2015 NATIONAL SCIENCE OLYMPIAD – NEXT GENERATION SCIENCE STANDARDS ALIGNMENT

C (SENIOR HIGH SCHOOL) DIVISION

C Events	Next Generation Science Standards
Air Trajectory – Prior to the competition, teams will design, construct, and calibrate a single device capable of launching projectiles into a target and collect data regarding device parameters and performance.	Science and Engineering Practices (2-6)
Anatomy and Physiology – Understand the anatomy and physiology of the Integumentary, Immune, and Cardiovascular systems.	From Molecules to Organisms: Structures and Processes (HS-LS1-2,3)
Astronomy – Teams will demonstrate an understanding of the basic concepts of mathematics and physics relating to stellar evolution and star and planet formation.	Earth's Place in the Universe (HS-ESS1-2,3,4)
Bridge – The objective of this event is for the team to design and build the lightest bridge with the highest structural efficiency that can span a given opening meeting the requirements as specified in these rules.	Science and Engineering Practices (2-6)
Bungee Drop – Using an elastic cord teams will conduct drops from a given height to a surface plane.	Energy (HS-PS3-1) Science and Engineering Practices (2-6)
Cell Biology – This event integrates content knowledge and process skills in the areas of cell biology and cellular biochemistry.	From Molecules to Organisms: Structures and Processes (HS-LS1-2,3,4,5,6,7)
Chemistry Lab – Teams will complete one or more tasks and answer a series of questions involving the Science processes of chemistry focused in the areas of chemical reactions/stoichiometry and kinetics.	Matter and Its Interactions (HS-PS1-2,4,5,7)
Compound Machines – This event includes activities and questions related to simple and compound machines.	Science and Engineering Practices (2-6)
Disease Detectives – Students will use their investigative skills in the scientific study of disease, injury, health, and disability in populations or groups of people with a focus on Population Growth.	Earth and Human Activity (HS-ESS3-4) Engineering Design (HS-ETS1-2, 3) Science and Engineering Practices (2)
Dynamic Planet—Oceanography – Teams will use NGSS Science and Engineering Practices such as asking questions and defining problems, developing and using models, planning and carrying out investigations, analyzing and interpreting data, using mathematics and computational thinking, constructing explanations and designing solutions, and engaging in argument from evidence and obtaining, evaluating, and communicating information to complete tasks related to physical and geological oceanography.	Earth's Systems (HS-ESS2-1) Science and Engineering Practices (2,4,6)
Entomology – Students will be asked to identify insects and selected immature insects by order and family, answer questions about insects and use or construct a dichotomous key.	Biological Evolution: Unity and Diversity (HS-LS4-2)
Experimental Design – This event will determine a team's ability to design, conduct, and report the findings of an experiment actually conducted on site.	Science and Engineering Practices (1-8)
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.	Science and Engineering Practices (2-8)
Fossils – Teams will demonstrate their knowledge of ancient life by completing selected tasks at a series of stations. Emphasis will be on fossil identification and ability to answer questions about classification, habitat, ecologic relationships, behaviors, environmental adaptations and the use of fossils to date and correlate rock units.	Earth's Systems (MS-ESS2-3) Earth's Systems (HS-ESS2-7) Biological Evolution: Unity and Diversity (MS-LS4-1,2)
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.	Earth's Systems (HS-ESS2-1) Science and Engineering Practices (2)
Green Generation – Students will answer questions involving the history and consequences of human impact on our environment, solutions to reversing trends and sustainability concepts.	Ecosystems: Interactions, Energy, and Dynamics (HS-LS2-12,3,4,5,6,7,8) Earth and Human Activity (HS-ESS3-4)
It's About Time – Competitors may construct one non-electrical device to measure time intervals between 10 and 300 seconds. They must also be asked to answer questions related to time.	Science and Engineering Practices (2-6)

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Mission Possible – Prior to competition, teams must design, build, test, and document a "Rube Goldberg® like Device" that completes a required Final Task using a sequence of consecutive Energy Transfers.	Energy (HS-PS3-3) Science and Engineering Practices (2-8)
Protein Modeling – Students will use computer visualization and online resources to guide the construction of physical models of proteins and to understand how protein structure determines function. Students will model proteins being used to edit the human genome. Currently these protein "tools" are designed by linking two specific parts (or domains) – one for DNA-targeting and answer for DNA-cleavage. Examples of DNA-targeting and DNA-cleaving protein domains will be featured in the Protein Modeling.	From Molecules to Organisms: Structures and Processes (HS-LS1-1,6) Science and Engineering Practices (2)
Scrambler – Competitors must design, build, and test a mechanical device, which uses the energy from a falling mass to transport an egg along a track as quickly as possible and stop as close to the center of a Terminal Barrier without breaking the egg.	Science and Engineering Practices (2-6)
Technical Problem Solving – Teams will gather and process data to solve problems.	Science and Engineering Practices (2-8)
Wright Stuff – Prior to the tournament teams design, construct, and test free flight rubber-powered monoplanes to achievement maximum time aloft.	Science and Engineering Practices (2-6)
Write It/Do It – One student will write a description of an object and how to build it, and then the other student will attempt to construct the object from this description.	Science and Engineering Practices (2,5-8)