Math for Health Careers

New for 2019-2020

This is a NEW event for the Middle School division only. Competitors are not required to show event guidelines at ILC.

Purpose To encourage HOSA members to improve their ability to identify, solve and apply mathematical principles used in health careers.

Description This event will be a 35 item written test dealing with selected problems involving math essentials, measurement systems and conversions, calculations and interpreting medical information and data. Written tests will measure knowledge and understanding at the recall, application and analysis levels. Higher-order thinking skills will be incorporated as appropriate.

Dress Code Competitors must be in official HOSA uniform or in proper business attire. Bonus points will be awarded for proper dress.

Rules and Procedures

1. Competitors in this event must be active members of HOSA-Future Health Professionals and in good standing in the Middle School division ONLY (in grades 6-8 during the 2019-2020 school year).

2. Competitors must be familiar with and adhere to the "General Rules and Regulations of the National HOSA Competitive Events Program (GRR)."

3. A series of five (5) complex, multi-step tie breaking questions will be administered with the original test. In case of a tie, successive tie-breaker questions will be used until a winner is determined. In the tie-breaker, correct spelling is required for an item to be considered correct.

4. The official reference for selection of symbols, abbreviations, and problems is:

   Helms, Joel R., *Mathematics for Health Sciences: A Comprehensive Approach.* Cengage Learning. Latest edition.

5. **Test Plan:**

   Math essentials (add, subtract, multiply, divide, fractions, decimals) 15%

   Measurement Systems & Conversions..... 25%

   Calculations..... 30%

   - Formulas & equations
   - Ratios & proportions
   - Percentages

   Interpreting Medical Information & Data..... 30%

   - Charts, tables & graphs
   - Basic statistics (mean, median, mode)

NOTE: *States/regions may use a different process for testing, to include but not limited to pre-conference testing, online testing, and testing at a computer. Check with your Area/Region/State for the process.*

6.. At the International Leadership Conference, HOSA will provide basic handheld calculators (no graphing calculators) for addition, subtraction, division, multiplication and square root. Check with State Advisor to determine if a calculator will be used at the State level.

7. All competitors will receive two (2) 8.5x11" sheets of blank paper for use during the test.

8. The "Reference Materials Summary" included in these guidelines (page 5) will be used as the official reference for the test for uniformity. Only equivalents and abbreviations included on 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. All competitors shall report to the site of the event at the time designated for the event orientation. The test will immediately follow the orientation. At ILC, photo ID must be presented prior to competing. **No proxies will be allowed for the orientation.**

10. **When a Scantron form is used** – the Scantron form for this event will require competitors to grid-in their responses.

    At the state-level, when a paper/pencil test is used or the test is administered on a computer, the competitor will write in or key in his/her response to each question.

11. Test Instructions: All competitors will be given a test, and a Scantron answer form. Competitors will be given instructions on the use of the Scantron form. After instructions have been given, the competitors will be notified to start the test. There will be a maximum of **60 minutes** to complete the test. Competitors may be excused from the testing site promptly after completion of the test.

12. **TIME REMAINING ANNOUNCEMENTS:** There will be a verbal announcement when there are 30 minutes, 15 minutes, 5 minutes, and 1 minute remaining to complete the test.

13. Converting between measurement systems will often render a different answer depending upon which systems and conversions are being used. The answer to a calculation problem will ultimately be the same answer after appropriate rounding.

    ROUNDING: When rounding decimal numbers to the nearest tenths, hundredths, or thousandths, 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 to the position 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).

Competitor Must Provide:

- ☐ Two #2 lead pencils with eraser
- ☐ Photo ID

FOR SPECIFICS ON EVENT MANAGEMENT SEE MANAGING COMPETITIVE EVENTS

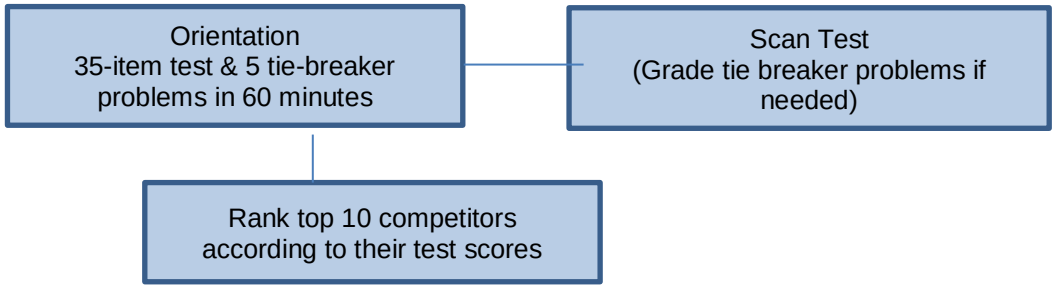
Required Personnel:

- ☐ One Event Manager
- ☐ One Judge Manager (JM) to provide quality assurance for the event by ensuring that the guidelines are followed and all event documents are complete.
- ☐ Proctors for Testing – Approximately one proctor for 20 competitors
- ☐ One-two event assistants per section

Facilities, Equipment and Materials:

- ☐ One room to accommodate the total number of competitors (see HOSA Room Sets)
- ☐ Tables/chairs or schoolroom desks/chairs for total number of competitors
- ☐ Tables/chairs for event personnel to provide for registration and distribution of materials
- ☐ List of competitors for check-in
- ☐ One pre-numbered test per competitor
- ☐ Scantron/answer forms - one copy per competitor
- ☐ Blank paper (2 sheets per competitor)
- ☐ Calculators (1 per competitor)
- ☐ Clock or timer
- ☐ Evaluation Forms – competitor and personnel
- ☐ #2 lead pencils with eraser to complete evaluations (event personnel)

Event Flow Chart



Sample Test Questions

1 Calculate the following: $[(2 \times 5)^2 + 12] \div 2 =$ _____.

2. A surgeon made an incision 15 cm long. How long is the incision in 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.

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Reference Materials Summary

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)