



## Merced County STEM Fair 2019-2020 Science Fair Categories Grades 5-10

<u>Aerodynamics/Hydrodynamics (Junior Division)</u>	Studies of aerodynamics and propulsion of air, land water and space vehicles; aero/hydrodynamics of structures and natural objects. Studies of the basic physics of fluid flow.
<u>Alternative Energy (Junior Division)</u>	Studies of power generation using alternative energy technologies such as solar cells.
<u>Applied Mechanics &amp; Structures</u>	Studies concerning the design, manufacture, and operation of mechanisms, including characteristics of materials, dynamic response, and active/passive control. Testing for strength and stiffness of materials used to provide structural capability; studies and testing of structural configurations designed to provide improved weight and force loading or stiffness capabilities.
<u>Behavioral &amp; Social Sciences</u>	Studies of human psychology, behavior, development, linguistics, and the effects of chemical or physical stress on these processes. Experimental or observational studies of attitudes, behaviors, or values of a society or groups within a society, and of the influences of society on group behavior. Includes gender and diversity studies, anthropology, archaeology, and sociology. Studies may focus on either normal or abnormal behavior. Senior Division only: includes studies of cognition.
<u>Biochemistry/Molecular Biology</u>	Studies at the molecular, biochemical, or enzymatic levels in animals (including humans), plants, and microorganisms, including yeast. Studies of biological molecules, e.g., DNA, RNA, proteins, fats, vitamins, nutrients.
<u>Chemistry</u>	Studies in which chemical properties of nonbiological organic and inorganic materials (excluding biochemistry) are observed. Some studies involving physical properties are appropriate, including phase changes, crystal structures and formation, intermolecular and intramolecular forces.
<u>Computational Systems &amp; Analysis</u>	Studies that focus primarily on the development or use of computational systems for applications in the biological, physical, or engineering sciences, such as analyzing big data, modeling and simulations, autonomous navigation, and bioinformatics.
<u>Earth &amp; Atmospheric Sciences (Junior Division)</u>	Studies in geology, seismology, physical oceanography, marine geology, coastal processes, atmospheric physics and chemistry, meteorology, and climatology including measurements, models and the effects of climate change.
<u>Electronics &amp; Electromagnetics</u>	Experimental or theoretical studies with electrical circuits, computer design, electro-optics, electromagnetic applications, and antennas.
<u>Environmental Engineering</u>	Projects which apply technologies such as recycling, reclamation, restoration, composting, and bioremediation which could benefit the environment and/or the effects of pollution on the environment.
<u>Environmental Science</u>	Projects surveying, measuring, or studying the impact of natural and man-made changes on the environment. Examples include floods, fires, biohazardous spills, acid rain, earthquakes, air pollution, and water pollution.
<u>Materials Science (Junior Division)</u>	Studies of materials characteristics and their static (not in motion) physical properties. Includes measurements and comparisons of materials durability, flammability, and insulation properties (thermal, electrical, acoustic, optical, electromagnetic, etc.).
<u>Mathematical Sciences</u>	Studies of mathematics (e.g., algebra, geometry, logic) and computer science (e.g., artificial intelligence and the design, improvement, or optimization of algorithms, computer languages, operating systems, or software architecture.)
<u>Microbiology (General)</u>	Studies of genetics, growth, and physiology of bacteria, fungi, protists, algae, or viruses. Includes surveys of bacterial contamination. (Medical) Studies of prevention, diagnosis, and treatment of infectious diseases caused by pathogenic bacteria, fungi, or viruses. Includes all antimicrobial studies except testing of commercial antimicrobials
<u>Microbiology (Senior Division) (Medical)</u>	Includes projects described within the category Microbiology (General). Studies of prevention, diagnosis, and treatment of Infectious diseases caused by pathogenic bacteria, fungi, or viruses. Includes all antimicrobial studies except testing of commercial antimicrobials.
<u>Physics &amp; Astronomy</u>	Studies of the physical properties of matter, light, acoustics, thermal properties, solar physics, astrophysics, orbital mechanics, observational astronomy, planetary science, and astronomical surveys.
<u>Plant Biology</u>	Studies of the genetics, growth, morphology, or physiology of plants. Studies of the effects of fertilizers on plants.
<u>Product Science (Physical) (Junior Division)</u>	Comparison and testing of commercial off-the-shelf products for quality and/or effectiveness for intended use in real-world consumer-oriented applications. This category is reserved for experimental methods involving non-biological, physical sciences and processes