Manson-Northwest Webster Science Standards K-12

Standard 1: Understand and apply the skills of scientific inquiry.

CODE	BENCHMARK
K.1.1	Knows that learning comes from careful observations and simple experiments.
K.1.2	Uses careful observations and simple experiments to increase scientific knowledge.
1.1.1	Discusses findings from simple investigations.
1.1.2	Asks questions based on observations and simple investigations.
2.1.1	Knows that tools (e.g., thermometers, magnifiers, rulers and balances) can be used to gather information and extend the senses.
2.1.2	Makes predictions during observations and scientific investigations.
2.1.3	Compares using two or more variables.
3.1.1	Observes and predicts when performing scientific experiments.
4.1.1a	Recognizes and classifies objects.
4.1.1b	Uses scientific investigations in asking and answering a question and comparing the answer to what scientists already know about the world.
5.1.1	Uses simple equipment and tools to gather scientific data, extend the senses.
6.1.1	Uses simple equipment and tools to gather and analyze scientific data and extend the senses.
6.1.2	Designs and conducts a scientific investigation.
7.1.1	Demonstrates an understanding of scientific methods and how they are used in the process of experimentation.
7.1.2	Uses appropriate tools and techniques to gather, analyze and interpret scientific data.
8.1.1	Uses appropriate tools and techniques to gather, analyze and interpret scientific data.
8.1.2	Knows that scientific inquiry includes evaluating results of scientific investigations, experiments, observations, theoretical and mathematical models, and explanations proposed by other scientists.
CH.1.1	Solves problems using dimensional analysis.
PS.1.1	Reads with confidence to find an answer and communicate results.
PS.1.2	Selects and uses appropriate technologies to gather, process, and analyze data and report information related to an investigation.
PS.1.3	Asks questions and formulates a testable hypothesis to guide exploration.
PS.1.4	Interprets and evaluates data in order to formulate conclusions.
PS.1.5	Uses discovery processes to experience science.
PS.1.6	Knows that hypotheses are widely used in science for choosing what data to pay attention to and what additional data to seek, and for guiding the interpretation of the data.
PS.1.7	Asks questions and formulates a testable hypothesis to guide exploration.
PS.1.8	Designs and conducts scientific investigations.

PS.1.9	Knows that conceptual principles and knowledge guide scientific inquiries.
PS.1.10	Knows that scientists conduct investigations for a variety of reasons.
PS.1.11	Knows the results of scientific inquiry – new knowledge and methods – emerge from different types of investigations.

Standard 2: Understand and apply scientific concepts, principles and theories pertaining to the earth and the universe.

CODE	BENCHMARK
K.2.2	Distinguishes between day and night.
1.2.1	Recognizes that the sun supplies heat and light to Earth.
1.2.2	Identifies the properties of Earth's materials.
2.2.1	Infers that weather can change from day to day and has seasonal patterns.
3.2.1	Describes the water cycle, (evaporation, condensation, and precipitation).
3.2.2	Describes and records weather conditions, patterns, and effects.
4.2.1a	Identifies the characteristics of the sun.
4.2.1b	Identifies the characteristics of the moon.
4.2.1c	Identifies the characteristics of the Earth.
4.2.2	Analyzes the properties of Earth's minerals and rocks.
5.2.1	Describes factors that affect the weather and its effects on the planet (water cycle, seasons, the atmosphere, weathering, etc.).
6.2.1a	Identifies objects in the universe.
6.2.1b	Understands how the objects in the universe are affected by gravity.
6.2.2	Understands how features on the Earth's surface are constantly changed by a combination of slow and rapid processes (plate tectonics, earthquake, volcanoes, sea floor spreading).
7.2.1	Knows how the Sun acts as a major source of energy for changes on the Earth's surface.
8.2.1	Understands basic processes of Earth.
8.2.2	Understands essential ideas about the composition and structure of the universe.
ES.2.1	Analyzes the structure of a dynamic Earth.
ES.2.2	Knows the major external and internal sources of energy on Earth.
ES.2.3	Knows that the weather and climate involve the transfer of energy in and out of the atmosphere.
ES.2.4	Knows processes involved in the rock cycle.
ES.2.5	Understands the concept of plate tectonics.
ES.2.6	Knows characteristics of our Sun and its position in the universe.
ES.2.7	Explains the interaction between the Earth's major forces.
ES.2.8	Knows characteristics and movement patterns of asteroids, comets, and meteors.

CH.2.1	Explains how an atom is affected when energy is absorbed or emitted by atoms.
PH.2.1	Understands the laws of planetary motion.

Standard 3: Understand and apply concepts, principles, and theories pertaining to life and its interactions.

CODE	BENCHMARK
K.3.1	Identifies the five senses and what they do.
K.3.2	Recognizes that there are living and non-living things.
1.3.1	Explains that plants and animals closely resemble their parents.
1.3.2	Recognizes that living things are found almost everywhere in the world.
1.3.3	Identifies the resources for energy and growth that plants and animals need (e.g., light, air, food, and water).
2.3.1	Recognizes that Earth's environment changes over time, and living things must be able to adapt to these changes in order to survive.
2.3.2	Describes the life cycles of plants and animals.
3.3.1	Knows that animals and plants progress through life cycles (birth, growth, development, reproduction and death).
3.3.2	Identifies five sense organs and the stimuli's for each sense.
4.3.1	Explains the functions of leaves, stems, and roots.
4.3.2	Recognizes that animal adaptations help it survive in its environment.
4.3.3	Discusses nutrition as it relates to health and body systems.
5.3.1	Lists and describes the major land and water biomes (including weather, climate, plants, and animals).
5.3.2a	Describes and lists the functions of the skeletal system.
5.3.2b	Describes and lists the functions of the muscular system.
6.3.1	Knows that all organisms are composed of cells, which are the fundamental units of life.
6.3.2a	Describes and lists the functions of the circulatory system.
6.3.2b	Describes and lists the functions of the respiratory system.
6.3.2c	Describes and lists the functions of the digestive system.
6.3.3	Analyzes the components of ecosystems (food chains, food webs, interactions).
7.3.1	Knows ways living things can be classified and their relationship in an ecosystem.
7.3.2	Understands the structure and function of living systems including human systems.
7.3.3	Identifies and describes the structure and function of the cell.
8.3.1	Explains how matter is recycled within ecosystems.
ES.3.1	Knows how life is adapted to conditions on Earth.
CH.3.1	Understands that enzymes are catalyst in chemical reactions in living organisms.
CH.3.2	Understands that food webs and food chains demonstrate laws of energy

	conservation.
CH.3.3	Understands that photosynthesis and respiration are examples of chemical reactions that take place in living organisms.
LS.3.1	Knows ways in which genes may be altered and combined to create genetic variation within a species.
LS.3.2	Knows that the genetic information stored in DNA provides instructions for protein synthesis in cells.
LS.3.3	Examine the interdependency of cells to acquire a general picture of the function of cells and their specialized parts.

Standard 4: Understand and apply concepts and theories pertaining to the matter, its composition and the forces that govern it.

CODE	BENCHMARK
K.4.1	Classifies objects accordingly to observable physical properties (e.g., shape, size, color, paper, and wood).
K.4.2	Observes an object's motion and position relative to its background (e.g., push/pull, gravity, and forms of energy).
1.4.1	Demonstrates that magnets can be used to make certain objects move without being touched.
2.4.1	Recognizes that objects exist in different states (solid, liquid, and gas).
2.4.2	Identifies different types of energy forms and their production (e.g., heat, light, sound, electricity and magnetism).
3.4.1	Explains that materials can be changed from one state to another.
3.4.2	Knows that magnets attract and repel each other and certain kinds of other materials.
4.4.1	Recognizes that light, heat and sound are kinds of energy that have certain properties.
5.4.1	Differentiates between a chemical and physical change.
5.4.2	Identifies forces and their effects on objects (motion, inertia, friction and simple machines).
5.4.3	Identifies the basic components of electricity (currents, static, circuits).
6.4.1	Demonstrates an understanding of basic atomic structures (protons, neutrons, electrons).
6.4.2	Distinguishes between acids and bases.
6.4.3	Describes what happens to sound and light whey they strike different types of matter (transmissions, absorption, reflection).
7.4.1	Understands the basics of the structure and properties of the matter.
8.4.1a	Understands the Law of Conservation of Energy.
8.4.1b	Understands properties of energy and heat (conduction, convection, and radiation).
8.4.2a	Understands that there are 100 known elements that combine in numerous ways to produce compounds.
8.4.2b	Recognizes that compounds account for living and non-living

	substances that we encounter.
ES.4.1	Knows that throughout the rock cycle the total amount of material stays the same as its form changes.
ES.4.2	Knows that evidence exists that suggests the universe is expanding.
ES.4.3	Knows the common characteristics of stars in the universe.
CH.4.1	Understands how elements are arranged in the periodic table.
CH.4.2	Knows that the physical and chemical properties of a compound are determined by its molecular structure.
CH.4.3	Classifies matter as elements, compounds and mixtures.
CH.4.4	Knows that the number of electrons in an atom determines whether the atom is electrically neutral or an ion (structure of matter).
CH.4.5	Understands the relationship between neutrons and isotopes and how it affects the mass and stability of the nucleus.
CH.4.6	Knows how to write electron configurations and Lewis Dot Diagrams to model electron probability.
CH.4.7a	Understands the relationship between the atomic/molecular mass and moles.
CH.4.7b	Uses mass-mole relationship in calculations.
CH.4.8	Compares and contrasts solids, liquids and gases and their changes in state.
CH.4.9	Knows the structure of an atom and understands the relationship between the subatomic particles.
CH.4.10	Discusses the Laws of Conservation (Mass and Energy).
CH.4.11a	Writes and balances chemical equations.
CH.4.11b	Identifies the types of reactions and energy changes.
CH.4.12	Knows that chemical reactions can take place at vastly different rates and reaction rates depend on a variety of factors.
CH.4.13	Knows how to write and name chemical formulas using oxidation numbers.
CH.4.14	Knows that atoms bond with one another by transferring or sharing electrons that are furthest from the nucleus (ionic, covalent, metallic).
CH.4.15	Knows how to find the concentration of a solution.
PS.4.1	Knows that structure of an atom and the relationship between the subatomic particles.
PS.4.2	Understands the relationship between neutrons and isotopes and how it affects the mass and stability of the nucleus.
PS.4.3	Understands, writes, and balances chemical equations.
PS.4.4	Knows that a large number of important reactions involve the transfer or sharing of electrons.
PS.4.5	Divides matter into different categories by their individual properties.
PS.4.6a	Knows that energy tends to move spontaneously from hotter to cooler objects by conduction, convection, or radiation.
PS.4.6b	Knows any ordered state tends to become less ordered over time.
PS.4.7a	Understands the kinetic molecular theory.
PS.4.7b	Knows that the higher the temperature, the greater the atomic or

	molecular motion.
PS.4.8	Knows that fission is the splitting of a large nucleus into smaller pieces, and fusion is the joining of two nuclei at extremely high temperature and pressure.
PS.4.9	Knows that gravity is a universal force that each mass exerts on any other mass (motion and forces).
PS.4.10	Knows that materials have different states and can be changed by heating or cooling.
PS.4.11	Compares and contrasts the structures and properties of the states of matter.
PS.4.12	Understands how elements are arranged in the periodic table, and how this arrangement shows repeating patterns among elements with similar properties.
PS.4.13	Explains that atoms may be bonded together into molecules or crystalline solids, and compounds are formed from chemical bonds between two or more different kinds of atoms.
PS.4.14	Knows that the number of electrons in an atom determines whether the atom is electrically neutral or an ion.
PS.4.15	Knows and applies how force and change in momentum are related.
PS.4.16a	Illustrates that objects change their motion only when a net force is applied.
PS.4.16b	Calculates the change in motion using F = ma.
PS.4.17	Knows that different kinds of materials respond differently to electric forces.
PS.4.18	Describes, explains, and quantifies that energy appears in different forms, and can be changed from one form to another according to the conservation of energy.
PS.4.19	Knows that an object's motion can be described, calculated, and represented graphically according to its change in position, direction of motion, and speed.
PS.4.20	Knows that most chemical reactions involve a transfer of energy.
PH.4.1	Understands motion and movement.
PH.4.2	Understands how forces affect motion (gravity, push/pull, friction).
PH.4.3	Understands the Universal Law of Gravitation.
PH.4.4	Recognizes that electrical forces are directly proportional to the charge and inversely proportional to the square of the distance between them.
PH.4.5	Understands the conservation of momentum.
PH.4.6	Understands and applies Newton's Laws of Motion.
PH.4.7	Recognizes that all energy is either potential energy or kinetic energy and it can be transferred between the two.
PH.4.8	Understands the properties of electromagnetic waves.
PH.4.9	Understands properties and behaviors of waves.
PH.4.10	Knows the range of the electromagnetic spectrum.
PH.4.11	Understands the relationship between electric and magnetic fields. Knows that magnetic forces are very closely related to electric forces

	and can be thought of as different aspects of a single electromagnetic force. The interplay of these forces is the basis for electric motors, generators, radio, television, and many other modern technologies (forces).
PH.4.12	Understands the properties of sound waves.
PH.4.13	Understands the Doppler Effect.
PH.4.14	Knows the laws governing the reflection and refraction of light.
PH.4.15	Knows that magnetic forces are very closely related to electric forces and can be thought of as different aspects of a single electromagnetic force. The interplay of these forces is the basis for electric motors, generators, radio, television, and many other modern technologies (forces).

Standard 5: Learn how scientific knowledge develops and changes over time.

CODE	BENCHMARK
3.5.1	Knows that people of all ages, backgrounds, and groups have made contributions to science as an ongoing process.
4.5.1	Recognizes scientific investigations that involve asking and answering a question and comparing the answer to what scientists already know about the world.
5.5.1	Knows various careers and settings in which scientists work.
6.5.1.	Knows ways in which sciences and society influence one another.
7.5.1	Knows that science helps drive technology, providing knowledge for better understanding, instruments, and techniques.
8.5.1	Realizes the role of technology in improving scientific understanding.
ES.5.1	Knows the scientific evidence that supports the theories of beginning.
ES.5.2	Knows that the theory of the center of the universe has changed.
CH.5.1	Summarizes the development and use of the Periodic Table.
CH.5.2	Describes how the modern atomic theory has evolved.
LS.5.1	Understands and explains how organisms change over time in terms of biological evolution and genetics.
LS.5.2	Knows that inheritable characteristics largely determine what capabilities an organism will have and how likely it is to survive and reproduce.
LS.5.3	Knows features of human inheritance.
LS.5.4	Explains that all organisms are composed of cells, which are the fundamental units of life.
PS.5.1	Knows that in science, the testing, revising, and occasional discarding of theories, new and old, never ends.

Standard 6: Understand personal and societal changes and responsibilities that affect health, world resources, and the Earth's environment.

CODE	BENCHMARK
K.6.1	Identifies harmful and non-harmful substances.
1.6.1	Lists personal responsibilities to the environment.
2.6.1	Develops an awareness of natural resources.
3.6.1	Identifies and assesses problems in the environment.
4.6.1	Analyzes the causes of environmental pollution as to the effect on living organisms.
5.6.1	Knows that recycling, reusing, and reducing consumption conserves resources.
6.6.1	Describes what natural resources are, how they are used on Earth, and the effects of pollution on the Earth.
7.6.1	Understands the interdependencies of human needs and the advancement of science.
8.6.1	Analyzes the impact of scientific contributions by people of various gender, race, and socioeconomic status and how it reflects social and political climate of their time.
ES.6.1	Knows that human behavior can modify Earth processes and systems.
LS.6.1	Knows ways in which humans can modify ecosystems and cause irreversible effects.
LS.6.2	Understands and explains the characteristics of living things, the diversity of life, and how living things interact with each other and with their environment.
PS.6.1	Knows that people continue inventing new ways of doing things, solving problems, and getting work done.