

# Math for Health Careers

Health Science Event .....

Eligible Divisions: Middle School	Round 1: 35 Q test in 60 minutes	Digital Upload: NO
Solo Event: 1 competitor		



## New for 2024 – 2025

A sample test scantron form has been added. Editorial updates 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 will be a 35 fill-in-the-blank written test with five tiebreaker questions dealing with selected problems involving math essentials, measurement systems and conversions, calculations, and medical information and data interpretation. This event aims to inspire members to be proactive future health professionals and measure knowledge and understanding at the recall, application, and analysis levels.

## 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 eraser

## General Rules

1. Competitors must be familiar with and adhere to the [General Rules and Regulations](#).

## Official References

2. The references below are used in the development of the test questions.
  - a. [Kenamer, Michael. Math for Health Care Professionals. Cengage, Latest edition.](#)
  - b. [Simmers, L., Simmers-Narker, Simmers-Kobelak. DHO: Health Science. Cengage Learning, Latest edition.](#)

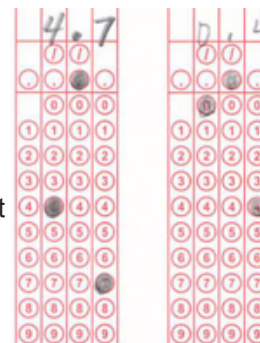
## Written Test

3. [Test Instructions](#): All competitors will be given a test and a Scantron answer form. The written test will consist of 35 fill-in-the-blank questions in a maximum of 60 minutes.
4. A series of five (5) complex, multi-step tiebreaker questions will be administered with the original test.
5. **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.
6. At the International Leadership Conference, HOSA will provide basic handheld calculators (no graphing calculators) for addition, subtraction, division, multiplication, and square root calculations.
7. **Test Plan**  
The test plan for the Math Health Career Test is:
  - Math essentials (add, subtract, multiply, divide, fractions, decimals) - 15%
  - Measurement Systems & Conversions - 25%
  - Calculations - 30%
    - o Formulas & equations

- o Ratios & proportions
- o Percentages
- Interpreting Medical Information & Data - 30%
  - o Charts, tables & graphs
  - o Basic statistics (mean, median, mode)

8. The “Reference Materials Summary” included in these guidelines (page 3) 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.**

9. **When a Scantron form is used** – the Scantron form 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.



10. **ROUNDING:** 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).

11. **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.”

12. **Sample Test Questions:**

1. Calculate the following:  $[(2 \times 5)^2 + 12] \div 2 = \underline{\hspace{2cm}}$ . Kennamer pp 182

**Solution:**  $2 \times 5 = 10$   
 $10^2 = 100$   
 $100 + 12 = 112$   
 $112 \div 2 = 56$

2. A surgeon made an incision 15 cm long. How long is the incision in inches? Simmers Pp 371

**Solution:**  $15 \text{ cm} \times 1''/2.54 \text{ cm} = 5.9055118 \text{ inches Rounded} = 6 \text{ inches}$

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:**  $^{\circ}\text{C} = (60 \text{ }^{\circ}\text{F} - 32) 5/9 = 28 \times 5/9 = 15.55 \text{ }^{\circ}\text{C Rounded} = 15.6 \text{ }^{\circ}\text{C}$

**Final Scoring**

13. In case of a tie, successive tiebreaker questions will be used until a winner is determined. In the tiebreaker, correct spelling is required for an item to be considered correct.

# Math for Health Careers Reference Materials Summary

## METRIC EQUIVALENTS

Length	Temperature
1 meter (m) = 100 centimeters (cm) = 1000 millimeters (mm) 1 centimeters (cm) = 10 millimeters (mm)	°C (Degrees Celsius) = (°F - 32) 5/9 °F (Degrees Fahrenheit) = (°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 <sup>3</sup> )	1 liter (L) = 1000 milliliters (mL)
1000 cubic centimeters (cm <sup>3</sup> ) = 1 cubic decimeter (dm <sup>3</sup> )	10 centiliters (cL) = 1 deciliter (dL)
1000 cubic millimeters (mm <sup>3</sup> ) = 1 cubic centimeter (cm <sup>3</sup> or cc)	10 deciliters (dL) = 1 liter (L)
	1 cubic centimeter (cm <sup>3</sup> 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)