# Statewide Healthcare Curriculum Contextualized Math Module

## Introduction to Basic Math for Allied Healthcare

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<th>OUTCOMES</th>
<th>CONTENT</th>
<th>ACTIVITIES/RESOURCES</th>
<th>ASSESSMENT</th>
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<tbody>
<tr>
<td>1. Understand value and importance of math accuracy in the healthcare field</td>
<td>Importance of math accuracy in healthcare</td>
<td>• Use current events or recent studies to demonstrate the importance of math in all health fields as well as the consequences of mathematical errors. <a href="http://www.alysion.org/dimensional/matherrors.htm">http://www.alysion.org/dimensional/matherrors.htm</a></td>
<td>Teacher Skill Checklist established for this course</td>
</tr>
<tr>
<td>2. Demonstrate 100% accuracy in multiplication to 10</td>
<td>Times Table</td>
<td>• Administer a test which requires students to complete as many multiplication problems in one minute as possible (NOT given in order). • Pre-i-Pathways: Math—Unit 1: Whole Numbers —Lesson 5: Multiplying • CARS: Math—Unit 1: Whole Numbers—Lesson 3: Multiplication and Division</td>
<td>Multiplication test</td>
</tr>
<tr>
<td>3. Differentiate the value of a number by its location</td>
<td>Place Value</td>
<td>• Give students a place value chart and demonstrate how to use it. <a href="http://www.math-aids.com/Place_Value/">http://www.math-aids.com/Place_Value/</a> • Pre-i-Pathways: Math—Unit 1: Whole Numbers —Lesson 1: Place Value and Number Lines • CARS: Math—Unit 1: Whole Numbers—Lesson 1: Place Value, Rounding and Estimating</td>
<td>Student participation</td>
</tr>
<tr>
<td>5. Interpret simple graphs and charts correctly</td>
<td>Reading and creating Graphs and Charts</td>
<td>• Distribute various examples of data, charts, and graphs. • Demonstrate skills needed to read and create them properly. • Pre-i-Pathways: Math—Unit 2: Decimals—Lesson 5: Graphs • CARS: Math—Appendix A: Reading Graphs and Charts</td>
<td>Student participation</td>
</tr>
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## Unit I: Whole Numbers

**Students will:**

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</thead>
</table>
| 1. Demonstrate competency in:  
  - Addition  
  - Subtraction  
  - Greater than/less than  
  - Multiplication  
  - Division  
  - Combining operations  
  - Combining operations using parentheses | Addition  
Subtraction  
Greater than/less than  
Multiplication  
Division | • Teacher instruction and demonstration for each new skill introduced  
• Use student handouts for skill practice and reinforcement at all levels  
• Pre-i-Pathways: *Math*—Unit 1: Whole Numbers —Lesson 4: Adding and Subtracting Whole Numbers & Lesson 5: Multiplying  
• CARS: *Math*—Unit 1: Whole Numbers—Lesson 2: Addition and Subtraction & Lesson 3: Multiplication and Division  
• Materials for Units I through VII:  
  - Steck-Vaughn *GED: Mathematics* (ISBN 0739828355)  
  - Steck-Vaughn *GED Skill Book: Mathematics Calculator*  
  - **This resource breaks down skills into 2-page lessons using applicable word problems**  
    Features included with book: CD-ROM with comprehensive reviews, practice and official tests  
  - i-Pathways: *Math*—Unit 1: Number Operations and Number Sense —Lesson 4: Solving Word Problems  
  - CARS: *Math*—Unit 1: Whole Numbers—Lesson 4: Problem Solving  
  - Web sources:  
    - [www.mathtv.com](http://www.mathtv.com)  
    - [http://www.khanacademy.org](http://www.khanacademy.org)  
    - [http://www.mathwords.com](http://www.mathwords.com)  
    - [http://yesucandoit2.blogspot.com](http://yesucandoit2.blogspot.com) | Teacher skill checklist  
Student handout review |
| 2. Demonstrate competencies using number and word problems | Word problems | | Unit I Assessment:  
CD-ROM practice test and official test (option) |
# Statewide Healthcare Curriculum
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### Unit II: Decimals

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<tr>
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Unit II: Decimals

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<tr>
<th>OUTCOMES</th>
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<th>ASSESSMENT</th>
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</table>
• Pre-i-Pathways: *Math*—Unit 2: Decimals—Lesson 1: Understanding Decimals  
• Pre-i-Pathways: *Math*—Unit 2: Decimals—Lesson 2: Comparing and Rounding Decimals  
• Pre-i-Pathways: *Math*—Unit 2: Decimals—Lesson 3: Adding and Subtracting Decimals  
• Pre-i-Pathways: *Math*—Unit 2: Decimals—Lesson 4: Multiplying and Dividing Decimals  
• i-Pathways: *Math*—Unit 1: Number Operations and Number Sense—Lesson 6: Decimal Review  
• CARS: *Math*—Unit 5: Decimal Numbers—Lesson 1: Decimal Numbers & Lesson 2: Addition and Subtraction of Decimal Numbers & Lesson 3: Multiplication and Division with Decimal Numbers | | Unit II Assessment:  
CD-ROM practice test and official test (option) |
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### Unit III: Fractions and Mixed Numbers

**Students will:**

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<tr>
<th>OUTCOMES</th>
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<th>ACTIVITIES/RESOURCES</th>
<th>ASSESSMENT</th>
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</thead>
<tbody>
<tr>
<td>1. Learn and demonstrate:</td>
<td>Fractions:</td>
<td>• Teacher instruction and demonstration for each new skill</td>
<td>Teacher skill checklist</td>
</tr>
<tr>
<td>• Lowest Common Denominator (LCD)</td>
<td>• Addition and Subtraction</td>
<td>• Student participation</td>
<td>Student work</td>
</tr>
<tr>
<td>• Lowest terms</td>
<td>• Multiplication and Division</td>
<td>• Use student handouts for skill practice and reinforcement, word problem practice</td>
<td>Student observation/student exercise</td>
</tr>
<tr>
<td>• Mixed numbers</td>
<td>• Combining operations</td>
<td>• Pre-i-Pathways: Math—Unit 3: Fractions and Mixed Numbers—Lesson 1: Understanding Fractions</td>
<td></td>
</tr>
<tr>
<td>• Proper fraction</td>
<td></td>
<td>• Pre-i-Pathways: Math—Unit 3: Fractions and Mixed Numbers—Lesson 2: Improper Fractions and Mixed Numbers</td>
<td></td>
</tr>
<tr>
<td>• Improper fraction</td>
<td></td>
<td>• Pre-i-Pathways: Math—Unit 3: Fractions and Mixed Numbers—Lesson 3: Equivalent Fractions</td>
<td></td>
</tr>
<tr>
<td>• Combine operations</td>
<td></td>
<td>• Pre-i-Pathways: Math—Unit 3: Fractions and Mixed Numbers—Lesson 4: Reducing a Fraction to Lowest Terms</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Pre-i-Pathways: Math—Unit 3: Fractions and Mixed Numbers—Lesson 5: Raising a Fraction to Higher Terms</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Pre-i-Pathways: Math—Unit 3: Fractions and Mixed Numbers—Lesson 6: Finding Common Denominators</td>
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<tr>
<td></td>
<td></td>
<td>• Pre-i-Pathways: Math—Unit 3: Fractions and Mixed Numbers—Lesson 7: Adding and Subtracting Fractions</td>
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<td></td>
<td>• Pre-i-Pathways: Math—Unit 3: Fractions and Mixed Numbers—Lesson 8: Multiplying and Dividing Fractions</td>
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<tr>
<td></td>
<td></td>
<td>• CARS: Math—Unit 3 Fractions—Lesson 1: Fractions &amp; Lesson 2: Multiplication with Fractions &amp; Lesson 3: Division with Fractions &amp; Lesson 4: Addition with Fractions &amp; Lesson 5: Subtraction with Fractions</td>
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</tbody>
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**Unit III: Fractions and Mixed Numbers**

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<th>OUTCOMES</th>
<th>CONTENT</th>
<th>ACTIVITIES/RESOURCES</th>
<th>ASSESSMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>3. Utilize fraction keys on the calculator</td>
<td>• Word Problems</td>
<td>• i-Pathways: <em>Math</em>—Unit 1: Number Operations and Number Sense—Lesson 7: Fractions, Decimals, and Percents</td>
<td>Student participation</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Web source: <a href="http://www.mathtv.com">www.mathtv.com</a>  o Converting fractions to decimals  o Converting decimals to fractions</td>
<td>Unit III Assessment:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• CARS: <em>Math</em>—Unit 5: Decimal Numbers—Lesson 4: Decimals, Fractions and Percents</td>
<td>CD-ROM practice test and official test (option)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Calculator instruction taught after skill instruction and handouts are completed  • Pre-i-Pathways and i-Pathways: <em>Math</em>—Calculator Overview</td>
<td></td>
</tr>
</tbody>
</table>
# Statewide Healthcare Curriculum  
## Contextualized Math Module  
### Unit IV: Percents

<table>
<thead>
<tr>
<th>OUTCOMES</th>
<th>CONTENT</th>
<th>ACTIVITIES/RESOURCES</th>
<th>ASSESSMENT</th>
</tr>
</thead>
</table>
| 1. Find the rate | **The Percent Triangle**  
All percent problems can be written as one of these three types:  
\[ 40 \text{ is } \boxed{\_\% \text{ of } 40} \]  
\[ 40 \text{ is } 50\% \text{ of } \boxed{\_} \]  
\[ \boxed{\_} \text{ is } 50\% \text{ of } 40 \]  
Percent Change Formula:  
\[ \text{new value} - \text{previous value} \]  
\[\frac{\text{previous value}}{\times 100}\] | • Simplified definition of percent: http://www.gcflearnfree.org/decimalsandpercents  
• i-Pathways: *Math*—Unit 1: Number Operations and Number Sense—Lesson 8: Using Proportions with Percents  
• i-Pathways: *Math*—Unit 1: Number Operations and Number Sense—Lesson 9: Solving Increasing and Decreasing Percents  
• i-Pathways: *Math*—Unit 4: Percents—Lesson 1: Understanding Percents  
• CARS: *Math*—Unit 7: Percents—Lesson 6: Percent of Increase and Percent of Decrease  
• Teacher instruction and demonstration for each new skill: percent triangle, percent change, simple interest  
• Board work - volunteers  
• Use student handouts for skill practice and reinforcement, word problem practice | Teacher skill checklist  
Student participation  
Student work |
# Unit IV: Percents

## OUTCOMES | CONTENT | ACTIVITIES/RESOURCES | ASSESSMENT
--- | --- | --- | ---
6. Calculate simple interest | Simple Interest: \( I = \frac{p \times r \times t}{100} \) | - Materials for Units I through VII:
  - Steck-Vaughn *GED: Mathematics* (ISBN 0739828355)
- Simple interest explained: [http://www.youtube.com/watch?v=xtUekejWIQk](http://www.youtube.com/watch?v=xtUekejWIQk)
- i-Pathways: *Math*—Unit 1: Number Operations and Number Sense—Lesson 11: Understanding Simple Interest
- CARS: *Math*—Unit 7: Percents—Lesson 4: Simple Interest | Unit IV Assessment:
CD-ROM practice test and official test (option)
## Unit V: Proportions, Ratios, Probability, Mean and Median

### Outcomes

<table>
<thead>
<tr>
<th>Outcomes</th>
<th>Content</th>
<th>Activities/Resources</th>
<th>Assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Solve proportion and ratio problems</td>
<td><strong>Proportions:</strong> Find the missing number: 2/10 = n/5</td>
<td>Teacher instruction and demonstration for each new skill</td>
<td>Teacher skill checklist</td>
</tr>
<tr>
<td><strong>Ratio:</strong> The ratio of numbers A and B can be expressed as:</td>
<td></td>
<td><strong>Ratio Activity:</strong> If a:b = 1:3 and b:c = 3:4, find a:c. Two ratios are given, third is to be found. The picture shows the two given ratios as blocks.</td>
<td>Student assessment</td>
</tr>
<tr>
<td></td>
<td>• the ratio of A to B</td>
<td>• We can see that a is one block and c is four blocks, so the ratio a:c is 1:4.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• A is to B</td>
<td>• If a:b=1:3 and b:c=3:4, b being the same in both cases, we can write the ratio a:b:c as 1:3:4</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• A:B</td>
<td>• i-Pathways: <em>Math</em>—Unit 1: Number Operations and Number Sense—Lesson 2: Fractions and Ratios</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• A rational number which is the quotient of A divided by B</td>
<td>• i-Pathways: <em>Math</em>—Unit 1: Number Operations and Number Sense—Lesson 3: Proportions</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• CARS: <em>Math</em>—Unit 6: Ratios and Proportions—Lesson 1: Ratio and Price Per Unit &amp; Lesson 2: Ratios and Proportions &amp; Lesson 3: Finding the Unknown Term in a Proportion &amp; Lesson 4: Problem Solving with Proportions</td>
<td></td>
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## Unit V: Proportions, Ratios, Probability, Mean and Median

**Students will:**

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<th>OUTCOMES</th>
<th>CONTENT</th>
<th>ACTIVITIES/RESOURCES</th>
<th>ASSESSMENT</th>
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</thead>
<tbody>
<tr>
<td>2. Solve probability problems</td>
<td><strong>Probability of an Event:</strong></td>
<td>• Probability Activity: A single 6-sided die is rolled. What is the probability of each outcome? What is the probability of rolling an even number? Of rolling an odd number? Chart your outcomes and probabilities</td>
<td>Student demonstration</td>
</tr>
<tr>
<td></td>
<td>Probability of something happening = ( \frac{\text{Successful outcomes}}{\text{Total number of outcomes}} )</td>
<td>• i-Pathways: <em>Math</em>—Unit 1: Number Operations and Number Sense—Lesson 5: Probability</td>
<td>Unit V Assessment:</td>
</tr>
<tr>
<td>3. Calculate the mean in a set of numbers</td>
<td><strong>Mean:</strong> 5 students. Quiz of 10 questions. Answers correct: 7, 10, 7, 9</td>
<td>• i-Pathways: <em>Math</em>—Unit 2: Measurement and Data Analysis—Lesson 3: Measures of Central Tendency (Mean and Median)</td>
<td>CD-ROM practice test and official test (option)</td>
</tr>
<tr>
<td></td>
<td>7 + 10 + 7 + 7 + 9 = 40 divide by 5</td>
<td>• CARS: <em>Math</em>—Appendix B: Elementary Statistics: Mean, Median, and Mode</td>
<td></td>
</tr>
<tr>
<td>4. Find the median in a set of numbers</td>
<td><strong>Median:</strong> The middle number in the collection of data: (7, 7, 7, 9, 10)</td>
<td></td>
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<tr>
<td></td>
<td>*Exception (7, 7, 8, 9, 10):</td>
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### Statewide Healthcare Curriculum
#### Contextualized Math Module

#### Unit VI: Algebra and Geometry I

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<th>ACTIVITIES/RESOURCES</th>
<th>ASSESSMENT</th>
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</thead>
<tbody>
<tr>
<td>Solve problems with:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Integers</td>
<td>Integers</td>
<td>- Teacher instruction/demonstration for each new skill/Student participation&lt;br&gt;- i-Pathways: Math—Unit 3: Algebra—Lesson 1: Integers, Algebraic Expression, and Number Line&lt;br&gt;- CARS: Math—Unit 8: Introduction to Real Numbers—Lesson 1: Integers &amp; Lesson 2: Addition with Integers &amp; Lesson 3: Subtraction with Integers &amp; Lesson 5: Multiplication, Division, and Order of Operations with Integers</td>
<td>Teacher Skill Checklist</td>
</tr>
<tr>
<td>4. Simple Algebraic Equations/Expressions</td>
<td>Algebra: equations expressions</td>
<td></td>
<td></td>
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<tr>
<td>5. FOIL Method</td>
<td>FOIL method</td>
<td></td>
<td></td>
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<tr>
<td>6. Substitution</td>
<td>Substitution</td>
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#### Unit VII: Algebra and Geometry II

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<th>ASSESSMENT</th>
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</thead>
</table>
| 1. Recognize algebra and geometry terms | Vocabulary | • Teacher instruction and demonstration for each new skill  
• Discuss vocabulary | Teacher skill checklist |
| 2. Use basic formulas to solve problems | Basic formulas | • Use student handouts for skill practice, formulas and reinforcement with word problem practice | Student assessment |
| 3. Measure angles and find missing measurements | Lines and angles | • Calculate the angles of motion for arms and legs  
• Determine the angle used to insert a needle into an arm or thigh  
• Determine the appropriate angles for support of head or legs  
• i-Pathways: *Math*—Unit 4: Geometry—Lesson 1: Applying Formulas  
• i-Pathways: *Math*—Unit 4: Geometry—Lesson 2: Angles and Lines  
• i-Pathways: *Math*—Unit 4: Geometry—Lesson 3: Triangles and Quadrilaterals  
• CARS: *Math* Unit 10: Introduction to Geometry—Lesson 1: Points, Lines, Planes, and Angles | |
| 4. Use the formula to find the slope of a line | Slope of a line | • i-Pathways: *Math*—Unit 3: Algebra—Lesson 6: Slope of a Line and Distance Between Two Points | |

The slope \( m \) of the line through the points \((x_1, y_1)\) and \((x_2, y_2)\) is given by:

\[
m = \frac{y_2 - y_1}{x_2 - x_1} \quad (x_1 \neq x_2)
\]
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### Unit VII: Algebra and Geometry II

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<th>CONTENT</th>
<th>ACTIVITIES/RESOURCES</th>
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</table>
| 5. Use the Pythagorean Theorem to find the missing side of a right triangle | Pythagorean Theorem | • i-Pathways: *Math*—Unit 4: Geometry—Lesson 4: Pythagorean Relationship  
• CARS: *Math*—Unit 10: Introduction to Geometry—Lesson 2: Classifying Triangles and the Pythagorean Theorem | Unit VII Assessment:  
CD-ROM practice test and official test (option) |
| 6. Plot points and graph simple linear equations on a coordinate plane | Graphing linear equations | • i-Pathways: *Math*—Unit 3: Algebra—Lesson 4: Solving and Graphing Equations  
• i-Pathways: *Math*—Unit 3: Algebra—Lesson 5: Coordinate Planes and Working with Coordinate Grids  
• Materials for Units I through VII:  
  o Steck-Vaughn *GED Skill Book: Mathematics Calculator*  
• See Geometry Formula Reference Sheet:  
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#### Unit VIII: Metrics

**Students will:**

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</table>
| 1. Use Metric measurements for:  
  - Weight  
  - Dosage  
  - Food intake  
  - Height/Length  
  - Liquid  
| Metric Symbols and Unit Measures:  
  ![Metric Symbols Diagram](image)  
  - Kilogram (kg)  
  - Hectogram (hg)  
  - Decagram (dag)  
  - Decigram (dg)  
  - Centigram (cg)  
  - Milligram (mg)  
  - Increment:  
    - e  
    - h  
    - da  
    - c  
    - dec  
    - mil  
| - Teacher instruction  
  - Discuss vocabulary  
  - Practice problems – workbook  
  - Word problems – workbook  
  - CD-ROM  
| Teacher skill checklist |
| 2. Identify the prefix, meaning and symbol for Metric units of measurement  
| ![Prefix Diagram](image)  
| Student self-test: metric system |
| 3. Convert unit measures with the Metric system  
| ![Conversion Diagram](image)  
| - Web Sources:  
  - [http://www.metric-conversions.org/](http://www.metric-conversions.org/)  
  - [http://ts.nist.gov/WeightsAndMeasures/Publications/appxc.cfm#1](http://ts.nist.gov/WeightsAndMeasures/Publications/appxc.cfm#1)  
| Unit VIII Assessment:  
  - CD-ROM practice test  
  - Official test (option) |
## Statewide Healthcare Curriculum
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**Unit IX: Reading Medical Labels**

**Students will:**

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<th>ASSESSMENT</th>
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</thead>
</table>
| 1. Learn to read:  
  - Drug labels  
  - Medicine cups  
  - Syringes  
  - IV Bags  | Drug Label Literacy:  
  - Generic name  
  - Trade name  
  - Manufacturer  
  - National Drug Code (NDC)  
  - Lot/Control number  
  - Drug form  
  - Dosage strength  
  - Total amount in vial  
  - Prescription Warning  
  - Expiration date  | - Teacher instruction  
  - Discuss vocabulary  
  - Practice problems – workbook  
  - Word problems – workbook  
  - CD-ROM  
  - Web Source: http://www.slideshare.net/windleh/reading-medication-labels  | Teacher checklist  
  - Student self-test: reading labels  
  - Unit IX Assessment: CD-ROM practice test and official test (option) |
| 2. Practical application | | | |
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### Unit X: Apothecary

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<th>ASSESSMENT</th>
</tr>
</thead>
</table>
| 1. Learn about apothecary measurement and conversions | Apothecary system and conversions | • Teacher instruction  
• Discuss vocabulary  
• Practice problems – workbook  
• Word problems – workbook  
• CD-ROM | Teacher checklist |
• Use Handout: *Apothecary and Metric Measurements* | Student self-test: Apothecary |
| 3. Practical application | | • Web Source:  
# Statewide Healthcare Curriculum
## Contextualized Math Module

## Unit XI: Dosage Calculations

### OUTCOMES

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<th>Students will:</th>
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<tbody>
<tr>
<td>1. Calculate the individual dose a client will receive</td>
</tr>
<tr>
<td>2. Read drug labels in order to determine the dosage strength and unit</td>
</tr>
<tr>
<td>3. Practical application</td>
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### CONTENT

<table>
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<tr>
<th>Abbreviations:</th>
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<tr>
<td>D = Dosage Ordered</td>
</tr>
<tr>
<td>H = Dosage Strength/Supply on hand</td>
</tr>
<tr>
<td>Q = Quantity or unit of Measure</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Medication Order Formula:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Desired or dosage ordered * Quantity = Unknown Dosage * Supply on hand</td>
</tr>
</tbody>
</table>

| Rule 1: |
| The dosage ordered/desired and the have/supply must be in the same unit of measure. |

| Rule 2: |
| The quantity and the unknown dosage will be in the same unit of measure. |

### ACTIVITIES/RESOURCES

- Teacher instruction
- Discuss vocabulary
- Practice problems – workbook
- Word problems – workbook
- CD-ROM


### ASSESSMENT

<table>
<thead>
<tr>
<th>Teacher checklist</th>
</tr>
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| Student self-test: |
| Dosage Calculations |

| Unit XI Assessment: |
| CD-ROM practice test and official test (option) |

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## Statewide Healthcare Curriculum
### Contextualized Math Module

#### Unit XII: Parenteral Dosage

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| 1. Identify parenteral medications in the form of:  
- Intradermal ID  
- Intramuscular IM  
- Intravenous IV  
- Subcutaneous sub-Q  | Injections – mixtures of pure drug dissolved in an appropriate liquid. Dosage strength will be given in milligrams per milliliter as a ratio or percent  
**Dosage Formula:**  
Desired or dosage ordered \( x \) Quantity = Unknown Dosage  
Supply on hand  
**Ratios:**  
- Grams (dry weight)  
- Milliliters (solution)  
2:500 converts to 2 grams in 500 milliliters.  
**Percents:**  
14% converts to 14 grams in 100 milliliter.  
**Abbreviations:**  
Milliequivalents (mEq)  
Units (U)  
One milliequivalent = one-thousandth (1/1000)  
**Milliequivalents per milliliter (mEq/mL)  
Units per milliliter (U/mL)** |  
- Teacher instruction  
- Discuss vocabulary  
- Practice problems – workbook  
- Word problems – workbook  
- CD-ROM  
**Student self-test:** Intravenous Fluids  
**Unit XII Assessment:**  
CD-ROM practice test and official test (option) |
| 2. Describe the most common syringes:  
- 1 milliliter/cubic centimeter  
- Insulin  
- 3 cubic centimeter |  |  |  |
| 3. Practical application |  |  |  |
**Statewide Healthcare Curriculum**  
**Contextualized Math Module**

**Unit XIII: Intravenous Fluid Administration**

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| 1. Identify common abbreviations in IV administration: | Flow Rate Formula:  
\[ \text{Flow rate} = \frac{\text{Volume}}{\text{Time}} \]  

- Intravenous IV  
- Piggy-Back PB  
- Drop/drops gtts/gtt  
- Hour hr  
- Minutes min  
- Drops per minute gtts/min  
- Drops per milliliter gtts/mL  
- Milliliters per hour mL/hr  
- Water H2O, W  
- 5% dextrose water D5W  
- 10% dextrose water D10W  
- Normal saline (0.9%) NS  
- One half normal saline (0.45%) 1/2NS  
- Ringer’s lactate solution RL  
- Lactated Ringer’s solution LR  

- Infusion Rate Formula:  
\[ \text{Amount of fluid (mL)} \times \frac{\text{Administration set drop factor}}{\text{Total time of infusion in min.}} = \text{Drops per min.} \]  

| 125 milliliters | 45 minutes | 45/60 = 0.75 hour  
|------------------|------------|-------------------|

- Remember: Drops must be rounded up or down to ensure a whole number of drops. There are no partial drops. Thus, drops per minute and drops per hour will be whole numbers. | • Teacher instruction  
• Discuss vocabulary  
• Practice problems – workbook  
• Word problems – workbook  
• CD-ROM  

| Teacher checklist | Student self-test | Unit XIII Assessment:  
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**Students will:**

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| 1. Learn that drug orders are often calculated based on weight | Convert pounds to kilograms: A kilogram is rounded to the nearest hundredth for dosage by weight calculations  
**Conversion factor #1:**  
1 kilogram (kg) = 2.2046 pounds (lb)  
**Conversion factor #2:**  
1 pound (lb) = 16 ounces (oz) | - Teacher instruction  
- Discuss vocabulary  
- Practice problems – workbook  
- Word problems – workbook  
- CD-ROM  
| 2. Convert pounds and ounces into a decimal number and round to the nearest hundredth before dividing by 2.2 to convert into kilograms | The client weighs 32 lbs. What is his weight in kilograms?  
To convert lbs. to kilograms with a formula, cross multiply  

\[
\frac{1 \text{ kilo.}}{2.2 \text{ lbs.}} = \frac{? \text{ kilograms}}{32 \text{ lbs.}}
\]

Answer: \(32/2.2 = 14.5454545\) | |

**Unit XIV: Basic Dosage by Body Weight**