

GENERAL MATHEMATICS

This course is designed to enhance students' knowledge in arithmetic, geometry and problem-solving. It emphasizes the fundamentals of arithmetic involving whole numbers, decimals, fractions and percents. The course will also extend students' knowledge of algebraic concepts.

Content Strands:

- Number and Operations
- Functions and Algebra
- Data, Statistics, and Probability
- Geometry and Measurement

Process Strands:

- Problem-solving, Reasoning , and Proof
- Communications, Representations, and Connections

Major Stems :

- Estimating and Rounding
- Addition and Subtraction
- Multiplication
- Division
- Statistics
- Order of Operations
- Measurement
- Basics of Fractions
- Multiplying and Dividing Fractions
- Adding and Subtracting Fractions
- Ratio and Proportion
- Basics of Percent
- Applications of Percent
- Basics of Geometry

GENERAL MATH COURSE COMPETENCIES

1. Demonstrates conceptual understanding of rational numbers
- 2 Demonstrates conceptual understanding of mathematical operations
- 3 Accurately solves problems
- 4 Uses a variety of mental computation strategies to solve problems
5. Makes estimates
- 6 Applies properties of numbers.
7. Uses measurement conversions.
8. Applies concepts of similarity
9. Solves problems involving perimeter, circumference, or area
10. Demonstrates conceptual understanding of algebraic expressions

GENERAL MATH COURSE PROCESS SKILLS

1. Students will use problem-solving strategies to investigate and understand increasingly complex mathematical content.
2. Students will use mathematical reasoning
3. Students will communicate their understanding of mathematics.
4. Students will recognize, explore, and develop mathematical connections

Numbers and Operations – Stem 1

Estimating & Rounding

Topics	Estimating sums & products, ordering a list, rounding to a designated place
Competencies	<p>2. Demonstrates conceptual understanding of mathematical operations</p> <p>3. accurately solves problems</p> <p>5. Makes estimates</p> <p>6 Applies properties of numbers.</p>
Knowledge/Skills	<p>Express whole numbers and decimal numbers in words and the reverse</p> <p>Order numbers using the symbols $>$, $<$, $=$</p> <p>Round numbers to the highest place and to the underlined place</p> <p>Decide appropriateness of exact or estimated answers</p> <p>Estimate sums and differences by rounding to the highest place</p> <p>Estimate products by rounding to the highest place</p> <p>Estimate quotients using compatible numbers</p> <p>Order lists of numbers from least to greatest</p>
Process Skills	<ol style="list-style-type: none"> 1. Students will use problem-solving strategies to investigate and understand increasingly complex mathematical content. 2. Students will use mathematical reasoning 3. Students will communicate their understanding of mathematics. 4. Students will recognize, explore, and develop mathematical connections

Numbers and Operations - Stem 2

Adding and Subtracting

Topics	Adding & subtracting decimals & whole numbers; arithmetic sequences; algebraic expression, checkbooks & taxes
Competencies	<ol style="list-style-type: none"> 1. Demonstrates conceptual understanding of rational numbers 2 Demonstrates conceptual understanding of mathematical operations 3 Accurately solves problems 4 Uses a variety of mental computation strategies to solve problems 5. Makes estimates 6 Applies properties of numbers.
Knowledge/Skills	<p>Add and subtract whole numbers and decimals Recognize and extend arithmetic sequences Evaluate simple algebraic expressions Add and subtract whole numbers and decimals Recognize and extend arithmetic sequences Evaluate simple algebraic expressions</p>
Process Skills	<ol style="list-style-type: none"> 1. Students will use problem-solving strategies to investigate and understand increasingly complex mathematical content. 2. Students will use mathematical reasoning 3. Students will communicate their understanding of mathematics. 4. Students will recognize, explore, and develop mathematical connections
Numbers and Operations -Stem 3	
Multiplication	
Topics	Multiplying with decimals & whole numbers; area; consumer applications, scientific notation; patterns

Competencies	<ol style="list-style-type: none"> 1. Demonstrates conceptual understanding of rational numbers 2 Demonstrates conceptual understanding of mathematical operations 3 Accurately solves problems 4 Uses a variety of mental computation strategies to solve problems 5. Makes estimates 6 Applies properties of numbers.
Knowledge/Skills	<p>Multiply whole numbers, including the use of the lattice method Multiply decimals Calculate credit prices and finance charges Estimate answers using the clustering technique Multiply and divide by powers of ten Calculate the areas of squares and rectangles Use floor plans to calculate area Convert numbers into scientific notation and the reverse Problem-solving with patterns and logic</p>
Process Skills	<ol style="list-style-type: none"> 1. Students will use problem-solving strategies to investigate and understand increasingly complex mathematical content. 2. Students will use mathematical reasoning 3. Students will communicate their understanding of mathematics. 4. Students will recognize, explore, and develop mathematical connections
Numbers and Operations - Stem 4	
Division	

Topics	Dividing with whole numbers & decimals; geometric sequences; divisibility rules; paychecks; powers
Competencies	<ol style="list-style-type: none"> 1. Demonstrates conceptual understanding of rational numbers 2 Demonstrates conceptual understanding of mathematical operations 3 Accurately solves problems 4 Uses a variety of mental computation strategies to solve problems 5. Makes estimates 6 Applies properties of numbers.
Knowledge/Skills	<p>Divide whole numbers including the possibility of remainders</p> <p>Divide decimals including the possibility of rounding</p> <p>Use guess and check in problem-solving</p> <p>Compute the mean from a list of numbers</p> <p>Recognize and extend geometric sequences</p> <p>Calculate wages, including overtime wages and take-home pay</p> <p>Know and apply the divisibility rules for 2, 3, 5, 9 and 10</p> <p>Interpret the data on paycheck stubs</p> <p>Evaluate with powers</p>
Process Skills	<ol style="list-style-type: none"> 1. Students will use problem-solving strategies to investigate and understand increasingly complex mathematical content. 2. Students will use mathematical reasoning 3. Students will communicate their understanding of mathematics. 4. Students will recognize, explore, and develop mathematical connections

Data, Statistics, and Probability - Stem 5

Statistics and Graphs

Topics	Using & creating various types of graphs; median, mean & mode; prime & composite numbers
Competencies	<ol style="list-style-type: none"> 1. Demonstrates conceptual understanding of rational numbers 2. Demonstrates conceptual understanding of mathematical operations 3. Accurately solves problems 4. Uses a variety of mental computation strategies to solve problems 5. Makes estimates 7. Uses measurement conversions.
Knowledge/Skills	<p>Identify prime and composite numbers Use tree diagrams to complete prime factorization Interpret data from graphs including pictographs, bar graphs, line graphs and circle graphs Create bar graphs, line graphs and circle graphs Calculate the median, mode, mean and range from a list of numbers Create a frequency table from a list of numbers</p>
Process Skills	<ol style="list-style-type: none"> 1. Students will use problem-solving strategies to investigate and understand increasingly complex mathematical content. 2. Students will use mathematical reasoning 3. Students will communicate their understanding of mathematics. 4. Students will recognize, explore, and develop mathematical connections
Functions & Algebra - Stem 6	
Order of Operations	

Topics	Simplifying numerical expression
Competencies	<p>1. Demonstrates conceptual understanding of rational numbers</p> <p>2 Demonstrates conceptual understanding of mathematical operations</p> <p>4 Uses a variety of mental computation strategies to solve problems</p> <p>6 Applies properties of numbers.</p> <p>10. Demonstrates conceptual understanding of algebraic expressions</p>
Knowledge/Skills	<p>Simplify numerical expressions using the order of operations</p> <p>Simplify numerical expressions containing parentheses</p>
Process Skills	<ol style="list-style-type: none"> 1. Students will use problem-solving strategies to investigate and understand increasingly complex mathematical content. 2. Students will use mathematical reasoning 3. Students will communicate their understanding of mathematics. 4. Students will recognize, explore, and develop mathematical connections
Geometry and Measurement - Stem 7	
Measurements	
Topics	Operations & conversions with units of measure
Competencies	<p>1. Demonstrates conceptual understanding of rational numbers</p> <p>2 Demonstrates conceptual understanding of mathematical operations</p>

	<p>3 Accurately solves problems</p> <p>4 Uses a variety of mental computation strategies to solve problems</p> <p>6 Applies properties of numbers.</p> <p>7. Uses measurement conversions.</p>
Knowledge/Skills	<p>Convert standard measurements from one unit to another</p> <p>Convert metric measurements from one unit to another</p> <p>Perform operations (adding, subtracting multiplying) with units of measurement</p>
Process Skills	<p>5. Students will use problem-solving strategies to investigate and understand increasingly complex mathematical content.</p> <p>6. Students will use mathematical reasoning</p> <p>7. Students will communicate their understanding of mathematics.</p> <p>8. Students will recognize, explore, and develop mathematical connections</p>
HEADING	
Numbers and Operations - Stem 8	
Basics of Fractions	
Topics	<p>Converting fractions & decimals; GCF; LCM; equivalent fractions</p>
Competencies	<p>1. Demonstrates conceptual understanding of rational numbers</p> <p>2 Demonstrates conceptual understanding of mathematical operations</p>

	<p>3 Accurately solves problems</p> <p>4 Uses a variety of mental computation strategies to solve problems</p> <p>6 Applies properties of numbers.</p>
Knowledge/Skills	<p>Apply the concept of part to a whole to fractions</p> <p>Convert fractions to decimals</p> <p>Determine whether given fractions are equivalent</p> <p>Use Greatest Common Factors (GCF) to simplify fractions</p> <p>Convert mixed numbers to improper fractions</p> <p>Convert improper fractions to mixed numbers</p> <p>Determine the Least Common Multiple (LCM) for two or three given numbers</p> <p>Use the LCM to create equivalent fractions</p> <p>Use the inequality symbols to order a list of fractions</p> <p>Convert decimals to fractions</p>
Process Skills	<ol style="list-style-type: none"> 1. Students will use problem-solving strategies to investigate and understand increasingly complex mathematical content. 2. Students will use mathematical reasoning 3. Students will communicate their understanding of mathematics. 4. Students will recognize, explore, and develop mathematical connections
Numbers and Operations - Stem 9	
Multiplying and Dividing Fractions	
Topics	Reciprocals; multiplying and dividing with fractions and whole numbers; consumer applications
Competencies	1. Demonstrates conceptual understanding of rational numbers

	<p>2 Demonstrates conceptual understanding of mathematical operations</p> <p>3 Accurately solves problems</p> <p>4 Uses a variety of mental computation strategies to solve problems</p> <p>5. Makes estimates</p> <p>6 Applies properties of numbers.</p> <p>9. Solves problems involving perimeter, circumference, or area</p>
Knowledge/Skills	<p>Multiply two fractions or one fraction and a whole number</p> <p>Multiply with mixed numbers</p> <p>Find the reciprocal of a number</p> <p>Divide two fractions or one fraction and a whole number</p> <p>Divide with mixed numbers</p> <p>Solve verbal problems using multiplication and/or division</p> <p>Use fractions with recipe problems</p> <p>Use fractions with credit price and downpayments</p> <p>Calculate overtime wages using time and a half</p>
Process Skills	<ol style="list-style-type: none"> 1. Students will use problem-solving strategies to investigate and understand increasingly complex mathematical content. 2. Students will use mathematical reasoning 3. Students will communicate their understanding of mathematics. 4. Students will recognize, explore, and develop mathematical connections
Numbers and Operations - Stem 10	
Adding & Subtracting Fractions	
Topics	Operations with fractions & mixed numbers

Competencies	<p>1. Demonstrates conceptual understanding of rational numbers</p> <p>2. Demonstrates conceptual understanding of mathematical operations</p> <p>3. Accurately solves problems</p> <p>4. Uses a variety of mental computation strategies to solve problems</p> <p>5. Makes estimates</p> <p>6. Applies properties of numbers.</p> <p>9. Solves problems involving perimeter, circumference, or area</p>
Knowledge/Skills	<p>Add fractions with like denominators and with unlike denominators</p> <p>Add two mixed numbers</p> <p>Subtract fractions with like denominators and unlike denominators</p> <p>Subtract two mixed numbers</p> <p>Subtract with one mixed number and one whole number</p> <p>Use fraction operation skills to solve picture frame problems</p>
Process Skills	<ol style="list-style-type: none"> 1. Students will use problem-solving strategies to investigate and understand increasingly complex mathematical content. 2. Students will use mathematical reasoning 3. Students will communicate their understanding of mathematics. 4. Students will recognize, explore, and develop mathematical connections
Functions and Algebra - Stem 11	
Ratio & Proportion	

Topics	Cross products; applications of proportion
Competencies	<ol style="list-style-type: none"> 1. Demonstrates conceptual understanding of rational numbers 2 Demonstrates conceptual understanding of mathematical operations 3 Accurately solves problems 4 Uses a variety of mental computation strategies to solve problems 5. Makes estimates 6 Applies properties of numbers. 8. Applies concepts of similarity 10. Demonstrates conceptual understanding of algebraic expressions
Knowledge/Skills	<p>Simplify ratios Test for proportions using the equivalent ratio method Solve simple one-step algebraic equations using inverse operation techniques Test for proportions using the cross-product method Solve proportions using the cross-product method Use proportional reasoning to solve verbal problems Use proportions to solve problems involving scale drawings and maps Use proportions to solve problems with similar geometric figures and unit pricing</p>
Process Skills	<ol style="list-style-type: none"> 1. Students will use problem-solving strategies to investigate and understand increasingly complex mathematical content. 2. Students will use mathematical reasoning 3. Students will communicate their understanding of mathematics.

	4. Students will recognize, explore, and develop mathematical connections
Numbers and Operations - Stem 12	
Basics of Percent	
Topics	Converting percents, decimals, fractions; using proportions; comparing using $<$ or $>$
Competencies	<p>1. Demonstrates conceptual understanding of rational numbers</p> <p>2. Demonstrates conceptual understanding of mathematical operations</p> <p>4. Uses a variety of mental computation strategies to solve problems</p> <p>5. Makes estimates</p> <p>6. Applies properties of numbers.</p> <p>7. Uses measurement conversions.</p> <p>10. Demonstrates conceptual understanding of algebraic expressions</p>
Knowledge/Skills	<p>Apply the concept of out of 100 to percents</p> <p>Convert percents to decimals</p> <p>Convert decimals to percents</p> <p>Use the proportion method to convert fractions to percents</p> <p>Use the division method to convert fractions to percents</p> <p>Convert percents to simplified fractions</p> <p>Use inequality symbols to compare fractions, decimals and percents</p>
Process Skills	<p>1. Students will use problem-solving strategies to investigate and understand increasingly complex mathematical content.</p> <p>2. Students will use mathematical reasoning</p> <p>3. Students will communicate their</p>

	<p>understanding of mathematics.</p> <p>4. Students will recognize, explore, and develop mathematical connections</p>
<p>Numbers and Operations - Stem 13</p>	
<p>Applications of Percents</p>	
<p>Topics</p>	<p>Using algebraic equations to solve percent problems; consumer problems</p>
<p>Competencies</p>	<p>1. Demonstrates conceptual understanding of rational numbers</p> <p>2 Demonstrates conceptual understanding of mathematical operations</p> <p>3 Accurately solves problems</p> <p>4 Uses a variety of mental computation strategies to solve problems</p> <p>5. Makes estimates</p> <p>6 Applies properties of numbers.</p> <p>10. Demonstrates conceptual understanding of algebraic expressions</p>
<p>Knowledge/Skills</p>	<p>Use an algebraic equation to find the percent of a number</p> <p>Use an algebraic equation to find what percent one number is of another number</p> <p>Use an algebraic equation to find a number when a percent of it is known</p> <p>Solve these three types of percent problem if given a mixture of problems</p> <p>Use percents to compute discounts, sale prices, discount rates and sales tax</p> <p>Calculate simple interest using $I = Prt$</p> <p>Compute a percent of increase or percent of decrease</p> <p>Calculate pay when it is based on commission</p> <p>Organize and convert a collection of data into percents</p>

Process Skills	<ol style="list-style-type: none"> 1. Students will use problem-solving strategies to investigate and understand increasingly complex mathematical content. 2. Students will use mathematical reasoning 3. Students will communicate their understanding of mathematics. 4. Students will recognize, explore, and develop mathematical connections
Geometry and Measurement - Stem 14	
Basics of Geometry	
Topics	Angles; lines; triangles; polygons; perimeter
Competencies	<ol style="list-style-type: none"> 3 Accurately solves problems 5. Makes estimates 8. Applies concepts of similarity 9. Solves problems involving perimeter, circumference, or area 10. Demonstrates conceptual understanding of algebraic expressions
Knowledge/Skills	<p>Know how to name points, rays, angles, lines and segments</p> <p>Classify angles using acute, right, obtuse and straight</p> <p>Measure angles using a protractor</p> <p>Recognize parallel, perpendicular and skew lines</p> <p>Classify types of triangles by sides and by angles</p> <p>Recognize types of quadrilaterals</p> <p>Calculate the perimeter of a polygon</p> <p>Find the measures of angles in triangles and quadrilaterals</p>
Process Skills	<ol style="list-style-type: none"> 1. Students will use problem-solving

	<p>strategies to investigate and understand increasingly complex mathematical content.</p> <ol style="list-style-type: none"><li>2. Students will use mathematical reasoning<li>3. Students will communicate their understanding of mathematics.<li>4. Students will recognize, explore, and develop mathematical connections
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