

STRANDS AND STANDARDS

MEDICAL MATH



Course Description

An instructional program that prepares students with skills to compute mathematical equations related to healthcare. The course integrates medical-physiological concepts and mathematics. Students will engage in math activities including problem solving, reasoning and proof, communication, connections, and representations.

Intended Grade Level	11-12
Units of Credit	0.5
Core Code	36.01.00.00.150
Concurrent Enrollment Core Code	N/A
Prerequisite	Secondary Math 2 PLUS a Health Science Course
Skill Certification Test Number	
Test Weight	
License Area of Concentration	CTE and/or Secondary Education 6-12
Required Endorsement(s)	
Endorsement 1	Medical Math
Endorsement 2	
Endorsement 3	

STRAND 1

Uses of Mathematics in Healthcare

Standard 1

Analyze the use of medical mathematics in the healthcare system.

- Explore different healthcare careers and the math used within the career.
- Compare and contrast at least two different careers.

Strand 1 Performance Skill listed below

STRAND 2

Common Mathematical Operations as Used in Healthcare

Standard 1

Compute fluently and make reasonable estimates.

- Evaluate and simplify numerical expressions containing rational numbers using the order of operations.
- Compute solutions to problems and determine the reasonableness of an answer by relating them to applied scenarios.
- Whole numbers
 - Supplies and inventories
 - Intake and output
 - Cholesterol
 - Quantities
 - Nutrition
 - Vital signs labs
 - Lever systems
 - Laboratory Values

Standard 2

Represent rational numbers in a variety of ways.

- Choose appropriate and convenient forms of rational numbers for solving problems and representing answers (e.g., decimal, fraction, or percent).
- Compute solutions to problems and determine the reasonableness of an answer by relating them to applied scenarios.
- Decimals:
 - Tools, instruments
 - Nutrition
 - Weights
 - Rounding
 - Temperature
 - EKG's
 - Medications
 - Laboratory values

Standard 3

Identify relationships among rational numbers and operations involving these numbers.

- Compute solutions to problems and determine the reasonableness of an answer by relating them to applied scenarios.
- Fractions
 - Tools, instruments
 - Weights
 - Estimation
 - EKG's
 - Medications
 - Laboratory values
 - Conversions (Fahrenheit/Celsius)

Standard 4

Calculate percentages.

- Compute solutions to problems and determine the reasonableness of an answer by relating them to applied scenarios.
 - Chemical solutions
 - Laboratory values
 - Growth charts
 - Medications
 - Nutrition
 - Intake/output
 - Target heart rate
 - Stroke volume
 - Cardiac output
 - Blood loss
 - Body surface area, burns
 - Oxygen saturation

STRAND 3**Ratios and Proportions****Standard 1**

Evaluate, solve, and analyze mathematical situations using algebraic properties and symbols.

- Solve proportions that include algebraic first-degree expressions (solve for x or use dimensional analysis).
 - Nutrition
 - Chemical solutions
 - Dosage conversions

Standard 2

Use ratios to compare data.

- Laboratory values

- Medications
- Diseases (statistics)analysis).

STRAND 4

Gathering Data (Use of Medical Instruments)

Standard 1

Use patterns, relations, and functions to represent mathematical situations.

- Compute solutions to problems and determine the reasonableness of an answer by relating them to applied scenarios.
 - Conversions
 - Metric units
 - Time (12/24)
 - Roman numerals (Arabic/Roman)
 - Temperature (Celsius/Fahrenheit)
 - Pre/Post workout weight analysis
 - Body composition
 - Pharmacology

Standard 2

Represent quantitative relationships using mathematical models and symbols.

- Find and interpret rates of change by analyzing graphical and numerical data.
- Understand measurable attributes of objects and the units, systems, and processes of measurement.
- Solve problems using visualization and spatial reasoning.
- Instruments
 - IV flow rates
 - Macro/micro drops (tubing)
 - Syringes
 - Rulers, tape measures
 - Scales
 - Goniometry, ROM
 - Centrifuges
 - Sphygmomanometer gauges (blood pressure)
 - Pulse oximeters
 - Oxygen flow rates
 - Thermometers

STRAND 5

Interpreting Data

Standard 1

Formulate and answer questions by collecting, organizing, and analyzing statistical data.

- Collect, record, organize, and display a set of statistical data.
- Determine whether the pattern of the data is linear or nonlinear when given in a list, table, or graph.

- Interpret the correlation between two variables as positive, negative, or having no correlation.
- Find a line of best fit by estimation, choosing two points, or using technology for a given set of statistical data.
- Analyze the meaning of the slope and y-intercept of a line of best fit as it relates to the statistical data set.
- Find mean, median, mode, and range for a statistical data set.
- Analyze the meaning of the maximum or minimum and intercepts of the regression equation as they relate to a given set of bivariate data.
- Make predictions and estimations and determine their reasonableness using a regression equation (line of best fit).
- Graphs and charts
 - Interpreting charts and graphs
 - Temperature, pulse, respiration graphs
 - Intake and output charts
 - Height, weight, measurement graphs
 - Cardiac output
 - Medication errors
 - Census
 - Acuties
 - Disease, mortality rates
 - Job outlook, projections
 - Treatment prognosis
 - Clinical trials
 - Healthcare costs
 - Effectiveness (facilities, providers)
 - Wellness indicators
 - Reliability and validity
 - Body mass index (BMI)
 - Body composition
 - Epidemiology

Standard 2

Apply basic concepts of probability.

- Determine and express the probability of an event as a fraction, percent, ratio, or decimal.
- Determine the conditional probability of an event (false positive/false negative).

STRAND 6

Math for Medications

Standard 1

Compute fluently and make reasonable estimates.

- Reading drug labels
- Interpreting prescriptions/Patient instructions

Standard 2

Evaluate, solve, and analyze mathematical situations using algebraic properties and symbols.

- Simplify and evaluate numerical expressions (including integer exponents and square roots), algebraic expressions, formulas, and equations.
- Using medical reference materials to determine if calculated dosages are safe.

Standard 3

Represent quantitative relationships using mathematical models and symbols.

- Dosing
- Dosage conversions

STRAND 7**Medical Accounting and Business****Standard 1**

Apply systems of order.

- Numerical filing
- Appointment scheduling

Standard 2

Evaluate, solve, and analyze mathematical situations using algebraic properties and symbols.

- Maintaining accounts
- Checks, deposit slips, and receipts
- Calculating cash transactions/Payroll
- Budgeting
- Depreciation, amortization
- Insurance

STRAND 8**Exponents and Logarithms****Standard 1**

Use properties of exponentials to solve equations.

- Radiation exposure
- Half life

Standard 2

Use properties of logarithms to solve equations.

- pH

Performance Skills

- Oral presentation on chosen healthcare career mathematics.
- Use healthcare career choice to create a business model.

Workplace Skills

- Critical thinking
- Collaboration
- Communication (Oral/Written)
- Organization
- Technical skills
- Consumer awareness
- Commercial awareness
- Legal requirements/
expectations
- Interpersonal relationships