Foundations of Medical Math

Event Category: Health Science

Eligible Divisions: Middle School	**Round One:** 35 Q test (60 minutes)	**Digital Upload:** NO
Solo Event: 1 competitor	HOSA will provide a handheld calculator for this test.	

New for 2026-2027

Math for Health Careers is now called Foundations of Medical Math. Editorial changes have been made.

Event Summary

Math for Health Careers allows **Middle School Division** HOSA members to improve their ability to identify, solve, and apply mathematical principles used in health careers. This competitive event consists of a written test. In the event of a tie, the tie-breaker questions will be judged to break the tie. This event aims to inspire members to be proactive future health professionals and measure knowledge and understanding at the recall, application, and analysis levels.

General Event Information

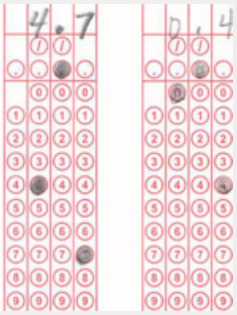
General Rules	Competitors must be familiar with and adhere to the General Rules and Regulations.
Dress Code	Proper business attire or official HOSA uniform. Bonus points will be awarded for proper dress.
Competitors Must Provide	• Photo ID • Two #2 lead pencils (not mechanical) with an eraser • Neon colored foam earplugs, NOT earbuds, for noise control (optional) HOSA Conference Staff will provide equipment and supplies listed in Appendix I.
Official References	The references below are used in the development of the test questions. • Kennamer, Michael. *Math for Health Care Professionals*. Cengage, Latest edition. • Simmers, L., Simmers-Nartker, K, Simmers-Kobelak, S., Morris, L. *DHO: Health Science.* Cengage Learning. Latest edition.

ROUND ONE- Test

Test Instructions	All competitors will be given a test and test answer sheet. The written test will consist of 35 fill-in-the-blank questions in a maximum of 60 minutes. See test instructions here. A series of five(5) complex, multi-step tiebreaker questions will be administered with the original test. Tiebreakers should be written in the space provided in the test booklet.
Time Remaining Announcements	There will be NO verbal announcements for time remaining during ILC testing. All ILC testing will be completed in the Testing Center, and competitors are responsible for monitoring their own time.

Written Test Plan	The test plan for the Math for Health Careers Test is:
	• Math essentials (add, subtract, multiply, divide, fractions, decimals)- 15%
	• Measurement Systems & Conversions - 25%
	• Calculations - 30%
	  ○ Formulas & equations
	  ○ Ratios & proportions

The expectation is that competitors read and are aware of all the content within these guidelines and associated links. Successful competitors will study all links for the detailed information.

	○ Percentages ● Interpreting Medical Information & Data- 30% ○ Charts, tables & graphs ○ Basic statistics (mean, median, mode)
Reference Materials Summary	The "Reference Materials Summary" included in these guidelines will be used as the official reference for the test for uniformity. Only equivalents and abbreviations included in the Reference Materials Summary sheet will be used in the test questions. **Middle School competitors will be provided a copy of this page for use during the test.**
Test Answer Sheet	The test answer sheet for this event will require competitors to grid their responses with pencils. Numbers must be written with the last number of the answer in the far right box. (See sample to the right.) When a paper/pencil test is used or administered on a computer, the competitor will write in or key in their response to each question. A forward slash and period are the only characters available as part of the answer. 
Rounding & Use of Zero	Converting between measurement systems will often render a different answer depending on which systems and conversions are used. The answer to a calculation problem will be the same after appropriate rounding. When determining a solution, round only the final answer after completing all calculation steps. When rounding decimal numbers to the nearest tenths, hundredths, or thousandths place, look to the immediate right of the digit located in the position to be rounded. If the number to the direct right is 5 or larger, round up one number and drop everything that follows. If the number to the direct right is 4 or smaller, leave the position being rounded as is and drop everything that follows. In specific situations, answers will be rounded per medical protocol. For example, pediatric dosage is always rounded DOWN to avoid potential overdose. Unless otherwise indicated, all answers should be rounded to the nearest whole number. (Examples: 31.249 (rounded down) = 31 and 23.75 (rounded up) = 24). **USE OF ZERO:** Decimal expressions of less than 1 should be preceded by a zero- "leading zero." A whole number should never be followed by a decimal point and a zero- "trailing zero."
Sample Test Questions	1. Calculate the following: $[(2 \times 5)^2 + 12] \div 2 =$ _____. (Kennamer pp 182) **Solution: 2 x 5 = 10** **10^2 = 100** **100 + 12 = 112** **112 ÷ 2 = 56** 2. A surgeon made an incision 15 cm long. How long is the incision in inches? (Simmers pp 371) **Solution: 15 cm x 1"/2.54 cm = 5.9055118 inches Rounded = 6 inches** 3. The outdoor temperature reads 60° on a Fahrenheit thermometer. What will this temperature register on a Celsius thermometer? (Round to the nearest tenth.) (Simmers pp 373) **Solution: °C = (60 °F – 32) 5/9 = 28 x 5/9 = 15.55 °C Rounded = 15.6 °C**

Final Scoring

In the event of a tie, successive tiebreaker questions will be judged until a winner is determined. Correct spelling is required for an item to be considered correct in the tiebreaker.

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Math for Health Careers

Reference Materials Summary

****NOTE: Middle School competitors will be provided with a copy of this reference during testing.**

Metric Equivalents

Length	Temperature
1 meter (m) = 100 centimeters (cm) = 1000 millimeters (mm) 1 centimeters (cm) = 10 millimeters (mm)	^{o}C (Degrees Celsius) = (^{o}F - 32) 5/9 ^{o}F (Degrees Fahrenheit) = (^{o}C) 9/5 + 32
Weight	**Weight Conversion**
1 kilogram (kg) = 1000 grams (g)	1 kilogram (kg) = 2.2 pounds (lb)
1 gram (g) = 1000 milligrams (mg)	1 pound (lb) = 16 ounces (oz)
1 milligram (mg) = 1000 micrograms (mcg)	
Volume for Solids	**Volume for Fluids**
1000 cubic decimeters (dm) = 1 cubic meter (m^3)	1 liter (L) = 1000 milliliters (mL)
1000 cubic centimeters (cm^3) = 1 cubic decimeter (dm^3)	10 centiliters (cL) = 1 deciliter (dL)
1000 cubic millimeters (mm^3)= 1 cubic centimeter (cm^3 or cc)	10 deciliters (dL) = 1 liter (L)
	1 cubic centimeter (cm^3 or cc) = 1 milliliter (mL)

Approximate Equivalents Among Systems

Metric	Household/English
240 milliliters (mL)	1 cup = 8 ounces (oz) = 16 tablespoons (tbsp)
30 milliliters (mL)	1 ounce (oz) = 2 tablespoons (tbsp) = 6 teaspoons (tsp)
15 milliliters (mL)	1 tablespoon (tbsp) = 3 teaspoons (tsp)
5 milliliters (mL)	1 teaspoon (tsp)
1 milliliter (mL)	15 drops (gtts)
0.0667 milliliters (mL)	1 drop (gtt)
1 meter (m)	39.4 inches (in)
2.54 centimeters (cm)	1 inch (in)
	1 foot (ft) = 12 inches (in)

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