Spring 2023 Event Descriptions and Preparation

EVENT	TYPE	DESCRIPTION	PREPARATION
Anatomy and Physiology	🌿	Participants will be assessed on their understanding of the anatomy and physiology for the human Respiratory, Digestive, and Immune systems.	● Write an exam (and/or stations, hands-on tasks, etc.)
Astronomy	🌋	Teams will demonstrate an understanding of Stellar Evolution & Variability.	● Write an exam (and/or stations, hands-on tasks, etc.)
Bio Process Lab	🌿	This event is a lab-oriented competition involving the fundamental science processes of a middle school life science/biology lab program.	● Write an exam (and/or stations, hands-on tasks, etc.)
Bridge	🏗	Teams will design and build a Bridge (Structure) meeting requirement specified in these rules to achieve the highest structural efficiency.	● Understand how to test teams' structures ● Set up existing bridge equipment
Can't Judge a Powder	🧪	Students will test and characterize one pure substance and then, based only on data they collect, answer a series of questions about that substance. Students will not be asked to identify the substance. Emphasis of this event is on the quality of data collected, answering questions about the substance and providing data to support their answers.	● Get access to necessary reagents and lab equipment/supplies ● Set up lab stations ● Prepare a short exam
Cell Biology	🌿	This event integrates content knowledge and process skills in the areas of cell biology and cellular biochemistry.	● Write an exam (and/or stations, hands-on tasks, etc.)
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 Oxidation/Reduction and Periodicity.	● Get access to necessary reagents and lab equipment/supplies ● Set up lab stations ● Write exam and lab activities
Codebusters	📝	Teams will cryptanalyze and decode encrypted messages using cryptanalysis techniques for historical and modern advanced ciphers.	● Write an exam ● Devise a system for timing the timed question
Crave the Wave	📢	In this event competitors must demonstrate knowledge and process skills needed to solve problems and answer questions regarding all types of waves and wave motion.	● Write an exam (and/or stations, hands-on tasks, etc.)
Crime Busters	🧪	Given a scenario, a collection of evidence, and possible suspects, students will perform a series of tests that along with other evidence will be used to solve a crime.	● Get access to necessary reagents and lab equipment/supplies ● Set up crime scene lab stations

			● Write crime scene and exam questions
Detector Building	🏗️	Teams will build a durable Mass/Force Sensing Device that will accurately measure and display both voltage and actual masses of different solid samples ranging from 20 to 1,000 grams.	● Prepare masses ● Set up build room ● Write an exam
Disease Detectives	🌿	Participants will use investigative skills in the scientific study of disease, injury, health and disability in populations or groups of people.	● Write an exam (and/or stations, hands-on tasks, etc.)
Dynamic Planet	🌋	In this event, students will use process skills to complete tasks related to Earth's fresh waters.	● Write an exam (and/or stations, hands-on tasks, etc.)
Environmental Chemistry	🧪	This event will focus on fresh water (e.g., residential, industrial or natural), the identified pages of The Clean Water Act (1972 & 1977), wastewater operator's certification manual (Indiana March 2018 revision) and its applications, various testing of particular analytes using standardized curves (either interpreted or created), and stabilization ponds, & introduction to the National Pretreatment Program.	● Get access to necessary reagents and lab equipment/supplies ● Set up lab stations ● Write exam and lab activities
Experimental Design	📝	This event will determine a participant's ability to design, conduct and report the findings of an experiment entirely on-site.	● Create sets of experiment materials ● Set up participant stations
Fast Facts	📝	Teams will fill in a grid of terms that begin with a given letter to match given science categories.	● Prepare grids
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.	● Write exam of fermi questions, and identify appropriate answers
Flight	🏗️	Prior to the tournament, teams will design, construct and test free flight rubber-powered aircraft to achieve maximum time aloft.	● Set up room ● Understand how to test teams' builds
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.	● Get access to necessary reagents and lab equipment/supplies ● Set up crime scene lab stations ● Write crime scene and exam questions
Forestry	🌿	Participants will be assessed on their knowledge of trees found in the United States that are on the Official Science Olympiad National Tree List.	● Get access to specimens for participants to identify (we have access to some, if needed) ● Prepare exam stations and answer sheet

Green Generation	🌱	Students will demonstrate an understanding of general ecological principles, the history and consequences of human impact on our environment, solutions to reversing trends and sustainability concepts.	• Write an exam (and/or stations, hands-on tasks, etc.)
It's About Time	🔊	Teams will answer questions related to time and they may construct and bring one non-electrical device that triggers a single signal to occur three times at equally spaced time intervals.	• Set up room • Devise a strategy to efficiently run the event • Understand how to test teams' builds • Write an exam
Meteorology	🌋	Participants will use scientific process skills as well as qualitative and quantitative analyses to demonstrate an understanding of the factors that influence Everyday Weather.	• Write an exam (and/or stations, hands-on tasks, etc.)
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.	• Write an exam (and/or stations, hands-on tasks, etc.)
Road Scholar	🌋	Participants 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.	• Write an exam (and/or stations, hands-on tasks, etc.) • Locate maps to use
Rocks and Minerals	🌋	Teams will demonstrate their knowledge of rocks and minerals.	• Get access to specimens for participants to identify • Prepare exam stations and answer sheet
Roller Coaster	🏗️	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.	• Set up room • Devise a strategy to efficiently run the event • Understand how to test teams' builds
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.	• Set up room & test track(s) • Devise a strategy to efficiently run the event • Understand how to test teams' builds
Solar System	🌋	Participants will demonstrate an understanding and knowledge of habitability within and beyond the Solar System.	• Write an exam (and/or stations, hands-on tasks, etc.)
Sounds of Music	🔊	Teams must construct and tune one device prior to the tournament based on a one-octave 12-tone equal tempered scale and complete a written test on the physics of sound and music concepts.	• Set up room(s) • Devise a strategy to efficiently run the event (VERY important for this one) • Understand how to test teams' builds • Write an exam

Storm the Castle		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.	• Set up room & launch area(s) • Devise a strategy to efficiently run the event • Understand how to test teams' builds • Prepare counterweights
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.	• Set up room & launch area(s) • Devise a strategy to efficiently run the event • Understand how to test teams' builds • Build elevated target platform
Wheeled Vehicle		Teams must design, build, and test one Vehicle that uses a non-metallic, elastic material as its sole means of propulsion to travel a distance as quickly and accurately as possible.	• Set up room & test track(s) • Devise a strategy to efficiently run the event • Understand how to test teams' builds
WiFi Lab		Teams must construct an antenna device prior to the tournament that is designed to transmit a signal at 2.4GHz and complete a written test on the principles of electromagnetic wave propagation.	• Write an exam • Set up room • Devise a strategy to efficiently run the event • Figure out the system to test teams' antennae (we should have the necessary equipment)
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.	• Obtain many sets of the same simple materials • Construct several identical models using these • Prepare a rubric for easy grading • Set up rooms