SCIENCE

Strand A: The Nature of Matter

Standard 1: The student understands that all matter has observable, measurable properties.

Benchmarks
SC.A.1.3.3 The student knows that temperature measures the average energy of motion of the particles that make up the substance.
SC.A.1.3.6 The student knows that equal volumes of different substances may have different masses.

Standard 2: The student understands the basic principles of atomic theory.

Benchmark
SC.A.2.3.3 The student knows that radiation, light, and heat are forms of energy used to cook food, treat diseases, and provide energy.

Strand B: Energy

Standard 1: The student recognizes that energy may be changed in form with varying efficiency.

Benchmark
SC.B.1.3.5 The student knows the processes by which thermal energy tends to flow from a system of higher temperature to a system of lower temperature.

Strand C: Force and Motion

Standard 1: The student understands that types of motion may be described, measured, and predicted.
Benchmark
SC.C.1.3.1 The student knows that the motion of an object can be described by its position, direction of motion, and speed.

Standard 2: The student understands that the types of force that act on an object and the effect of that force can be described, measured, and predicted.

Benchmarks
SC.C.2.3.1 The student knows that many forces (e.g., gravitational, electrical, and magnetic) act at a distance (i.e., without contact).
SC.C.2.3.7 The student knows that gravity is a universal force that every mass exerts on every other mass.

Strand D: Processes that Shape the Earth

Standard 1: The student recognizes that processes in the lithosphere, atmosphere, hydrosphere, and biosphere interact to shape the Earth.

Benchmark
SC.D.1.3.5 The student understands concepts of time and size relating to the interaction of Earth’s processes (e.g., lightning striking in a split second as opposed to the shifting of the Earth’s plates altering the landscape, distance between atoms measured in Ångstrom units as opposed to distance between stars measured in light-years).

Strand E: Earth and Space

Standard 1: The student understands the interaction and organization in the Solar System and the universe and how this affects life on Earth.

Benchmarks
SC.E.1.3.1 The student understands the vast size of our Solar System and the relationship of the planets and their satellites.
SC.E.1.3.2 The student knows that available data from various satellite probes show the similarities and differences among planets and their moons in the Solar System.
SC.E.1.3.3 The student understands that our sun is one of many stars in our galaxy.
SC.E.1.3.4 The student knows that stars appear to be made of similar chemical elements, although they differ in age, size, temperature, and distance.

Standard 2: The student recognizes the vastness of the universe and the Earth’s place in it.

Benchmark
SC.E.2.3.1 The student knows that thousands of other galaxies appear to have the same elements, forces, and forms of energy found in our Solar System.

Strand H: The Nature of Science

Standard 1: The student uses the scientific processes and habits of mind to solve problems.
**Benchmarks**

SC.H.1.3.1  The student knows that scientific knowledge is subject to modification as new information challenges prevailing theories and as a new theory leads to looking at old observations in a new way.

SC.H.1.3.2  The student knows that the study of the events that led scientists to discoveries can provide information about the inquiry process and its effects.

SC.H.1.3.3  The student knows that science disciplines differ from one another in topic, techniques, and outcomes, but that they share a common purpose, philosophy, and enterprise.

SC.H.1.3.4  The student knows that accurate record keeping, openness, and replication are essential to maintaining an investigator’s credibility with other scientists and society.

**Standard 2:** *The student understands that most natural events occur in comprehensible, consistent patterns.*

**Benchmark**

SC.H.2.3.1  The student recognizes that patterns exist within and across systems.

**Standard 3:** *The student understands that science, technology, and society are interwoven and independent.*

**Benchmarks**

SC.H.3.3.1  The student knows that science ethics demand that scientists must not knowingly subject coworkers, students, the neighborhood, or the community to health or property risks.

SC.H.3.3.7  The student knows that computers speed up and extend people’s ability to collect, sort, and analyze data; prepare research reports; and share data and ideas with others.
Strand B: Measurement

Standard 1: The student measures quantities in the real world and uses the measures to solve problems.

Benchmarks
MA.B.1.3.1 The student uses concrete and graphic models to derive formulas for finding perimeter, area, surface area, circumference, and volume of two- and three-dimensional shapes, including rectangular solids and cylinders.
MA.B.1.3.3 The student understands and describes how the change of a figure in such dimensions as length, width, height, or radius affects its other measurements such as perimeter, area, surface area, and volume.
MA.B.1.3.4 The student constructs, interprets, and uses scale drawings such as those based on number lines and maps to solve real-world problems.

Standard 2: The student compares, contrasts, and converts within systems of measurement (both standard/nonstandard and metric/customary).

Benchmarks
MA.B.2.3.1 The student uses direct (measured) and indirect (not measured) measures to compare a given characteristic in either metric or customary units.
MA.B.2.3.2 The student solves problems involving units of measure and converts answers to a larger or smaller unit within either the metric or customary system.

Strand D: Algebraic Thinking

Standard 1: The student describes, analyzes, and generalizes a wide variety of patterns, relations, and functions.

Benchmarks
MA.D.1.3.1 The student describes a wide variety of patterns, relationships, and functions through models, such as manipulatives, tables, graphs, expressions, equations, and inequalities.
MA.D.1.3.2 The student creates and interprets tables, graphs, equations, and verbal descriptions to explain cause-and-effect relationships.

Strand E: Data Analysis and Probability

Standard 1: The student understands and uses the tools of data analysis for managing information.

Benchmark
MA.E.1.3.1 The student collects, organizes, and displays data in a variety of forms, including tables, line graphs, charts, bar graphs, to determine how different ways of presenting data can lead to different interpretations.

Standard 3: The student uses statistical methods to make inferences and valid arguments about real-world situations.
Benchmark
MA.E.3.3.1 The student formulates hypotheses, designs experiments, collects and interprets data, and evaluates hypotheses by making inferences and drawing conclusions based on statistics (range, mean, median, mode) and tables, graphs, and charts.
Strand A: Reading

Standard 1: The student uses the reading process effectively.

Benchmark
LA.A.1.3.3 The student demonstrates consistent and effective use of interpersonal and academic vocabularies in reading, writing, listening, and speaking.

Standard 2: The student constructs meaning from a wide range of texts.

Benchmark
LA.A.2.3.5 The student locates, organizes, and interprets written information for a variety of purposes, including classroom research, collaborative decision making, and performing a school or real-world task.

Strand B: Writing

Standard 1: The student uses writing processes effectively.

Benchmarks
LA.B.1.3.1 The student organizes information before writing according to the type and purpose of writing.
LA.B.1.3.2 The student drafts and revises writing that: is focused, purposeful, and reflects insight into the writing situation; conveys a sense of completeness and wholeness with adherence to the main idea; has an organizational pattern that provides for a logical progression of ideas; has support that is substantial, specific, relevant, concrete, and/or illustrative; demonstrates a commitment to and an involvement with the subject; has clarity in presentation of ideas; uses creative writing strategies appropriate to the purpose of the paper; … and has few, if any, convention errors in mechanics, usage, and punctuation.

Standard 2: The student writes to communicate ideas and information effectively.

Benchmarks
LA.B.2.3.1 The student writes text, notes, outlines, comments, and observations that demonstrate comprehension of content and experiences from a variety of media.
LA.B.2.3.3 The student selects and uses appropriate formats for writing, including narrative, persuasive, and expository formats, according to the intended audience, purpose, and occasion.
LA.B.2.3.4 The student uses electronic technology including databases and software to gather information and communicate new knowledge.

Strand C: Listening, Viewing, and Speaking

Standard 1: The student uses listening strategies effectively.

Benchmarks
LA.C.1.3.1 The student listens and uses information gained for a variety of purposes, such as gaining information from interviews, following direction, and pursuing personal interest.
LA.C.1.3.4 The student uses responsive listening skills, including paraphrasing, summarizing, and asking questions for elaboration and clarification.
Standard 3: The student uses speaking strategies effectively.

Benchmarks
LA.C.3.3.2 The student asks questions and makes comments and observations that reflect understanding and application of content, processes, and experiences.
LA.C.3.3.3 The student speaks for various occasions, audiences, and purposes, including conversations, discussions, projects, and informational, persuasive, or technical presentations.

Strand D: Language

Standard 2: The student understands the power of language.

Benchmark
L.A.D.2.3.1 The student selects language that shapes reactions, perceptions, and beliefs.