

# (CTE) MATHEMATICS IN HEALTH SCIENCES

## Math IV

### Unit Pacing Guide

#### Rational and Purpose:

Professional math IV is provided to enhance mathematics in high school and provide students with the math skills necessary for the current job market and/or prepare students for college entry. Curriculum that is contained within Career Technology Education (CTE) provides enhanced mathematics instruction that makes mathematics more explicit in a meaningful context and helps reinforce students' mathematics understanding both in and out of context.

#### Guidelines:

All objectives must be mastered at or above a 70% efficiency level in order to receive 1 Math credit. The content/objectives to be completed in four (4) semesters are listed below in each trade specific program. Since each program contains differing content at various stages, an independent content/objective list will be constructed for each curriculum in every course. Once a designated semester worth of content/objectives (which are listed in the following table) are accomplished, .25 credits will be earned per semester for a total of 1 math credit at the end of 2 years. Failure to complete the required semester content/objectives may result in the student being removed from the Professional Math IV program.

Competencies	Time Span (quarter/wks)	Course Objectives	Show-Me Standards and CLE Code	Vocabulary	Resources	Learning Activities & Instructional Strategies	Assessment
<p><b>Unit Title:</b> (Pre-knowledge) Review of all mathematic objectives for mastery to be a success in the welding program of study</p> <p><b>Core Concept:</b> Addition and subtraction of whole numbers, multiplication and division of whole numbers, mathematical operation of addition and subtraction of decimal fractions, mathematical operation of multiplication and division of decimal fractions, addition and subtraction of fractions, multiplication and division of fractions, changing common fractions to decimal fractions, changing decimal fractions to common fractions.</p>							
Addition and subtraction of whole numbers	1 <sup>st</sup> quarter 1 week	After completing this unit the Student will be able to calculate whole numbers through the mathematical processes of addition, subtraction,	MA1,  Goals: G, 1.10  CLEs N-1B, N-1C. M-2D	Whole numbers Real numbers Natural numbers Numbers Addend, Sum Minuend Subtrahend Difference	Worksheets of addition and subtraction problems	Paper and pencil problems and software demonstrational activities	Test of at least 10 problems in each operation to demonstrate mastery

Competencies	Time Span (quarter/wks)	Course Objectives	Show-Me Standards and CLE Code	Vocabulary	Resources	Learning Activities & Instructional Strategies	Assessment
Multiplication and division of whole numbers	1 <sup>st</sup> quarter 1 week	After completing this unit the Student will be able to calculate whole numbers through the mathematical processes of multiplication and division.	MA1,  Goals: G, 1.10  CLEs N-1B, N-1C. M-2D	Whole numbers Real numbers Natural numbers Rational numbers, Multiplicand Multiplier Product factor, Quotient divisor, Dividend	Worksheets of multiplication and division problems	Paper and pencil problems and software demonstrational activities	Test of at least 10 problems in each operation to demonstrate mastery
Reducing proper and improper fractions	1 <sup>st</sup> quarter 1 week	After completing this unit the student will be able to add & subtract proper and improper fractions	MA1  Goals: G, 3.3, 3.4  CLEs N-1B, N- 1C, N-2D, N-3E	Prime numbers Greatest common factor, Least common multiple, Rational expression, Numerator Denominator Reciprocal Equivalent	Hardcopy worksheets, video, internet and other electronic sources	Paper and pencil problems and software demonstrational activities. Peer grouping for additional support and interaction.	Test of at least 10 problems in each operation to demonstrate mastery
Add fractions With like denominators and reducing to lowest terms	1 <sup>st</sup> quarter 1 week	After completing this unit the student will be able to add rational numbers with like denominators and reduce them to lowest terms	MA 1, MA 5  Goals: G 1.6, 1.10, 3.4  CLEs N-1B, N-1C,N-2D,N- 3D,	Prime numbers Greatest common factor, Least common multiple, Rational expression, Numerator Denominator Reciprocal Equivalent	Hardcopy worksheets, video, internet and other electronic sources	Paper and pencil problems and software demonstrational activities. Peer grouping for additional support and interaction	Test of at least 10 problems in each operation to demonstrate mastery
Add fractions with unlike denominators	1 <sup>st</sup> quarter 1 week	After completing this unit the student will be able to add rational numbers with unlike denominators	MA 1, MA 5  Goals: G 3.3, 1.6, 3.4  CLEs N-1C, N-2D, N-3D, N-3E	Prime numbers Greatest common factor, Least common multiple, Rational expression, Numerator Denominator Reciprocal	Hardcopy worksheets, video, internet and other electronic sources	Paper and pencil problems and software demonstrational activities. Peer grouping for additional support and interaction	Test of at least 10 problems in each operation to demonstrate mastery

Competencies	Time Span (quarter/wks)	Course Objectives	Show-Me Standards and CLE Code	Vocabulary	Resources	Learning Activities & Instructional Strategies	Assessment
				Equivalent			
Add fractions With unlike denominators When neither is lowest common denominator	1 <sup>st</sup> quarter 1 week	After completing this unit the student will be able to add rational numbers with unlike denominators when neither is lowest.	MA 1, MA 5  Goals: G 3.3, 1.6, 1.10, 3.4  CLEs N-1B, N-1C, N-2D, N-3D, N-3E	Prime numbers, Greatest common factor, Least common multiple, Rational expression, Numerator Denominator Reciprocal Equivalent	Hardcopy worksheets, video, internet and other electronic sources	Paper and pencil problems and software demonstrational activities. Peer grouping for additional support and interaction	Test of at least 10 problems in each operation to demonstrate mastery
Add mixed numbers with like denominators	1 <sup>st</sup> quarter 1 week	After completing this unit the student will be able to add mixed numbers with like denominators.	MA 1, MA 5  Goals: G 1.6, 1.10, 3.4  CLEs N-1B, N-1C, N-2D, N-3D,	Prime numbers, Greatest common factor, Least common multiple, Rational expression, Numerator Denominator Reciprocal Equivalent	Hardcopy worksheets, video, internet and other electronic sources	Paper and pencil problems and software demonstrational activities. Peer grouping for additional support and interaction	Test of at least 10 problems in each operation to demonstrate mastery
Add mixed numbers with unlike denominators	1 <sup>st</sup> quarter 1 week	After completing this unit the student will be able to add mixed numbers with rational numbers when neither rational number has a common denominator.	MA 1, MA 5  Goals: G 1.6, 1.10, 3.4  CLEs N-1B, N-1C, N-2D, N-3D	Prime numbers, Greatest common factor, Least common multiple, Rational expression, Numerator Denominator Reciprocal Equivalent	Hardcopy worksheets, video, internet and other electronic sources	Paper and pencil problems and software demonstrational activities. Peer grouping for additional support and interaction	Test of at least 10 problems in each operation to demonstrate mastery
Subtracting fractions with like denominators	2nd quarter 1 week	After completing this unit the student will be able to subtract rational numbers with like denominators.	MA 1, MA 5  Goals: G 1.6, 1.10, 3.4  CLEs N-1B,	Prime numbers, Greatest common factor, Least common multiple, Rational expression, Numerator	Hardcopy worksheets, video, internet and other electronic sources	Paper and pencil problems and software demonstrational activities. Peer grouping for additional support	Test of at least 10 problems in each operation to demonstrate mastery

Competencies	Time Span (quarter/wks)	Course Objectives	Show-Me Standards and CLE Code	Vocabulary	Resources	Learning Activities & Instructional Strategies	Assessment
			N-1C,N- 2D, N- 3D,	Denominator Reciprocal Equivalent		and interaction	
Subtracting fractions with unlike denominators	2 <sup>nd</sup> quarter 1 week	After completing this unit the student will be able to subtract rational numbers with unlike denominators.	MA 1, MA 5  Goals: G 1.6, 1.10, 3.4  CLEs N-1B, N-1C,N- 2D, N-3D,	Prime numbers, Greatest common factor, Least common multiple, Rational expression, Numerator Denominator Reciprocal Equivalent	Hardcopy worksheets, video, internet and other electronic sources	Paper and pencil problems and software demonstrational activities. Peer grouping for additional support and interaction	Test of at least 10 problems in each operation to demonstrate mastery
Subtracting mixed numbers and reducing answers to lowest terms	2 <sup>nd</sup> quarter 1 week	After completing this unit the student will be able to subtract mixed numbers and reduce their answers to lowest terms.	MA 1, MA 5  Goals: G 1.6, 1.10, 3.4  CLEs N-1B, N-1C,N- 2D, N-3D,	Prime numbers, Greatest common factor, Least common multiple, Rational expression, Numerator Denominator Reciprocal Equivalent	Hardcopy worksheets, video, internet and other electronic sources	Paper and pencil problems and software demonstrational activities. Peer grouping for additional support and interaction	Test of at least 10 problems in each operation to demonstrate mastery
Subtracting fractions when borrowing is necessary	2 <sup>nd</sup> quarter 1 week	After completing this unit the student will be able to subtract rational numbers when borrowing is necessary.	MA 1, MA 5  Goals: G 1.6, 1.10, 3.4  CLEs N-1B, N-1C,N- 2D, N-3D,	Prime numbers, Greatest common factor, Least common multiple, Rational expression, Numerator Denominator Reciprocal Equivalent	Hardcopy worksheets, video, internet and other electronic sources	Paper and pencil problems and software demonstrational activities. Peer grouping for additional support and interaction	Test of at least 10 problems in each operation to demonstrate mastery
Multiplying fractions	2 <sup>nd</sup> quarter 1 week	After completing this unit the student will be able to multiply rational numbers.	MA 1, MA 5  Goals: G 1.6, 1.10, 3.4	Prime numbers, Greatest common factor, Least common multiple, Rational	Hardcopy worksheets, video, internet and other electronic sources	Paper and pencil problems and software demonstrational activities. Peer	Test of at least 10 problems in each operation to demonstrate mastery

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			CLEs N-1B, N-1C, N- 2D, N- 3D,	expression, Numerator Denominator Reciprocal Equivalent		grouping for additional support and interaction	
Multiplying fractions and whole numbers	2 <sup>nd</sup> quarter 1 week	After completing this unit the student will be able to multiply rational numbers and whole numbers.	MA 1, MA 5  Goals: G 1.6, 1.10, 3.4  CLEs N-1B, N-1C, N- 2D, N-3D,	Prime numbers, Greatest common factor, Least common multiple, Rational expression, Numerator Denominator Reciprocal Equivalent	Hardcopy worksheets, video, internet and other electronic sources	Paper and pencil problems and software demonstrational activities. Peer grouping for additional support and interaction	Test of at least 10 problems in each operation to demonstrate mastery
Dividing fractions	2 <sup>nd</sup> quarter 1 week	After completing this unit the student will be able to divide rational numbers.	MA 1, MA 5  Goals: G 1.6, 1.10, 3.4  CLEs N-1B, N-1C, N- 2D, N-3D,	Prime numbers, Greatest common factor, Least common multiple, Rational expression, Numerator Denominator Reciprocal Equivalent	Hardcopy worksheets, video, internet and other electronic sources	Paper and pencil problems and software demonstrational activities. Peer grouping for additional support and interaction	Test of at least 10 problems in each operation to demonstrate mastery
Changing common fractions to decimal fractions and decimal fractions to common fractions	2 <sup>nd</sup> quarter 1 weeks	After completing this unit the student will be able to Change common fractions to decimal fractions and decimal fractions to common fractions.	MA 1, MA 5  Goals: G 3.3, 1.6, 1.10, 3.4  CLEs N-1B, N-1C, M-2D, M-3D, M-3E	Prime numbers, Greatest common factor, Least common multiple, Rational expression, Numerator Denominator Reciprocal Equivalent	Hardcopy worksheets, video, internet and other electronic sources	Paper and pencil problems and software demonstrational activities. Peer grouping for additional support and interaction	Test of at least 10 problems in each operation to demonstrate mastery
Addition, subtraction, multiplication	2 <sup>nd</sup> quarter 1 week	After completing this unit the student will be able to add, subtract, multiply and divide	MA 1, MA 5  Goals:	Prime numbers, Greatest common factor, Least	Hardcopy worksheets, video, internet	Paper and pencil problems and software	Test of at least 10 problems in each operation to

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and divisions of decimals to recognize and collect data from Tables and Charts and use this data to perform more advanced Calculations.		decimal fractions.	G 3.3, 1.6, 1.10, 3.4  CLEs N-1B, N-1C, M-2D, M-3D, M-3E	common multiple, Rational expression, Numerator Denominator Reciprocal Equivalent	and other electronic sources	demonstrational activities. Peer grouping for additional support and interaction	demonstrate mastery

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<p><b>Unit Title:</b> (Current Knowledge) Module # I Multiplication, Long Division (Without a Calculator), Interpretation of Roman Numerals, Computation of Fractions, Decimals, Percentages, Ratios, and Proportions, and apply Apothecaries' System to make conversions from one measure to another.</p> <p><b>Core Concepts:</b> Students will learn: How to use multiplication and long division in reference to health science applications, how to interpret Roman Numerals relevant to the medical field, accurately interpret different measurements using Apothecaries' System, and successfully demonstrate a working knowledge of fractions, decimals, percentages, ratios, and proportions.</p>							
<p><b>Comp. # 1</b></p> <p>Calculate multiplication and division problems. This will include the memorization of multiplication matrixes through 12 X 12 and long division without the aid of a calculator</p>	3 <sup>rd</sup> quarter 2 weeks	After completing this unit the student will be able to work basic multiplication and division problems, fill out a times table chart through 12 X 12 by memory, learn long hand division symbols and terminology such as dividend, divisor, and quotient, and know the fractional interpretation of a remainder.	<p>MA 1,</p> <p>Goals: G 1.6, 1.10,</p> <p>CLEs N-3D, N-3E, G 4B</p>	<p>Multiplication</p> <p>Division</p> <p>Dividend</p> <p>Divisor</p> <p>Quotient</p> <p>Multiplicand</p> <p>Multiplier</p> <p>Product</p> <p>Remainder</p>	<p>Paper and pencil</p> <p>Refresher lecture</p> <p>Blank table of multiplication and division grid</p>	<p>Classroom lecture</p> <p>Students will work long division problems on the board</p> <p>The students will be given a worksheet for guided practice</p>	Students will be given a test to check for competency in mathematical operations discussed in this lesson plan
<p><b>Comp. # 2</b></p> <p>Interpret roman numerals correctly from 1 to 1000.</p>	3 <sup>rd</sup> quarter 1 week	After completing this unit the student will be able to translate Roman numerals into Arabic, and Arabic numerals to Roman numerals correctly and accurately up to 1000 or M.	<p>MA 1,</p> <p>Goals: G-1.7, 1.10, 3.4.</p> <p>CLEs N-1C</p>	<p>Roman numerals</p> <p>I</p> <p>V</p> <p>X</p> <p>C</p> <p>D</p> <p>M</p> <p>Arabic</p>	<p>Worksheets</p> <p>Chart with roman numerals and their values</p> <p>Sheet explaining the 4 rules for using roman numeral</p> <p>Pencil and paper</p>	<p>There will be a review sheet handed out and the information on the review sheet will be used to change Roman numerals into Arabic and the Arabic numerals into Roman numerals.</p>	There will be an assessment given to the students to check their understanding of making proper conversions when using Roman numeral

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<p><b>Comp. # 3</b></p> <p>Accurately interoperate and compute fractions, decimals, percentages, ratios, and proportions</p>	3 <sup>rd</sup> quarter 2 weeks	After completing this unit the student will be able to apply basic mathematical rules in calculating fractions, decimal fractions, percentages, ratios, and proportions.	<p>MA-1,</p> <p>Goals: G-3.4, 1.6</p> <p>CLEs N-3D, 3E,</p>	<p>Decimals</p> <p>Decimal fractions</p> <p>Numerator</p> <p>De nominator</p> <p>Decimal point</p> <p>Units</p> <p>Tens</p> <p>Hundreds</p> <p>Thousands</p> <p>Ten thousands</p> <p>Hundred thousands</p>	<p>Paper and pencil</p> <p>Calculator</p> <p>Worksheets of problems and conversions</p>	Short class lecture with corresponding worksheet examples for guided practice	There will be a written test to check for comprehension in reference to fractions, decimals, percentages, ratios, and proportions
<p><b>Comp. # 4</b></p> <p>Apply the concepts of apothecaries' system to make conversions from one measure to another.</p>	3 <sup>rd</sup> quarter 2 weeks	After completing this unit the student will be able to convert minims to fluid drams, fluid drams to fluid ounces, fluid ounces to pints, pints to quarts, quarts to gallons, minims to ounces, grains to drams, drams to ounces, grains to ounces, and ounces to pounds.	<p>MA-1, MA-2,</p> <p>Goals: G-3.4, G-2.3, G-4.6</p> <p>CLEs N-3D, M- M-2C, 2D</p>	<p>Liquid measures</p> <p>Minims</p> <p>Fluid dram</p> <p>Fluid ounce</p> <p>Pint</p> <p>Quart</p> <p>Gallon</p> <p>Pound</p> <p>Ounces</p>	<p>Scientific Calculators</p> <p>Detailed Lesson Plan</p> <p>Work sheets</p> <p>Conversion charts</p>	<p>Short lecture</p> <p>Hand out worksheets for guided practice</p> <p>Assign conversion problems to check for understanding</p>	Paper and pencil test to demonstrate mastery of apothecaries' system of conversions



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<p><b>Unit Title:</b> (Current Knowledge) Module # II The metric system, household measuring systems and equivalents, measuring and recording heights using an upright scale, apothecaries' system, and common abbreviations in reference to solving medication problems.</p> <p><b>Core Concepts:</b> Students will analyze and interpret the metric system; synthesize the values of household measuring systems; measure height with an upright scale, make associations between household measuring units, apothecary units, and the metric system.</p>							
<p><b>Comp. # 1</b></p> <p>Analyze the metric system and make conversions from one measure to another.</p>	4 <sup>th</sup> quarter 2 weeks	After completing this unit the student will know the prefixes of the metric system, which indicate the multiples or fractions of the unit, and make conversions from one metric unit of measure to another metric unit of measured.	<p>MA-1, MA-2,</p> <p>Goals: G1.6, G-1.8, G-1.10, G-3. 4.</p> <p>CLEs N-3D, N-3E, A-1C,M-2D.</p>	<p>Meter Centimeters Deciliter Liter Milliliters Cubic centimeters (cc) Kilogram (kg) Grams Milligrams Micrograms Equivalent</p>	<p>Pencil Paper</p> <p>Scientific Calculator</p> <p>Metric conversion charts</p> <p>Conversion worksheets</p>	The students will be exposed to a lecture about the metric system and how to determine if the decimal point moves to the right or left for making numbers larger or smaller	A test will be given to check for student's understanding of how to make metric conversions
<p><b>Comp. # 2</b></p> <p>Synthesize the values of household measuring systems and their equivalents. Measuring and Recording Ht. using an upright Scale.</p>	4 <sup>th</sup> quarter 2 weeks	After completing this unit the student will be able to convert household measures such as drops to teaspoonfuls, teaspoonfuls to tablespoonful, tablespoons to ounces, ounces to teacupfuls, ounces to glasses or cups and measuring and recording height using an upright scale.	<p>MA-1, MA-5</p> <p>Goals: G-1.6, G-1.10, G-3. 4. G-4.1</p> <p>CLEs N-1B, N-3D, N-3E, G-4B</p>	<p>Drops (gtt) Teaspoons (t) Tablespoons(T or Tbsp) Ounces Teacupful Glassful</p>	<p>Pencil Paper</p> <p>Scientific Calculator</p> <p>Conversion chart</p>	The students will be given worksheets to make standard household measuring conversions	A test will be given to check for student's understanding of household measuring conversions
<p><b>Comp. # 3</b></p> <p>Make</p>	4 <sup>th</sup> quarter 2 weeks	After completing this unit the student will be able to make conversions between Household,	MA 1, MA 2, MA 5	<p>Teaspoonful Tablespoonful Teacupful Glassful</p>	<p>Calculator</p> <p>Illustrations on</p>	Short in class lecture with illustrations	The students will be given a written test to check for

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connections involving the units used in household measuring systems, apothecaries' system, and the metric system.		<p>Apothecaries' System, and the Metric System. Such conversions will consist of : 1 teaspoon to 1 dram or 60 minims, to 4 or 5 milliliters; 1 tablespoon to 3 or 4 drams to 15 or 16 milliliters; 2 tablespoons to 8 drams or 1 ounce to 30 or 32 milliliters; 1 teacupful to 6 ounces to 180 milliliters; and 1 glassful to 8 ounces to 240 ml.</p> <p>The student will also learn key associations between different measuring units while converting household measures to other systems such as 1 drop equals 1 minim and weighs 1 grain.</p>	<p>Goals: G- 1.10, 2.3, 3.4, 4.1</p> <p>CLEs N-1B, N-3D, M-2D</p>	<p>Dram or minims Ounces ml cc gm lbs</p>	<p>Worksheets</p> <p>Conversion chart</p>	<p>drawn on the board</p> <p>In class math problems with worksheet illustrations that demonstrate conversion possibilities</p>	<p>mastery of all concepts reviewed in this lesson plan</p>
<p><b>Comp. # 4</b></p> <p>Differentiate between common abbreviations or acronyms and symbols to interpret their proper application toward solving medication problems.</p>	4 <sup>th</sup> quarter 3 weeks	<p>After completing this unit the student will know and understand common abbreviations used in prescription labels and by physicians to properly identify and calculate drug dosage amounts. The student will be able to interpret information from prescription labels such as:</p> <p>Diltiazem HC1 60mg PO bid</p> <p>Ceclor 0.5 gm PO tid</p> <p>Principen 200 mg PO qid</p>	<p>MA 1, MA 5</p> <p>Goals: G- 1.7, 1.8, 1.10, G-2.1, 2.3, G-3.4, G-4.6.</p> <p>CLEs N-1C, N-3D, 3E,</p>	<p>IM IV tid qid bid q2h prn gt elix bid M ss stat</p>	<p>Calculator</p> <p>List of common abbreviations</p> <p>Practice prescription labels</p>	<p>Math instructor will hand out common abbreviation sheets and a page or two of prescription labels. The Health Science instructor will explain the definition of the abbreviation sheet and explain how these abbreviations are used in the labels. Students will do problems</p>	<p>Students will accomplish several problems that involve reading prescription labels, correctly interpreting the abbreviations on the labels, and doing proper calculations to solve for correct dosage</p>

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<p><b>Unit Title:</b> (Current Knowledge) Module # III Determining formulas used for dosages of tablets, capsules, or liquids, and medical dosages for a given time, using apothecaries', metric, and household measurement systems to calculate drug dosages, differentiate between standard time and military time, temperature conversions, and calculating dosages for parenteral injections, including special preparations such as insulin.</p> <p><b>Core Concepts:</b> Student will be able to: Employ formulas to determine dosages for tablets, capsules, liquids, number of capsules, and amount of liquid to be ordered for a given amount of time; use apothecaries' metric, and household measurement systems to accurately calculate drug dosages, differentiate between standard time and military time, temperature conversions, and calculate dosages for parenteral injections, including special preparations such as insulin.</p>							
<p><b>Comp. # 1</b></p> <p>Establish key points of operation or chronological steps of procedures used to prepare information collected about drug dosages for the formulas used to determine the dosages of tablets, capsules, or liquids.</p>	5 <sup>th</sup> quarter 2 weeks	<p>After completing this unit the student will be able to change dosages to the same unit of measurement, reduce dosages to simplest terms, and use common sense to prepare numbers and abbreviations for drug calculation formulas.</p> <p>Note: (The students may have to review previously studied basic proportion problems to use formula correctly)</p>	<p>MA 1, MA 2,</p> <p>Goal: G 1.10, 3.4, 3.6, 4.6</p> <p>CLEs N-1B, 1.D, 3D, N-3E,</p>	<p>Oral dosage Dose ordered Dose available Drug form Tablets Capsules Liquid Ratio Proportion Medication Prescription labels</p>	<p>calculator</p> <p>Pencil and Paper</p> <p>Graph paper</p> <p>Handouts with applicable formulas, list of key points to remember and order of operations of those points.</p>	<p>Lecture reviewing basic use of proportions while solving problems.</p> <p>Introduction of drug dosage formulas</p> <p>Explanation of key points and order of operations</p> <p>Administration of drug dosage problems</p>	<p>Written test to prove that each student can successfully complete accurate drug dosage calculations and interpret given drug description abbreviations such as gr ss q4h</p>
<p><b>Comp. # 2</b></p> <p>Utilize formulas that determine the total number of tablets, capsules, or amount of liquid to be ordered for</p>	5 <sup>th</sup> quarter 2 weeks	<p>After completing this unit the student will be able to successfully use the formula:</p> <p>Dosage ordered / Dose available X Tablets or capsules per dose / Drug form (tablets or capsules) = Number of tablets or capsules per dose. (For number of capsules or</p>	<p>MA 1, MA 2,</p> <p>Goal: G 1.10, 3.4, 3.6, 4.6</p> <p>CLEs N-1B, 1.D, 3D, N-3E, M-2D</p>	<p>Dose Drug form Minims ml dram liquid tablets capsules oral dosages</p>	<p>Hard copy review sheet of formulas</p> <p>Sheet of practice problems</p> <p>Pages of practice prescription</p>	<p>Go over review sheet of formulas and work several oral dosage problems on the board</p> <p>Have program instructor explain</p>	<p>The students will be given several prescription labels with order given and they will have to interpret and calculate what is available and</p>

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a specified time.		tablets to order)  And  Dose desired / Dose available X Drug form (minims, ml, dram) = Amount of liquid per dose  (For calculating liquid dosages)		ratio-proportion desired available	reading labels Calculator  Paper and pencil	medication labels to the students as the problems are worked  Have the students work in pair as the class works several problems together	how much should be given
<b>Comp. # 3</b>  Differentiate between standard time and military time.	5 <sup>th</sup> quarter 2 weeks	The students will learn 24-hour clock or (Military Time) conversions. Comparisons will be made between a clock and the trigonometric unit circle.	MA-1, MA-2, MA-4  Goals: G-1.7, 1.10, 2.1, 2.3, 3.5, 4.6  CLEs N-1B, 3D, 3E, G-2A, G- 4B M-2D	Time Military Recording Data collection Calendars MM/DD/YYYY Digital Analog Standard time Orthography	Clock handout That demonstrates standard time and military time  A blank clock handout to fill in with military time from memory  Paper and pencil	Lecture explaining chapter handouts and lesson plan  Guided practice of students writing the days date in numerous ways  Have students practice filling in a blank military clock handout.	Students will answer 10 questions about military time and fill out a military clock handout from memory
<b>Comp. # 4</b>  Calculate dosages for parenteral injections, including those for special preparations	5 <sup>th</sup> quarter 3 weeks	After completing this unit the student will be able to set up an equation and solve for an unknown variable by using ratios and proportion such as:  Dosage Available : Dilution = Drug Desired : X	MA 1, MA 2,  Goal: G 1.10, 3.4, 3.6, 4.6  CLEs N-1B, 1.D, 3D, N- 3E, M-2D	Dosage Parenteral Medication Dilution Drug desired Dose desired Formula ml means	Worksheet of formulas  Practice problems  Prescription label examples	The instructor will work 5 to 10 problems on the board or tablet notebook demonstrating how to calculate parenteral dosages	The students will be given a test using formulas presented in class to calculate basic dosages for parenteral injections

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such as insulin.		<p>Dose Desired / 1mL = Total Drug Available / X</p> <p>Amount Available / 1mL = Amount Desired / X mL</p> <p>And solve problems using the formulas such as:</p> <p>Dose desired / Dose Available X Dilution or amount of solution = Amount of solution per dose</p> <p>Total drug available / Dose desired x 1mL = Amount of diluents required to add vial powder so that dose ordered = 1mL</p>		extremes diluents	Insulin dosages Problems using Prescription labels	<p>The class will work several problems together taking information from actual prescription labels</p> <p>Students will fill in a practice worksheet computing insulin dosages</p>	

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<p><b>Unit Title:</b> (Current Knowledge) Module # IV Flow rates for infusions, rules for calculating medications for children, vital sign data for graphing entries, Intake/output data.</p> <p><b>Core Concepts:</b> The Student will be able to: Calculate Flow rates for fusions; use three different rules to calculate medication dosages for children; collect and interpret data for graphing entries to synthesize conclusions and critique patient's routine care for the purpose of completing a patient care spreadsheet.</p>							
<p><b>Comp. # 1</b></p> <p>Determine flow rates for intravenous infusions.</p>	6 <sup>th</sup> quarter 2 weeks	<p>After completing this lesson the student will be able to:</p> <p>Find the drop factor which is located on the different manufacturers of IV infusion equipment</p> <p>Calculate flow rate in (drops/min) by using the formula:</p> <p>Total of fluid to give / Total time (minutes) X Drop factor = Flow Rate</p> <p>Calculate total administration time for IV fluids by using the formula:</p> <p>Total drops to be infused / Flow rate (drops/min) X 60 = Total infusion time (hr or min)</p>	<p>MA 1, MA 5</p> <p>Goals: G-1.7, 1.10, 2.3, 2.7, 3.4</p> <p>CLEs N-1C, 3D, 3E, M-2D</p>	<p>Flow rates</p> <p>Infusions</p> <p>intravenous</p> <p>IV infusions</p> <p>Drop factor</p> <p>Drops/min</p> <p>Micro drops</p> <p>Mil/min</p>	<p>Calculator</p> <p>Worksheets</p> <p>Board examples of problems worked</p> <p>IV prescription examples and labels</p> <p>Practice computations of insulin dosages</p> <p>Examples of drop factors taken from different manufactures of IV equipment</p>	<p>The students will be given a sheet defining flow rate and drop factor and demonstrating the original formula for calculating flow rate in drops/min. The students will then modifying the formula for calculating drop rate for children, and adjusting the formula to calculate total administration time.</p>	<p>Written test containing problems similar to the ones worked in class</p>
<p><b>Comp. # 2</b></p> <p>Investigate three different rules used to calculate medication dosages for children and use these rules to set</p>	6 <sup>th</sup> quarter 2 weeks	<p>After completing this unit the student will be able to use the three rules for calculating dosages for children and know how to use body surface area formula when accuracy is needed.</p> <p>Clark's rule – Based on the child's body weight</p>	<p>MA 1, MA 2,</p> <p>Goal: G 1.10, 3.4, 3.6, 4.6</p> <p>CLEs N-1B, 1.D, 3D, N-3E, M-2D</p>	<p>Clark' rule</p> <p>Young's rule</p> <p>Fried's rule</p> <p>Body surface area</p> <p>Proportional</p> <p>Average</p> <p>Pediatric</p> <p>Infant</p> <p>Nomogram</p>	<p>Handout of formulas</p> <p>Calculator</p> <p>Height and weight conversion chart</p>	<p>Instructor will demonstrate proper use of formulas on the white board and discuss the handout which demonstrates a nomogram height</p>	<p>Students will write down all formulas used in this lesson from memory, know when to use each formula, and calculate at least one situational</p>

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up proper ratios and proportions to find correct medication quantity		<p>Young's rule – Used for children ages 2 to 12</p> <p>Fried's rule – Used for children under the age of 2</p> <p>Body surface area formula:</p> <p>Surface area of the child in meters sq. / Surface area of an adult in meters sq. (1.73m<sup>2</sup>) x Usual adult dose = Child's dose</p>			<p>Blank charts of demonstrated child age, weight, and height scenarios</p> <p>Practice calculation problems</p> <p>Calculator</p>	<p>and weight conversion chart</p> <p>The students will calculate children's or infant dosages using Clark's, Young's, and Fried's rules and use calculated answers to fill in a provided chart</p> <p>Students will accomplish several situational word problems</p>	<p>problem with each formula.</p> <p>Students will accomplish several situational word problems on a hand written test.</p>
<b>Comp. # 3</b> Examine dimensional analysis and learn how this process provides a single method to use for all kinds of multiple step drug problems	6 <sup>th</sup> quarter 2 weeks	After completing this unit the student will be able to reduce the chance of errors or incorrect placement of drug calculation factors while working complex problems or those that have multiple steps of conversions.	<p>MA-1, MA-2 MA-5</p> <p>Goals: G-1.7, 1.8, 1.10, 2.7, 3.4, 4.6</p> <p>CLEs N-1B, 2-D, N-3D, 3E, 4B, M-2D</p>	<p>Dimensional analysis</p> <p>Cross-cancellation</p> <p>Inversely proportional</p> <p>Directly proportional</p> <p>Tablets</p> <p>Grid</p> <p>mg</p> <p>mL</p> <p>gtts</p>	<p>Worksheets illustrating dimensional analysis examples</p> <p>Paper and pencil</p> <p>Calculators</p>	<p>Problems worked out on dry erase board</p> <p>Students completing problems in front of other students while assisting each other</p> <p>Demonstration of various drugs in their visual units of measure</p>	An assessment will be given that requires the student to calculate multiple step drug conversions using the dimensional analysis model
<b>Comp. # 4</b> Collect vital sign data for graphing entries to	6 <sup>th</sup> quarter 3 weeks	After completing this unit the student will be able to identify, collect, and enter patient care data such as blood pressure, temperature, pulse, respiration	<p>MA-1, MA-2 MA-5</p> <p>Goals: G-1.7, 1.8,</p>	<p>Vital signs</p> <p>Blood pressure</p> <p>Systolic</p> <p>Diastolic</p> <p>Stethoscope</p>	Power point slide handout with space provided to make notes.	The students will watch a power point presentation about vital signs.	The students will be given a blank assignment sheet for graphing T.P.R. , vital sign

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<p>synthesize conclusions and critique patient's status and e able to collect intake/output data from a patient's routine care for the purpose of completing a patient care flow or spreadsheet.</p>		<p>and weight, into a blank graphic sheet to correctly chart the information and complete a patient care flow sheet to identify, collect, and record patient care intake/output data.</p>	<p>1.10, 2.7, 3.4, 4.6  CLEs N-1B, 2-D, N-3D, 3E, 4B, M-2D, D-1C</p>	<p>Sphygmomanometer Pulse Brachial artery Hypertension Pyrexia (fever) Oral Axillary Rectal TPR Temperature Pulse Respiratory</p>	<p>Handout illustrating proper graphing of vital signs  Blank vital sign graph paper from program instructor  Blank vital sign and weight flow sheet  Patient care flow sheet</p>	<p>The student will then be given a situational problem concerning a patient and he or she will take vital sign information and place the information into a graph.  The student will fill out a vital sign and weight flow sheet  The student will fill out a patient care flow sheet to track patient intake and output data.</p>	<p>flow sheet, and a patient care flow sheet to show competency in how to complete proper documentation of patient care.</p>



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<p><u>Unit Title:</u> (Post Knowledge) Higher education/career prep project</p> <p><u>Core Concept:</u> To unite in a project with at least one other program to utilize mathematical concepts learned in previous mathematics curriculum to provide evidential proof of mastery.</p>							
<p>To conduct a project designed and prepared by a joint effort between Program Instructor and Math instructor to demonstrate mastery of previously learned competencies and to demonstrate mastery of applicable Concepts of mathematics.</p>	<p>4<sup>th</sup> Semester</p>	<p>After completing this unit the student will be able to unite with fellow students to complete a real world situational workplace endeavor or task.</p>	<p>MA 1, MA 2, MA 3, MA 4, MA 5. G 1.1, 1.2, 1.4, 1.8, 1.10, 2.1, 2.2, 2.3, 2.7, 3.1, 3.2, 3.3, 3.5, 3.6, 3.7, 3.8, 4.1, 4.4, 4.5, 4.6, 4.7. CLEs N-1B, N-1C, N-3D, N-3E, G-1A, G-1B, G-2A, G- 4B, M- 2C, M- 2D,</p>	<p>Determine, compare agree, support, prove, influence, estimate, choose decide justify, appraise, interpret, build disprove, test, compile, invent, solve, perceive, influence, plan, conclude, defend, evaluate, predict, measure, rate, design, select prioritize explain, criteria, assess value deduct, construct, and theorize.</p>	<p>All material and resources available from the Cass Career Center</p>	<p>Project jointly agreed upon by trade specific instructor, CCC administration, and core resource teachers.</p>	<p>Assessment will be designed and designated at the beginning of each project.</p>