

MEDICAL MATH (VIRTUAL)



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.

Contest Clothing Notes (Apply ONLY to Virtual Competitions):

- Official SkillsUSA Competition Clothing recommended but NOT required.
- Contestant clothing options include the following:
 - Official Competition Clothing.
 - Trade Appropriate Clothing.
 - Professional Dress.
 - Business Casual.
- Clothing must meet industry safety standards.
- No identification of the contestant, school or state is allowed on clothing.

- No offensive, vulgar or inappropriate images or text are allowed on contestants clothing.
- No shorts or sleeveless shirts are allowed.
- Skirts must be at least knee-length.
- Proper Personal Protective Equipment (PPE) must be worn by contestant to meet all state, local and school requirements due to COVID-19.
- Scoring deductions may only be given and/or disqualification of contestant if clothing safety standards are not met.

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.

EQUIPMENT AND MATERIALS

1. Supplied by the technical committee:
 - a. Test will be given electronically via protocol etc.
2. Supplied by the contestant:
 - a. Computer with high-speed internet capability and camera to use applications such as Zoom, Teams, etc. The minimum recommended internet bandwidth speeds for joining Zoom meetings, accessing on-demand curriculum and other online operations is 2.0 Mbps up and down. You can test your current internet speeds by following this link: <https://www.speedtest.net/>. Allow the page to load and click on GO.
 - b. A secondary camera(s) may be required to provide judges with the ability to view contestants from different angles. Additional camera requirements will be located on the SkillsUSA website at <http://updates.skillsusa.org>.
 - c. A contest Proctor will be required to be on site to assist judges. A local industry expert is preferred to serve as the Proctor and shall not be an individual that has been involved with the training of the contestant(s). The Proctor will serve as the onsite "hands and eyes" for the judges. Proctor will follow instructions from the judges for safety and operations related to the

competition. Proctor may be asked by judges to perform several tasks such as operating a portable camera to show specific components or steps, measure parts, or any task that will provide judges with information needed to assist in accurate scoring of the contestant's work or presentation.

However, the Proctor shall not serve as a judge nor have any influence in contestant scores.

- d. The contestant's instructor or advisor shall be on site to observe all competition activities to ensure a safe and healthy competition experience for all participants. That instructor or advisor will not be allowed to interact or interfere with the competitor unless a safety issue arises that requires interaction. Any other support or interaction between the contestant and the instructor/advisor will result in disqualification
- e. All competitors must create a one-page résumé and submit an electronic copy to the technical committee chair at least seven (7) days in advance of the competition. Failure to do so will result in a 10-point penalty. Instructions for submission of the electronic résumé copy will be provided on the SkillsUSA website at <http://updates.skillsusa.org>.
- f. Basic hand-held calculator (no graphing or scientific calculators [with fraction keys] will be permitted)

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 (Simmons, 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/.