



**KENOSHA UNIFIED SCHOOL DISTRICT NO. 1
CURRICULUM AND INSTRUCTIONAL SERVICES
STANDARDS AND BENCHMARKS
SCIENCE**

GRADE 4

STANDARD A: SCIENCE CONNECTIONS—STUDENTS WILL UNDERSTAND AND DESCRIBE THE UNIFYING CONCEPTS AND PROCESSES AMONG SCIENCE TOPICS WHICH LEAD TO CONNECTIONS BETWEEN PHYSICAL SCIENCE, EARTH/SPACE SCIENCE, AND LIFE SCIENCE.

A-1: Systems

In something that consists of many parts, the parts usually influence one another. Something may not work as well (or at all) if a part of it is missing, broken, worn out, mismatched, or misconnected.

A-2: Models

Seeing how a model works after changes are made to it may suggest how the real thing would work if the same were done to it.

Geometric figures, sketches, number lines, maps, and stories can be used to represent objects, events, and processes in the real world, although such representations can never be exact in every detail.

A-3: Change and Constancy

Some features of things may stay the same even when other features change.

Things change in steady, repetitive, or irregular ways—or sometimes in more than one way at the same time. Often, the best way to tell which kinds of change are happening is to make a table or graph of measurements.

A-4: Scale

Almost anything has limits on how big or small it can be.

Finding out what the biggest and the smallest possible values of something are often as revealing as knowing what the usual value is.

A-5: Connections

The study of earth and space science, life and environmental science, and physical science are interconnected by unifying themes.

STANDARD B: NATURE OF SCIENCE—STUDENTS WILL UNDERSTAND THAT THE STUDY OF SCIENCE IS ONGOING, AND THEORIES AND CONCEPTS IN SCIENCE CHANGE OVER TIME AS NEW EVIDENCE IS FOUND. SCIENTIFIC EXPLANATIONS MUST ADHERE TO CRITERIA SUCH AS: A PROPOSED EXPLANATION MUST BE LOGICALLY CONSISTENT, IT MUST ABIDE BY THE RULES OF EVIDENCE, IT MUST BE OPEN TO QUESTIONS AND POSSIBLE MODIFICATION, AND IT MUST BE BASED ON HISTORICAL AND CURRENT SCIENTIFIC KNOWLEDGE.

B-1: Science is a Human Endeavor, and There are Many Commonly Known Careers in Science.

Men and women from many cultures have contributed to science and technology throughout history, but much more remains to be understood. Science will never be finished.

Many people choose science as a career and devote their lives to studying it.

In science it is helpful to work with a team and share findings with others.

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B-2: Nature of Scientific Process and Knowledge

Science is based on questions.

The job of a scientist is to construct ideas and explanations.

Scientific knowledge may change when new things are learned.

Science experiments will usually work the same way when repeated under similar conditions.

Scientists make the results of their investigations public; they describe the investigations in ways that enable others to repeat the investigations.

Scientists use different kinds of investigations depending on the questions they are trying to answer.

B-3: History of Science

(No Fourth Grade Benchmarks)

STANDARD C: SCIENCE INQUIRY—STUDENTS WILL INVESTIGATE QUESTIONS USING SCIENTIFIC METHODS AND TOOLS, REVISE THEIR PERSONAL UNDERSTANDING TO ACCOMMODATE KNOWLEDGE, AND COMMUNICATE THOSE UNDERSTANDINGS TO OTHERS.

C-1: Ask Questions about Objects, Organisms, and Events in the Everyday World.

Identify, formulate and clarify questions that can be answered through scientific investigations using appropriate equipment and resources.

C-2: Make Connections to Prior Knowledge.

Use prior knowledge and investigations to make predictions and help answer the question being investigated.

C-3: Gather Background Knowledge Related to the Questions Being Investigated.

Locate and access data and scientific knowledge in age-appropriate information sources and reference materials. (See English/Language Arts and Information and Technology Literacy Standards.)

C-4: Design and Conduct Responsible and Safe Investigations to Help Answer Questions.

Demonstrate knowledge of age-appropriate safe laboratory procedures.

Participate in guided inquiry to plan and conduct investigations, predict results, and build explanations.

C-5: Safely Use Appropriate Senses, Equipment and Tools to Make Observations and Gather Data.

Determine which metric measuring tool is the most appropriate to use for data gathering when answering a question or planning an investigation, and use the measuring tool appropriately.

Identify when to use an appropriate standard metric unit of length, liquid capacity, mass, time, and temperature. (See Math D-3.)

C-6: Collecting and Representing Qualitative and Quantitative Data

(See Math Standard E.)

Collect, compare, and organize observations and results in a journal, record sheet, response sheet, calendar, or by using media and technology appropriate to purpose and content.

Create and interpret bar graphs, line graphs, tables, and charts to organize and analyze data.

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C-7: Summarizing, Synthesizing, Inferring, and Building Explanations

Analyze, interpret, and summarize data to determine patterns and representative values, and the data's usefulness for building explanations and asking new questions.

Compare results and explanations to known science concepts, models, or theories.

Interpret bar graphs, line graphs, tables, and charts.

C-8: Communicating Results

Report the results of scientific investigations by using precise vocabulary to complete an appropriate lab report, journal, or response sheet or by using media and technology appropriate to purpose and content. Explain the validity of the experimental design and results, and revise methods and explanations.

STANDARD D: PHYSICAL SCIENCE —STUDENTS WILL DEMONSTRATE AN UNDERSTANDING OF THE PHYSICAL AND CHEMICAL PROPERTIES OF MATTER, THE FORMS AND PROPERTIES OF ENERGY, AND THE WAYS IN WHICH MATTER AND ENERGY INTERACT.

D-1: Properties of Matter

Objects and materials have many observable and measurable properties such as color, size, shape, mass, weight, texture, hardness, flexibility, reactivity with other materials, etc.

Objects and materials can be sorted and ordered in terms of their properties.

Solids, liquids, and gases have different properties.

D-2: Structure of Matter

All things are made of matter, which can exist as solids, liquids, or gases and some materials are mixtures of different types of matter.

Air is a gas that surrounds us and takes up space.

Materials may be composed of parts that are too small to be seen without magnification.

D-3: Physical, Chemical and Nuclear Changes in Matter

Heating and cooling cause changes in the properties of materials and may cause the material to change state.

Many kinds of changes occur faster under hotter conditions.

D-4: Position and Motion of Objects

The motion of an object can be described by its position, direction of motion, and speed. That motion can be measured and represented on a graph.

Changes in speed or direction of motion are caused by forces and the greater the force is, the greater the change in motion will be.

The more massive an object is the less effect a given force will have.

D-5: Forces of Nature

The earth's gravity pulls any object toward it without touching it.

Without touching them, a magnet pulls on all things made of iron and either pushes or pulls on other magnets.

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D-6: Interactions of Energy and Matter

Electricity in circuits can produce light, heat, sound, and magnetic effects.

Electrical circuits require a complete loop through which an electrical current can pass.

Heat can be produced in many ways, such as burning, rubbing, or mixing one substance with another.

A change in temperature is a result of addition or subtraction of heat.

Energy can be stored and released to make an object move.

When warmer things are put with cooler ones, the warm ones lose heat and the cool ones gain it until they are all at the same temperature.

D-7: Conservation of Energy
(No Fourth Grade Benchmarks)

STANDARD E: EARTH SCIENCE—STUDENTS WILL DEMONSTRATE AN UNDERSTANDING OF THE STRUCTURE AND SYSTEMS OF EARTH AND THE UNIVERSE AND OF THEIR INTERACTIONS.

E-1: Properties and Structures of the Earth and its Materials

Earth materials are solid rocks and soils, water, and the gases of the atmosphere.

Rock is composed of different combinations of minerals. Smaller rocks come from the breakage and weathering of bedrock and larger rocks.

Different types of earth materials have different properties (e.g., color, texture, capacity to retain water, ability to support plant growth), which make them useful in different ways (e.g., building materials, sources of fuel, growing plants.)

Water is a very important earth material that can be liquid, solid, or gas and can be made to change from one form to another.

Air surrounds us and can move and cause changes.

Rocks and minerals can be organized based on properties, such as hardness, color, texture, and appearance.

Some earth materials absorb more water than other earth materials do.

Water flows more easily through some earth materials than through others.

E-2: History and Changes of the Earth

The surface of the earth changes. Some changes are due to slow processes, such as erosions and weathering, and some changes are due to rapid processes, such as landslides, volcanic eruptions, and earthquakes.

Waves, wind, water, and ice shape and reshape the earth's land surface by eroding rock and soil in some areas and depositing them in other areas.

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E-3: Cycles in the Earth System

The sun, moon, and stars all appear to move slowly across the sky.

Planets change their positions against the background of stars.

Evaporation and condensation contribute to the movement of water through the water cycle.

Clouds and fog are made of tiny droplets of water.

E-4: The Earth, Our Solar System, and Space

The earth is approximately spherical in shape. The rotation of the earth on its axis every 24 hours produces the night and day cycle.

The earth is one of several planets that orbit the sun, and the moon orbits around the earth.

STANDARD F: LIFE AND ENVIRONMENTAL SCIENCE —STUDENTS WILL DEMONSTRATE AN UNDERSTANDING OF THE CHARACTERISTICS AND STRUCTURES OF LIVING THINGS, THE PROCESSES OF LIFE, AND HOW LIVING THINGS INTERACT WITH ONE ANOTHER AND THEIR ENVIRONMENT.

F-1: Characteristics, Structure, and Function in Living Things

(No Fourth Grade Benchmarks)

F-2: Life Cycles and Heredity of Living Things

(No Fourth Grade Benchmarks)

F-3: Organisms, Populations, and Ecosystems

(No Fourth Grade Benchmarks)

F-4: Matter and Energy in Living Systems

All animals depend on plants. Some animals eat plants for food. Other animals eat animals that eat the plants.

Over the whole earth, organisms are growing, dying and decaying and new organisms are being produced.

Some source of energy is needed for organisms to live and grow.

STANDARD G: SCIENCE APPLICATIONS—STUDENTS WILL DEMONSTRATE AN UNDERSTANDING OF THE RELATIONSHIP BETWEEN SCIENCE AND TECHNOLOGY AND THE WAYS IN WHICH THAT RELATIONSHIP INFLUENCES HUMAN ACTIVITIES.

G-1: The Process of Technological Design

Explain a simple problem; propose a product or design to solve the problem; implement the proposed solution; evaluate the product or design; and communicate the problem, design, and solution.

G-2: Abilities to Distinguish Between Natural Objects and Objects Made by Humans

Some objects occur in nature; others have been designed and made by people to solve human problems and enhance the quality of life.

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G-3: Understanding About Science and Technology

People have always invented tools and ways of doing things to solve problems, but most tools of today are modifications of tools from the past.

Tools are used to do things better or more easily and to do some things that could not otherwise be done at all. Tools are used to observe, measure, and make things.

Scientists and engineers often work together in teams to solve problems and develop new technology.

STANDARD H: SCIENCE IN SOCIAL AND PERSONAL PERSPECTIVES—STUDENTS WILL USE SCIENCE INFORMATION AND SKILLS TO MAKE INFORMED DECISIONS ABOUT THEMSELVES, THEIR COMMUNITY, AND THE WORLD IN WHICH THEY LIVE.

H-1: Personal and Community Health

(No Fourth Grade Benchmarks)

H-2: Human Population Growth

Human populations are groups of people living in a particular location.

The size of a population can increase or decrease.

H-3: Types of Resources

Resources are things we get from the living and nonliving environment to meet the needs and wants of a population.

Some resources are basic materials, such as air, water, and soil; some are produced from basic resources, such as food, fuel and building materials.

The supply of many resources is limited, but their availability can be extended through recycling and decreased use.

H-4: Quality of and Changes in Environments

Environments are the space, conditions, and factors that affect an individual's and a population's ability to survive and their quality of life.

Changes in environments can be natural or influenced by humans. Some changes are good; and some, like pollution, can influence the health, survival, or activities of living things, including humans.

Some environmental changes occur slowly, and others occur rapidly.

H-5: Science and Technology in Society

Science and technology have improved our food quality and quantity, transportation, health, sanitation, and communication; but these benefits are not equally available to all people in the world.