

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: SkillsUSA official attire: Official red blazer, windbreaker-style jacket or sweater, black dress slacks, white dress shirt; plain black tie with no pattern or SkillsUSA black tie from Midwest trophy; black socks and black shoes. *For Women:* Official red blazer, windbreaker-style jacket or sweater; black dress slacks or 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 hose and black 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. To purchase official clothing, contact Midwest Trophy Manufacturing Co., Inc. by calling 1-800-324-5996 or order online at www.mtmrecognition.com/skillsusa/.

Eligibility

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

Equipment and Materials

Supplied by the technical committee:

- a. Test problems and instructions
- b. Scratch paper and pencils

Supplied by the contestant

- a. Basic hand-held calculator (no graphing or scientific calculators will be permitted).

- b. 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 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.

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 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.

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 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