

# **KANSAS Extended Science Standards**



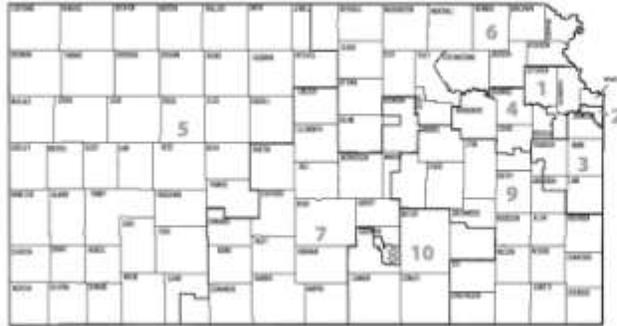
**Kansas State Board of Education**  
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Kansas State Board of Education  
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# Introduction

This document is the revised edition of the Kansas Extended Science Standards that align with the grade level Kansas Curricular Science Standards. These revised standards were developed by a number of educators, administrators, and education consultants during the summer of 2008. The focus of the group was to revise the current extended science standards in support of the general education science standards at the student's grade level.

The Kansas Extended Science Standards guide the direction of instruction and the development of Individualized Education Program (IEP) goals for students Grades 4, 7, and High School who are eligible to take the Kansas Alternate Assessment (KAA). These Extended Indicators are designed for students who require substantial adjustments in the general education science curriculum in order to participate with their nondisabled peers. When using this document, it is important for students' IEP teams to remember the extended science standards, benchmarks, and indicators are taught at the appropriate grade level using chronologically age appropriate contexts and materials in academic settings.

## Individuals with Disabilities Education Improvement Act (IDEA, 2004) Background

*Section 614(d)(VI)(bb):* "if the IEP Team determines that the child shall take an alternate assessment on a particular State or district wide assessment of student achievement, a statement of why – (AA) the child cannot participate in the regular assessment; and (BB) the particular alternate assessment selected is appropriate for the child;"

Accordingly, the Kansas Extended Science Standards were developed to be consistent with the general science standards for the purpose of ensuring that the education of all students, including those with the most significant disabilities, is uniform with goals and standards for students without disabilities as established by the Kansas State Board of Education (KSBE). Furthermore, Kansas is required to develop an alternate assessment for students with disabilities who are unable to participate in regular state and district assessments. In keeping with this requirement, the Extended Indicators serve as the basis for the development of the Kansas Alternate Assessment (KAA).

*Section 611(1)(16)(A):* In general – All children with disabilities are included in all general State and district-wide assessment programs, including assessments described under section 111 of the Elementary and Secondary Education Act of 1965, with appropriate accommodations and alternate assessments where necessary and as indicated in their respective individualized education programs.

(C)(i) In general – The state (or, in the case of a district wide assessment the local education agency) has developed and implemented guidelines for the participation of children with disabilities in alternate assessments for those children who cannot participate in regular assessments.

(ii) Requirements for Alternate Assessments – The guidelines under this clause (i) shall provide for alternate assessments that – (I) are aligned with the State's challenging academic content standards and challenging student academic achievement standards;

(iii) Conduct of alternate Assessments – The state conducts the alternate assessments described in the subparagraph.

## Title 1 – No Child Left Behind Act (NCLB, 2001) Background

*34 C.F.R. 200 1(d): Alternative academic achievement standards.* For students under section 602(3) of the Individuals with Disabilities Education Act with the most significant cognitive disabilities who take an alternate assessment, a State may through a documented and validated standards setting process, define alternate academic achievement standards, provided those standards—

(1) Are aligned with the State's academic content standards;

(2) Promote access to the general curriculum; and

(3) Reflect professional judgment of the highest achievement standards possible.

Kansas is required to hold all students to the same standards except that these regulations permit States to measure the achievement of students with the most significant cognitive disabilities based on alternate achievement standards. For the content area of science, these standards are titled, The Kansas Extended Science Standards. Alternate achievement standards are acceptable only for the small number of students with the most significant cognitive disabilities. The use of "highest learning standards possible" is intended to reflect the alternate achievement standards should be no less challenging for students with the most significant cognitive disabilities than for their peers without disabilities.

## Definitions

The following definitions clarify the seven levels of this Extended Indicators document. These definitions are closely aligned with the definitions that are used in *The Kansas Curricular Science Standards*.

### Standard

A curricular standard is a general statement of what a student should know and be able to do in academic subjects.

#### Example of a Standard:

The student will develop an understanding of biological concepts including, but not limited to, the characteristics of life, the needs of living organisms, their life cycles, their habitats, the molecular basis of heredity, and reproduction. The student also should learn how organisms interact with their environment, energy transfer from the sun and through the environmental systems, the chemical basis for life and behavior of organisms. The student should be able to apply process skills to explore and demonstrate an understanding of the structures and function in living systems, heredity regulation and behavior, and ecosystems.

### Benchmark

A benchmark is a specific statement of what a student should know and be able to do. Benchmarks are used to measure a student's progress toward meeting a standard.

Benchmarks are listed in hierarchical order under a standard.

#### Example of a Benchmark:

The student will demonstrate an understanding of diversity of living things, their life cycles, and their habitats.

### Indicator

An indicator is a statement of the knowledge or skills that a student demonstrates in order to meet a benchmark. Indicators are important in understanding the benchmarks and standards. Where possible, the indicators are listed in hierarchical order under a benchmark that progress from lower-level to higher-level indicators.

#### Example of an Indicator:

The learner recognizes that living things need air, water, food, and shelter.

### Clarifying Examples – have be taken out of this document and will be posted at [www.ksde.org](http://www.ksde.org)

Clarifying examples propose how a student might demonstrate a skill listed in the indicator that is academic. Clarifying science examples are not listed in hierarchical order. The clarifying science examples are closely related to the Present Levels of Academic Achievement and Functional Performance [PLAAFP (IDEA, 2004)]. These general areas are those in which the student receives instruction to practice, maintain, and generalize skills. The clarifying examples provide a clear connection between the standards and instructional practice.

#### Example of a Clarifying Example:

Academic: The student will investigate rocks found on a sciences field trip.

### Abbreviations for General and Extended Science Indicators

General: S.4.1.1.1 means (S) Science, (4) 4rth Grade, (1) Standard 1, (1) Benchmark 1, (2) Indicator 1

Extended: ES.1.1.1 means (ES) Extended Science, (1) Standard 1, (1) Benchmark 1, (1) Indicator 1. The extended benchmarks and indicators are hierarchical or increase in skill complexity. For example, Extended Indicator 10 is a more complex skill than Extended Indictor 4.

## Use of This Document

This document may be used for a variety of purposes to assist Kansas' teachers in planning local curriculum and assessments for students with significant cognitive disabilities in science. *The Kansas Extended Science Standards* document is intended to provide a curricular focus; it is not a state-mandated curriculum. In addition, the document provides a resource that can be used in developing the student's IEP. Educators should use this document to:

- serve as a guide for instruction,
- use as a guide for developing IEP goals,
- select extended science indicators to be assessed on *The Kansas Alternate Assessment*; and
- understand what is assessed in each grade level on *The Kansas State General Assessments*.

**General and Extended  
Science Standards  
(Grade Level Aligned)**



#### 4<sup>th</sup> Grade – Science as Inquiry

**STANDARD 1:** The student will experience science as *full inquiry*. In elementary grades, students begin to develop the physical and intellectual abilities of scientific inquiry.

General Indicator	Extended Indicators
S.4.1.1.1 ▲ asks questions that he/she can answer by investigating.	ES.1.1.1 investigates objects and/or environments. ES.1.1.2 identifies properties of objects and/or environments. ES.1.1.3 classifies and arranges groups of objects by a variety of properties. ES.1.1.6 asks and answers questions about objects, organisms, and events in their environment. ES.1.2.2 conducts a simple investigation.
S.4.1.1.2 ▲ plans and conducts a simple investigation.	ES.1.1.1 investigates objects and/or environments. ES.1.1.5 collects data relating to familiar everyday experiences by counting, tallying, observing, interviewing, etc. ES.1.1.6 asks and answers questions about objects, organisms, and events in their environment. ES.1.2.1 manipulates the environment to achieve an outcome ES.1.2.2 conducts a simple investigation
S.4.1.1.3 ▲ employs appropriate equipment, <i>tools</i> , and safety procedures to gather data.	ES.1.1.4 uses appropriate materials and/or tools to collect information. ES.1.1.5 collects data relating to familiar everyday experiences by counting, tallying, observing, interviewing, etc.
S.4.1.1.4 ▲ begins developing the abilities to communicate critique, analyze his/her own <i>investigations</i> , and interpret the work of other students.	ES.1.2.1 manipulates the environment to achieve an outcome

#### 4<sup>th</sup> Grade – Physical Science

**STANDARD 2:** The student will increase their understanding of the *properties* of objects and materials that they encounter on a daily basis. The student will compare, describe, and sort and *classify* these materials by observable properties.

General Indicator	Extended Indicators
S.4.2.1.1 ▲ observes <i>properties</i> of objects and measures those <i>properties</i> using appropriate <i>tools</i> .	ES.2.1.1 describes an object by one of its properties. ES.2.1.6 measures properties using appropriate tools.
S.4.2.1.2 ▲ describes and <i>classifies</i> objects by more than one property.	ES.2.1.2 separates and/or sorts a group of objects or materials by properties. ES.2.1.5 describes objects by multiple properties.
S.4.2.1.3 ▲ observes and records how one object <i>interacts</i> with another object.	ES.2.2.2 demonstrates how one object reacts with another object or substance
S.4.2.1.4 ▲ recognizes and describes the differences between solids, liquids, and gases.	ES.2.1.1 describes an object by one of its properties. ES.2.1.2 separates and/or sorts a group of objects or materials by properties. ES.2.1.6 measures properties using appropriate tools ES.2.2.1 identifies the changes in the properties of solids, liquids and/or gases.
S.4.2.2.1 ▲ moves objects by pushing, pulling, throwing, spinning, dropping, and rolling and describes the motion.	ES.2.1.3 manipulates and/or describes the movement of objects. ES.2.2.2 demonstrates how one object interacts with another object or substance.
S.4.2.3.1 ▲ identifies that the source of sound is vibrations.	ES.2.1.4 recognizes and/or discriminates between sounds made by different objects.
S.4.2.4.1 ▲ demonstrates that magnets attract and repel.	ES.2.1.1 describes an object by one of its properties. ES.2.2.2 demonstrates how one object interacts with another object or substance.

#### 4<sup>th</sup> Grade – Life Science

**STANDARD 3:** The student will develop an understanding of biological concepts through direct experience with living things, their life cycles, and their habitats.

General Indicator	Extended Indicators
S.4.3.1.1 ▲ observes different organisms and compares and contrasts how similar functions are served by different structural characteristics.	ES.3.1.1 identifies body parts, organs, and/or their functions. ES.3.2.3 compares, and/or contrasts characteristics of living things.
S.4.3.1.2 ▲ compares basic needs of different organisms in their environment.	ES.3.1.2 demonstrates understand of how his/her disabilities influence life actions. ES.3.2.2 identifies that living things need air, water, food, and shelter. ES.3.4.2 plans for anticipated environmental changes.
S.4.3.2.1 ▲ compares, contrasts, and asks questions about life cycles of various organisms.	ES.3.2.1 identifies living things and their life cycles in various environments. ES.3.3.1 identifies similar familial characteristics of humans and other organisms.

#### 4<sup>th</sup> Grade – Life Science

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**STANDARD 4:** The student will observe, objects, materials, and the changes, in their environment, note their properties, distinguish one from another, and develop their own explanation making sense of their observations.

General Indicator	Extended Indicators
S.4.4.1.1 ▲ collects, observes properties, and classifies a variety of earth materials in his/her environment.	ES.4.1.1 investigates earth materials ES.4.1.2 describes, collects, observes properties and/or classifies a variety of Earth materials
S.4.4.1.3 ▲ describes properties of water and process of the water cycle.	ES.4.1.1 investigates earth materials ES.4.1.2 describes, collects, observes properties and/or classifies a variety of Earth materials
S.4.4.2.3 ▲ discusses that the sun provides light and heat (electro-magnetic radiation) to maintain the temperature of the earth.	ES.4.2.2 understands how human-made and/or natural objects in the sky contribute to life on Earth. ES.4.2.3 demonstrates understanding of the components of the solar system. ES.4.3.1 demonstrates understanding of weather conditions. ES.4.3.2 responds appropriately to weather conditions and/or weather changes.
S.4.4.3.1 ▲ describes changes in the surface of the earth.	ES.4.1.2 describes, collects, observes properties and/or classifies a variety of Earth materials.
S.4.4.3.2 ▲ observes, describes, and records daily and seasonal weather changes.	ES.4.3.1 demonstrates understanding of weather conditions.

#### 4<sup>th</sup> Grade - Science and Technology

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**STANDARD 5:** The student will have a variety of educational experiences which involve science and technology. The student will begin to understand the design process.

General Indicator	Extended Indicators
S.4.5.1.1 ▲ identifies a simple <i>design problem</i> (designs a plan, implements the plan, evaluates the results, makes changes to improve the product, and communicates the results).	ES.5.1.1 demonstrates understanding of cause and effect within the physical environment ES.5.1.2 uses assistive technology in daily living activities in order to control his/her environment. ES.5.1.3 uses assistive technology for communication and/or social interaction. ES.5.2.1 investigates science through technology

**4<sup>th</sup> Grade – Science in Personal and Environmental Perspectives**

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**STANDARD 6:** The student will demonstrate personal health and environmental practices.

<b>General Indicator</b>	<b>Extended Indicators</b>
S.4.6.1.1 ▲ discusses the nutritional value of various foods and their contribution to health.	ES.6.1.2 understands that various foods contribute to health.

**7<sup>th</sup> Grade – Science as Inquiry**

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**STANDARD 1:** The student will develop the abilities to do *scientific inquiry*, be able to demonstrate how *scientific inquiry* is applied, and develop understandings about *scientific inquiry*.

General Indicator	Extended Indicators
S.7.1.1.1 ▲ identifies questions that can be answered through scientific investigations.	ES.1.1.6 asks and answers questions about objects, organisms, and events in their environment. ES.1.2.1 manipulates the environment to achieve an outcome ES.1.2.2 conducts a simple investigation
S.7.1.1.2 ▲ designs and conducts <i>scientific investigations</i> safely using appropriate tools, mathematics, <i>technology</i> , and techniques to gather, analyze, and interpret data.	ES.1.1.1 investigates objects and/or environments. ES.1.1.2 identifies properties of objects and/or environments. ES.1.1.3 classifies and arranges groups of objects by a variety of characteristics. ES.1.1.4 uses appropriate materials and/or tools to collect information. ES.1.1.5 collects data relating to familiar everyday experiences by counting, tallying, observing, interviewing, etc. ES.1.2.2 conducts a simple investigation
S.7.1.1.3 ▲ identifies the relationship between evidence and logical conclusions.	ES.1.1.1 investigates objects and/or environments. ES.1.1.2 identifies properties of objects and/or environments. ES.1.1.3 classifies and arranges groups of objects by a variety of characteristics. ES.1.1.4 uses appropriate materials and/or tools to collect information. ES.1.1.5 collects data relating to familiar everyday experiences by counting, tallying, observing, interviewing, etc. ES.1.1.7 uses data related to familiar experiences to answer questions of a scientific nature. ES.1.2.2 conducts a simple investigation

## 7<sup>th</sup> Grade - Physical Science

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**STANDARD 2:** The student will apply process skills to develop an understanding of physical science including: properties, changes of properties of matter, motion and forces, and transfer of energy.

General Indicator	Extended Indicators
S.7.2.1.1 ▲ compares and classifies the states of matter; solids, liquids, gases, and plasma.	ES.2.1.1 describes an object by one of its properties. ES.2.1.5 describes objects by multiple properties. ES.2.1.6 measures properties using appropriate tools.
S.7.2.2.2 ▲ measures and graphs the effects of temperature on matter.	ES.2.1.6 measures properties using appropriate tools. ES.2.2.1 identifies the changes in the properties of solids, liquids and/or gases
S.7.2.3.2 ▲ describes, measures, and represents data on a graph showing the motion of an object (position, direction of motion, speed).	ES.2.1.3 manipulates and/or describes the movement of objects.
S.7.2.3.3 ▲ recognizes and describes examples of Newton's Laws of Motion.	ES.2.1.3 manipulates and/or describes the movement of objects. ES.2.2.2 demonstrates how one object interacts with another object or substance.
S.7.2.4.3 ▲ observes and communicates how light (electromagnetic) energy interacts with matter: transmitted, reflected, refracted, and absorbed.	ES.2.1.1 describes an object by one of its properties. ES.2.1.2 separates and/or sorts a group of objects or materials by properties.
S.7.2.4.4 ▲ understands that heat energy can be transferred from hot to cold by radiation, convection, and conduction.	ES.2.1.6 measures properties using appropriate tools

**7<sup>th</sup> Grade – Life Science**

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**STANDARD 3:** The student will apply process skills to explore and understand structure and function in living systems, reproduction and heredity, regulation and behavior, populations and ecosystems, and diversity and adaptations of organisms.

General Indicator	Extended Indicators
S.7.3.1.1 ▲ will understand the cell theory; that all organisms are composed of one or more cells, cells are the basic unit of life, and the cells come from other cells.	ES.3.1.1 identifies body parts, organs, and/or their functions. ES.3.2.1 identifies living things and their life cycles in various environments. ES.3.2.3 compares, and/or contrasts diverse characteristics of living things.
S.7.3.1.2 ▲ relates the structure of cells, organs, tissues, organ systems, and whole organisms to their functions.	ES.3.1.1 identifies body parts, organs, and/or their functions. ES.3.1.2 demonstrates understand of how his/her disabilities influence life actions. ES.3.2.1 identifies living things and their life cycles in various environments. ES.3.3.1 identifies similar familial characteristics of humans and other organisms.
S.7.3.2.1 ▲ differentiates between asexual and sexual reproduction of organisms.	ES.3.1.1 identifies body parts, organs, and/or their functions. ES.3.2.1 identifies living things and their life cycles in various environments. ES.3.2.3 compares, and/or contrasts diverse characteristics of living things.
S.7.3.3.1. ▲ understands that internal and/or environmental conditions affect an organism’s behavior and/or response in order to maintain and regulate stable internal conditions to survive in a continually changing environment.	ES.3.1.2 demonstrates understand of how his/her disabilities influence life actions. ES.3.2.4 identifies ways humans and other organisms use their senses in their environments. ES.3.4.1 identifies how organisms adapt to environmental changes such as temperature, weather, light, etc. ES.3.4.2 plans for anticipated environmental changes.

## 7<sup>th</sup> Grade – Life Science

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**STANDARD 3:** The student will apply process skills to explore and understand structure and function in living systems, reproduction and heredity, regulation and behavior, populations and ecosystems, and diversity and adaptations of organisms.

General Indicator	Extended Indicators
S.7.3.4.1 ▲ recognizes that all populations living together (biotic resources) and the physical factors (abiotic resources) with which they interact compose an ecosystem.	ES.3.1.1 identifies body parts, organs, and/or their functions. ES.3.2.2 identifies that living things need air, water, food, and shelter. ES.3.2.3 compares, and/or contrasts diverse characteristics of living things. ES.3.4.1 adapts to environmental changes such as temperature, weather, light, etc.
S.7.3.4.3 ▲ traces the energy flow from the sun (source of radiant energy) to producers (via photosynthesis – chemical energy) to consumers and decomposers in food webs.	ES.3.2.1 identifies living things and their life cycles in various environments. ES.3.2.3 compares, and/or contrasts diverse characteristics of living things. ES.3.4.1 adapts to environmental changes such as temperature, weather, light, etc.
S.7.3.5.2 ▲ understands that adaptations of organisms (changes in structure, function, or behavior that accumulate over successive generations) contribute to biological diversity.	ES.3.1.1 identifies body parts, organs, and/or their functions. ES.3.2.3 compares, and/or contrasts diverse characteristics of living things. ES.3.4.1 adapts to environmental changes such as temperature, weather, light, etc.
S.7.3.5.3 ▲ associates extinction of a species with environmental changes and insufficient adaptive characteristics.	ES.3.2.1 identifies living things and their life cycles in various environments. ES.3.2.3 compares, and/or contrasts diverse characteristics of living things. ES.3.4.1 adapts to environmental changes such as temperature, weather, light, etc.

**7<sup>th</sup> Grade – Earth and Space Science**

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**STANDARD 4:** The student will apply process skills to explore and develop an understanding of the structure of the earth system, earth's history, and earth in the solar system.

General Indicator	Extended Indicators
S.7.4.1.1 ▲ identifies properties of the solid earth, the oceans and fresh water, and the atmosphere.	ES.4.1.1 investigates earth materials. ES.4.1.2 describes, collects, observes properties, and/or classifies a variety of Earth materials.
S.7.4.1.2 ▲ models earth's cycles, constructive and destructive processes, and weather systems.	ES.4.3.1 demonstrates understanding of weather conditions. ES.4.3.2 responds appropriately to weather conditions and/or weather changes.
S.7.4.2.1 ▲ understands that earth processes observed today (including movement of lithospheric plates and changes in atmospheric conditions) are similar to those that occurred in the past; earth history is also influenced by occasional catastrophes, such as the impact of a comet or asteroid.	ES.4.1.2 describes, collects, observes properties, and/or classifies a variety of Earth materials ES.4.2.2 understands how human-made and/or natural objects in the sky contribute to life on Earth ES.4.2.3 demonstrates understanding of the components of the solar system.
S.7.4.3.1 ▲ compares and contrasts the characteristics of stars, planets, moons, comets, and asteroids.	ES.4.2.1 observes and recognizes the sun, moon, stars, clouds, birds, airplanes, and other objects in the sky or space. ES.4.2.3 demonstrates understanding of the components of the solar system.
S.7.4.4.1 ▲ demonstrates and models object/space/time relationships that explain phenomena such as the day, the month, the year, seasons, phases of the moon, eclipses and tides.	ES.4.2.1 observes and recognizes the sun, moon, stars, clouds, birds, airplanes, and other objects in the sky or space. ES.4.2.2 understands how human-made and/or natural objects in the sky contribute to life on Earth. ES.4.2.3 demonstrates understanding of the components of the solar system ES.4.3.1 demonstrates understanding of weather conditions.

## **7<sup>th</sup> Grade – Science in Personal and Environmental Perspectives**

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**STANDARD 6:** The student will apply process skills to explore and develop an understanding of issues of personal health, population, resources and environment, and natural hazards.

<b>General Indicator</b>	<b>Extended Indicators</b>
S.7.6.1.1 ▲ identifies individual nutrition, exercise, and a rest needs based on science and uses a scientific approach to thinking critically about personal health, lifestyle choices, risks and benefits.	ES.6.1.1 demonstrates that safety involves freedom from danger, risk, or injury. ES.6.1.2 understands that various foods contribute to health.
S.7.6.2.1 ▲ investigates the effects of human activities on the environment and analyzes decisions based on the knowledge of benefits and risks.	ES.6.2.1 participates in activities to help the environment. ES.6.3.1 demonstrates an understanding of the impact his/her daily personal activities have on the environment.

## **7<sup>th</sup> Grade – History and Nature of Science**

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**STANDARD 7:** The student will examine and develop an understanding of science as a historical human endeavor.

<b>General Indicator</b>	<b>Extended Indicators</b>
S.7.7.2.1 ▲ recognizes that new knowledge leads to new questions and new discoveries, replicates historic experiments to understand principles of science, and relates contributions of men and women to the fields of science.	ES.7.1.1 demonstrates understanding of the contributions of men and women to the fields of science. ES.7.1.2 knows about major discoveries, inventions or advancements in science.

## High School – Science as Inquiry

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**Standard 1:** The student will develop the abilities necessary to do scientific inquiry and develop an understanding of scientific inquiry.

General Indicator	Extended Indicators
<p>S.HS.1.1.2 ▲ actively engages in investigations, including developing questions, gathering and analyzing data, and designing and conducting research.</p>	<p>ES.1.1.1 investigates objects and/or environments.            ES.1.1.2 identifies properties of objects and/or environments.            ES.1.1.5 collects data relating to familiar everyday experiences by counting, tallying, observing, interviewing, etc.            ES.1.1.6 asks and answers questions about objects, organisms, and events in their environment.            ES.1.2.1 manipulates the environment to achieve an outcome            ES.1.2.2 conducts a simple investigation.</p>
<p>S.HS.1.1.3 ▲ actively engages in using technological tools and mathematics in their own scientific investigations.</p>	<p>ES.1.1.1 investigates objects and/or environments.            ES.1.1.2 identifies properties of objects and/or environments.            ES.1.1.4 uses appropriate materials and/or tools to collect information.            ES.1.1.5 collects data relating to familiar everyday experiences by counting, tallying, observing, interviewing, etc.            ES.1.1.6 asks and answers questions about objects, organisms, and events in their environment.            ES.1.2.1 manipulates the environment to achieve an outcome            ES.1.2.2 conducts a simple investigation.</p>

## High School - Chemistry

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**STANDARD 2A:** The student will develop an understanding of the structure of atoms, *compounds*, chemical reactions, and the interactions of energy and matter.

General Indicator	Extended Indicators
S.HS.2A.3.1 ▲ understands a chemical reaction occurs when one or more substances (reactants) react to form a different chemical substance(s) (products). There are different types of chemical reactions all of which demonstrated the Law of Conservation of Matter and Energy.	ES.2.2.1 identifies the changes in the properties of solids, liquids, and/or gases. ES.2.2.2 demonstrates how one object reacts with another object or substance.

## High School - Physics

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**STANDARD 2B:** The student will develop an understanding of the structure of atoms, *compounds*, chemical reactions, and the interactions of energy and matter.

General Indicator	Extended Indicators
S.HS.2B.1.1 ▲ understands Newton's Laws and the variables of time, position, velocity, and acceleration can be used to describe the position and motion of particles.	ES.2.1.3 manipulates and/or describes the movement of objects. ES.2.1.5 describes objects by multiple properties. ES.2.1.6 measures properties using appropriate tools.
S.HS.2B.3.2 ▲ understands waves have energy and can transfer energy when they interact with matter.	ES.2.1.4 recognizes and/or discriminates between sounds made by different objects. ES.2.1.5 describes objects by multiple properties ES.2.1.6 measures properties using appropriate tools.

## High School – Life Science

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**STANDARD 3:** The student will develop an understanding of the cell, molecular basis of heredity, biological evolution, interdependence of organisms, matter, energy, and organization in living systems, and the behavior of organisms.

General Indicator	Extended Indicators
S.HS.3.1.2 ▲ understands cell functions involve specific chemical reactions.	ES.3.1.1 identifies body parts, organs, and/or their functions.
S.HS.3.2.1 ▲ understands living organisms contain DNA or RNA as their genetic material, which provides the instructions that specify the characteristics of organisms.	ES.3.1.2 demonstrates understand of how his/her disabilities influence life actions. ES.3.3.1 identifies similar familial characteristics of humans and other organisms.
S.HS.3.2.3 ▲ understands hereditary information is contained in genes, located in the chromosomes of each cell.	ES.3.1.1 identifies body parts, organs, and/or their functions. ES.3.1.2 demonstrates understand of how his/her disabilities influence life actions.
S.HS.3.3.4 ▲ understands organisms vary widely within and between populations. Variation allows for natural selection to occur.	ES.3.1.1 identifies body parts, organs, and/or their functions. ES.3.2.3 compares, and/or contrasts diverse characteristics of living things. ES.3.3.1 identifies similar familial characteristics of humans and other organisms.
S.HS.3.4.3 ▲ understands the distribution and abundance of organisms and populations in ecosystems are limited by the carrying capacity.	ES.3.2.2 identifies that living things need air, water, food, and shelter. ES.3.4.1 adapts to environmental changes such as temperature, weather, light, etc. ES.3.4.2 plans for anticipated environmental changes.

## High School – Life Science

**STANDARD 3:** The student will develop an understanding of the cell, molecular basis of heredity, biological evolution, interdependence of organisms, matter, energy, and organization in living systems, and the behavior of organisms.

General Indicator	Extended Indicators
S.HS.3.5.3 ▲ understands food molecules contain biochemical energy, which is then available for cellular respiration.	ES.3.1.1 identifies body parts, organs, and/or their functions. ES.3.2.2 identifies that living things need air, water, food, and shelter. ES.3.2.3 compares, and/or contrasts characteristics of living things.
S.HS.3.6.1 ▲ understands animals have behavioral responses to internal changes and to external stimuli.	ES.3.2.3 compares, and/or contrasts characteristics of living things. ES.3.2.4 identifies ways humans and other organisms use their senses in their environments. ES.3.4.1 adapts to environmental changes such as temperature, weather, light, etc.
S.HS.3.7.2 ▲ understands that homeostasis is the dynamic regulation and balance of an organism’s internal environment to maintain conditions suitable for survival.	ES.3.1.1 identifies body parts, organs, and/or their functions. ES.3.2.1 identifies living things and their life cycles in various environments. ES.3.2.3 compares, and/or contrasts characteristics of living things. ES.3.2.4 identifies ways humans and other organisms use their senses in their environments. ES.3.3.1 identifies similar familial characteristics of humans and other organisms.
S.HS.3.7.3 ▲ understands that living things change following a specific pattern of developmental stages called life cycles.	ES.3.1.1 identifies body parts, organs, and/or their functions. ES.3.2.1 identifies living things and their life cycles in various environments. ES.3.2.3 compares, and/or contrasts characteristics of living things. ES.3.2.4 identifies ways humans and other organisms use their senses in their environments. ES.3.3.1 identifies similar familial characteristics of humans and other organisms.

## High School – Earth and Space Science

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**STANDARD 4:** The student will develop an understanding of energy in the earth system, geochemical cycles, the formation and organization of the earth system, the dynamics of the earth/moon/sun system, and the organization and development of the universe.

General Indicator	Extended Indicators
S.HS.4.3.2 ▲ understands the relationship between the earth, moon, and sun explains the seasons, tides, and moon phases.	ES.4.2.1 Identifies and recognizes the sun, moon, stars, clouds, birds, airplanes, and other objects in the sky or space. ES.4.2.2 understands how human-made and/or natural objects in the sky contribute to life on Earth ES.4.2.3 demonstrates understanding of the components of the solar system. ES.4.3.1 demonstrates understanding of weather conditions. ES.4.3.2 responds appropriately to weather conditions and/or weather changes.
S.HS.4.4.1 ▲ understands stellar evolution	ES.4.2.3 demonstrates understanding of the components of the solar system

## High School – Science and Technology

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**STANDARD 5:** The student will develop understandings about the relationship between science and technology.

General Indicator	Extended Indicators
S.HS.5.1.1 ▲ understands technology is the application of scientific knowledge for functional purposes.	ES.5.1.1 demonstrates understanding of cause and effect within the physical environment ES.5.1.2 uses assistive technology in daily living activities in order to control his/her environment. ES.5.1.3 uses assistive technology for communication and/or social interaction. ES.5.2.1 investigates science through technology

## High School – Science in Personal and Environmental Perspectives

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**STANDARD 6:** The student will develop an understanding of personal and community health, population growth, natural resources, environmental quality, natural and human-induced hazards, and science and technology in local, national, and global settings.

General Indicator	Extended Indicators
S.HS.6.3.1 ▲ understands natural resources from the lithosphere and ecosystems are required to sustain human populations.	ES.6.2.1 participates in activities to help the environment.



# Glossary



# Glossary

**Explore:** To investigate or search

**Fact:** In science, an observation that has been repeatedly confirmed.

**Falsification:** A method for determining the validity of a hypothesis, theory or law. To be falsifiable a theory must be testable, by others, in such a way that, if it is false, the tests can show that it is false.

**Inquiry:** Scientific inquiry refers to the diverse ways in which scientists study the natural world and propose explanations based on the evidence derived from their work. Inquiry also offers to the activities of students in which they develop knowledge and understanding of scientific ideas, as well as an understanding of how scientists study the natural world. Inquiry is a multifaceted activity that involves many process skills. Conducting hands-on activities does not guarantee inquiry, nor is reading about science incompatible with inquiry.

**Law:** A descriptive generalization about how some aspect of the natural world behaves under stated circumstances. Laws are frequently, but not always, mathematical formulations.

**Material:** The elements, constituents, or substances of which something is composed or can be made.

**Properties:** Descriptions of objects based directly on the senses (e.g., hard, soft, smooth) or through extended use of the senses (an atom contains a nucleus)

**Science:** The human activity of seeking logical explanations for what we observe in world around us. These explanations are based on observations, experiments, and logical arguments that adhere to strict empirical standards and a healthy skeptical perspective.

**Technology:** Science-based activity in which human start with initial conditions, then design, build, and implement an intervention that improves the world about us in terms of our original needs (e.g., eye glasses or contacts).



# **Indicators & Indicator Changes**

## Science

### Extended Standard Indicator

Current Indicator Number	Extended Standard Indicator	Old Indicator Number
<b>Science Standard 1: Science as Inquiry</b>		
<b>Benchmark 1</b> The student will be involved in activities that develop skills necessary to conduct scientific inquiries		
ES.1.1.1	investigates objects and/or environments	ES.1.1.1
ES.1.1.2	identifies properties of objects and / or environments	ES.1.1.2
ES.1.1.3	classifies and arranges groups of objects by a variety of characteristics	ES.1.1.3
ES.1.1.4	uses appropriate materials and tools to collect information	ES.1.1.4
ES.1.1.5	collects data relating to familiar everyday experiences by counting, tallying, observing, interviewing, etc	ES.1.1.5
ES.1.1.6	asks and answers questions about objects, organisms, and events in their environment	ES.1.1.6
<b>Benchmark 2:</b> The student will apply different kinds of investigations to different kinds of questions		
ES.1.2.1	manipulates environment to achieve an outcome	ES.1.2.1
ES.1.2.2	conducts a simple investigation	ES.1.2.2
<b>Science Standard 2: Physical Science</b>		
<b>Benchmark 1:</b> The student will describe objects and/or demonstrate their properties		
ES.2.1.1	describes an object by one of its properties	ES.2.1.1
ES.2.1.2	separates and/or sorts a group of objects or materials by properties	ES.2.1.2
ES.2.1.3	manipulates and/or describes the movement of objects	ES.2.1.3
ES.2.1.4	recognizes and/or discriminates between sounds made by different objects	ES.2.1.4
ES.2.1.5	describes objects by multiple properties	ES.2.1.5
ES.2.1.6	measures properties using appropriate tools	ES.2.1.6
<b>Benchmark 2:</b> The student will observe, compare, and classify properties of matter		
ES.2.2.1	identifies the changes in the properties of solids, liquids and /or gases.	ES.2.3.1
ES.2.2.2	demonstrates how one object interacts with another object or substance	ES.2.3.2
<b>Science Standard 3: Life Science</b>		
<b>Benchmark 1:</b> The student will demonstrate an understanding of his/her own body's structure and function		
ES.3.1.1	identifies body parts, organs, and/or their functions.	ES.3.1.3
ES.3.1.2	demonstrates understand of how his/her disabilities influence life actions.	ES.3.1.4

<b>Benchmark 2:</b> The student will develop an understanding of the diversity of living things, their life cycles, and their habitats.		
ES.3.2.1	identifies living things and their life cycles in various environments.	ES.3.2.1
ES.3.2.2	identifies that living things need air, water, food, and shelter.	ES.3.2.2
ES.3.2.3	compares, and/or contrasts characteristics of living things.	ES.3.2.3
ES.3.2.4	identifies ways humans and other organisms use their senses in their environments	ES.3.2.4
<b>Benchmark 3:</b> The student will understand the role of reproduction and heredity		
ES.3.3.1	identifies similar familial characteristics of humans and other organisms.	ES.3.3.1
<b>Benchmark 4:</b> The student will understand the effects of a changing environment and related adaptation required of organisms		
ES.3.4.1	Identifies how organisms adapt to environmental changes such as temperature, weather, light, etc.	ES.3.4.1.
ES.3.4.2	plans for anticipated environmental changes	ES.3.4.2
<b>Science Standard 4: Earth and Space Science</b>		
<b>Benchmark 1:</b> The student will develop an understanding of the properties of rocks, soil, air, and water as well as other Earth materials		
ES.4.1.1.	investigates Earth materials	ES.4.1.1.
ES.4.1.2	describes, collects, observes properties and/or classifies a variety of Earth materials.	ES.4.1.2
<b>Benchmark 2:</b> The student will observe and describe objects in the sky or space.		
ES.4.2.1	identifies and recognizes the sun, moon, stars, clouds, birds, airplanes, and other objects in the sky or space.	ES.4.2.1
ES.4.2.2	understands how human-made and/or natural objects in the sky contribute to life on Earth	ES.4.2.2
ES.4.2.3	demonstrates understanding of the components of the solar system.	ES.4.2.3
<b>Benchmark 3:</b> The student will observe and/or describe changes in weather		
ES.4.3.1	demonstrates understanding of weather conditions.	ES.4.3.1
ES.4.3.2	responds appropriately to weather conditions and/or weather changes.	ES.4.3.2
<b>Science Standard 5: Technology</b>		
<b>Benchmark 1:</b> The student will use assistive technology to interact with the world around him or her		
ES.5.1.1	demonstrates understanding of cause and effect within the physical environment	ES.5.1.1
ES.5.1.2	uses assistive technology in daily living activities in order to control his/her environment	ES.5.1.2
ES.5.1.3	uses assistive technology for communication and/or social interaction.	ES.5.1.2
<b>Benchmark 2:</b> The student will use technology to learn about the world around him or her		
ES.5.2.1	investigates science through technology	ES.5.2.1

<b>Science Standard 6: Science in Personal and Environmental Perspective</b>		
<b>Benchmark 1:</b> The student will develop an understanding of personal health		
ES.6.1.1	demonstrates that safety involves freedom from danger, risk, or injury.	ES.6.1.1
ES.6.1.2	understands that various foods contribute to health.	ES.6.1.3
<b>Benchmark 2:</b> The student will demonstrate environmental awareness		
ES.6.2.1	participates in activities to help the environment.	ES.6.2.1
<b>Benchmark 3:</b> The student will understand the impact of human activity on the environment		
ES.6.3.1	demonstrates an understanding of the impact his/her daily personal activities have on the environment	ES.6.3.1
<b>Science Standard 7: History and Nature of Science</b>		
<b>Benchmark 1:</b> The student will understand contributions to science throughout history		
ES.7.1.1	demonstrates understanding of the contributions of men and women to the fields of science	ES.7.1.1
ES.7.1.2	knows about major discoveries, inventions or advancements in science.	ES.7.1.2