

## Applications of Mathematics

This course offers a continuation of the basic mathematics skills studied in General Mathematics I and II with an applications approach. Students will learn how to use mathematics in daily living, including consumer and career situations. There will be a constant review of arithmetic skills, applications using a calculator or computer, and problem solving methods

### **Content Strand:**

Numbers and Operations  
Functions and Algebra

### **Major Stems:**

Computations  
Fractions and Mixed Numbers  
Part Time and Summer Jobs  
Full Time Work  
Purchases  
Checking and Savings Accounts  
Credit  
Automobile Expenses  
Transportation  
Taxes  
Trade Industries  
Probability  
Expressions and Equations

### **APPLICATIONS OF MATHEMATICS COURSE CONTENT COMPETENCIES**

This is a remedial course that uses a combination of grade 8 and High School Grades-Span Expectations.

1. Demonstrates understanding of the relative magnitudes of real numbers.
2. Demonstrates conceptual understanding of rational numbers
3. Accurately solves problems involving rational numbers within mathematics, across content strands, disciplines or contexts.
4. Uses a variety of mental computation strategies to solve problems.
5. Determines the reasonableness of answers.
6. Makes estimates in given situations by identifying when estimation is appropriate.
7. Demonstrates conceptual understanding of algebraic expressions.
8. Demonstrates conceptual understanding of equality.
9. Solves problems involving experimental or theoretical probability.

## Unit 1: Computations

<b>Topics</b>	
<b>Competencies</b>	<ol style="list-style-type: none"> <li>1. Demonstrates understanding of the relative magnitudes of real numbers</li> <li>2. Demonstrates conceptual understanding of rational numbers</li> </ol>
<b>Knowledge/Skills</b>	<ul style="list-style-type: none"> <li>• Add, subtract, multiply and divide Whole numbers</li> <li>• Add, subtract, multiply and divide decimals</li> <li>• Find the percent of a number</li> <li>• Calculate the mean, median and mode of a set of data</li> </ul>
<b>Process Skills</b>	

## Unit 2: Fractions and Mixed Numbers

<b>Topics</b>	Calculating sums, differences, products, and quotients of rational numbers
<b>Competencies</b>	<ol style="list-style-type: none"> <li>1. Demonstrates understanding of the relative magnitudes of real numbers</li> <li>2. Demonstrates conceptual understanding of rational numbers</li> </ol>
<b>Knowledge/Skills</b>	<ul style="list-style-type: none"> <li>• Reduce fractions</li> <li>• Compare fractions</li> <li>• Convert between improper fractions and mixed numbers</li> <li>• Add, subtract, multiply and divide fractions</li> <li>• Add, subtract, multiply and divide mixed numbers</li> </ul>
<b>Process Skills</b>	

## Unit 3: Part Time and Summer Jobs

<b>Topics</b>	calculating tips, calculating pay including tips
<b>Competencies</b>	<ol style="list-style-type: none"> <li>4. Uses a variety of mental computation strategies to solve problems.</li> </ol>

	<ol style="list-style-type: none"> <li>3. Accurately solves problems involving rational numbers within mathematics, across content strands, disciplines or contexts.</li> <li>5. Determines the reasonableness of answers.</li> <li>6. Makes estimates in given situations by identifying when estimation is appropriate.</li> </ol>
<b>Knowledge/Skills</b>	<ul style="list-style-type: none"> <li>• Compute pay from hourly wages</li> <li>• Calculate 10%, 15%, and 20% both mentally and with calculators</li> <li>• Calculate pay from hourly wages and tips</li> <li>• Calculate social security withholdings</li> <li>• Investigating want adds to determine pay and hours worked</li> </ul>
<b>Process Skills</b>	
<b>Unit 4: Full Time Work</b>	
<b>Topics</b>	Calculating pay
<b>Competencies</b>	<ol style="list-style-type: none"> <li>3. Accurately solves problems involving rational numbers within mathematics, across content strands, disciplines or contexts.</li> <li>5. Determines the reasonableness of answers.</li> <li>6. Makes estimates in given situations by identifying when estimation is appropriate.</li> </ol>
<b>Knowledge/Skills</b>	<ul style="list-style-type: none"> <li>• Calculate hourly pay and overtime pay</li> <li>• Complete time cards and time sheets</li> <li>• Convert between annual salary and weekly, biweekly, semimonthly and monthly pay</li> <li>• Calculate pay earned through piecework</li> <li>• Calculate pay including commissions</li> </ul>
<b>Process Skills</b>	
<b>Unit 5: Purchases</b>	

<b>Topics</b>	Calculating discounts, mark ups and sales tax
<b>Competencies</b>	<ol style="list-style-type: none"> <li>4. Uses a variety of mental computation strategies to solve problems.</li> <li>3. Accurately solves problems involving rational numbers within mathematics, across content strands, disciplines or contexts.</li> <li>5. Determines the reasonableness of answers.</li> <li>6. Makes estimates in given situations by identifying when estimation is appropriate.</li> </ol>
<b>Knowledge/Skills</b>	<ul style="list-style-type: none"> <li>• Find the discount, discount rate</li> <li>• Calculate the sale price</li> <li>• Use the wholesale price and the mark up rate to find the retail price</li> <li>• Calculate sales tax and total cost</li> <li>• Determine the cost of items purchased through catalogs including shipping costs</li> <li>• Calculate unit cost</li> </ul>
<b>Process Skills</b>	

### Unit 6: Checking and Savings Accounts

<b>Topics</b>	Managing bank accounts, balancing check books
<b>Competencies</b>	<ol style="list-style-type: none"> <li>3. Accurately solves problems involving rational numbers within mathematics, across content strands, disciplines or contexts.</li> <li>5. Determines the reasonableness of answers.</li> </ol>
<b>Knowledge/Skills</b>	<ul style="list-style-type: none"> <li>• Write checks and checking deposit slips</li> <li>• Complete check register</li> <li>• Reconciling a checking account statement with the check register</li> <li>• Complete savings account deposit and withdrawal slips</li> </ul>
<b>Process Skills</b>	

### Unit 7: Credit

--	--

<b>Topics</b>	Calculating the cost associated with financing
<b>Competencies</b>	<p>3. Accurately solves problems involving rational numbers within mathematics, across content strands, disciplines or contexts.</p> <p>5. Determines the reasonableness of answers.</p>
<b>Knowledge/Skills</b>	<ul style="list-style-type: none"> <li>• Identify parts of credit card statements</li> <li>• Calculate the finance charge, previous balance and new balance on a credit card account</li> <li>• Calculate the monthly payment for a secure loan using interest tables</li> <li>• Calculate the down payment and finance charge on a purchase made on installments</li> </ul>
<b>Process Skills</b>	

**Unit 8: Automobile Expenses**

<b>Topics</b>	Calculating costs of owning a vehicle
<b>Competencies</b>	<p>3. Accurately solves problems involving rational numbers within mathematics, across content strands, disciplines or contexts.</p> <p>5. Determines the reasonableness of answers.</p> <p>6. Makes estimates in given situations by identifying when estimation is appropriate.</p>
<b>Knowledge/Skills</b>	<ul style="list-style-type: none"> <li>• Calculate the amount to be financed, monthly payment(using tables), amount to be repaid, finance charge and total cost for an automobile loan</li> <li>• Calculate MPG (miles per gallon)</li> <li>• Calculate the cost for gasoline for a trip</li> <li>• Determine the cost of a car rental including daily rate and mileage charge</li> </ul>
<b>Process Skills</b>	

**Unit 9: Transportation**

<b>Topics</b>	Understanding and reading maps, calculating travel cost
<b>Competencies</b>	<p>3. Accurately solves problems involving rational numbers within mathematics, across content strands, disciplines or contexts.</p> <p>5. Determines the reasonableness of answers.</p> <p>6. Makes estimates in given situations by identifying when estimation is appropriate.</p>
<b>Knowledge/Skills</b>	<ul style="list-style-type: none"> <li>• Determine distance and estimate travel time for a trip</li> <li>• Use a road map to determine directions and estimate travel distance using a map scale</li> <li>• Determine cost and travel time of public transportation including bus, train, subway and air travel</li> <li>• Compute the fare for a taxi ride with and without tip</li> <li>• Estimate the cost of a trip including travel expenses, lodging and food</li> </ul>
<b>Process Skills</b>	
<b>Unit 10: Taxes</b>	
<b>Topics</b>	Completing tax forms
<b>Competencies</b>	<p>3. Accurately solves problems involving rational numbers within mathematics, across content strands, disciplines or contexts.</p> <p>5. Determines the reasonableness of answers.</p>
<b>Knowledge/Skills</b>	<ul style="list-style-type: none"> <li>• Identify wages, federal tax, state tax, social security tax, and local tax amounts from an IRS W-2 form</li> <li>• Identify interest income from an IRS 1099 form</li> <li>• Calculate gross income including earnings, interest and dividends</li> <li>• Calculate the adjusted gross income and taxable income</li> <li>• Complete a IRS tax form 1040EZ</li> </ul>

<b>Process Skills</b>	
<b>Unit 11: Trade Industries</b>	
<b>Topics</b>	Area and perimeter, calculating construction costs
<b>Competencies</b>	<p>3. Accurately solves problems involving rational numbers within mathematics, across content strands, disciplines or contexts.</p> <p>5. Determines the reasonableness of answers.</p>
<b>Knowledge/Skills</b>	<ul style="list-style-type: none"> <li>• Use area and perimeter to calculate the cost of remodeling and new construction</li> <li>• Use proportions to create scale drawings</li> <li>• Calculate board feet and the cost of materials in construction</li> <li>• Calculate the inside or outside diameter of a pipe with a given thickness</li> <li>• Calculate the cost of materials for a plumbing or electrical job</li> <li>• Use area to calculate the number of gallons and cost of paint to complete a job</li> </ul>
<b>Process Skills</b>	
<b>Unit 12: Probability</b>	
<b>Topics</b>	Simple and compound probability
<b>Competencies</b>	10. Solves problems involving experimental or theoretical probability.
<b>Knowledge/Skills</b>	<ul style="list-style-type: none"> <li>• Calculate simple probability with equally likely events</li> <li>• Determine the sample space of a given experiment</li> <li>• Use the fundamental counting principle to calculate the number of possible outcomes for an experiment</li> <li>• Determine if events are independent and calculate the probability of independent events occurring</li> <li>• Calculate the probability of dependent events</li> </ul>

	occurring <ul style="list-style-type: none"> <li>• Use probability to predict the number of times a particular event will occur</li> </ul>
<b>Process Skills</b>	
<b>Unit 13: Expressions and Equations</b>	
<b>Topics</b>	Simplifying expressions, solving equations
<b>Competencies</b>	7. Demonstrates conceptual understanding of algebraic expressions. 8. Demonstrates conceptual understanding of equality.
<b>Knowledge/Skills</b>	<ul style="list-style-type: none"> <li>• Simplify numeric expressions using order of operations</li> <li>• Translate phrases and sentences to algebraic expressions and equations</li> <li>• Simplify algebraic expressions by combining like terms</li> <li>• Simplify algebraic expressions using the distributive property</li> <li>• Solving equations involving addition, subtraction, multiplication, and division</li> <li>• Solving 2-step equations</li> <li>• Solving equations with variables on both sides</li> </ul>
<b>Process Skills</b>	