

# Robotics

**HS-PS2-2** Use mathematical representations to support the claim that the total momentum of a system of objects is conserved when there is no net force on the system.

**HS-PS3-3** Design, build, and refine a device that works within given constraints to convert one form of energy into another form of energy.

**HS-PS4-5** Communicate technical information about how some technological devices use the principles of wave behavior and wave interactions with matter to transmit and capture information and energy.

**HS-ETS1-1** Analyze a major global challenge to specify qualitative and quantitative criteria and constraints for solutions that account for societal needs and wants.

**HS-ETS1-2** Design a solution to a complex real-world problem by breaking it down into smaller, more manageable problems that can be solved through engineering.

**HS-ETS1-3** Evaluate a solution to a complex real-world problem based on prioritized criteria and trade-offs that account for a range of constraints, including cost, safety, reliability, and aesthetics, as well as possible social, cultural, and environmental impacts.



# Physical Science

**S5 C1 PO 1.** Describe substances based on their physical properties.

**S5 C1 PO 2.** Describe substances based on their chemical properties.

**S5 C1 PO 3.** Predict properties of elements and compounds using trends of the periodic table (e.g., metals, non-metals, bonding – ionic/covalent).

**S5 C1 PO 6.** Describe the following features and components of the atom: protons, neutrons, electrons, mass, number and type of particles, structure, and organization.

**S5 C1 PO 7.** Describe the historical development of models of the atom.

**S5 C2 PO 9.** Represent the force conditions required to maintain static equilibrium.

**S5 C2 PO 2.** Analyze the relationships among position, velocity, acceleration, and time: graphically, mathematically.

**S5 C2 PO 3.** Explain how Newton's 1st Law applies to objects at rest or moving at constant velocity.

**S5 C2 PO 4.** Using Newton's 2nd Law of Motion, analyze the relationships among the net force acting on a body, the mass of the body, and the resulting acceleration: graphically, mathematically.

**S5 C2 PO 5.** Use Newton's 3rd Law to explain forces as interactions between bodies (e.g., a table pushing up on a vase that is pushing down on it; an athlete pushing on a basketball as the ball pushes back on her).

# San Carlos High School

## SCIENCE Safety Net Standards



### MISSION STATEMENT

We exist to educate and empower students to become culturally responsive, global Níee.

### VISION STATEMENT

The vision of San Carlos Unified School District No. 20 is to be an effective student focused learning community graduating culturally confident citizens.

## Biology

**HS.4S.C1.PO4:** Analyze mechanisms of transport of materials (e.g., water, ions, macromolecules) into and out of cells: passive transport, active transport

**HS.4S.C1.PO5:** Describe the purposes and processes of cellular reproduction.

**HS.4S.C2.PO1:** Analyze the relationships among nucleic acids (DNA, RNA), genes, and chromosomes

**HS.4S.C2.PO2:** Describe the molecular basis of heredity, in viruses and living things, including DNA replication and protein synthesis.

**HS.4S.C2.PO3:** Explain how genotypic variation occurs and results in phenotypic diversity.

**HS.4S.C3.PO1:** Identify the relationships among organisms within populations, communities, ecosystems, and biomes.

**HS.4S.C3.PO3:** Assess how the size and the rate of growth of a population are determined by birth rate, death rate, immigration, emigration, and carrying capacity of the environment.

**HS.4S.C4.PO2:** Explain how genotypic and phenotypic variation can result in adaptations that influence an organism's success in an environment.

**HS.4S.C5.PO3.** Diagram the following biogeochemical cycles in an ecosystem: water, carbon, nitrogen

**HS.4S.C5.PO5:** Describe the levels of organization of living things from cells, through tissues, organs, organ systems, organisms, populations, and communities to ecosystems.

## Physics

**HS.S5.C2.PO2** Analyze the relationships among position, velocity, acceleration, and time graphically and mathematically.

**HS.S5.C2.PO3** Explain how Newton's 1st Law applies to objects at rest or moving at constant velocity.

**HS.S5.C2.PO4** Using Newton's 2nd Law of Motion, analyze the relationships among the net force acting on a body, the mass of the body, and the resulting acceleration: Graphically, Mathematically

**HS.S5.C2.PO5** Use Newton's 3rd Law to explain forces as interactions between bodies

**HS.S5.C2.PO9** Represent the force conditions required to maintain static equilibrium.

**HS.S5.C3.PO1** Describe the following ways in which energy is stored in a system: mechanical, electrical, chemical, nuclear

**HS.S5.C3.PO3** Recognize that energy is conserved in a closed system

**HS.S5.C3.PO4** Calculate quantitative relationships associated with the conservation of energy.

**HS.S5.C5.PO8** Describe the relationship among electric potential, current, and resistance in an ohmic system.

**HS.S5.C5.PO9** Quantify the relationships among electric potential, current, and resistance in an ohmic system.

**HS.5S.C1.PO03** Predict properties of elements and compounds using trends of the periodic table (e.g., metals, non-metals, bonding-ionic/covalent).

**HS.5S.C4.P04** Distinguish among the types of bonds (i.e., ionic, covalent, metallic, hydrogen bonding).

**HS.5S.C1.PO06** Describe the following features and components of the atom: protons, neutrons, electrons, mass number and type of particles, structure, and organization.

**HS.5S.C1.PO07** Describe the historical development of models of the atom.

**HS.5S.C1.PO08** Explain the details of atomic structure (e.g., electron configuration, energy levels, isotopes).

**HS.5S.C4.01-02** Apply the law of conservation of matter to changes in a system and identify the indicators of chemical change, including formation of a precipitate, evolution of a gas, color change, absorption or release of heat energy.

**HS.5S.C4.PO3 & 09** Represent a chemical reaction by using a balanced equation and predict the properties of a chemical reaction using types of reactions (synthesis, decomposition, replacement and combustion).

**HS.5S.C4.PO5-P06** Describe the mole concept and its relationship to Avogadro's number and solve problems involving such quantities as moles, mass, molecules, volume of a gas, and molarity using the mole concept and Avogadro's number.

**HS.5S.C4.PO13** Determine the transfer of electrons in oxidation/reduction reactions.

**HS.5S.C4.PO12** Compare the nature, behavior, concentration, and strengths of acids and bases