

**2023 NATIONAL SCIENCE OLYMPIAD STANDARDS ALIGNMENT BY EVENT
C DIVISION (MIDDLE SCHOOL; Grades 9-12)**

| Event | Standards |
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| AIR TRAJECTORY – Prior to the competition, teams will design, construct, and calibrate a single device capable of launching projectiles onto a target and collect data regarding device parameters and performance | <i>HS-PS 2-1, HS-PS 2-6, HS-PS 3-1, HS-PS 3-3, HS-ETS 1-2, HS-ETS 1-3, HS-ETS 1-4</i> |
| ANATOMY AND PHYSIOLOGY – Participants will be assessed on their understanding of the anatomy and physiology for the human Cardiovascular, Lymphatic, and Excretory systems. | <i>HS-LS 1–2, HS-LS 1–3</i> |
| ASTRONOMY – Teams will demonstrate an understanding of Stellar Evolution: Star Formation & Exoplanets. | <i>HS-ESS 1–2, HS-ESS 1–3</i> |
| CELL BIOLOGY – This event integrates content knowledge and process skills in the areas of cell biology and cellular biochemistry. | <i>HS-LS 1-1, HS-LS 1-3, HS-LS 1-4, HS-LS 1-5, HS-LS 1-6, HS-LS 1-7, HS-PS 2-6</i> |
| CHEMISTRY LAB - Teams will complete one or more tasks and answer a series of questions involving the scientific processes of chemistry focused in the areas of Periodicity and Equilibrium. | <i>HS-PS 1–1, HS-PS 1–2, HS-PS 1–3, HS-PS 1–4, HS-PS 1–5, HS-PS 1–6, HS-PS 1–7</i> |
| CODEBUSTERS – Teams will cryptanalyze and decode encrypted messages using cryptanalysis techniques for historical and modern advance ciphers. | K-12 Computer Science Framework <i>9-12 Computing Systems 9-12 Algorithms and Programming 9-12 Networks and the Internet</i> |
| DETECTOR BUILDING – Teams will build a durable ORP or Redox Probe that will accurately measure and display both voltage and the concentrations of NaCl in parts per million from 0 to 5000 ppm of different water samples and complete a written test on the principles and theories behind the event. | <i>HS-PS 2-1, HS-PS 2-3., HS-PS 2-4., HS-PS 3-3, HS-ETS 1-2., HS-ETS 1-3., HS-ETS 1-4.</i> |
| DISEASE DETECTIVES – Participants will use their investigative skills in the scientific study of disease, injury, health, and disability in populations or groups of people. | <i>HS-LS 1–2, HS-LS 1–3, HS-LS 2-1, HS-LS 2-2, HS-LS 2-6, HS-LS 2-7, HS-LS 2-8, HS-LS 4-3, HS-LS 4-4, HS-LS 4-5, HS-LS 4-6, HS-ETS 1-1, HS-ETS 1-3, HS-ETS 1-4</i> |
| DYNAMIC PLANET – Participants will demonstrate an understanding of the large-scale processes affecting the structure of Earth’s crust. | <i>HS-ESS 1-5, HS-ESS 2-1, HS-ESS 2-2, HS-ESS 2-6, HS-ESS 3-6</i> |
| ECOLOGY – Students will answer questions involving content knowledge and process skills in the area of ecology and adaptations in featured North American biomes. | <i>HS-LS 2-3, HS-LS 2-4, HS-LS 2-1, HS-ESS 2-2, HS-LS 2-6, HS-LS 2-7</i> |
| EXPERIMENTAL DESIGN – This event will determine the participant’s ability to design, conduct, and report the findings of an experiment conducted entirely on site. | <i>HS-PS 1-4, HS-PS 1-5, HS-PS 1-6, HS-PS 2-1, HS-PS 2-3, HS-PS 2-5, HS-PS 3-3, HS-PS 3-4, HS-PS 3-5</i> |
| FERMI QUESTIONS – Teams provide answers to a series of “Fermi Questions”; science related questions that seek fast, rough estimates of a quantity, which is either difficult or impossible to measure directly. | <i>HS-PS 1-7, HS-PS 1-8, HS-PS 2-1, HS-PS 2-2, HS-PS 2-4, HS-LS 2-1, HS-LS 2-2, HS-LS 2-4, HS-LS 2-5, HS-ESS 1-4, HS-ESS 2-6</i> |
| FLIGHT – Prior to the tournament teams design, construct, and test free flight rubber-powered aircraft to achieve maximum time aloft. | <i>HS-PS 2-1, HS-PS 3-3, HS-ETS 1-2, HS-ETS 1-3, HS-ETS 1-4</i> |
| FORENSICS - Given a scenario and some possible suspects, students will perform a series of tests. These tests, along with other evidence or test results, will be used to solve a crime. | <i>HS-PS 1-1, HS-PS 1-3, HS-LS 3-1, LS 3-3, HS-ETS 1-3</i> |
| FORESTRY – Participants will be assessed on their knowledge of trees found in the United States that are on the 2024 Official Science Olympiad National Tree List. | <i>HS-LS 2-8., HS-LS 4-1., HS-LS 4-2.</i> |
| FOSSILS – Teams use fossils to date and correlate rock units as well as demonstrate their knowledge of ancient life by completing tasks related to fossil identification and classification. | <i>HS-ESS 2-5, HS-ESS 2-7</i> |
| GEOLOGIC MAPPING – Teams will demonstrate understanding in the construction and use of topographic maps, geologic maps, and cross sections, and their use in forming interpretations regarding subsurface structures and geohazard risks especially with respect to subduction zones. | <i>HS-ESS 2-1, HS-ESS 3-1</i> |
| MICROBE MISSION – Teams will answer questions, solve problems, and analyze data pertaining to microbes. | <i>HS-LS 1-1, HS-LS 1-3, HS-LS 1-4, HS-LS 1-5, HS-LS 1-6, HS-LS 1-7</i> |
| OPTICS – Teams will participate in an activity involving positioning mirrors to direct a laser beam towards a target and complete a written test on the principles of geometric and physical optics. | <i>HS-PS 4-1, HS-PS 4-3</i> |
| REMOTE SENSING – Participants will use remote sensing imagery, data, and computational process skills to complete tasks related to climate change processes in the Earth system. | <i>HS-PS 4-1, HS-PS 4-2, HS-PS 4-5</i> |

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| <p>ROBOT TOUR - Teams design, build, program and test one Robotic Vehicle to navigate a track to reach a target in a set amount of time as accurately and efficiently as possible.</p> | <p><i>HS-PS 2-1, HS-PS 3-3, HS-PS 4-2, HS-PS 4-5, HS-ETS 1-2, HS-ETS 1-3, HS-ETS 1-4</i></p> |
| <p>ROCKS AND MINERALS – Participants will demonstrate their knowledge of rocks and minerals.</p> | <p><i>HS-PS 2-6, HS -ESS 1-6, HS-ESS 2-1, HS-ESS 2-3</i></p> |
| <p>SCRAMBLER – Teams design, build, and test a mechanical device, which uses the energy from a falling mass to transport an egg along a straight track as quickly as possible and stop as close to the center of a Terminal Barrier (TB) without breaking the egg.</p> | <p><i>HS-PS 2-2, HS-PS 3-2, HS-ETS 1-2, HS-ETS 1-3, HS-ETS 1-4</i></p> |
| <p>TOWER – Teams will design and build a Tower (Structure) meeting requirements specified in these rules to achieve the highest structural efficiency.</p> | <p><i>HS-ETS 1-2, HS-ETS 1-3, HS-ETS 1-4</i></p> |
| <p>WIND POWER - Teams construct a blade assembly device prior to the tournament that is designed to capture wind power and complete a written test on the principles of alternative energy.</p> | <p><i>HS-PS 2-6, HS-PS 3-5, HS-PS 4-1, HS-PS 4-2, HS-PS 4-5, HS-ETS 1-2, HS-ETS 1-3, HS-ETS 1-4</i></p> |
| <p>WRITE IT/DO IT – One participant will write a description of an object and how to build it. The other participant will attempt to construct the object from this description.</p> | <p>CCSS ELA Standards <i>W9-10.2, W11-12.2</i> K-12 Computer Science Framework <i>9-12 Algorithms and Programming</i></p> |