Newark Board of Education 2022 - Mathematics Olympics Overview

Objective: To foster and provide a competitive virtual experience in mathematics for students in grades 6 through 12.

Participation: Students from grades 6 through 12

Format: Time constrained, challenge questions that require young mathematicians to apply mathematical ideas towards creating elegant solutions.

Details:

- The date of the Math Olympics will be **June 3, 2022**
- On this date, challenge questions will be posted for each of the following 9 math subjects:
    - Grades 6, 7, and 8 Mathematics
    - Algebra I, Geometry, Algebra II, PreCalculus, Calculus, and Statistics
- Questions will be made available to pre-registered students via email and through NBOE Math Coaches and Department Chairs at noon on June 3. Students are encouraged to pre-register for this event; however, registration is not mandatory to participate.
- Students are expected to work individually.
- **Student responses are due at noon on Saturday, June 4, 2022**:
    - provide as complete a solution to the question as possible
    - delivered electronically in JPEG format through Google Forms
- The Rubric by which solutions are scored is appended.

Scoring:

- Scoring of submitted work will be based on several parameters:
    - How correct the solution is
    - How completely the solution is rendered
    - How effectively the solution is communicated
    - How inventive the solution is
- The Scoring Rubric appended below.

Awards:

- Plaques, certificates and calculators will be given for first, second and third place winners in each middle school grade level and high school subject. Awards will be delivered to students' schools.
- The first, second and third place winners will also be invited to create a video presenting their solutions.

Scoring Rubric for Newark Board of Education Math Olympics

	Expert (3)	Practitioner (2)	Apprentice (1)	Novice (0)
Problem Solving	An efficient strategy is chosen and progress towards a solution is evaluated. Adjustments in strategy, if necessary, are made along the way, and/or alternative strategies are considered. Evidence of analyzing the situation in mathematical terms and extending prior knowledge is present. *Note: The Expert must achieve a correct answer.*	A correct strategy is chosen based on the mathematical situation in the task. Planning or monitoring of strategy is evident. Evidence of solidifying prior knowledge and applying it to the problem-solving situation is present.	A partially correct strategy is chosen, or a correct strategy for only part of the task is chosen. Evidence of drawing on relevant previous knowledge is present, showing some relevant engagement in the task.	No strategy is evident, or a strategy is chosen that will not lead to a solution. Little or no evidence of engagement in the task is evident.
Reasoning and Proof	Deductive arguments are used to justify decisions and may result in formal proofs. Evidence is used to justify and support decisions made and conclusions reached.	Arguments are constructed with adequate mathematical basis. A systematic approach and/or justification of correct reasoning is present.	Arguments are made with some mathematical basis. Some correct reasoning or justification for reasoning is present.	Arguments are made with no mathematical basis. No correct reasoning nor justification for reasoning is present.

Communication	A sense of audience and purpose is communicated. Communication at the Practitioner level is achieved, and communication of argument is supported by mathematical properties. Formal math language and symbolic notation is used to consolidate math thinking and to communicate ideas. At least one of the math terms or symbolic notations is beyond grade level.	A sense of audience or purpose is communicated. Communication of an approach is evident through a methodical, organized, coherent, sequenced and labeled response. Formal math language is used to share and clarify ideas. At least two formal math terms or symbolic notations are evident, in any combination.	Some awareness of the audience or purpose is communicated. Some communication of an approach is evident through verbal/written accounts and explanations. An attempt is made to use formal mathematical language. Some formal math terminology or symbolic notation is evident.	No awareness of the audience or purpose is communicated. No formal mathematical terms or symbolic notation are evident.
Connections	Mathematical connections are used to extend the solution to other mathematics or to a deeper understanding of the mathematics in the task. Some examples may include one or more of the following: • testing and accepting or rejecting of a hypothesis or conjecture • explanation of phenomenon • generalizing and extending the solution to other cases	A mathematical connection is made. Proper contexts are identified that link both the mathematics and the situation in the task. Some examples may include one or more of the following: • clarification of the mathematical or situational context of the task • exploration of mathematical phenomenon in the context of the broader topic in which the task is situated . noting patterns, structures and regularities.	A mathematical connection is attempted but is partially incorrect or lacks contextual relevance.	No connections are made, or connections are mathematically or contextually irrelevant.

Representations	Appropriate mathematical representations are constructed to analyze relationships, extend thinking and clarify or interpret phenomena.	Appropriate and accurate mathematical representations are constructed and refined to solve problems or portray solutions.	An attempt is made to construct a mathematical representation to record and communicate problem solving, but it is not accurate.	No attempt is made to construct a mathematical representation.