MEDICAL MATH

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

First, download and review the General Regulations at: http://updates.skillsusa.org.

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

CLOTHING REQUIREMENTS
Class B: Healthcare Attire
- Official blue scrubs
- Scrubs should fit appropriately for all health contests and should be properly hemmed and wrinkle free. Only plain, white, collarless T-shirts may be worn underneath the scrubs. Hair must be pinned up and off the collar.
- White socks or skin-tone seamless hose
- Health-professionals white or black leather work shoes
- Shoes must be all-white or black leather (no canvas), completely enclosed (no open-toe or open-heel). Athletic-style shoes that meet the 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 1-888-501-2183.

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

EQUIPMENT AND MATERIALS
1. Supplied by the technical committee:
   a. Test problems and instructions
   b. Scratch paper and a pencil
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.

   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 at http://updates.skillsusa.org.

No watches/smartwatches/cellphones or other timing devices are permitted in the contest area.

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. There will be additional questions related to professional development.

   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 100 or more 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 and a half 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.

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.
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)
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)

Standards and Competencies

MM 1.0 — SkillsUSA Framework

The SkillsUSA Framework is used to pinpoint the Essential Elements found in Personal Skills, Workplace Skills and Technical Skills Grounded in Academics. Students will be expected to display or explain how they used some of these Essential Elements. Please reference the graphic above, as you may be scored on specific elements applied to your project. For more, visit: www.skillsusa.org/about/skillsusa-framework/.