California Science

8th Integrated

Introducing Scientific thinking, Modeling and Investigation Practices. NOS	1 **Safely plan and carry out investigations** NOS.1
	2 **Explain a models limitations, misconceptions, and errors as applicable** NOS.2
	3 **Use and engage in scientific argument for a claim with evidence and scientific reasoning** NOS.3
	4 **Explain how phenomena can have more than one cause or explanation using science** NOS.4
	5 **Identify the independent and dependent variable within any experiment** NOS.5
	6 **Use scientific tools to measure accurately the quantity of any type of substance** NOS.6
	7 **Use and apply the science and engineering practices** NOS.7
Examining the forces that cause Celestial Objects to form and move and the ways they are examined from Earth. AST	1 **Use data to understand and describe different characteristics to objects in space, including distances, size, surface features, structure and composition** AST.1
	2 **Understand and describe the role of gravity, as an attractive force, in the formation of the solar system** AST.2
	3 **Describe relationships and interactions between components of the solar and galaxy systems, including gravity, orbital motion and mass** AST.3
	4 **Model apparent motion of celestial object (such as Earth, Moon, Sun) with accurate scale and distance relationships** AST.4
	5 **Understand the Electromagnetic Spectrum and that stars release this type of energy** AST.5
	6 **Explain the Lunar phases and how solar energy from the Sun reflects off the Moon to the Earth** AST.6
	7 **Explain the change in seasons on Earth as a result of the orientation of the Earth relative to the Sun** AST.7
Identify and describe the property of matter and light waves and how	1 **Identify the characteristics of a wave, including amplitude, frequency and wavelength** WAV.1

wave technology can be applied to solve problems. WAV	**2** Describe how waves characteristics corresponds to physical observations such as pitch and volume WAV.2
	3 Given data about a repeating physical phenomena (a wave), identify the amount of energy present and transmitted by the wave WAV.3
	4 Understand interactions of waves with a medium such as reflection, absorption, transmission, and the source of the wave WAV.4
	5 Apply scientific principles to design a method for monitoring and minimizing a human impact on the animals and the environment WAV.5
	6 Argue with evidence that digital signals are a more reliable way to encode and transmit information than analog signals WAV.6
	7 Evaluate the Electromagnetic Spectrum wavelengths and the corresponding energy levels in real world situations WAV.7
How do forces cause motion and how is energy transferred between objects. FME	**1** Identify different types of forces FME.1
	2 Describe the difference between balanced and unbalanced forces FME.2
	3 Understand the difference between speed and acceleration FME.3
	4 Understand and apply Newton's Laws of Motion to an object FME.4
	5 Describe motion of an object using correct units and the frames of reference FME.5
	6 Explain the interaction of forces between two colliding objects FME.6
	7 Create and analyze models of energy flow in a system; Collisions, and relative changes in Potential Energy FME.7
	8 Describe the relationships between kinetic energy (KE) and speed, and KE and mass FME.8
	9 Non-contact forces, like electric and magnetic forces, can attract or repel, with strength depending on charge, current, field strength, and distance. FME. 9
Use evidence from the geologic record to model and explain the theory of evolution GEO	**1** Understand and describe geologic processes in the formation of rock strata to determine relative age and type. GEO.1
	2 Construct and use a model of the geologic timescale for Earth's 4.6 billion year history GEO.2
	3 Track major events in Earth's History with evidence: fossil record, volcanic activity, atmospheric changes, asteroid impacts. GEO.3

4 **Investigate the diversity of prehistoric ecosystems with patterns and abundance of fossils and other markers.** GEO.4

5 **Use anatomical similarities and differences (in fossils and embryos) to infer evolutionary relationships among modern organisms (whales) and between modern and fossil organisms (Dorudon)** GEO.5

6 **Use the fossil record to identify patterns of increasing complexity of anatomical structures over time** GEO.6

7 **Use and apply the science and engineering practices** GEO.7

Examine how DNA is passed through generations and how Natural Selections acts to change populations of organisms over time DNA

1 **Model the relevant components in a cell, including genes, chromosomes, proteins and traits of organism.** DNA.1

2 **Understand gene and protein structure and how it leads to observable organism traits.** DNA.2

3 **Model a gene mutation that leads to beneficial, neutral or harmful change in an organism.** DNA.3

4 **Explain how genetic variations of traits affects the probability of surviving and reproducing in a specific environment.** DNA.4

5 **Describe how individuals in a species have genetic variation that can be passed on to their offspring.** DNA.5

6 **Explain the way humans influence the inherited traits in plants and animals, such as gene therapy, genetic modification, and selective breeding.** DNA.6

7 **Explain changes and trends over time in the distribution of traits within a population.** DNA.7

8 **Explain cause-and-effect relationships between environmental conditions and natural selection in a population.** DNA.8

9 **Use and apply the science and engineering practices** DNA.9