

**Richmond Public Schools**  
Curriculum Framework  
*Grade 8*

<b>Strand: Computation and Estimation</b>	
8.4 The student will solve practical problem involving consumer applications.	
<b>Suggested Pacing</b>	
Second Nine Weeks – 10 Instructional Days (including common assessment)	
<b>Related Standards</b>	
<p><b>Spiral Down</b></p> <p><b>7.2</b> The student will solve practical problems involving operations with rational numbers.</p> <p><b>7.3</b> The student will solve single-step and multistep practical problems, using proportional reasoning.</p> <p><b>6.5</b> The student will</p> <ul style="list-style-type: none"> <li>b) solve single-step and multistep practical problems involving addition, subtraction, multiplication, and division of fractions and mixed numbers; and</li> <li>c) solve multistep practical problems involving addition, subtraction, multiplication, and division of decimals.</li> </ul>	<p><b>Spiral Up</b></p> <p><b>A.4</b> The student will solve</p> <ul style="list-style-type: none"> <li>e) practical problems involving equations and systems of equations.</li> </ul>
<b>Essential Questions</b>	<b>Common Misconceptions</b>
<p><b>What is the difference between percent increase and percent decrease?</b> <i>They are both percents of change measuring the percent a quantity increases or decreases. Percent increase shows a growing change in a quantity while percent decrease shows a lessening change.</i></p> <p><b>What is a percent?</b> <i>A percent is a special ratio with a denominator of 100.</i></p>	<ul style="list-style-type: none"> <li>● Students need to be reminded to convert the percent into either a fraction or decimal before using it in the percent equation.</li> <li>● Students need to be reminded for simple interest time (<math>t</math>) is in years.</li> </ul>

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#### **What is reconciliation?**

*Reconciling an account is a process used to verify that two sets of records (usually the balances of two accounts) are in agreement. Reconciliation is used to ensure that the balance of an account matches the actual amount of money deposited and/or withdrawn from the account.*

#### **What is a discount? Markup?**

*A discount is a percent of the original price. The discount price is the original price minus the discount. A markup price is the original price plus the amount of markup.*

#### **How do you determine the final price after sales tax or tip?**

*Add the amount of sales tax or tip to the total.*

#### **What is simple interest?**

*Simple interest ( $I$ ) for a number of years is determined by finding the product of the principal ( $p$ ), the annual rate of interest ( $r$ ), and the number of years ( $t$ ) of the loan or investment using the formula  $I = prt$ .*

#### **How do you calculate total cost of an investment? Total value?**

*The total value of an investment is equal to the sum of the original investment and the interest earned. The total cost of a loan is equal to the sum of the original cost and the interest paid.*

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Understanding the Standard	Essential Knowledge and Skills
<ul style="list-style-type: none"><li>• Rational numbers may be expressed as whole numbers, integers, fractions, percents, and numbers written in scientific notation.</li><li>• Practical problems may include, but are not limited to, those related to economics, sports, science, social science, transportation, and health. Some examples include problems involving the amount of a paycheck per month, commissions, fees, the discount price on a product, temperature, simple interest, sales tax and installment buying.</li><li>• A percent is a ratio with a denominator of 100.</li><li>• Reconciling an account is a process used to verify that two sets of records (usually the balances of two accounts) are in agreement. Reconciliation is used to ensure that the balance of an account matches the actual amount of money deposited and/or withdrawn from the account.</li><li>• A discount is a percent of the original price. The discount price is the original price minus the discount.</li><li>• Simple interest (<math>I</math>) for a number of years is determined by finding the product of the principal (<math>p</math>), the annual rate of interest (<math>r</math>), and the number of years (<math>t</math>) of the loan or investment using the formula <math>I = prt</math>.</li><li>• The total value of an investment is equal to the sum of the original investment and the interest earned.</li><li>• The total cost of a loan is equal to the sum of the original cost and the interest paid.</li></ul>	<p><b>The student will use problem solving, mathematical communication, mathematical reasoning, connections, and representations to</b></p> <ul style="list-style-type: none"><li>• Solve practical problems involving consumer applications by using proportional reasoning and computation procedures for rational numbers.</li><li>• Reconcile an account balance given a statement with five or fewer transactions.</li><li>• Compute a discount or markup and the resulting sale price for one discount or markup.</li><li>• Compute the sales tax or tip and resulting total.</li><li>• Compute the simple interest and new balance earned in an investment or on a loan given the principal amount, interest rate, and time period in years.</li><li>• Compute the percent increase or decrease found in a practical situation.</li></ul>

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<ul style="list-style-type: none"> <li>Percent increase and percent decrease are both percents of change measuring the percent a quantity increases or decreases.</li> </ul>	
Vocabulary	Instructional Activities Organized by Learning Objective
<p>Ratio Discount Discount Price Total Cost Commission Sale Price Mark Up Tip Sales Tax Reconciliation Deposit Withdraw Installment Simple Interest Principle Proportion Scale Drawing Scale Annual Rate of Interest Percent of Change Percent Increase Percent Decrease Investment Loan Checkbook Registry</p>	<p><b>Virginia Department of Education</b>  <u>The Scoop on Ice Cream</u> – Lesson Plan  <u>Do you Like to Spend Money?</u> – Lesson Plan  <u>Percent of Increase or Decrease</u> – Lesson Plan</p> <p><u>Ratio/Proportion</u>, page(s) 18 – 35 (<i>ARI Curriculum Companion</i>)</p> <p><b>Textbook</b>  <i>Virginia Pre-Algebra</i>, ©2012, Glencoe/McGraw-Hill</p> <ul style="list-style-type: none"> <li>Solving Proportions, page(s) 291 – 296</li> <li>Scale Drawings and Models, page(s) 298 – 303</li> <li>Using a Percent Model, page(s) 347 – 348</li> <li>Using a Percent Proportion, page(s) 349 – 354</li> <li>Percent of Change, page(s) 368 – 373</li> <li>Simple and Compound Interest, page(s) 374 – 378</li> </ul> <p><b>Notes</b></p> <ul style="list-style-type: none"> <li><a href="#">8.4 Proportion Practical Problems</a></li> <li><a href="#">8.4 Percent Increase &amp; Decrease</a></li> </ul> <p><b>Resources</b></p> <ul style="list-style-type: none"> <li><b>Print</b>  <i>Virginia Coach</i>, NEW SOL Edition, Grade 8, Mathematics            Lesson 5 – page 32 (Solve Real-World Problems)</li> </ul>
Assessment	<ul style="list-style-type: none"> <li><b>Technology-based</b></li> </ul>

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<p><b>RPS PowerSchool Unit Test – RPS 8.4 Common Assessment</b> Test ID#:</p> <p><b>Formative Assessments</b> White Board Checks Kahoot.it Plickers Exit Tickets Graphic Organizers Venn Diagrams</p>	<ul style="list-style-type: none"><li>○ <i>ExploreLearning.com (Gizmo) – <a href="#">Beam to Moon</a>, <a href="#">Percent of Change</a>, and <a href="#">Percent and Proportions</a> – Interactive Instructional Resource *Sign-in required</i></li></ul> <p><b>Station Activities</b></p> <ul style="list-style-type: none"><li>● Task Cards - Have students complete problems in small groups Think-Pair-Share.</li><li>● Goldfish Activity (<a href="#">example</a>)</li><li>● Foldable - Have students create a foldable, describing characteristics, providing examples, and relationships.</li><li>● <a href="#">Word Problem QR Code Activity</a></li><li>● <a href="#">Solving Word Problems with Proportions</a></li></ul>
<b>Cross-Curricular Connections</b>	<b>Differentiations</b>
<p><b>History</b> Calculate the percent of change for populations’ overtime due to historic History events.</p>	<ul style="list-style-type: none"><li>● Explain to students how multiplying or dividing by 10 changes a decimal number.</li><li>● Challenge students to multiply or divide by 20 using mental math.</li><li>● Have students cut out pictures from a magazine and make their own sales flyer. Have other students buy items from peers paper and determine sales tax, discounts, and final cost.</li><li>● From task above, has students fill out checkbook register and balance it after items have been purchased. Before students begin have them deposit some money.</li><li>● Have students determine whether the numbers in a percent increase or decrease problem are increasing or decreasing first.</li><li>● Have students look at sale prices and determine whether the problem will be an increase (sales tax) or decrease (discount).</li></ul>