Vertical Articulation of the Big Ideas in the Science Disciplines

This chart shows the grade-by-grade progression of the big ideas and content standards within each science discipline. It outlines a coherent progression in science content from kindergarten through high school.

Grade	Physical	Life	Earth and Space
K	**Properties of Matter**: Characteristics of living and non-living things **Forces and Motion:** Motion	**Organization of Living Systems:** Characteristics of plants and animals	**Objects in the Universe**: Objects in sky **Matter and Energy:** Sun warms land, air, water
1	**Properties of Matter**: Properties of objects **Forces and Motion:** Force and motion	**Organization of Living Systems:** Characteristics of living things **Matter and Energy:** Needs of living things	**Properties of Earth Materials**: Properties of Earth materials
2	**Forces and Motion:** Objects and magnetic forces	**Matter and Energy:** Describe life cycles **Diversity:** Variety in living and non-living things	**Objects in the Universe**: Patterns of change in objects seen in the sky **Matter and Energy:** Temperature changes
3	**Properties of Matter**: States of matter **Forces and Motion:** Position, motion, speed	**Matter and Energy:** Compare and contrast life cycles **Diversity:** Characteristics of offspring and parents	**Objects in the Universe**: Earth as a planet **Matter and Energy:** Seasonal weather changes
4	**Forms of Energy**: Properties of energy **Changes in Matter:** Physical changes	**Interdependence**: Plants, animals, and environment **Diversity**: Fossils	**Properties of Earth Materials**: Properties, uses, and availability of Earth materials **Matter and Energy**: Earth surface changes
5	**Forces and Motion:** Effects of friction, gravity, and magnetic forces on objects	**Organization of Living Systems:** Living things are composed of parts **Interdependence**: Plants, animals, and environment **Diversity**: adaptation and survival	**Objects in the Universe**: Sun-Earth-Moon System **Matter and Energy:** Sun's energy affects weather and climate
6	**Properties of Matter**: Physical and chemical properties of matter **Forms of Energy:** Properties of forms of energy and waves **Energy Transfer:** Electricity, magnetism, waves	**Organization of Living Systems:** Components, types and complexity of cells, tissues, organs, and organ systems **Matter and Energy:** Interactions within organisms **Interdependence:** Organisms, populations, and resources in ecosystems	**Objects in the Universe**: Objects in our solar system, galaxy, and universe **Matter and Energy:** Water cycle, landforms, and weather
7	**Properties of Matter**: Atoms, elements, and compounds **Forces and Motion:** Types of motion and forces and gravitation	**Matter and Energy:** Energy and materials for growth and metabolism of organisms, **Evolution and Diversity:** Reproduction, life cycles, inherited and learned traits, genes, chromosomes	**History of Earth**: Changes in Earth's atmosphere and landforms **Matter and Energy:** Use of Earth's resources, natural processes, human activities, and global environmental changes

8	**Properties of Matter**: Atomic model, physical and chemical properties of elements and compounds, Periodic Table **Changes in Matter:** Physical and chemical changes and conservation of mass **Energy Transfer and Conservation:** Conservation of energy	**Organization of Living Systems:** Classification, internal and external structures, relationships among organisms **Evolution and Diversity:** Natural selection, evidence for evolution	**History of Earth:** Geologic, climatic, environmental and life form changes **Matter and Energy:** Processes of Earth's atmosphere, oceans, and geosphere, and gravity, motions, and Earth changes
HS	**Properties of Matter:** Atomic structure, Periodic Table, isotopes, radioactivity, types and strengths of bonds and properties of compounds **Changes in Matter:** Chemical reactions and conservation of mass **Energy Transfer and Conservation:** Interactions of energy and matter, conservation of energy **Forces and Motion:** Interaction of forces on an object and the resultant motions	**Organization of Living Systems:** Organic macromolecules, cellular processes, DNA, proteins **Matter and Energy:** Energy and elements cycle through biological systems **Interdependence:** Relationships between biotic and abiotic factors and disturbances and change in ecosystems **Evolution and Diversity:** Reproduction, genetic diversity, and multiple lines of evidence for evolution	**Objects in the Universe**: Properties and classification of objects in our solar system, galaxy, and universe **Properties of Earth Materials:** Structure and composition of Earth's atmosphere, geosphere, and hydrosphere **History of Earth:** Evolution of universe, galaxies, stars, and planets **Matter and Energy**: Effects of energy, forces, processes, and human activities on Earth systems, cycling of matter and energy