple of a/b as a multiple of 1/b, and use this understanding to multiply a fraction by a whole number.	**SMP1** Make sense of problems and persevere in solving them. **SMP2** Reason abstractly and quantitatively. **SMP3** Construct viable arguments and critique the reasoning of others. **SMP4** Model with mathematics. **SMP7** Look for and make use of structure.	Find the area of a rectangle when the length is 5 yards and the width is ⅔ yards. A puppy weighing 5 pounds is fed 1 ⅜ cups of food each day. How many cups of food will he eat in 3 days?	Students practice multiplying a fraction by a whole number in fraction number stories and area questions. Students use drawings, tables or equations to show what they did.	Modifications: Use questions and sentence frames.Use Think-Pair-Share during lesson. Work in partnerships to solve problems. Display visuals when solving the area problems. Record number model prior to solving for area. Enrichment: Students extend their understanding of multiplying fractions by exploring the area formula. They practice converting decimals to fractions and fractions to decimal before solving.

Key: ■ Major Cluster □ Supporting Cluster ◎ Additional Cluster

■ **4.NF.4c** Solve word problems involving multiplication of a fraction by a whole number, e.g., by using visual fraction models and equations to represent the problem.	**SMP2** Reason abstractly and quantitatively. **SMP4** Model with mathematics.	Find the area of each rectangle. length 5 yards, width 2/3 yard length 4 3/10 meters, width 3 meters	Review formula for area. Students will multiply fractions and mixed numbers by a whole number as they apply the area formula to rectangles.	Modifications: Use questions and sentence frames. Use Think-Pair-Share during lessons. Work in partnerships to solve problems. Sketch visuals when solving the area problems. Record number model prior to solving for area. Enrichment: Play Multiplication Wrestling Solve area problems with missing sides and decimals.
■ **4.NF.5** Express a fraction with denominator 10 as an equivalent fraction with denominator 100, and use this technique to add two fractions with respective denominators 10 and 100.	**SMP2** Reason abstractly and quantitatively. **SMP7** Look for and make use of structure.	Create number models using different operations, fractions and decimals.	Students will create various ways to name whole numbers, fractions and decimals.	Modifications: Use sentence frames. Use base-10 grids. Enrichment: Create their own name collection box and fill in. Play Name that Number-challenge them to use three or four cards.

Key: ■ Major Cluster □ Supporting Cluster ◎ Additional Cluster

■ **4.NF.6** - Use decimal notation for fractions with denominators.	**SMP2** Reason abstractly and quantitatively.	Translate from decimal notation to fraction notation, compute with the fractions, and then translate back to decimal notation.	Students solve decimal number stories.	Modifications: Practice converting decimals to fractions and adding two fractions with denominators 10 and 100 respectively. Students use base 10 blocks to find sums. Enrichment: To further investigate the relationship between tenths and hundredths in decimals and fractions, students design two identical racks to display a baseball cap collection.
□ **4.MD.7** Recognize angle measure as additive.	**SMP4** Model with mathematics. **SMP5** Use appropriate tools strategically.	Given a diagram with angles, draw arcs to indicate angles, find the measures angles	Students will explore field of vision by looking at diagrams and find unknown angles Students will work with pattern blocks to use known angle measures to find the measures of other angles.	Modification: Have students play Angle Add-Up to practice angle measures as additive. Enrichment: Have students determine the angle measures of fraction circle pieces. They can explore sums of angle measures of various combinations of fraction circle pieces.

Key: ■ Major Cluster □ Supporting Cluster ◎ Additional Cluster

☐ **4.MD.2** Use the four operations to solve word problems involving distances, intervals of time, liquid volumes, masses of objects, and money including problems involving simple fractions or decimals and problems that require expressing measurements given in a larger unit in terms of a smaller unit.	**SMP3** Construct viable arguments and critique the reasoning of others.	Multiply a fraction by a whole number.	Students solve measurement problems. Students solve a puzzle by converting between units of equivalent measures in each type of measurement.	Modifications: Use measurement scales or record relationship between measures on top of page. Students can cut out fractions of a pound to create models. Enrichment: Students work within given parameters to solve number stories about a fishing tournament (weighing fish in ounces) and describe their solution strategies.
☐ **4.G.3** Recognize a line of symmetry for a two dimensional figure	**SMP2** Reason abstractly and quantitatively. **SMP7** Look for and make use of structure.	Observe the lines of symmetry students draw in the shapes they create with their Geometry templates.	Students will explore line symmetry by using pattern blocks to create symmetric shapes with a specified number of lines of symmetry. They will draw these shapes on paper using Geometry templates and mark the lines of symmetry.	Modifications: Use geometry template, pattern blocks or enlarged cut-outs of shapes. Fold paper to find different lines of symmetry. Enrichment: Explore rotation symmetry. Create quilting patterns.

Key: ■ Major Cluster ☐ Supporting Cluster ◎ Additional Cluster

Benchmark Assessment • End of the Year Common Assessment	**Modifications/Accommodations (ELL, Special Education, Gifted, At-Risk of Failure, 504)** • Provide appropriate modifications according to student IEP/504 plans.
Summative Assessment(s) • Unit 8 Checking Progress	**Modifications/Accommodations (ELL, Special Education, Gifted, At-Risk of Failure, 504)** • Provide appropriate modifications according to student IEP/504 plans.

Key: ■ Major Cluster □ Supporting Cluster ◎ Additional Cluster

Bibliography
Grade Four

Supplemental Materials/Resources:

Bell, J., Bell, M., Bretzlauf, J., Dillard, A., Hartfield, R., Isaacs, A., McBride, J., Moran, C. G., Pitvorec, K., Saecker, P., (2020). *Everyday mathematics: Student reference book. Fourth Edition.* McGraw Hill: Chicago.

Bell, J., Bell, M., Bretzlauf, J., Dillard, A., Hartfield, R., Isaacs, A., McBride, J., Moran, C. G., Pitvorec, K., Saecker, P., (2020). *Everyday Mathematics, Fourth Edition.* McGraw Hill, Education: Chicago.

Bell, J., Carroll, W.A., Dillard, A., Pitvorec, K., (2020). *Everyday Mathematics Assessment Handbook.* McGraw Hill, Education: Chicago.

Bell, M., Bell, J., Bretzlauf, J., Dillard, A., Flanders, J., Hartfield, R., Isaacs, A., Leslie, D. A., McBride, J., Pitvorec, K., Saecker, P., (2020). *Everyday mathematics: Teacher's manual. Fourth Edition.* McGraw Hill: Chicago.

Bell, M., Bretzlauf, J., Dillard, Hartfield, R., Isaacs, A., McBride, J., Pitvorec, K., Saecker, P., Willingham, N., (2020). *Everyday mathematics: Math masters. Fourth Edition.* McGraw Hill: Chicago

Bell, M., Bretzlauf, J., Dillard, Hartfield, R., Isaacs, A., McBride, J., Pitvorec, K., Saecker, P., Willingham, N., (2020). *Everyday mathematics: Student journal: Volume 1 and 2. Fourth Edition.* McGraw Hill: Chicago.

Bell, J., Carroll, W .A., Dillard, A., Pitvorec, K., (2020). *Everyday mathematics: Assessment handbook. Fourth Edition.* McGraw Hill: Chicago.

Dillard, A. Pitvorec, K., (2020). *Everyday mathematics: Differentiation Handbook. Fourth Edition.* McGraw Hill: Chicago.

Dyer, M., Rasala, S., Snook, K., Sconiers, S., (2020). *Everyday Mathematics 5-Minute Math, Grades 4-6.* McGraw Hill, Education: Chicago.

Digital:

McGraw Hill ConnectEd - All hard copy materials are also available digitally