

**2021 NATIONAL SCIENCE OLYMPIAD STANDARDS ALIGNMENT BY EVENT  
C DIVISION (HIGH SCHOOL; Grades 9-12)**

<b>Event</b>	<b>Standards</b>
<b>ANATOMY AND PHYSIOLOGY</b> – Understand the anatomy and physiology of human body systems.	<i>HS-LS 1–2, HS-LS 1–3</i>
<b>ASTRONOMY</b> – Teams will demonstrate an understanding of stellar evolution in normal & starburst galaxies.	<i>HS-ESS 1–2, HS-ESS 1–3</i>
<b>BOOMILEVER</b> – Teams will design and build a Boomilever meeting requirements specified in these rules to support a minimum load and achieve the highest structural efficiency.	<i>HS-ETS 1-2, HS-ETS 1-3, HS-ETS 1-4</i>
<b>CHEMISTRY LAB</b> – Teams will complete one or more tasks and answer a series of questions involving the science processes of chemistry focused in the areas of Physical Properties and Acids & Bases.	<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>
<b>CIRCUIT LAB</b> – Participants must complete tasks and answer questions about electricity and magnetism.	<i>HS-PS 2-4, HS-PS 2-5, HS-PS 3-1, HS-PS 3-2, HS-PS 3-5</i>
<b>CODEBUSTERS</b> – Teams will cryptanalyze (decode) encrypted messages using cryptanalysis techniques and show skill with advanced ciphers by encrypting or decrypting a message.	K-12 Computer Science Framework <i>9-12 Computing Systems 9-12 Algorithms and Programming 9-12 Networks and the Internet</i>
<b>DESIGNER GENES</b> – Participants will solve problems and analyze data or diagrams using their knowledge of the basic principles of genetics, molecular genetics, and biotechnology.	<i>HS-LS 3-1, HS-LS 3-2, HS-LS 3-3.</i>
<b>DETECTOR BUILDING</b> - Teams will build a durable temperature-sensing Device that will accurately measure, and display temperatures between 0°C to 75°C to determine the temperature of four different water samples.	<i>HS-PS 1-5., HS-PS 3-4., HS-ETS 1-2., HS-ETS 1-3., HS-ETS 1-4.</i>
<b>DISEASE DETECTIVES</b> – 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>
<b>DYNAMIC PLANET</b> – Teams will complete tasks related to physical and geological oceanography.	<i>HS-ESS 2-1, HS-ESS 2-4, HS-ESS 2-5, HS-ESS 2-6, HS-ESS 3-1, HS-ESS 3-4, HS-ESS 3-5, HS-ESS 3-6</i>
<b>EXPERIMENTAL DESIGN</b> – 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>
<b>FORENSICS</b> – 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>
<b>FOSSILS</b> – 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 2-7</i>
<b>GEOLOGIC MAPPING</b> – 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>
<b>GRAVITY VEHICLE</b> - Teams design, build, and test one Vehicle and Ramp that uses the Vehicle’s gravitational potential energy as its sole means of propulsion to reach a target as quickly and accurately as possible.	<i>HS-PS 2-2, HS-PS 3-2, HS-ETS 1-2, HS-ETS 1-3, HS-ETS 1-4</i>
<b>MACHINES – SIMPLE AND COMPUND</b> - Teams will complete a written test on simple, Division B, and compound, Division C, machine concepts and construct a lever-based measuring device prior to the tournament to determine the ratio between two masses.	<i>HS-PS 2-1, HS-PS 3-3, HS-ETS 1-2, HS-ETS 1-3, HS-ETS 1-4</i>
<b>ORNITHOLOGY</b> - Participants will be assessed on their knowledge of North American birds.	<i>HS-LS 2-8., HS-LS 4-1., HS-LS 4-2.</i>
<b>PING PONG PARACHUTE</b> - Prior to the tournament, teams will design, build, and bring up to two bottle rockets to the tournament to launch a ping pong ball attached to a parachute to stay aloft for the greatest amount of time.	<i>HS-PS 2-1., HS-PS 2-2., HS-PS 3-1., HS-PS 3-3., HS-ETS 1-2., HS-ETS 1-3., HS-ETS 1-4.</i>

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<p><b>PROTEIN MODELING</b> – Students will use computer visualization and online resources to construct physical models of the CRISPR Cas9 protein, that is being engineered to edit plant and animal cell genomes, and answer a series of questions about the chemistry of protein folding and the interaction of structure and function for model proteins.</p>	<p><i>HS-PS 1-1, HS-PS 1-2, HS-PS 1-3, HS-LS 1-1, HS-LS 1-6</i></p>
<p><b>SOUNDS OF MUSIC</b> – Teams must construct and tune one device prior to the tournament based on a 12-tone equal tempered scale and complete a written test on the physics of sound.</p>	<p><i>HS-PS 3-1, HS-PS 3-3, HS-PS 4-1, HS-ETS 1-2, HS-ETS 1-3, HS-ETS 1-4.</i></p>
<p><b>WATER QUALITY</b> – Participants will be assessed on their understanding and evaluation of aquatic environments.</p>	<p><i>HS-LS 2-1, HS-LS 2-2, HS-LS 2-6, HS-LS 2-7</i></p>
<p><b>WRIGHT STUFF</b> – Prior to the tournament teams design, construct, and test free flight rubber-powered monoplanes to achieve maximum time aloft.</p>	<p><i>HS-PS 2-1, HS-PS 3-3, HS-ETS 1-2, HS-ETS 1-3, HS-ETS 1-4</i></p>
<p><b>WRITE IT/DO IT</b> – 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>