

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**