2022-23 EDITION

SkillsUSA CHAMPIONSHIPS

MEDICAL MATH

SkillsUSA Championships Technical Standards

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 healthcare science technology program.

CLOTHING REQUIREMENTS

Class B: Healthcare Attire

- Official SkillsUSA blue scrubs
- White socks or white seamless/nonpattern hose visible above the top of the shoe
- Health-professionals white or black leather work shoe

Note: Scrubs should fit appropriately for all health competitions 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.

Note: Shoes must be all-white or black leather (no canvas/mesh) and 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: Competitors must wear their official competition clothing to the competition orientation meeting.

EQUIPMENT AND MATERIALS

1. Supplied by the technical committee:
   a. Test problems and instructions
   b. Scratch paper
2. Supplied by the competitor:
   a. Basic hand-held calculator (no graphing or scientific calculators [with fraction keys] will be permitted)
   b. No. 2 pencil
   c. All competitors must create a one-page resume. See "Resume Requirement" below for guidelines.

Note: No watches/smartwatches/cellphones or other timing devices are permitted in the competition area.

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

RESUME REQUIREMENT

Competitors must create a one-page resume to submit online. SkillsUSA national competitors should submit their resume by June 1. The link for resume submission will be published on http://updates.skillsusa.org on May 1. Failure to submit a resume will result in a 10-point penalty.

Your resume must be saved as a PDF file type using file name format of "Last Name_First Name." For example, "Amanda Smith" would save her resume as **Smith_Amanda**. If you need assistance with saving your file as a PDF, visit the Adobe website for more information.

***Note*:** Check the Competition Guidelines and/or the updates page on the SkillsUSA website at http://updates.skillsusa.org.

PROHIBITED DEVICES

Cell phones or other electronic devices not approved by a competition's national technical committee are ***NOT*** allowed in the competition area. Please follow the guidelines in each technical standard for approved exceptions. Technical committee members may also approve exceptions onsite during the SkillsUSA Championships if deemed appropriate.

Penalties for Prohibited Devices
If a competitor's electronic device makes noise or if the competitor is seen using it at any time during the competition, an official report will be documented for review by the SkillsUSA Championships director. If confirmed that the competitor used the device in a manner which compromised the integrity of the competition, the competitor's scores may be canceled.

SCOPE OF COMPETITION

KNOWLEDGE PERFORMANCE

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. Competitors are required to take the SkillsUSA professional development test.

SKILLS PERFORMANCE

1. Competitors 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 competitors the opportunity to use their problem-solving skills as well as their mathematical ability.
3. The competitors 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 competitor will be allowed to go in or out of the testing site during the testing.
4. All 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 competition.
5. 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 competition 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 competition.

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 competition 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/.