



Pennsylvania - District 2

Education . . . with a competitive side

MEDICAL MATH

Clothing Requirements

Official blue scrubs, white socks or skin-tone seamless hose and health professional's white or black, leather work shoes (no canvas), completely enclosed (no open toe or open heel). Athletic style shoes that meet the aforementioned criteria are acceptable.

Note: At the district level if a student is not able to wear the official SkillsUSA attire he/she may wear an outfit that would be acceptable in their specific field of study. *Please keep in mind that official SkillsUSA attire will be required at the state and national level.*

Eligibility

Open to active SkillsUSA members enrolled in a health care science technology program.

Equipment and Materials: Supplied by host school:

1. All instruments, equipment and materials required for the contest
2. All necessary information and furnishings for judges and technical committee

Equipment and Materials: Supplied by contestant:

1. All students must have a one-page, typewritten résumé
2. Watch
3. Basic Function hand-held calculator. No graphing or scientific calculators; no calculators with fraction keys will be permitted. The calculator will be inspected.
4. Pen (black ink)

Scope of the Contest – *(Defined by the National Competition Regulations)*

(District Competitions are meant to be a scaled down version of National Competition. It is important for the students to participate in a competition that will reflect a cross-section of the industry skills needed to prepare them for the state and national levels)

The contest is defined by industry standards as set by the current industry technical standards. To evaluate the students' ability to understand and solve mathematical problems commonly used in the various health care settings.

Knowledge Performance

Medical Math contestants demonstrate their knowledge of general math concepts used in the healthcare fields. Contestants will complete a written test that may include the use of ratio/proportion, dosage calculation, metric and household equivalents, Roman numerals, abbreviations and general math including percentages, among other medical math-related problems.

Skill Performance

The contest will consist of math problems related to various health care situations.

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Contest Guidelines

This test can include any or all of the following:

1. Contestants will demonstrate their ability to perform a variety of math related problems that will be needed in the Health field.

Standards and Competencies – (Summary of national technical standards list)

1. The test questions will be taken from problems encountered in the medical field and are selected from the area that might be used in real world applications. Contestants will demonstrate their ability to solve math problems that deal with the following areas:
 - a. Measurements—including vital signs, temperature conversions, and height and weight
 - b. Metric and household measurements
 - c. Conversions
 - d. Ratio and proportion
 - e. Percentage
 - f. Intake and output
 - g. Roman Numerals
 - h. Dosage Calculations
2. The test will contain 50 problems that will allow contestants the opportunity to utilize their problem solving skills as well as their mathematical ability.
3. The contestants will have two (2) hours to complete the test. No bonus points will be given for early completion of the test, and no contestant will be allowed to go in or out of the testing site during the testing.
4. Suggested references: Standardized Medical Abbreviations. Included with the contest guidelines are lists that may be used as study materials but **will not be permitted in the testing area.**

Medical Math Rating Sheet

Items Evaluated	Possible Points	Contestant Score
Written Test – 50 questions	100	
Resume Penalty		
Clothing Penalty		
Total Points	100	

NOTE: Cell phones may not be used as a calculator. Contestants will be disqualified if a cell phone is brought to the contest site.

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STUDY ABBREVIATIONS BELOW

Term	Abbreviation
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

Medical Abbreviations for Medical Math Contest

(To be used as reference prior to the competition but not allowed in the contest area.)

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

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Conversion Chart for Medical Math Contest

(To be used as reference prior to the competition but not allowed in the contest area.)

Metric System:

Length

1 meter = 100 centimeters = 1000 millimeters

10 millimeters = 1 centimeter

Weight

1 gram = 1000 milligrams

1 milligram = 1000 micrograms

1 kilogram = 1000 grams

Volume for Solids

1000 cubic millimeters = 1 cubic centimeter

1000 cubic centimeters = 1 cubic decimeter

1000 cubic decimeters = 1 cubic meter

Volume for Fluids

1 liter = 1000 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

$^{\circ}\text{C} = (^{\circ}\text{F} - 32) \frac{5}{9}$ or 0.5556

$^{\circ}\text{F} = (^{\circ}\text{C}) \frac{9}{5}$ or $1.8 + 32$

Equivalents (Note: 1 cc = 1 mL)

Metric	Household
1 cc or 1 mL	15 gtts (drops)
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.)
500 mL or cc	1 pt (pint) (16 ounces)
1000 mL or cc	1 qt (quart) (32 ounces)
1 meter	39.372 inches (3.281 feet)
0.914 meters	3 feet (1 yard)
0.3048 meters	12 inches (1 foot)
2.54 centimeters	1 inch

Note: No cell phones or other electronic devices may be used at any time during a competition; this includes using a calculator function on a cell phone for competitions in which calculators are permitted.

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