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| 6**Develop models to describe the atomic composition of simple molecules and extended structures.**  |
| **Gather and make sense of information to describe that synthetic materials come from natural resources and impact society.**  |
| **Develop a model that predicts and describes changes in particle motion, temperature, and state of a pure substance when thermal energy is added or removed.**  |
| **Apply Newton’s Third Law to design a solution to a problem involving the motion of two colliding objects.\***  |
| **Plan an investigation to provide evidence that the change in an object’s motion depends on the sum of the forces on the object and the mass of the object.**  |
| **Analyze and interpret data to provide evidence for the effects of resource availability on organisms and populations of organisms in an ecosystem.**  |
| **Develop a model to describe the cycling of matter and flow of energy among living and nonliving parts of an ecosystem.**  |
| **Construct an explanation that predicts patterns of interactions among organisms across multiple ecosystems.**  |
| **Develop and use a model of the Earth-sun-moon system to describe the cyclic patterns of lunar phases, eclipses of the sun and moon, and seasons.**  |
| **Develop and use a model to describe the role of gravity in the motions within galaxies and the solar system.**  |
| **Analyze and interpret data to determine scale properties of objects in the solar system.**  |
| **Construct an explanation based on evidence for how geoscience processes have changed Earth’s surface at varying time and spatial scales.**  |
| **Analyze and interpret data on the distribution of fossils and rocks, continental shapes, and seafloor structures to provide evidence of the past plate motions.**  |
| **Develop a model to describe the cycling of Earth’s materials and the flow of energy that drives this process.**  |
| **Develop a model to describe the cycling of water through Earth’s systems driven by energy from the sun and the force of gravity.**  |
| **Collect data to provide evidence for how the motions and complex interactions of air masses results in changes in weather conditions.**  |
| **Develop and use a model to describe how unequal heating and rotation of the Earth cause patterns of atmospheric and oceanic circulation that determine regional climates.**  |
| **Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.** |
| **Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.** |
| **Analyze data from tests to determine similarities and differences among several design solutions to identify the best characteristics of each that can be combined into a new solution to better meet the criteria for success.** |
| **Develop a model to generate data for iterative testing and modification of a proposed object, tool, or process such that an optimal design can be achieved.** |