

Occupational Math - Course Outcome Summary Southwest Wisconsin Technical College

Information

Project Title: Occupational Math
Developer(s): Peter C. Esser
Development Date: 10/10/2003
Revised By: Pete Esser
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Course Number: 31-804-313
Organization: SWTC - Southwest Wisconsin Technical College
Division: General Education
Department: Mathematics
Potential Hours of Instruction: 16
Total Credits: 1

Instruction Type	Periods	Outside	
		Hours	Credits
A. Classroom Presentation	16	0	1

Course Description

Students taking Occupational Math compute with rational numbers. Students use ratio and proportion and formulas to solve problems. In each topic area, students solve application problems.

Course Prerequisites

none

Textbooks

Math Review

Author: Peter C. Esser
Publisher: Lulu.com
Source: SWTC Bookstore or directly from Lulu.com

Supplies

Scientific Calculator

Notebook

Target Exit Learning Outcomes

General Education Outcomes

A. Solve problems

Core Abilities

- A. Act Professionally
- B. Communicate Clearly
- C. Value Learning
- D. Work Productively
- E. Work Cooperatively
- F. Solve Problems

Performance Expectations

Goals

1. Compute using rational numbers
2. Compute using formulas.
3. Compute with proportions
4. Apply computational skills to application problems

1. Compute using rational numbers

Criteria - *Criteria - Performance will be satisfactory when:*

- o learner writes intermediate computation steps when solving generic rational number (add, subtract, multiply, divide: fractions, decimals, and percents) problems.
- o final answer to a generic rational number problem is written to the tolerance specified with each question. (Example: "Round answer to nearest tenth of an inch.")
- o learner successfully answers 80% of all questions.
- o learner completes test within scheduled class period.

Conditions for Assessment - *Conditions - Competence will be demonstrated:*

- o Student may not use the Math Review textbook while taking quizzes and tests.
- o Student may use pencil, blank paper, calculator, and 1/2 page of notes for all chapter tests.
- o In chapter tests.

Learning Objectives

- a. Convert among different fraction forms (common, improper, mixed).
- b. Compare relative size of given fractions.
- c. Use "multiply top times top bottom times bottom" idea to multiply fractions together.
- d. Use "invert and multiply" idea to divide fractions.
- e. Add and subtract fractions by putting fractions in common denominator form.
- f. Explain decimal positional notation system.
- g. Convert decimal to fractions and vice versa.
- h. Round decimals to specified place value.
- i. Convert decimal to a specified fractional value (ex: to the nearest 64th or nearest 32nd.)
- j. Compute with decimals using the four basic operations.
- k. Solve basic word problems using decimal computational skills.
- l. Convert among fractional, decimal, and percent form.
- m. Identify the components of generic and word percent problems. Part, Base, Rate
- n. Solve percent problems by determining components known and solving for the component to be found.

2. Compute using formulas.

Criteria - *Criteria - Performance will be satisfactory when:*

- o learner demonstrates understanding of a given formula's variables by substituting given values into the correct position in the formula.
- o answer is written to the indicated precision.
- o answer is written with the correct unit of measure.
- o student completes quiz/unit test with an 80% or higher score.

Conditions for Assessment - *Conditions - Competence will be demonstrated:*

- o when learner completes unit test.

Learning Objectives

- a. Review symbolic notation (eg sq. roots, other symbols for multiplication, exponents)
- b. Review calculator skills
- c. List the four levels of mathematical operations as indicated by the Order of Operations.
- d. Compute multi-operation expressions using the Order of Operations.

- e. Determine the purpose of each variable and constant in a formula.
- f. Substitute known values into the formula.
- g. Evaluate the formula with calculator using the Order of Operations.
- h. Express answer to the required accuracy with the correct units of measure.
- i. Discuss how to obtain a reasonable estimate for the answer that can be used to check the final computed value.

3. Compute with proportions

Criteria - *Criteria - Performance will be satisfactory when:*

- o ratios are reduced to lowest terms
- o ratios are written in the proper order
- o learner shows the proportion set-up
- o answer contains the correct units
- o answer is within +/- 1% of actual value

Conditions for Assessment - *Conditions for assessment:*

- o in a unit test
- o using a calculator

Learning Objectives

- a. Write ratios based on given information
- b. Solve existing proportions for an unknown
- c. Classify direct and indirect proportions
- d. Solve a problem by setting up and using a direct proportion
- e. Solve a problem by setting up and using an indirect proportion
- f. Apply skills to an application problem

4. Apply computational skills to application problems

Criteria - *Criteria - Performance will be satisfactory when:*

- o learner writes intermediate computation steps when solving generic rational number (add, subtract, multiply, divide: fractions, decimals, and percents) problems.
- o final answer to a generic rational number problem is written to the tolerance specified with each question. (Example: " Round answer to nearest tenth of an inch.")
- o learner successfully answers 80% of all questions.
- o learner completes test within scheduled class period.

Conditions for Assessment - *Conditions - Competence will be demonstrated:*

- o Student may not use the Math Review textbook while taking quizzes and tests.
- o Student may use pencil, blank paper, calculator, and 1/2 page of notes for all chapter tests.
- o In chapter tests.
- o In order to complete the entire Applied Math course, Chapters 1-3 should be completed by the fifth week

Learning Objectives

- a. Read problem thoroughly to understand what is to be determined or solved.
- b. Determine whether or not enough information is given to solve the given problem.
- c. Determine the mathematical operation(s) needed to solve the problem.
- d. Select the numbers necessary to solve the problem.
- e. Estimate a reasonable answer for the given problem.
- f. Compute with selected numbers and selected mathematical operations.