

**2021 NATIONAL SCIENCE OLYMPIAD STANDARDS ALIGNMENT BY EVENT  
B DIVISION (MIDDLE SCHOOL; Grades 6-9)**

<b>Event</b>	<b>Standards</b>
<b>ANATOMY AND PHYSIOLOGY</b> – Understand the anatomy and physiology of human body systems.	<i>MS-LS 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>MS-ETS 1-1, MS-ETS 1-2, MS-ETS 1-3, MS-ETS 1-4</i>
<b>CIRCUIT LAB</b> – Participants must complete tasks and answer questions about electricity and magnetism.	<i>MS-PS 2-3, MS-PS 2–5, MS-PS 3-2,</i>
<b>CRIME BUSTERS</b> – Given a scenario, a collection of evidence, and possible suspects, students will perform a series of tests. The test results along with other evidence will be used to solve a crime.	<i>MS-PS 1–2, MS-PS 1–3, MS-ETS 1-1, MS-ETS 1-2, MS-ETS 1-3</i>
<b>DENSITY LAB</b> – Participants compete in activities and answer questions about mass, density, number density, area density, concentration, pressure, and buoyancy.	<i>MS-PS 1-2, MS-PS 1-4, HS-PS 1-3, HS-PS 1-5</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>MS-LS 1-5, MS-LS 2-2, MS-LS 2-4, MS-LS 4-4, MS-ESS 3-4, MS-ETS 1-1, MS-ETS 1-2, MS-ETS 1-3</i>
<b>DYNAMIC PLANET</b> – Teams will complete tasks related to physical and geological oceanography.	<i>MS-ESS 2-4, MS-ESS 2-6, MS-ESS 3-2, MS-ESS 3-3,</i>
<b>ELASTIC LAUNCHED GLIDER</b> – Prior to the tournament teams design, construct, and test elastic-launched gliders to achieve the maximum time aloft.	<i>MS-PS 2-1, MS-PS 3-5, MS-ETS 1-1, -ETS 1-2, MS-ETS 1-3, MS-ETS 1-4.</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>MS-PS 1-2, MS-PS 1-4, MS-PS 1-5, MS-PS 2-2, MS-PS 2-5, MS-PS 3-1, MS-PS 3-4, MS-LS 1–1, MS-LS 1–3, MS-LS 1–6</i>
<b>FOOD SCIENCE</b> - Participants will answer questions on food chemistry with a focus on fermentation and pickling. In addition, participants will build a salinometer/hydrometer capable of measuring salt compositions between 1-10% (mass/volume).	<i>MS-PS 1-2., MS-LS 1-7.</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>MS-PS 2-3, MS-LS 4-1, MS-LS 4-2,</i>
<b>GAME ON</b> – This event will determine a team’s ability to design and build an original computer game using the program Scratch incorporating the scientific theme provided to them by the supervisor.	<i>MS-ETS 1-1, MS-ETS 1-2, MS-ETS 1-3, K-12 Computer Science Framework: 6-8 Algorithms and Programming; 6-8 Data and Analysis;</i>
<b>HEREDITY</b> – Participants will solve problems and analyze data or diagrams using their knowledge of the basic principles of genetics.	<i>MS-LS 3-1, MS-LS 3-2</i>
<b>MACHINES – SIMPLE AND COMPOUND</b> - Teams will complete a written test on simple, <b>Division B</b> , and compound, <b>Division C</b> , machine concepts and construct a lever-based measuring device prior to the tournament to determine the ratio between two masses.	<i>MS-PS 3-5., MS-ETS 1-1., MS-ETS 1-2., MS-ETS 1-3.</i>
<b>METEOROLOGY</b> – This event emphasizes understanding of basic meteorological principles with emphasis on analysis and interpretation of meteorological data, graphs, charts, and images.	<i>MS-ESS 2-5, MS-ESS 2-6, MS-ESS 3-2,</i>
<b>MISSION POSSIBLE</b> - Prior to the competition, participants design, build, test, and document a Rube Goldberg <sup>®</sup> - like Device that completes required Start and Final Actions through a series of specific actions.	<i>MS-PS 3-5., MS-ETS 1-1., MS-ETS 1-2., MS-ETS 1-3., MS-ETS 1-4.</i>
<b>MOUSETRAP VEHICLE</b> - Teams design, build, and test one Vehicle using one mousetrap as its sole means of propulsion to reach a target as quickly and accurately as possible.	<i>MS-PS 2-1., MS-PS 3-5., MS-ETS 1-1., MS-ETS 1-2., MS-ETS 1-3., MS-ETS 1-4.</i>
<b>ORNITHOLOGY</b> - Participants will be assessed on their knowledge of North American birds.	<i>MS-LS 1-4., MS-LS 4-2., MS-LS 4-3.</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>MS-PS 2-2., MS-PS 2-4., MS-PS 3-1., MS-PS 3-5., MS-ETS 1-1., MS-ETS 1-2., MS-ETS 1-3., MS-ETS 1-4.</i>
<b>REACH FOR THE STARS</b> - Students will demonstrate an understanding of the properties and evolution of stars and galaxies as well as their observation using different portions of the electromagnetic spectrum (e.g., Radio, Infrared, Visible, Ultraviolet, X-Ray, Gamma Ray).	<i>MS-ESS 1-2., HS-ESS 1-2., HS-ESS 1-3.</i>

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<p><b>ROAD SCHOLAR</b> – Teams will answer interpretive questions that may use one or more state highway maps, USGS topographic maps, Internet-generated maps, a road atlas or satellite/aerial images.</p>	<p><i>MS-ESS 2-3, MS-ESS 3-1</i></p>
<p><b>ROLLER COASTER</b> – Prior to the competition, teams design, build, and test a Roller Coaster track to guide a ball/sphere that uses gravitational potential energy as its sole means of propulsion to travel as close as possible to a Target Time.</p>	<p><i>MS-PS 2-1, MS-PS 2-2, MS-PS 3-1, MS-PS 3-5, MS-ETS 1-1, MS-ETS 1-2, MS-ETS 1-3, MS-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>MS-LS 2-1, MS-LS 2-2, MS-LS 2-3, MS-LS 2-4</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>W6.2, W7.2, W8.2</i> K-12 Computer Science Framework <i>6-8 Algorithms and Programming,</i></p>