

MEDICAL MATH



PURPOSE

To evaluate the students' ability to understand and solve mathematical problems commonly used in the various health care settings.

First, refer to General Regulations, Page 9.

CLOTHING REQUIREMENT

For men: Official blazer, jacket or sweater, black dress slacks, white dress shirt; plain black tie with no pattern or SkillsUSA black tie; black socks and black shoes.

For women: Official blazer, jacket or sweater; black dress slacks or knee-length skirt with businesslike white, collarless blouse or white blouse with small, plain collar that may not extend onto the lapels of the blazer; black sheer or skin-tone seamless hose and black dress shoes.

For men or women: May wear official blue scrubs, white socks or clear seamless hose and white leather health professional's work shoes. Shoes must be all white leather (no canvas), completely enclosed (no open toe or open heel). Athletic style shoes that meet the aforementioned criteria are acceptable.

These regulations refer to clothing items that are pictured and described at: www.skillsusastore.org. If you have questions about clothing or other logo items, call 800-401-1560 or 703-956-3723.

Note: Contestants must wear their official contest clothing to the contest orientation meeting.

ELIGIBILITY

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

EQUIPMENT AND MATERIALS

1. Supplied by the technical committee:
 - a. Test problems and instructions
 - b. Scratch paper and pencils

2. Supplied by the contestant:
 - a. Basic hand-held calculator (no graphing or scientific calculators [with fraction keys] will be permitted)
 - b. All competitors must create a one-page résumé and submit a hard copy to the technical committee chair at orientation. Failure to do so will result in a 10-point penalty. Check the website for further instructions.

Note: Your contest may also require a hard copy of your résumé as part of the actual contest. Check the Contest Guidelines and/or the updates page on the SkillsUSA website: www.skillsusa.org/compete/updates.shtml

Note: No reference materials may be brought into the contest area.

SCOPE OF CONTEST

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 comprise 50 problems that will allow contestants the opportunity to use their problem-solving skills as well as their mathematical ability.
3. The contestants will have two 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.

Suggested references: "Standardized Medical Abbreviations"

Medical Abbreviations

The following list is to be used as a reference **prior** to the competition, but it is **not** allowed in the contest area.

This list of 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	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

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)
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)
1,000 mL or cc	1 qt (quart) (32 ounces)
1 meter	39.37 inches (3.281 feet)
0.914 meters	3 feet (1 yard)
0.3048 meters	12 inches (1 foot)
2.54 centimeters	1 inch