



Totowa Public Schools

Mathematics

Grade 4

Aligned to NJSL Standards

Revised and BOE Adopted: 8/31/2022

Revised 12/14/2022

Units of Study & Pacing Guide

<u>Unit of Study</u>	<u>Timeline</u>	<u>Notes</u>
Unit 1: Place Value of Whole Numbers, Estimation, and Number Theory	8 Weeks	
Unit 2: Whole Number Multiplication and Division Properties of Operations	8 Weeks	
Unit 3: Addition, Subtraction and Multiplication of Fractions and Mixed Numbers, Introduce Decimals	8 Weeks	
Unit 4: Solving word problems using fractions and decimal notation.	8 Weeks	
Unit 5: Angles, Parallel and Perpendicular Lines, Measurement of Perimeter and Area and unit Measures	4 Weeks	

Title	Place value and use the Four Operations with Whole Numbers to Solve Problems. Estimation and Number Theory
Unit Duration	8 Weeks
Unit Summary & Rationale	<i>This unit begins with extending place value understanding of multi-digit numbers, student understanding of multiplication and division, and the use of all four operations to solve word problems. Students will use estimations and number theory in order to solve problems.</i>
Unit Goals	
Essential Questions	<ul style="list-style-type: none"> • When would you want to compare numbers using $<$, $>$, and $=$? • How do you determine how to round multi-digit whole numbers to any place? • How do I show the relationship between numbers and place value for whole numbers up to the millions? • What strategies can be used to solve problems using multiplication and division? • Why is it important to write an equation for a word problem? • How can being fluent in addition and subtraction facts help me?
Enduring Understandings	<ul style="list-style-type: none"> • Students need to be proficient in understanding place value of whole numbers up to 100,000 in order to add, subtract, multiply and divide, write equations and make multiplicative comparisons while using mathematical reasoning to solve real world problems. Develop understanding and fluency with multi digit multiplication and develop understanding of dividing to find quotients involving multi digit dividends. • There are many ways to represent a quantity and you would want to know when quantities are equal, less than, or greater than in making decisions. • Rounding numbers help you to estimate and use mental math. • Knowing the value is essential for life long money management/finances.

	<ul style="list-style-type: none"> • Knowing many different strategies to solve word problems is helps students to successfully solve for the answer. • Fluency in addition and subtraction facts help with proficiency.
Learning Outcomes	<ul style="list-style-type: none"> • Be able to identify place value through the millions. • Be able to identify the value of digits through the millions. • Be able to compare and order numbers based on place value to the millions place. • Be able to write numbers in standard notation, written form, and expanded notation. • Be able to round numbers to the nearest ten, hundred, thousands or millions. • Be able to write number sentences to match given problem situations. • Be able to use opposite operations to solve algebraic expressions. • Be able to multiply numbers up to 3 digit by 2 digit numbers. • Be able to use partial products multiplication to multiply 3 digit by 2 digit numbers. • Be able to use expanded notation to decompose numbers. • Be able to divide numbers up to 3 digits by 2 digit numbers. • Be able to use partial quotients to divide numbers up to 3 digits by 2 digits. • Be able to use problem solving steps to solve real world problems. • Be able to add and subtract multi digit numbers using the standard algorithm.

Assessment Evidence	
Formative	Collaborative Activities, Homework, Classwork, Discussion, Independent Class Assignment, Informal Observations of Students, Digital Personal Math Trainer, Games, Exit Slips, Questioning, Teacher Made Pages, Learning Centers, LinkIt, Problem of the Day, Problem of the Week, Entrance Slips.
Summative	LinkIt Benchmark Assessments, Tests, Mid-Chapter Checkpoint Assessments, Quizzes, Written Responses.
Alternative and Benchmark	LinkIt Benchmark Assessments, Totowa TPA

	Alternative – Reteaching, One on One Conferencing, Learning Centers, Levels Homework, Higher Order Thinking Problems, Additional leveled practice Formative, Summative, Alternative and Benchmark Assessments
Resources to Promote Learning	
Resources & Equipment Needed	Smartboard, Computers, iPads, websites and digital interactives/models, Multi-media presentations, video streaming, Brain Pop, Microsoft 365, Primary and Secondary Source Documents, Go Math! Resources, Assorted Manipulatives, Khan Academy, ThinkCentral. Approved Class Resource List
Content & Interdisciplinary Standards	
NJ 2020 SLS: Mathematics	
NJSLS	Activity
4.NF.A.1. Explain why a fraction a/b is equivalent to a fraction $(n \times a)/(n \times b)$ by using visual fraction models, with attention to how the number and size of the parts differ even though the two fractions themselves are the same size. Use this principle to recognize and generate equivalent fractions.	<ul style="list-style-type: none"> • Guess my number activity based on place value. Matching place value card game. Use base ten blocks to make place value concrete. • Number card comparison game. Dice roll game to create numbers, compare them and identify specific digits.
4.NF.A.2. Compare two fractions with different numerators and different denominators, e.g., by creating common denominators or numerators, or by comparing to a benchmark fraction such as $1/2$. Recognize that comparisons are valid only when the two fractions refer to the same whole. Record the results of comparisons with symbols $>$, $=$, or $<$, and	

<p>justify the conclusions, e.g., by using a visual fraction model.</p>	
<p>4.NF.B.3. Understand a fraction a/b with $a > 1$ as a sum of fractions $1/b$. 4.NF.B.3a. Understand addition and subtraction of fractions as joining and separating parts referring to the same whole. 4.NF.B.3b. Decompose a fraction into a sum of fractions with the same denominator in more than one way, recording each decomposition by an equation. Justify decompositions, e.g., by using a visual fraction model. Show details 4.NF.B.3c. Add and subtract mixed numbers with like denominators, e.g., by replacing each mixed number with an equivalent fraction, and/or by using properties of operations and the relationship between addition and subtraction. 4.NF.B.3d. Solve word problems involving addition and subtraction of fractions referring to the same whole and having like denominators, e.g., by using visual fraction models and equations to represent the problem.</p>	<ul style="list-style-type: none"> • Round numbers on cards and sort them according to specific rounding rules.
<p>4.OA.A.1. Interpret a multiplication equation as a comparison, e.g., interpret $35 = 5 \times 7$ as a statement that 35 is 5 times as many as 7 and 7 times as many as 5.</p>	<ul style="list-style-type: none"> • Use sentence strips to write number sentences. • Use counters and calculators to model repeated subtraction and repeated addition to relate to multiplication/division. Create posters of problem solving strategies.

<p>Represent verbal statements of multiplicative comparisons as multiplication equations.</p> <p>4.OA.A.2. Multiply or divide to solve word problems involving multiplicative comparison, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem, distinguishing multiplicative comparison from additive comparison.</p> <p>4.OA.A.3. Solve multistep word problems posed with whole numbers and having whole-number answers using the four operations, including problems in which remainders must be interpreted. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.</p>	<ul style="list-style-type: none"> • Use problem solving model (4 part problem-solving boxes/graph) to write equations. • Use a graphic organizer as a problem solving tool.
<p>4.NBT.B.4. Fluently add and subtract multi-digit whole numbers using the standard algorithm.</p>	<ul style="list-style-type: none"> • Play a dice game to practice “Adding up to 999” and “Subtracting Down to 0.” Use store advertisements and a specified budget to solve real world addition and subtraction,”2 Items for \$1,000” and “3 Items for \$500”. Use base 10 blocks to find solutions.
<p>Mathematical Practices</p>	
<ul style="list-style-type: none"> • MP.1. Make sense of problems and persevere in solving them. • MP.2. Reason abstractly and quantitatively. • MP.3. Construct viable arguments and critique the reasoning of others. 	

- MP.4. Model with mathematics.
- MP.5. Use appropriate tools strategically.
- MP.6. Attend to precision.
- MP.7. Look for and make use of structure.
- MP.8. Look for and express regularity in repeated reasoning.

NJ: 2016 SLS: English Language Arts

- RI.4.1. Refer to details and examples in a text and make relevant connections when explaining what the text says explicitly and when drawing inferences from the text.
- RI.4.3. Explain events, procedures, ideas, or concepts in a historical, scientific, or technical text, including what happened and why, based on specific information in the text.
- 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.4.1. Write opinion pieces on topics or texts, supporting a point of view with reasons and information.
- 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.
- L.4.1. Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.
- L.4.3. Use knowledge of language and its conventions when writing, speaking, reading, or listening.

2020 SLS: Computer Science & Design Thinking

NJSLS Performance Expectations (By the end of 5th Grade)

- 8.2.5.ED.3: Follow step by step directions to assemble a product or solve a problem, using appropriate tools to accomplish the task.
- 8.1.5.IC.1: Identify computing technologies that have impacted how individuals live and work and describe the factors that influenced the changes.
- 8.1.5.IC.2: Identify possible ways to improve the accessibility and usability of computing technologies to address the diverse needs and wants of users.
- 8.1.5.DA.1: Collect, organize, and display data in order to highlight relationships or support a claim.
- 8.1.5.DA.3: Organize and present collected data visually to communicate insights gained from different views of the data.

2020 SLS: Career Readiness, Life Literacies, and Key Skills

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Career Readiness, Life Literacies, and Key Skills Practices describe the habits of the mind that all educators in all content areas should seek to develop in their students. They are practices that have been linked to increase college, career, and life success. These practices should be taught and reinforced in all content areas with increasingly higher levels of complexity and expectation as a student advances through a program of study.

- Act as a responsible and contributing community members and employee.
- Attend to financial well-being.
- Consider the environmental, social and economic impacts of decisions
- Demonstrate creativity and innovation.
- Utilize critical thinking to make sense of problems and persevere in solving them.
- Model integrity, ethical leadership and effective management.
- Plan education and career paths aligned to personal goals.
- Use technology to enhance productivity increase collaboration and communicate effectively.
- Work productively in teams while using cultural/global competence

- 9.2.5.CAP.1: Evaluate personal likes and dislikes and identify careers that might be suited to personal likes.
- 9.4.5.CI.3: Participate in a brainstorming session with individuals with diverse perspectives to expand one’s thinking about a topic of curiosity (e.g., 8.2.5.ED.2, 1.5.5.CR1a).
- 9.4.5.CT.1: Identify and gather relevant data that will aid in the problem-solving process
- 9.4.5.CT.2: Identify a problem and list the types of individuals and resources
- 9.4.5.CT.3: Describe how digital tools and technology may be used to solve problems.
- 9.4.5.CT.4: Apply critical thinking and problem-solving strategies to different types of problems such as personal, academic, community and global.

Interdisciplinary Connections

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.

21st Century Connections

- Creativity and Innovation
- Critical thinking
- Collaboration and Teamwork
- Problem Solving

Title	Whole Number Multiplication and Division and Properties of Operations
Unit Duration	8 Weeks
Unit Summary & Rationale	<i>Unit 2 computes multi-digit whole numbers and generates equivalent fractions. Unit 2 has one benchmarked standard: “Fluently add and subtract multi-digit whole numbers using the standard algorithm” [4.NBT.4]. Students will find all factor pairs, multiples and patterns for whole numbers ranging from 1-100. Students will multiply and divide large numbers using arrays and area models as strategies. Students will also solve word problems with four operations to include answers with whole numbers and remainders. Lastly, students will recognize, generate, and explain why fractions are equivalent using visual models and equations.</i>
Unit Goals	
Essential Questions	<ul style="list-style-type: none"> • How can being fluent in addition and subtraction facts help me? • How can I use arrays and area models to compute and explain multiplication and division? • How many different ways can I use models to determine, explain and compare equivalent fractions? • How can I represent an unknown number in a word problem and how do I solve for what the unknown number represents? • Why is it important to recognize if a number is prime or composite? • Why and how do we break multiples down into factors? • Are patterns important in our world and why?
Enduring Understandings	<ul style="list-style-type: none"> • Fluency in addition and subtraction facts help with proficiency • Arrays and area models aid in concrete understanding

	<ul style="list-style-type: none"> • Manipulatives create concrete understanding of fractions • Understanding how to use variables as unknowns help to translate word problems into equations. • Knowing how to break down multiples into factors aids students in proficiency. • Division is an important operation in real world problems with understanding the concept of parts to the whole. • Patterns are everywhere in the real world and should be analyzed to help us to form a concrete understanding.
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Learning Outcomes	<ul style="list-style-type: none"> • Be able to add and subtract multi-digit numbers using the standard algorithm. • Be able to draw pictures of groups, arrays, and area models to solve multiplication problems with 4 digits by 1 digit and 2 digit by 2 digit numbers. • Be able to draw pictures, arrays, and area models to solve division problems with multi-digit dividends by one-digit divisors. • Be able to write number sentences to accompany a division model. • Be able to identify equivalent fractions. • Be able to use problem solving strategies to solve real world problems. • Be able to define a multiple and factor. • Be able to find multiples of a factor. • Be able to find all factors of one number. • Be able to identify and complete patterns and number sequences and tables. • Be able to multiply fractions by whole numbers.
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Assessment Evidence	
Formative	Collaborative Activities, Homework, Classwork, Discussion, Independent Class Assignment, Informal Observations of Students, Digital Personal Math Trainer, Games, Exit Slips, Questioning, Teacher Made Pages, Learning Centers, LinkIt, Problem of the Day, Problem of the Week, Entrance Slips.
Summative	LinkIt Benchmark Assessments, Tests, Mid-Chapter Checkpoint Assessments, Quizzes, Written Responses.

Alternative and Benchmark	<p>LinkIt Benchmark Assessments, Totowa TPA</p> <p>Alternative – Reteaching, One on One Conferencing, Learning Centers, Levels Homework, Higher Order Thinking Problems, Additional leveled practice</p> <p>Formative, Summative, Alternative and Benchmark Assessments</p>
Resources to Promote Learning	
Resources & Equipment Needed	<p>Smartboard, Computers, iPads, websites and digital interactives/models, Multi-media presentations, video streaming, Brain Pop, Microsoft 365, Primary and Secondary Source Documents, Go Math! Resources, Assorted Manipulatives, Khan Academy, ThinkCentral.</p> <p>Approved Class Resource List</p>
Content & Interdisciplinary Standards	
NJ 2020 SLS: Mathematics	
NJSLS	Activity
<p>4.OA.B.4. Find all factor pairs for a whole number in the range 1–100. Recognize that a whole number is a multiple of each of its factors. Determine whether a given whole number in the range 1–100 is a multiple of a given one-digit number. Determine whether a given whole number in the range 1–100 is prime or composite.</p> <p>4.OA.C.5. Generate a number or shape pattern that follows a given rule. Identify apparent features of the pattern that were not explicit in the rule itself.</p>	<ul style="list-style-type: none"> • Create posters with definitions of prime and composite numbers for classroom display. • Create factor trees to find factors for a given multiple. • Students use number cards and blank tables to find patterns and tables. Match tables cards with their appropriate rule cards.
<p>4.NF.A.1. Explain why a fraction $\frac{a}{b}$ is equivalent to a fraction $\frac{n \times a}{n \times b}$ by using visual fraction models, with attention to how the number and size of the parts</p>	<ul style="list-style-type: none"> • Use pattern blocks and fraction bars to create concrete examples of equivalent fractions.

<p>differ even though the two fractions themselves are the same size. Use this principle to recognize and generate equivalent fractions.</p> <p>4.NF.A.2. Compare two fractions with different numerators and different denominators, e.g., by creating common denominators or numerators, or by comparing to a benchmark fraction such as $\frac{1}{2}$. Recognize that comparisons are valid only when the two fractions refer to the same whole. Record the results of comparisons with symbols $>$, $=$, or $<$, and justify the conclusions, e.g., by using a visual fraction model.</p>	<ul style="list-style-type: none"> • Students play a game with fraction cards to compare fractions. Students draw models and write equations to compare and solve fractions.
<p>4.NBT.B.6. Find whole-number quotients and remainders with up to four-digit dividends and one-digit divisors, using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.</p>	<ul style="list-style-type: none"> • Use counters to solve problems involving splitting a given total into equal groups. Use graphic organizers to draw examples of division.
<p>Mathematical Practices</p>	
<ul style="list-style-type: none"> • MP.1. Make sense of problems and persevere in solving them. • MP.2. Reason abstractly and quantitatively. • MP.3. Construct viable arguments and critique the reasoning of others. • MP.4. Model with mathematics. • MP.5. Use appropriate tools strategically. • MP.6. Attend to precision. • MP.7. Look for and make use of structure. 	

- MP.8. Look for and express regularity in repeated reasoning.

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- W.4.1. Write opinion pieces on topics or texts, supporting a point of view with reasons and information.
- 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.
- L.4.1. Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.
- L.4.3. Use knowledge of language and its conventions when writing, speaking, reading, or listening.

2020 SLS: Computer Science & Design Thinking

NJSLS Performance Expectations (By the end of 5th Grade)

- 8.2.5.ED.3: Follow step by step directions to assemble a product or solve a problem, using appropriate tools to accomplish the task.
- 8.1.5.IC.1: Identify computing technologies that have impacted how individuals live and work and describe the factors that influenced the changes.
- 8.1.5.IC.2: Identify possible ways to improve the accessibility and usability of computing technologies to address the diverse needs and wants of users.
- 8.1.5.DA.1: Collect, organize, and display data in order to highlight relationships or support a claim.
- 8.1.5.DA.3: Organize and present collected data visually to communicate insights gained from different views of the data.

2020 SLS: Career Readiness, Life Literacies, and Key Skills

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Career Readiness, Life Literacies, and Key Skills Practices describe the habits of the

- Act as a responsible and contributing community members and employee.
- Attend to financial well-being.

<p>mind that all educators in all content areas should seek to develop in their students. They are practices that have been linked to increase college, career, and life success. These practices should be taught and reinforced in all content areas with increasingly higher levels of complexity and expectation as a student advances through a program of study.</p>	<ul style="list-style-type: none"> • Consider the environmental, social and economic impacts of decisions • Demonstrate creativity and innovation. • Utilize critical thinking to make sense of problems and persevere in solving them. • Model integrity, ethical leadership and effective management. • Plan education and career paths aligned to personal goals. • Use technology to enhance productivity increase collaboration and communicate effectively. • Work productively in teams while using cultural/global competence
<ul style="list-style-type: none"> • 9.2.5.CAP.1: Evaluate personal likes and dislikes and identify careers that might be suited to personal likes. • 9.4.5.CI.3: Participate in a brainstorming session with individuals with diverse perspectives to expand one’s thinking about a topic of curiosity (e.g., 8.2.5.ED.2, 1.5.5.CR1a). • 9.4.5.CT.1: Identify and gather relevant data that will aid in the problem-solving process • 9.4.5.CT.2: Identify a problem and list the types of individuals and resources • 9.4.5.CT.3: Describe how digital tools and technology may be used to solve problems. • 9.4.5.CT.4: Apply critical thinking and problem-solving strategies to different types of problems such as personal, academic, community and global. 	
<p>Interdisciplinary Connections</p>	
<p>Science</p>	<p>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.</p>
<p>21st Century Connections</p>	<ul style="list-style-type: none"> • Creativity and Innovation • Critical thinking • Collaboration and Teamwork • Problem Solving

<p>Title</p>	<p>Addition, Subtraction and Multiplication of Fractions and Mixed Numbers, Introduce Decimals</p>
<p>Unit Duration</p>	<p>8 Weeks</p>
<p>Unit Summary & Rationale</p>	<p><i>In unit 3 students compare, decompose, and add and subtract fractions with like</i></p>

	<p><i>denominators (including mixed numbers). Students will also acquire the skill of creating a number or shape pattern so that they can identify the sequence, apply the sequence rule to the pattern, and observe and explain the outcome of the extended pattern. Students compare, add, and subtract fractions with unlike denominators by translating the fractions into fractions with common denominators. Also, students will add and subtract mixed numbers with common denominators and continue to solve multi-step real world problems with four operations. Students will be able to multiply fractions by a whole number.</i></p>
Unit Goals	
Essential Questions	<ul style="list-style-type: none"> • How can models help me to compare fractions with unlike and common denominators? • How can I change mixed numbers into fractions? What strategies can I use? • Why is it important to know how to solve addition and subtraction of fractions? • Why do we use variables to represent the unknown in equations? • How do we decompose and reconstruct numbers to find sums and differences when adding and subtracting?
Enduring Understandings	<ul style="list-style-type: none"> • Models allow the student to formulate concrete understandings and extend their learning of concepts. • Understanding the various strategies for changing mixed numbers into fractions aids in good number sense. • Fractions are used in every day in the real world and must be an acquired skill to accurately represent measurements. • Using and writing variables is a skill used in the real world to understand relationships among numbers. • Using variables develops the awareness of algebraic equations.
Learning Outcomes	<ul style="list-style-type: none"> • Be able to use symbols to compare and order fractions that are less than one whole. • Be able to use models to compare fractions • Be able to decompose a fraction into a sum of fractions with the same denominator. • Be able to add and subtract mixed numbers with like denominators.

- Be able to solve addition and subtraction fraction word problems using fraction models and equations.
- Be able to write addition and subtraction equations using variables using data given in word problems.
- Be able to add and subtract 2 multi-digit whole numbers using standard algorithm.

Assessment Evidence	
Formative	Collaborative Activities, Homework, Classwork, Discussion, Independent Class Assignment, Informal Observations of Students, Digital Personal Math Trainer, Games, Exit Slips, Questioning, Teacher Made Pages, Learning Centers, LinkIt, Problem of the Day, Problem of the Week, Entrance Slips.
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Resources to Promote Learning	
Resources & Equipment Needed	Smartboard, Computers, iPads, websites and digital interactives/models, Multi-media presentations, video streaming, Brain Pop, Microsoft 365, Primary and Secondary Source Documents, Go Math! Resources, Assorted Manipulatives, Khan Academy, ThinkCentral. Approved Class Resource List
Content & Interdisciplinary Standards	
NJ 2020 SLS: Mathematics	
NJSLS	Activity
4.NF.B.3b. Decompose a fraction into a sum of fractions with the same	<ul style="list-style-type: none"> • Use fraction cards and models to decompose fractions providing concrete experiences.

<p>denominator in more than one way, recording each decomposition by an equation. Justify decompositions, e.g., by using a visual fraction model.</p> <p>4.NF.B.3c. Add and subtract mixed numbers with like denominators, e.g., by replacing each mixed number with an equivalent fraction, and/or by using properties of operations and the relationship between addition and subtraction.</p> <p>4.NF.B.3d. Solve word problems involving addition and subtraction of fractions referring to the same whole and having like denominators, e.g., by using visual fraction models and equations to represent the problem.</p> <p>4.NF.B.4. Apply and extend previous understandings of multiplication to multiply a fraction by a whole number.</p>	<ul style="list-style-type: none"> • Students play a team game using fraction and wipe-out cards to add and subtract mixed numbers for points. Students draw models and write number sentences that represent addition and subtraction of mixed numbers in word problems. • Play a teacher created challenge for points. • Students use shaded fraction models to find answers to multiplication problems. • Teams play student / teacher created challenges for points.
<p>4.OA.A.3. Solve multistep word problems posed with whole numbers and having whole-number answers using the four operations, including problems in which remainders must be interpreted. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.</p>	<ul style="list-style-type: none"> • Students play a team game writing and answering equations to solve problems for points.

<p>4.NBT.B.4. Fluently add and subtract multi-digit whole numbers using the standard algorithm.</p>	<ul style="list-style-type: none"> • Students complete math puzzles.
<p>4.MD.A.1. Know relative sizes of measurement units within one system of units including km, m, cm, mm; kg, g; lb, oz.; l, ml; hr, min, sec. Within a single system of measurement, express measurements in a larger unit in terms of a smaller unit. Record measurement equivalents in a two-column table.</p>	<ul style="list-style-type: none"> • Students play the Measurement Stand Off Game to compare two measurements.
<p>Mathematical Practices</p>	
<ul style="list-style-type: none"> • MP.1. Make sense of problems and persevere in solving them. • MP.2. Reason abstractly and quantitatively. • MP.3. Construct viable arguments and critique the reasoning of others. • MP.4. Model with mathematics. • MP.5. Use appropriate tools strategically. • MP.6. Attend to precision. • MP.7. Look for and make use of structure. • MP.8. Look for and express regularity in repeated reasoning. 	
<p>NJ: 2016 SLS: English Language Arts</p>	
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2020 SLS: Computer Science & Design Thinking

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- Plan education and career paths aligned to personal goals.
- Use technology to enhance productivity increase collaboration and communicate effectively.

and expectation as a student advances through a program of study.	<ul style="list-style-type: none"> • Work productively in teams while using cultural/global competence
<ul style="list-style-type: none"> • 9.2.5.CAP.1: Evaluate personal likes and dislikes and identify careers that might be suited to personal likes. • 9.4.5.CI.3: Participate in a brainstorming session with individuals with diverse perspectives to expand one’s thinking about a topic of curiosity (e.g., 8.2.5.ED.2, 1.5.5.CR1a). • 9.4.5.CT.1: Identify and gather relevant data that will aid in the problem-solving process • 9.4.5.CT.2: Identify a problem and list the types of individuals and resources • 9.4.5.CT.3: Describe how digital tools and technology may be used to solve problems. • 9.4.5.CT.4: Apply critical thinking and problem-solving strategies to different types of problems such as personal, academic, community and global. 	
Interdisciplinary Connections	
Science	<ul style="list-style-type: none"> • 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.
21st Century Connections	<ul style="list-style-type: none"> • Creativity and Innovation • Critical thinking • Collaboration and Teamwork • Problem Solving

Title	Extend Understanding of Fractions, Solve Word Problems, Introduce Decimals, Compare Decimals
Unit Duration	8 Weeks
Unit Summary & Rationale	<i>Unit 4 extends the understanding of fractions to solve word problems including decimal notation. Students continue to multiply fractions by whole numbers. Students also add fractions with denominators of 10 and 100 by writing each fraction with denominators of 100. Additionally, students also convert fractions with denominators of 100 into decimals. Students apply perimeter and area formulas for rectangles in real world mathematical problems. Lastly, students continue to solve word problems using variables for unknowns as well as use four operations involving simple fractions and decimals that incorporate measurement comparisons of like units. Students identify and classify two</i>

dimensional figures. Lastly, students draw and identify points, lines, segments, rays and lines of symmetry.

Unit Goals

Essential Questions

- How can I use models to demonstrate multiplying fractions and whole numbers?
- How does converting fractions to like denominators of 100 help me with understanding decimals?
- How can I use place value of tenths and hundredths to compare fractions and decimals?
- What is the difference between a line segment, line, ray, and points..
- What two dimensional shapes are found in our real world.
- How can I find a shape's line of symmetry and what shapes have lines of symmetry.

Enduring Understandings

- Proficient knowledge of fractions leads to better understanding of decimals when the denominators are 10 and 100. This skill leads to applying perimeter and area formulas to measurements in real world mathematical situations. Understanding that geometric figures can be analyzed and classified based on their properties as having parallel sides, perpendicular sides, particular angle measurement and symmetry.
- The use of grid models aids in understanding how multiplying a fraction by a fraction produces a smaller fraction.
- Decimals with a denominator of 100 can easily be compared to one another as well as fractions with denominators of 100 can easily be compared to one another as well as fractions to decimals since the decimal system is a base 10 system.
- Understand that symmetry can be found in the real world in humans, nature, images and objects.

Learning Outcomes

- Be able to multiply fractions by whole numbers.
- Be able to solve word problems involving multiplying a fraction by a whole number.
- Be able to add fractions with denominators with 10 and 100 as denominators by first writing them as a fraction with denominators of 100.

- Be able to write decimal representation for a model/picture through the hundreds place.
- Be able to determine what picture matches a decimal picture/model.
- Be able to convert fraction with denominators of 10 and 100 to decimals.
- Be able to compare and order decimals to the hundredths place.
- Be able to identify point, line, line segment, ray and plane.
- Be able to classify triangles as right, obtuse, isosceles, and scalene.
- Be able to identify a line of symmetry.
- Be able to determine if a shape is symmetrical
- Be able to analyze and classify two dimensional figures based on properties.

Assessment Evidence	
Formative	Collaborative Activities, Homework, Classwork, Discussion, Independent Class Assignment, Informal Observations of Students, Digital Personal Math Trainer, Games, Exit Slips, Questioning, Teacher Made Pages, Learning Centers, LinkIt, Problem of the Day, Problem of the Week, Entrance Slips.
Summative	LinkIt Benchmark Assessments, Tests, Mid-Chapter Checkpoint Assessments, Quizzes, Written Responses.
Alternative and Benchmark	LinkIt Benchmark Assessments, Totowa TPA Alternative – Reteaching, One on One Conferencing, Learning Centers, Levels Homework, Higher Order Thinking Problems, Additional leveled practice Formative, Summative, Alternative and Benchmark Assessments
Resources to Promote Learning	
Resources & Equipment Needed	Smartboard, Computers, iPads, websites and digital interactives/models, Multi-media presentations, video streaming, Brain Pop, Microsoft 365, Primary and Secondary Source Documents, Go Math! Resources, Assorted Manipulatives, Khan Academy, ThinkCentral. Approved Class Resource List
Content & Interdisciplinary Standards	

NJ 2020 SLS: Mathematics	
NJSLS	Activity
<p>4.NF.B.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.</p> <p>4.NF.B.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</p>	<ul style="list-style-type: none"> • Students use shaded fraction models to find answers to multiplication problems. • Teams play mathematical game for points.
<p>4.NF.C.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.</p> <p>4.NF.C.6. Use decimal notation for fractions with denominators 10 or 100</p> <p>4.NF.C.7. Compare two decimals to hundredths by reasoning about their size. Recognize that comparisons are valid only when the two decimals refer to the same whole. Record the results of comparisons with the symbols $>$, $=$, or $<$, and justify the conclusions, e.g., by using a visual model.</p>	<ul style="list-style-type: none"> • Students use base 10 blocks to change fractions from tenths to hundredths as a concrete visual. • Students use base 10 blocks to learn place value in tenths and hundredths for decimal sense. Students use model money to help find decimals. • Play a game whereby students draw decimal cards, shade in models to represent decimals and then compare them. Play dice game to create decimals and then compare them.
<p>4.OA.A.3. Solve multistep word problems posed with whole numbers and having whole-number answers using the four operations, including problems in which</p>	<ul style="list-style-type: none"> • Students work in partnerships to write equations and solve problems.

<p>remainders must be interpreted. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.</p>	
<p>4.G.A.2. Classify two-dimensional figures based on the presence or absence of parallel or perpendicular lines, or the presence or absence of angles of a specified size. Recognize right triangles as a category, and identify right triangles.</p> <p>4.G.A.3. Recognize a line of symmetry for a two-dimensional figure as a line across the figure such that the figure can be folded along the line into matching parts. Identify line-symmetric figures and draw lines of symmetry.</p>	<ul style="list-style-type: none"> • Students create a flip book to include definitions and pictures of each type of triangle. Students classify triangles through picture sorts. Students use rulers to construct different triangles. • Students classify pictures into those that are or are not symmetrical. Students create designs that are symmetrical.
Mathematical Practices	
<ul style="list-style-type: none"> • MP.1. Make sense of problems and persevere in solving them. • MP.2. Reason abstractly and quantitatively. • MP.3. Construct viable arguments and critique the reasoning of others. • MP.4. Model with mathematics. • MP.5. Use appropriate tools strategically. • MP.6. Attend to precision. • MP.7. Look for and make use of structure. • MP.8. Look for and express regularity in repeated reasoning. 	
NJ: 2016 SLS: English Language Arts	

- RI.4.1. Refer to details and examples in a text and make relevant connections when explaining what the text says explicitly and when drawing inferences from the text.
- RI.4.3. Explain events, procedures, ideas, or concepts in a historical, scientific, or technical text, including what happened and why, based on specific information in the text.
- 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.4.1. Write opinion pieces on topics or texts, supporting a point of view with reasons and information.
- 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.
- L.4.1. Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.
- L.4.3. Use knowledge of language and its conventions when writing, speaking, reading, or listening.

2020 SLS: Computer Science & Design Thinking

NJSLS Performance Expectations (By the end of 5th Grade)

- 8.2.5.ED.3: Follow step by step directions to assemble a product or solve a problem, using appropriate tools to accomplish the task.
- 8.1.5.IC.1: Identify computing technologies that have impacted how individuals live and work and describe the factors that influenced the changes.
- 8.1.5.IC.2: Identify possible ways to improve the accessibility and usability of computing technologies to address the diverse needs and wants of users.
- 8.1.5.DA.1: Collect, organize, and display data in order to highlight relationships or support a claim.
- 8.1.5.DA.3: Organize and present collected data visually to communicate insights gained from different views of the data.

2020 SLS: Career Readiness, Life Literacies, and Key Skills

NJSLS Performance Expectations (By the end of 5th Grade)

Career Readiness, Life Literacies, and Key Skills Practices describe the habits of the mind that all educators in all content areas should seek to develop in their students. They are practices that have been linked to increase college, career, and life success. These practices should be taught and

- Act as a responsible and contributing community members and employee.
- Attend to financial well-being.
- Consider the environmental, social and economic impacts of decisions
- Demonstrate creativity and innovation.
- Utilize critical thinking to make sense of problems and persevere in solving them.

reinforced in all content areas with increasingly higher levels of complexity and expectation as a student advances through a program of study.	<ul style="list-style-type: none"> • Model integrity, ethical leadership and effective management. • Plan education and career paths aligned to personal goals. • Use technology to enhance productivity increase collaboration and communicate effectively. • Work productively in teams while using cultural/global competence
<ul style="list-style-type: none"> • 9.2.5.CAP.1: Evaluate personal likes and dislikes and identify careers that might be suited to personal likes. • 9.4.5.CI.3: Participate in a brainstorming session with individuals with diverse perspectives to expand one’s thinking about a topic of curiosity (e.g., 8.2.5.ED.2, 1.5.5.CR1a). • 9.4.5.CT.1: Identify and gather relevant data that will aid in the problem-solving process • 9.4.5.CT.2: Identify a problem and list the types of individuals and resources • 9.4.5.CT.3: Describe how digital tools and technology may be used to solve problems. • 9.4.5.CT.4: Apply critical thinking and problem-solving strategies to different types of problems such as personal, academic, community and global. 	
Interdisciplinary Connections	
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.
21st Century Connections	<ul style="list-style-type: none"> • Creativity and Innovation • Critical thinking • Collaboration and Teamwork • Problem Solving

Title	Angles, Parallel and Perpendicular Lines, Measurement of Perimeter and Area and unit Measures
Unit Duration	4 Weeks
Unit Summary & Rationale	<i>In unit 5 students add and subtract problems involving angles in real world situations. Students continue to solve multi-step word problems by using whole</i>

	<i>numbers while applying the four operations. Students apply perimeter and area formulas for rectangles in real world mathematical problems. Lastly, Students solve word problems using variables for unknowns as well as use four operations that involve measurement comparisons of like units.</i>
Unit Goals	
Essential Questions	<ul style="list-style-type: none"> • How do I measure angles in a two dimensional shape? • How many different types of angles are there and what are their attributes? • Where do we find angles in our real world? • Which unit of measure do I use to measure weight, length, volume and capacity? Is there universal measuring system? • When would I need to use perimeter or area in real life situations? • How does placing data on a graph help me to organize data display data and solve fraction problems with like denominators?
Enduring Understandings	<ul style="list-style-type: none"> • There are many ways to represent quantities and changing a fraction with a denominator of hundredths helps to prepare students for percentages. • Angles are everywhere in the real world and all constructions are based upon geometric figures. • Understand that angles can be found in drawings, architecture, artwork, clothing construction and computer generated graphics. • Measurements must be quantified using a universal same type unit of measurement to establish the relationships amongst the measurement.
Learning Outcomes	<ul style="list-style-type: none"> • Be able to recognize right, acute and obtuse angles. • Be able to classify angles into three groups-right, obtuse and acute angles. • Be able to use protractors to measure angles. • Be able to find the missing angle measurement in polygons. • Be able to solve addition and subtraction problems for unknown angles in word problems and use symbols for the unknown measures. • Be able to use a measurement chart to aid in making conversions. • Be able to use t-charts to make conversions between measurements • Be able to make conversions between measurements to solve problems. • Be able to solve problems involving time, temperature, money, weight, capacity, and length

- Be able to measure length to the nearest centimeter and $\frac{1}{4}$ inch
- Be able to use formulas to solve for perimeter and area.
- Be able to decide if a word problem is asking about perimeter or area.
- Be able to find area and perimeter of rectangles
- Be able to find area of irregular shapes using formulas for rectangles

Assessment Evidence	
Formative	Collaborative Activities, Homework, Classwork, Discussion, Independent Class Assignment, Informal Observations of Students, Digital Personal Math Trainer, Games, Exit Slips, Questioning, Teacher Made Pages, Learning Centers, LinkIt, Problem of the Day, Problem of the Week, Entrance Slips.
Summative	LinkIt Benchmark Assessments, Tests, Mid-Chapter Checkpoint Assessments, Quizzes, Written Responses.
Alternative and Benchmark	LinkIt Benchmark Assessments, Totowa TPA Alternative – Reteaching, One on One Conferencing, Learning Centers, Levels Homework, Higher Order Thinking Problems, Additional leveled practice Formative, Summative, Alternative and Benchmark Assessments
Resources to Promote Learning	
Resources & Equipment Needed	Smartboard, Computers, iPads, websites and digital interactives/models, Multi-media presentations, video streaming, Brain Pop, Microsoft 365, Primary and Secondary Source Documents, Go Math! Resources, Assorted Manipulatives. Approved Class Resource List
Content & Interdisciplinary Standards	
NJ 2020 SLS: Mathematics	
NJSLS	Activity
4.MD.A.1. Know relative sizes of measurement units within one system of units including km, m, cm, mm; kg, g; lb, oz.; l, ml; hr, min, sec. Within a single	<ul style="list-style-type: none"> • Students play the measurement Stand Off game to compare two measurements. • Students work in teams to solve problems.

<p>system of measurement, express measurements in a larger unit in terms of a smaller unit. Record measurement equivalents in a two-column table. Show details 4.MD.A.2. Use the four operations to solve word problems involving distances, intervals of time, liquid volumes, masses of objects, and money, including problems involving simple fractions or decimals, and problems that require expressing measurements given in a larger unit in terms of a smaller unit. Represent measurement quantities using diagrams such as number line diagrams that feature a measurement scale. 4.MD.A.3. Apply the area and perimeter formulas for rectangles in real world and mathematical problems.</p>	<ul style="list-style-type: none"> • Students make classroom posters showing area and perimeter definitions, key words and formulas. • Class creates a line plot about length of their hands and analyzes data.
<p>4.MD.B.4. Make a line plot to display a data set of measurements in fractions of a unit ($\frac{1}{2}$, $\frac{1}{4}$, $\frac{1}{8}$). Solve problems involving addition and subtraction of fractions by using information presented in line plots</p>	<ul style="list-style-type: none"> • Make a line plot
<p>4.MD.C.5. Recognize angles as geometric shapes that are formed wherever two rays share a common endpoint, and understand concepts of angle measurement: 4.MD.C.5a. An angle is measured with reference to a circle with its center at the common endpoint of the rays, by considering the fraction of the circular arc</p>	<ul style="list-style-type: none"> • Students create angle flipbooks to include definitions and example pictures. Students use their arms to act out each type of angle. Use pattern blocks to create a design showing three types of angles. Students create posters displaying hints and mnemonic devices to remember difference among three angles.

between the points where the two rays intersect the circle. An angle that turns through $\frac{1}{360}$ of a circle is called a “one-degree angle,” and can be used to measure angles.

4.MD.C.5b. An angle that turns through n one-degree angles is said to have an angle measure of n degrees.

4.MD.C.6. Measure angles in whole-number degrees using a protractor. Sketch angles of specified measure.

4.MD.C.7. Recognize angle measure as additive. When an angle is decomposed into non-overlapping parts, the angle measure of the whole is the sum of the angle measures of the parts. Solve addition and subtraction problems to find unknown angles on a diagram in real world and mathematical problems, e.g., by using an equation with a symbol for the unknown angle measure.

4.G.A.1. Draw points, lines, line segments, rays, angles (right, acute, obtuse), and perpendicular and parallel lines. Identify these in two-dimensional figures.

4.G.A.2. Classify two-dimensional figures based on the presence or absence of parallel or perpendicular lines, or the presence or absence of angles of a specified size.

- Play a team game to identify correct term and describe picture given. Students match world examples from pictures with proper terms. Students use a graphic organizer to learn definitions and draw pictures of each.

Recognize right triangles as a category, and identify right triangles.

4.G.A.3. Recognize a line of symmetry for a two-dimensional figure as a line across the figure such that the figure can be folded along the line into matching parts. Identify line-symmetric figures and draw lines of symmetry.

Mathematical Practices

- MP.1. Make sense of problems and persevere in solving them.
- MP.2. Reason abstractly and quantitatively.
- MP.3. Construct viable arguments and critique the reasoning of others.
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- MP.5. Use appropriate tools strategically.
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- MP.7. Look for and make use of structure.
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NJ: 2016 SLS: English Language Arts

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- L.4.3. Use knowledge of language and its conventions when writing, speaking, reading, or listening.

2020 SLS: Computer Science & Design Thinking

NJSLS Performance Expectations (By the end of 5th Grade)

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- 8.1.5.DA.3: Organize and present collected data visually to communicate insights gained from different views of the data.

2020 SLS: Career Readiness, Life Literacies, and Key Skills

NJSLS Performance Expectations (By the end of 5th Grade)

Career Readiness, Life Literacies, and Key Skills Practices describe the habits of the mind that all educators in all content areas should seek to develop in their students. They are practices that have been linked to increase college, career, and life success. These practices should be taught and reinforced in all content areas with increasingly higher levels of complexity and expectation as a student advances through a program of study.

- Act as a responsible and contributing community members and employee.
- Attend to financial well-being.
- Consider the environmental, social and economic impacts of decisions
- Demonstrate creativity and innovation.
- Utilize critical thinking to make sense of problems and persevere in solving them.
- Model integrity, ethical leadership and effective management.
- Plan education and career paths aligned to personal goals.
- Use technology to enhance productivity increase collaboration and communicate effectively.
- Work productively in teams while using cultural/global competence

- 9.2.5.CAP.1: Evaluate personal likes and dislikes and identify careers that might be suited to personal likes.
- 9.4.5.CI.3: Participate in a brainstorming session with individuals with diverse perspectives to expand one’s thinking about a topic of curiosity (e.g., 8.2.5.ED.2, 1.5.5.CR1a).

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- 9.4.5.CT.2: Identify a problem and list the types of individuals and resources
- 9.4.5.CT.3: Describe how digital tools and technology may be used to solve problems.
- 9.4.5.CT.4: Apply critical thinking and problem-solving strategies to different types of problems such as personal, academic, community and global.

Interdisciplinary Connections

Science	<ul style="list-style-type: none"> • 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.
21st Century Connections	<ul style="list-style-type: none"> • Creativity and Innovation • Critical thinking • Collaboration and Teamwork • Problem Solving

Accommodations & Modifications

Special Education Students, 504 students, English Language Learners, Students at-Risk Based on Students' Individual Needs

Time/General	Processing	Comprehension
<ul style="list-style-type: none"> • Allow extra time • Repeat and clarify directions • Provide breaks in between tasks • Have student verbalize directions • Provide timelines/due dates for reports and projects 	<ul style="list-style-type: none"> • Provide extra response time • Have student verbalize steps • Repeat directions • Provide small group instruction • Include partner work 	<ul style="list-style-type: none"> • Provide reading material on student's level • Have student underline important points • Assist student on how to use context clues to identify words/phrases • Ensure short manageable tasks
Tests/Quizzes/Grading	Behavior/Attention	Organization

<ul style="list-style-type: none"> • Provide extended time • Provide study guides • Limit number of responses 	<ul style="list-style-type: none"> • Establish classroom rules • Write a contract with the student specifying expected behaviors • Provide preferential seating • Re-focus student as needed • Reinforce student for staying on task 	<ul style="list-style-type: none"> • Monitor the student and provide reinforcement of directions • Verify the accurateness of homework assignments • Display a written agenda
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ELL, Enrichment, Gifted & Talented Strategies

Accommodations Based on Students' Individual Needs

ELL Strategies

- Provide explicit, systematic instruction in vocabulary.
- Ensure that ELLs have ample opportunities to talk with both adults and peers and provide ongoing feedback and encouragement.
- Expose ELLs to rich language input.
- Scaffolding for ELLs language learning.
- Encourage continued L1 language development.
- Alphabet knowledge
- Phonological awareness
- Print awareness
- Design instruction that focuses on all of the foundational literacy skills.
- Recognize that many literacy skills can transfer across languages.
- English literacy development by helping ELLs make the connection between what they know in their first language and what they need to know in English.
- Graphic organizers
- Modified texts
- Modified assessments
- Written/audio instruction
- Shorter paragraph/essay length

- Homogeneously grouped by level

Accommodations Based on Students' Individual Needs:

Enrichment Strategies

- Evaluate vocabulary
- Elevate Text Complexity
- Incorporate inquiry based assignments and projects
- Extend curriculum
- Balance individual, small group and whole group instruction
- Provide tiered/multi-level activities
- Include purposeful learning centers
- Provide open-ended activities and projects
- Offer opportunities for heterogeneous grouping to work with age and social peers as well as homogeneous grouping to provide time to work with individual peers
- Provide pupils with experiences outside the 'regular' curriculum
- Alter the pace the student uses to cover regular curriculum in order to explore topics of interest in greater depth/breadth within their own grade level
- Require a higher quality of work than the norm for the given age group
- Promote higher level of thinking and making connections.
- Focus on process learning skills such as brainstorming, decision making and social skills
- Use supplementary materials in addition to the normal range of resources.
- Encourage peer to peer mentoring
- Integrate cross-curricular lessons
- Incorporate real-world problem solving activities
- Facilitate student-led questioning and discussions

Gifted & Talented Strategies

- More elaborate, complex, and in-depth study of major ideas, problems, and themes that integrate knowledge within and across systems of thought.
- Development and application of productive thinking skills to enable students to reconceptualize existing knowledge and/or generate new knowledge.
- Explore constantly changing knowledge and information and develop the attitude that knowledge is worth pursuing in an open world.
- Encourage exposure to, selection, and use of appropriate and specialized resources.
- Promote self-initiated and self-directed learning and growth.
- Provide for the development of self-understanding and the understanding of one's relationship to persons, societal institutions, nature, and culture.
- Flexible pacing
- Use of more advanced or complex concepts, abstractions, and materials
- Encourage students to move through content areas at their own pace. If they master a particular unit, they need to be provided with more advanced learning activities, not more of the same activity.
- Questions that require a higher level of response and/or open-ended questions that stimulate inquiry, active exploration, and discovery.
- Encourage students to think about subjects in more abstract and complex ways
- Activity selection based on student interests, that encourage self-directed learning
- Group interaction and simulations
- Guided self-management
- Encourage students to demonstrate what they have learned in a wide variety of forms that reflect both knowledge and the ability to manipulate ideas.
- Engage students in active problem-finding and problem-solving activities and research.
- Provide students opportunities for making connections within and across systems of knowledge by focusing on issues, themes, and ideas.

