Statewide Healthcare Curriculum
Contextualized Math Module

Introduction to Basic Math for Allied Healthcare

Students will:

OUTCOMES	CONTENT	ACTIVITIES/RESOURCES	ASSESSMENT
1. Understand value and importance of math accuracy in the healthcare field	Importance of math accuracy in healthcare	• Use current events or recent studies to demonstrate the importance of math in all health fields as well as the consequences of mathematical errors. http://www.alysion.org/dimensional /matherrors.htm	*Teacher Skill Checklist* established for this course
2. Demonstrate 100% accuracy in multiplication to 10	Times Table	• 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	Multiplication test
3. Differentiate the value of a number by its location	Place Value	• Give students a place value chart and demonstrate how to use it. *http://www.math-aids.com/Place_Value/* • 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	Student participation
4. Use the calculator and its functions correctly	Calculator Basics	• Teacher demonstrates using a calculator with different types of problems. Students will use their own calculator to imitate the instructions. *http://www.workbase.org.nz/Resource.aspx?ID=211* • Pre-i-Pathways: *Math and* i-Pathways *Math*—Calculator Overview	Student participation
5. Interpret simple graphs and charts correctly	Reading and creating Graphs and Charts	• 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	Student participation

Statewide Healthcare Curriculum
Contextualized Math Module

Unit I: Whole Numbers

Students will:

OUTCOMES	CONTENT	ACTIVITIES/RESOURCES	ASSESSMENT
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* (10 pack ISBN 0-7398-4669-8)** **This resource breaks down skills into 2-page lessons using applicable word problems • Additional Materials: *Math Basics for the Health Care Professional* by Michele Benjamin Lesmeister (3rd Edition) (ISBN 978-0-13-512632-5) Features included with book: CD-ROM with comprehensive reviews, practice and official tests	Teacher skill checklist Student handout review
2. Demonstrate competencies using number and word problems	Word problems	• 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.khanacademy.org ○ http://www.mathwords.comhttp://yesucandoit2.blogspot.com	Unit I Assessment: CD-ROM practice test and official test (option)

Statewide Healthcare Curriculum
Contextualized Math Module

Unit II: Decimals

Students will:

OUTCOMES	CONTENT	ACTIVITIES/RESOURCES	ASSESSMENT
1. Solve problems with decimals	Using decimals in: Addition Subtraction	• Teacher instruction and demonstration for each new skill • Student participation • Show relationship between decimals and using money Video: http://www.gcflearnfee.org/decimalsandpercents • 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	Teacher skill checklist Student work
2. Solve decimal problems with different operations, including parentheses	Multiplication Division Combining operations Order of Operations: **PEMDAS** (Please Excuse My Dear Aunt Sally) Estimate/ Rounding	• Use student handouts for skill practice and reinforcement, word problem practice. http://www.homeschoolmath.net/teaching/problem_solving.php http://www.asdk12.org/depts/step/disability/documents/ARticle5.pdf http://assets.pearsonschool.com/asset_mgr/current/201034/Randy%20Charles%20Monograph.pdf • Activity: Have students work in pairs to buy or sell "items," add, subtract, combine operations and estimate a bill • Materials for Units I through VII: ○ Steck-Vaughn *GED: Mathematics* (ISBN 0739828355) ○ Steck-Vaughn *GED Skill Book: Mathematics Calculator* (10 pack ISBN 0-7398-4669-8)	Student demonstration/ Teacher observation

Statewide Healthcare Curriculum
Contextualized Math Module

Unit II: Decimals

Students will:

OUTCOMES	CONTENT	ACTIVITIES/RESOURCES	ASSESSMENT
2. Solve decimal problems with different operations, including parentheses *(Continued)*		• Additional Materials: *Math Basics for the Health Care Professional* by Michele Benjamin Lesmeister (3rd Edition) (ISBN 978-0-13-512632-5) • 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)

Statewide Healthcare Curriculum
Contextualized Math Module

Unit III: Fractions and Mixed Numbers

Students will:

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

Statewide Healthcare Curriculum
Contextualized Math Module

Unit III: Fractions and Mixed Numbers

Students will:

OUTCOMES	CONTENT	ACTIVITIES/RESOURCES	ASSESSMENT

1. (Continued)		• CARS: *Math*—Unit 4 Mixed Numbers—Lesson 1: Mixed Numbers & Lesson 2: Multiplying and Dividing Mixed Numbers & Lesson 3: Adding Mixed Numbers & Lesson 4: Subtracting Mixed Numbers
		• Materials for Units I through VII:
		  ○ Steck-Vaughn *GED: Mathematics* (ISBN 0739828355)
		  ○ Steck-Vaughn *GED Skill Book: Mathematics Calculator* (10 pack ISBN 0-7398-4669-8)
		  ○ *Math Basics for the Health Care Professional* by Michele Benjamin Lesmeister (3rd Edition) (ISBN 978-0-13-512632-5)	

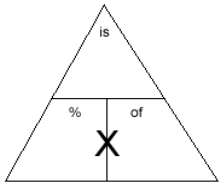
2. Convert fractions into decimals and decimals into fractions	• Conversions	• i-Pathways: *Math*—Unit 1: Number Operations and Number Sense—Lesson 7: Fractions, Decimals, and Percents
		• Web source: www.mathtv.com
		  ○ Converting fractions to decimals
		  ○ Converting decimals to fractions
		• CARS: *Math*—Unit 5: Decimal Numbers—Lesson 4: Decimals, Fractions and Percents
			Student participation
			
			Unit III Assessment:

3. Utilize fraction keys on the calculator	• Word Problems	• Calculator instruction taught after skill instruction and handouts are completed • Pre-i-Pathways and i-Pathways: *Math*—Calculator Overview	CD-ROM practice test and official test (option)

Statewide Healthcare Curriculum
Contextualized Math Module

Unit IV: Percents

Students will:

OUTCOMES	CONTENT	ACTIVITIES/RESOURCES	ASSESSMENT
1. Find the rate **2.** Find the part of a number **3.** Find the base or whole number **4.** Find the percent of increase or decrease between two numbers **5.** Add and subtract a percent of a number	**The Percent Triangle** All percent problems can be written as one of these three types: 40 is ____% of 80 40 is 50% of ____ ____ is 50% of 80  Percent Change Formula: $\frac{new\ value - previous\ value}{previous\ value} \times 100$	• 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

Statewide Healthcare Curriculum
Contextualized Math Module

Unit IV: Percents

Students will:

OUTCOMES	CONTENT	ACTIVITIES/RESOURCES	ASSESSMENT

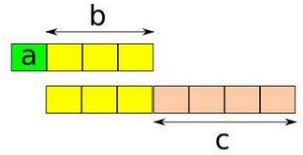
		• Materials for Units I through VII:
		  ○ Steck-Vaughn *GED: Mathematics* (ISBN 0739828355)
		  ○ Steck-Vaughn *GED Skill Book: Mathematics Calculator* (10 pack ISBN 0-7398-4669-8)
		  ○ *Math Basics for the Health Care Professional* by Michele Benjamin Lesmeister (3rd Edition) (ISBN 978-0-13-512632-5)	

6. Calculate simple interest	Simple Interest: 	• Simple interest explained: 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)

Statewide Healthcare Curriculum
Contextualized Math Module

Unit V: Proportions, Ratios, Probability, Mean and Median

Students will:

OUTCOMES	CONTENT	ACTIVITIES/RESOURCES	ASSESSMENT
1. Solve proportion and ratio problems	**Proportions:** Find the missing number: 2/10 = n/5 **Ratio**: The ratio of numbers *A* and *B* can be expressed as: • the ratio of *A* to *B* • *A* is to *B* • *A*:*B* • A rational number which is the quotient of *A* divided by *B*	• Teacher instruction and demonstration for each new skill • Ratio Activity: 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.  ○ We can see that a is one block and c is four blocks, so the ratio a:c is 1:4. ○ 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 • i-Pathways: *Math*—Unit 1: Number Operations and Number Sense—Lesson 2: Fractions and Ratios • i-Pathways: *Math*—Unit 1: Number Operations and Number Sense—Lesson 3: Proportions • CARS: *Math*—Unit 6: Ratios and Proportions—Lesson 1: Ratio and Price Per Unit & Lesson 2: Ratios and Proportions & Lesson 3: Finding the Unknown Term in a Proportion & Lesson 4: Problem Solving with Proportions	Teacher skill checklist Student assessment

Statewide Healthcare Curriculum
Contextualized Math Module

Unit V: Proportions, Ratios, Probability, Mean and Median

Students will:

OUTCOMES	CONTENT	ACTIVITIES/RESOURCES	ASSESSMENT
2. Solve probability problems	**Probability of an Event:** $\text{Probability of something happening} = \frac{\text{Successful outcomes}}{\text{Total number of outcomes}}$	• 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 • i-Pathways: *Math*—Unit 1: Number Operations and Number Sense—Lesson 5: Probability	Student demonstration Unit V Assessment: CD-ROM practice test and official test (option)
3. Calculate the mean in a set of numbers	**Mean:** 5 students. Quiz of 10 questions. Answers correct: 7,10, 7, 7, 9 7 + 10 + 7 + 7 + 9 = 40 divide by 5 Answer: 8	• i-Pathways: *Math*—Unit 2: Measurement and Data Analysis—Lesson 3: Measures of Central Tendency (Mean and Median) • CARS: *Math*—Appendix B: Elementary Statistics: Mean, Median, and Mode	
4. Find the median in a set of numbers	**Median:** The middle number in the collection of data: (7, 7, **7**, 9, 10) *Exception (7, 7**, 7, 8,** 9, 10):		

Statewide Healthcare Curriculum
Contextualized Math Module

Unit VI: Algebra and Geometry I

OUTCOMES	CONTENT	ACTIVITIES/RESOURCES	ASSESSMENT
Solve problems with: **1.** Integers	Integers	• Teacher instruction/demonstration for each new skill/Student participation • i-Pathways: *Math*—Unit 3: Algebra—Lesson 1: Integers, Algebraic Expression, and Number Line • CARS: *Math*—Unit 8: Introduction to Real Numbers—Lesson 1: Integers & Lesson 2: Addition with Integers & Lesson 3: Subtraction with Integers & Lesson 5: Multiplication, Division, and Order of Operations with Integers	Teacher Skill Checklist Student self-assessment
2. Exponents	Exponents	• CARS: *Math*—Unit 8: Introduction to Real Numbers—Lesson 4: Adding and Subtracting with Signed Numbers • Pre-i-Pathways: *Math*—Lesson 7: Squares, Cubes, and Square Roots	
3. Roots/Radicals	Roots	• i-Pathways: *Math*—Unit 3: Algebra—Lesson 3: Exponents and Square Roots, Factoring, and Inequalities • Pre-i-Pathways: *Math*—Unit 6: Introduction to Algebra—Lesson 2: Expressions	
4. Simple Algebraic Equations/ Expressions	Algebra: equations expressions	• Pre-i-Pathways: *Math*—Unit 6: Introduction to Algebra—Lesson 3: Equations with Linear Equations and Inequalities • CARS: *Math*—Unit 9: Introduction to Algebra—Lesson 1: Variables and Algebraic Expressions & Lesson 2: Combining Like Terms and Simplifying Expressions & Lesson 3: Solving Algebraic Equations Using the Addition Principle & Lesson 4: Solving Algebraic Equations Using Multiplication Principle & Lesson 5: Solving Algebraic Equations Using the Multiplication and Addition Principle & Lesson 6: Solving Algebraic Equations with Fractions and Decimals	Unit VI Assessment: CD-ROM practice test and official test (option)
5. FOIL Method	FOIL method	• Use student handouts for skill practice and reinforcement, word problem practice • See Algebra Formula Sheet: www.regentsprep.org/regents/math/algebra/FormulaSheetAlgebra.pdf	
6. Substitution	Substitution		

Statewide Healthcare Curriculum
Contextualized Math Module

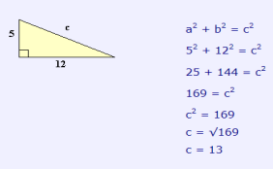
Unit VII: Algebra and Geometry II

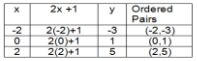
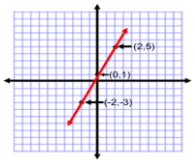
Students will:

OUTCOMES	CONTENT	ACTIVITIES/RESOURCES	ASSESSMENT
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 The slope m of the line through the points (x_1, y_1) and (x_2, y_2) is given by $m = \frac{y_2 - y_1}{x_2 - x_1} \quad (x_1 \neq x_2)$	• i-Pathways: *Math*—Unit 3: Algebra—Lesson 6: Slope of a Line and Distance Between Two Points	

Statewide Healthcare Curriculum
Contextualized Math Module

Unit VII: Algebra and Geometry II

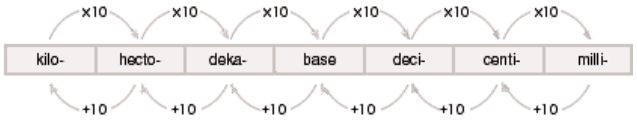
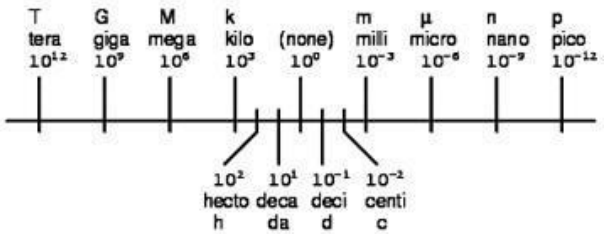
OUTCOMES	CONTENT	ACTIVITIES/RESOURCES	ASSESSMENT
5. Use the Pythagorean Theorem to find the missing side of a right triangle	Pythagorean Theorem 	• i-Pathways: *Math*—Unit 4: Geometry—Lesson 4: Pythagorean Relationship • CARS: *Math*—Unit 10: Introduction to Geometry—Lesson 2: Classifying Triangles and 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:
		  ○ Steck-Vaughn *GED: Mathematics* (ISBN 0739828355)
		  ○ Steck-Vaughn *GED Skill Book: Mathematics Calculator* (10 pack ISBN 0-7398-4669-8)
		  ○ *Math Basics for the Health Care Professional* by Michele Benjamin Lesmeister (3rd Edition) (ISBN 978-0-13-512632-5)
		
		• See Geometry Formula Reference Sheet: http://mdk12.org/instruction/curriculum/hsa/geometry/math_reference_sheet.html	

Statewide Healthcare Curriculum
Contextualized Math Module

Unit VIII: Metrics

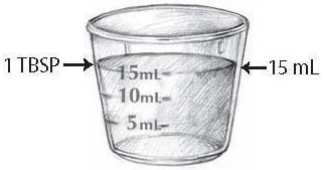
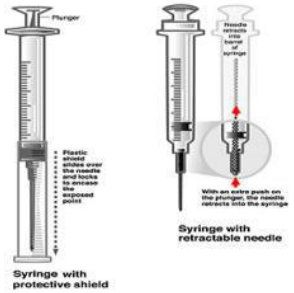
Students will:

OUTCOMES	CONTENT	ACTIVITIES/RESOURCES	ASSESSMENT
1. Use Metric measurements for: • Weight • Dosage • Food intake • Height/Length • Liquid **2.** Identify the prefix, meaning and symbol for Metric units of measurement **3.** Convert unit measures with the Metric system **4.** Complete practical applications with word problems	Metric Symbols and Unit Measures:  | Name of unit	Symbol	Increment | |---|---|---| | Kilogram | kg | thousand grams | | Hectogram | hg | hundred grams | | Decagram | dag | ten grams | | Decigram | dg | 1–tenth gram | | Centigram | cg | 1-hundredth gram | | Milligram | mg | 1-thousandth gram |  	• Teacher instruction • Discuss vocabulary • Practice problems – workbook • Word problems – workbook • CD-ROM • Use: *Math Basics for the Health Care Professional* by Michele Benjamin Lesmeister (3rd Edition) (ISBN 978-0-13-512632-5) • Web Sources: http://www.metric-conversions.org/ http://ts.nist.gov/WeightsAndMeasures/Publications/appxc.cfm#1	Teacher skill checklist Student self-test: metric system Unit VIII Assessment: CD-ROM practice test and official test (option)

Statewide Healthcare Curriculum
Contextualized Math Module

Unit IX: Reading Medical Labels

Students will:

OUTCOMES	CONTENT	ACTIVITIES/RESOURCES	ASSESSMENT
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 • Use: *Math Basics for the Health Care Professional* by Michele Benjamin Lesmeister (3rd Edition) (ISBN 978-0-13-512632-5) • 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			

Statewide Healthcare Curriculum
Contextualized Math Module

Unit X: Apothecary

Students will:

OUTCOMES	CONTENT	ACTIVITIES/RESOURCES	ASSESSMENT
1. Learn about apothecary measurement and conversions **2.** Use rounding for dosage calculations **3.** Practical application	Apothecary system and conversions	• Teacher instruction • Discuss vocabulary • Practice problems – workbook • Word problems – workbook • CD-ROM • Use: *Math Basics for the Health Care Professional* by Michele Benjamin Lesmeister (3rd Edition) (ISBN 978-0-13-512632-5) • Use Handout: **Apothecary and Metric Measurements** • Web Source: http://www.nurse-center.com/studentnurse/nur11.html	Teacher checklist Student self-test: Apothecary Unit X Assessment: CD-ROM practice test and official test (option)

Statewide Healthcare Curriculum
Contextualized Math Module

Unit XI: Dosage Calculations

Students will:

OUTCOMES	CONTENT	ACTIVITIES/RESOURCES	ASSESSMENT
1. Calculate the individual dose a client will receive	Abbreviations: D = Dosage Ordered H = Dosage Strength/Supply on hand Q = Quantity or unit of Measure	• Teacher instruction • Discuss vocabulary • Practice problems – workbook • Word problems – workbook • CD-ROM	Teacher checklist
2. Read drug labels in order to determine the dosage strength and unit		• Use: *Math Basics for the Health Care Professional* by Michele Benjamin Lesmeister (3rd Edition) (ISBN 978-0-13-512632-5)	Student self-test: Dosage Calculations
3. Practical application	Medication Order Formula: Desired or dosage ordered **X** Quantity **=** Unknown Dosage Supply on hand **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.		Unit XI Assessment: CD-ROM practice test and official test (option)

Statewide Healthcare Curriculum
Contextualized Math Module

Unit XII: Parenteral Dosage

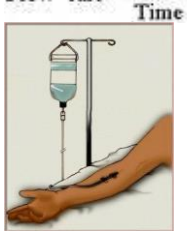
Students will:

OUTCOMES	CONTENT	ACTIVITIES/RESOURCES	ASSESSMENT
1. Identify parenteral medications in the form of: • Intradermal **ID** • Intramuscular **IM** • Intravenous **IV** • Subcutaneous **sub-Q** **2.** Describe the most common syringes: • 1 milliliter/cubic centimeter • Insulin • 3 cubic centimeter **3.** Practical application	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 • Use: *Math Basics for the Health Care Professional* by Michele Benjamin Lesmeister (3rd Edition) (ISBN 978-0-13-512632-5)	Teacher checklist Student self-test: Intravenous Fluids Unit XII Assessment: CD-ROM practice test and official test (option)

Statewide Healthcare Curriculum
Contextualized Math Module

Unit XIII: Intravenous Fluid Administration

Students will:

OUTCOMES	CONTENT	ACTIVITIES/RESOURCES	ASSESSMENT
1. Identify common abbreviations in IV administration: Intravenous **IV** Piggy-Back **PB** Drop/drops **gtt/gtts** Hour **hr** Minutes **min** Drops per minute **gtts/min** Drops per milliliter **gtts/mL** Milliliters per hour **mL/hr** Water **H20, 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** **2.** Practical application	**Flow Rate Formula:** $\text{Flow rate} = \frac{\text{Volume}}{\text{Time}}$  $\frac{\text{125 milliliters}}{\text{45 minutes}}$ = 45 minutes is 45/60 or .75 hour **Infusion Rate Formula:** $\frac{\text{Amount of fluid (mL)}}{\text{Total time of infusion in min.}}$ **X Administration set drop factor = Drops per min.** **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 • Use: *Math Basics for the Health Care Professional* by Michele Benjamin Lesmeister (3rd Edition) (ISBN 978-0-13-512632-5)	Teacher checklist Student self-test Unit XIII Assessment: CD-ROM practice test and official test (option)

Statewide Healthcare Curriculum
Contextualized Math Module

Unit XIV: Basic Dosage by Body Weight

Students will:

OUTCOMES	CONTENT	ACTIVITIES/RESOURCES	ASSESSMENT
1. Learn that drug orders are often calculated based on weight **2.** Convert pounds and ounces into a decimal number and round to the nearest hundredth before dividing by 2.2 to convert into kilograms	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) 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	• Teacher instruction • Discuss vocabulary • Practice problems – workbook • Word problems – workbook • CD-ROM • Use: *Math Basics for the Health Care Professional* by Michele Benjamin Lesmeister (3rd Edition) (ISBN 978-0-13-512632-5) • Conversion Chart: http://curezone.com/conversions.asp	Teacher checklist Student self-test: Body Weight Calculations Unit XIV Assessment: CD-ROM practice test and official test (option)