	# CONTEST SCOPE **Contest Chair** Kathie Murray **Contest Chair E-Mail** kmurray@rmctc.org ## Reading Muhlenberg CTC *2615 Warren Road Reading PA 19606*

# Contest:	Medical Math
# Purpose:	Medical Math provides future healthcare professionals with the opportunity to gain knowledge and skills required to identify, solve, and apply mathematical principles. The purpose is to accurately demonstrate various mathematical integrations used in health care, including temperature, weights, medications, IV drips and various measures used in the health community.
# Clothing:	Scrubs or official SkillsUSA attire

Equipment and Material:

Equipment/Tools/Materials Provided by Host School:

Written Medical Math test.
Scratch paper and a pencil

Equipment/Tools/Materials Provided by the Contestant:

Basic hand-held calculator - No graphing or scientific calculators [with fraction keys] will be permitted
Pencil

Scope of Contest

Contestants will demonstrate knowledge of math problems encountered in the medical field and are selected from the areas that might be used in real world applications. Contestants will demonstrate their ability to solve math problems that deal with the following areas: measurements including vital signs, temperature conversions, height and weight, metric and household measurements, measurement conversions, ratio and proportion, percentage, intake and output, roman numerals, dosage calculations and interpretation of medical information in form of a written test.

Additional Information

The written test will be 50 questions
Questions will be both full calculations and multiple choice questions.
All work should be shown with the full calculations/fill in questions.
Tie breaking will be based upon time completion of the test.
Competitors may NOT use any type of conversion chart or resource during the test.

1 ½ hour time limit

Verbal Time Remaining Announcements will be given at: 30 minutes, 15 minutes, 5 minutes, and 1 minute remaining to complete the test

ROUNDING: Converting between measurement systems will often render a different answer depending upon which systems and conversions are being used. The answer to a calculation problem will ultimately be the same answer after appropriate rounding. When determining a solution, round only the final answer after all calculation steps have been completed. When rounding decimal numbers to the nearest tenths, hundredths, or thousandths, look to the immediate right of the digit located in the position to be rounded. If the number to the direct right is 5 or larger, round to the position up one number and drop everything that follows. If the number to the direct right is 4 or smaller, leave the position being rounded as is and drop everything that follows. In specific situations, answers will be rounded per medical protocol. For example, pediatric dosage is always rounded DOWN to avoid potential overdose. Unless otherwise indicated, all answers should be rounded to the nearest whole number. (Examples: 31.249 (rounded down) = 31 and 23.75 (rounded up) = 24).

All of the items listed on this page are suggested references. The test items are not limited to this material. This is just a basic reference of things that may be required knowledge for the contest.

This list of math related terms and abbreviations is a sample of abbreviations taken from Diversified Health Occupations (Simmers, Louise). Please use that reference for other abbreviations related to medical math that could be used in the contest.

Term Abbreviations
millimeter mm
centimeter cm
meter m
foot/feet ft
inch in
gram G
milligram mg
microgram mcg
kilogram kg
pound lb
ounce oz
degrees Fahrenheit °F
degrees Celsius (Centigrade) °C
cubic centimeter cc
milliliter ml or mL
liter L
unit U
pint pt
quart qt
gallon gal
tablespoon tbsp
teaspoon tsp
drop or drops gtt or gtts
minim minim
dram dr
milliequivalent mEq
grain gr
intravenous IV
tablet tab
capsule cap
suspension susp
intake and output I & O

Conversion Chart:
(To be used as reference prior to the competition but not allowed in the contest area.)
Length
1 meter = 100 centimeters = 1,000 millimeters
10 millimeters = 1 centimeter

Weight
1 gram = 1,000 milligrams
1 milligram = 1,000 micrograms
1 kilogram = 1,000 grams
1 grain = 60 milligrams

Volume for Solids
1,000 cubic millimeters = 1 cubic centimeter
1,000 cubic centimeters = 1 cubic decimeter
1,000 cubic decimeters = 1 cubic meter

Volume for Fluids
1 liter = 1,000 milliliters
1 milliliter = 1 cubic centimeter
10 centiliters = 1 deciliter
10 deciliters = 1 liter

Weight Conversion
1 kilogram = 2.2 pounds
1 pound = 16 ounces
1 ounce = 0.028 kilograms

Temperature Conversion
°C = (°F-32) 5/9 or 0.5556
°F = (°C) 9/5 or 1.8 + 32

Metric/Household Equivalents
(Note: 1 cc = 1 mL)
1 cc or 1 mL 15 gtts (drops)
0.914 meters 3 feet (1 yard)
0.3048 meters 12 inches (1 foot)
2.54 centimeters 1 inch
5 mL or cc 1 tsp (teaspoon)
15 mL or cc 1 tbsp (tablespoon)
30 mL or cc 1 oz. (ounce)
240 mL or cc 1 cup (8 oz.)
480 mL or cc 1 pt (pint) (16 ounces)
960 mL or cc 1 qt (quart) (32 ounces)
1 meter 39.37 inches (3.281 feet)