

Adapting Curriculum and Classroom Environments for Student Success

Companion Guide for Grade Band Extensions

Science



Introduction

Welcome to the Delaware Content Standards Grade Band Extensions (GBEs) Science Companion Guide!

The Adapting Curriculum and Classroom Environments for Student Success (ACCESS) Project at the University of Delaware's Center for Disabilities Studies in partnership with the Delaware Department of Education developed this guide to assist educators in navigating the GBEs. This tool provides educators various avenues to select content standards in order to develop lessons that provide access to the general education curriculum for students with significant intellectual disabilities.

The Companion Guide does not replace the GBEs. It is a reference tool to be used in conjunction with the Delaware Content Standards GBE document. To view the complete GBE document, visit the ACCESS Project website at www.deaccessproject.org.

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Understanding the document

The guide was developed not only to identify content standards but to provide the user with additional resources to assist in the creation and implementation of classroom lessons.

This document is divided by grade band as shown in the shaded bar at the top of each page.

To assist in connecting both this guide and the GBE document, refer to the corresponding page number(s) provided on the upper right-hand side of each page.

Covered in this standard: The essence (main idea) is listed for each grade level expectation as identified in the GBE document.

Essential essences (in bold) have been identified as those that are critical for student success based on a criteria of importance across school, life, and state assessment. While all are important to address, those bolded should be given priority.

Energy and Its Effects		4-5
Covered in this standard: (Essential bolded)		GBE page 26/29
Components of sunlight (5.2)	Motion of sound energy (5.8)	
Components of white light (5.3)	Pitch and volume (5.7)	
Conductivity of electricity (4.3)	Solar energy (5.1)	
Electrical circuits (4.1)	Sound as a form of energy (5.5)	
Energy from the Sun (5.1)	Speed's impact on energy (5.9)	

Understanding the document

Science Kits: Grade level science units or kits are available from the Delaware Department of Education website (www.doe.k12.de.us) and can be adapted for classroom use. Kits may require additional training before use.

Science Kits: (4) Magnetism and Electricity, Solar and Alternative Energy; (5) Motion and Design

Unit Ideas: Batteries; Conductors; Pulleys; Roller Coasters; Sound and Vibrations; Speed; Sports; The Ear; The Sun

Additional Unit Ideas:* Topics or thematic ideas are provided for developing standards-based lessons.

Real life application:* Real life applications can be used as an entry point to select standard(s) and grade level expectations. Additionally, these real life activities may be embedded within a lesson and can aid in generalization of skills.

Real life application: Using a microwave safely; Using a magnet; Safely using electrical devices; Charging hand-held electronics or video game systems; Playing with toy cars/racetrack; Conserving energy; Playing sports; Putting away groceries (refrigerator vs. cabinet); Using sunscreen; Playing an instrument; Protecting yourself from the sun (hat, sunglasses); Riding a roller coaster; Riding a boogie or skate board

Science terms used in this standard:* Key terminology is defined to assist teachers in understanding concepts in order to develop and implement standards-based lessons.

Science terms used in this standard:

GBE page 26/29

Absorption of light- the stopping of light when it hits a wall or other opaque object

Axis- an imaginary line which runs through both poles of a planet

Circuit- a path that is made for an electric current

**Items listed are intended to provide examples and are not exhaustive.*

Science

K-3

5

Nature and Application of Science and Technology

K-3

Covered in this standard: (Essential bolded)

GBE page 7

Collect, record, and compare data (3.3)

Integrate reading, writing, math, or technology into scientific investigations (3.6)

Explanations based on data (3.4)

Questions and predictions about the natural world (3.1)

Follow simple plans to explore questions or predictions (3.2)

Report and explain observations (3.5)

Science Kits: **(K)** Senses, Trees, Wood and Paper; **(1)** Organisms, Solids and Liquids, Weather; **(2)** Balance and Motion, Balancing and Weighing, Insects, Life Cycle of Butterflies, Soils; **(3)** Earth Materials, Human Body, Physics of Sound, Water

Additional Unit Ideas: All About Ants; Butterflies; Caterpillars; Crickets; Musical Instruments; Reuse and Recycle; Skeletons; Spiders and Spider Webs

Real life application: Making predictions; Collecting data; Graphing; Expressing opinions; Tracking personal information (age, weight, height)

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Science terms used in this standard:

GBE page 7

Data- information that is used to make a decision or come to a conclusion

Hypothesis- a statement that explains a set of facts and can be tested to determine if it is false or not accurate

Observation- the act of watching something closely

Prediction- an educated guess

Theory- a tested set of statements that explain how something works in the natural world

Materials and Their Properties

Covered in this standard: (Essential bolded)

GBE page 8/9

Attributes of liquids (1.4)

Impact of treatments on physical properties (1.7)

Attributes of solids (1.2)

Order objects by weight (2.2)

Changes in water properties (3.2)

Volume and weight (2.3)

Evaporation and condensation (3.1)

Weigh objects (2.1)

Science Kits: **(K)** Senses, Trees, Wood and Paper; **(1)** Solids and Liquids; **(2)** Balance and Motion, Balancing and Weighing, Soils; **(3)** Physics of Sound, Water

Additional Unit Ideas: Buoyancy; Melting and Freezing; Ocean; States of Water; Water Cycle; What Sinks and What Floats

Real life application: Dressing for the weather; Following a recipe; Sorting; Recycling; Playing with construction toys (Legos, Tinker Toys, Lincoln Logs); Weighing yourself; Making and using ice cubes and popsicles; Playing with water toys

Science terms used in this standard:

GBE page 8/9

Condensation- the change of a gas or vapor into liquid either by cooling or being exposed to greater pressure

Evaporation- the change of liquid into a vapor when the liquid is below its boiling point

Physical properties- properties that can be observed or measured without changing an object

Treatment- subjection to some agent or action (e.g., temperature, sunlight, water)

Volume- the amount of space that is filled by an object

Water properties- solid, liquid, or gas

Weight- the pull of gravity on an object

Covered in this standard: (Essential bolded)

GBE page 10/12

Electrical energy (3.2)

Motion of water and air (3.1)

Energy of moving objects (2.1)

Movement of objects (2.1)

Energy of the Sun (1.1/1.2)

Position of objects (K.1)

Energy transfer (3.3)

Properties of water (3.1)

Heat energy (3.1)

Transfer of body energy to objects (3.4)

Heat energy and temperature (3.2)

Science Kits: (1) Weather; (2) Balance and Motion, Balancing and Weighing; (3) Earth Materials, Human Body, Physics of Sound, Water

Additional Unit Ideas: Food Chain; Musical Instruments; Roller Coasters; Solar and Wind Power; States of Water; Sun; Things that Move; Windmills

Real life application: Riding a bike; Playing sports (soccer, T-ball); Exercising; Charging hand-held electronics or video game systems; Going to an amusement park; Riding in a car; Watching car racing; Reading a thermometer; Flying a kite; Blowing bubbles

Science terms used in this standard:

GBE page 10/12

Energy- the capacity for activity or the exertion of power**Force-** something that causes an object to move, change its shape, change its speed or direction if it is moving (gravity, weight, and friction)**Kinetic energy-** the energy that an object has as a result of being in motion**Motion-** the act of changing position or place**Potential energy-** the energy that an object has stored because of its position or condition**State of matter-** one of the conditions in which matter exists (solid, liquid, gas)**Transfer of energy-** occurs when energy is passed from one object to another**Transformation of energy-** occurs when energy changes from one form to another**Covered in this standard: (Essential bolded)**

GBE page 13

Binoculars (K.1)

Earth's shape (K.1)**Cyclic patterns of the Moon (1.3)****Objects found in the sky (1.1)****Earth's rotation (1.4)****Positioning of the Sun (1.2)****Science Kits: (1) Weather; (2) Balance and Motion****Additional Unit Ideas:** Astronauts and Space; Earth and Beyond; Moon; Planets; Seasons; Stars; Take Me To The Stars; Things that Fly; Universe; What Makes Day and Night**Real life application:** Star gazing; Bird watching; Participating in morning routine (calendar, weather); Using a map; Visiting a planetarium; Riding in an airplane; Using binoculars or a telescope; Creating a bedtime routine; Using an alarm clock

Science terms used in this standard:

GBE page 13

Binoculars- an instrument for seeing things at a distance

Cyclic pattern- a process that repeats itself (e.g., daily, monthly)

Moon phase- a stage in the changing shape that the moon seems to have when it is viewed from Earth (e.g., full, third quarter, new, first quarter)

Rotation- the act of spinning on an axis

Three-dimensional- having, or seeming to have, the dimension of depth as well as width and height

Earth's Dynamic Systems

Covered in this standard: (Essential bolded)

GBE page 14/16

Composting (2.1)

Rock components (3.1)**Earth materials (1.1)****Rocks and minerals (3.2)**

Measuring precipitation (1.5)

Thermometers (1.3)

Minerals (3.2)

Types of clouds (1.4)

Properties of minerals (3.4)

Weather conditions (1.7)

Properties of rocks (3.1)

Weather patterns (1.6)

Properties of water (3.5)

Wind speed (1.2)

Science Kits: (1) Solids and Liquids, Weather; **(2)** Soils; **(3)** Earth Materials, Water

Additional Unit Ideas: Clouds; Conservation; Fossils; "Let's Go Fly a Kite"; Natural Disasters (Tornado, Hurricane, Earthquake); Natural Resources; Rain "What is Rain?", "Rain, Rain Go Away"; Rock Sculptures; Using Bubbles to Observe Wind Speed and Direction; Volcanos; Weather Records or Extremes

Real life application: Recycling; Composting; Rock collecting; Gardening; Participating in morning routine (weather); Taking vitamins; Visiting a natural history museum; Hiking; Playing in the snow; Using an umbrella; Dressing appropriately for the weather; Reading a weather thermometer; Using a rain gauge; Watching the weather on TV

Science terms used in this standard:

GBE page 14/16

- Aquatic-** living or growing in water
- Beauford scale-** a scale for classifying the force of the wind ranging from 0 (calm) to 12 (hurricane)
- Cirrus cloud-** a thin, white cloud that often looks like feathers or streamers
- Compost-** a mixture of rotted plants and food that is used to fertilize soil
- Cumulus cloud-** a rounded, fluffy, fair-weather cloud
- Earth materials-** rock, soil, water, air
- Mineral-** one of many different solid chemical compounds found in rocks and soil (quartz, fluorite, calcite, gypsum)
- Natural resource-** any part of the Earth or its atmosphere that is necessary or useful to humans
- Nimbus cloud-** a cloud that produces rain
- Organic-** relating to living things or to any of the substances that are made by living things
- Precipitation-** water that falls to Earth as rain, snow, sleet, or hail
- Rain gauge-** an instrument for measuring rainfall
- Stratus cloud-** a low-lying, grayish cloud layer that covers the whole sky and sometimes produces light rain or drizzle
- Terrestrial-** having to do with the planet Earth or to the organisms that live on it

Covered in this standard: (Essential bolded)

GBE page 17/18

- | | |
|--|--|
| Animal and human needs for survival (3.1) | Insect structures (2.4) |
| Body's response to external stimuli (3.2) | Needs of living things (2.2) |
| Bone, muscle, and joint functions (3.1) | Skeleton's structure and function (3.3) |
| Brain signals and muscle responses (3.1) | Structures help living things survive (1.3) |
| External factors that affect the body (3.1) | Types of joint movement (3.2) |
| Five senses (K.2) | |

Science Kits: (K) Senses, Trees; (1) Organisms; (2) Insects, Life Cycle of Butterflies; (3) Human Body

Additional Unit Ideas: Bones; Brain; Creepy Crawlers; Dinosaurs; Exercise; Food Webs; Germs and Cleanliness; Healthy Snacks; Junk Food; Muscles and Motion; Skeletons

Real life application: Caring for a pet; Practicing good nutrition; Collecting bugs; Maintaining proper hygiene; Exercising; Participating in gym class; Playing sports; Using hand sanitizer; Jumping and stretching; Listening to music; Going to the doctor or dentist; Tasting new foods; Practicing home safety (knowing hot/cold); Wearing safety gear (bike helmet, knee pads)

Science terms used in this standard:

GBE page 17/18

Aquatic- living or growing in water**Bone function-** to provide a protection to organs**External stimuli-** something environmental that causes an automatic response in a body part or living thing**Internal stimuli-** a stimulus that comes from within the body**Joint function-** connecting two or more bone surfaces to allow movement (gliding, fixed, hinged, pivot, ball and socket)**Muscle function-** to generate force and provide shape and form to an organism**Skeleton-** the framework of bones that supports the body and protects the organs**Terrestrial-** having to do with the planet Earth or to the organisms that live on it**Vertebrate-** an animal with a spine or backbone**Diversity and Continuity of Living Things****Covered in this standard: (Essential bolded)**

GBE page 19

Bone development of children to adults (3.1)

Structures and functions of skeletons (3.1)

Life cycles (2.1)**Use of technology in science (3.1)****Parents and offspring (1.3)****Science Kits: (K)** Trees; **(1)** Organisms; **(2)** Insects, Life Cycle of Butterflies; **(3)** Human Body**Additional Unit Ideas:** All the Fish in the Sea; Family Trees; How We Grow; Microscopes; My Life as a Tree; Skeletons; What Makes Bones Strong**Real life application:** Creating a family tree; Using a magnifying glass; Having an X-ray; Taking vitamins; Eating healthy foods; Feeding and watering plants; Caring for a pet; Wearing safety gear (bike helmet, knee pads); Celebrating a birthday; Knowing your age

Science terms used in this standard:

GBE page 19

Evolution- the gradual change that takes place in living things over long periods of time**Genetics-** the scientific study of how traits are passed from parent to offspring**Life cycle-** the series of changes or stages in the life of a plant or animal**Offspring-** the young of a living thing, especially a plant or animal**Organism-** a single form of life such as a plant, animal, or fungus that is able to grow and reproduce**Reproduction-** the process by which living things produce offspring**Trait-** something in the appearance, activity, or behavior of a living thing that is determined by genes**Vertebrate-** an animal with a spine or backbone**Covered in this standard: (Essential bolded)**

GBE page 20

Conservation of matter (2.1)**Overcrowding (2.3)****Environmental changes (2.1)**

Plants and animals benefit from each other (2.2)

Impact of human activity on the environment (3.1)**Science Kits: (K)** Trees, Wood and Paper; **(1)** Organisms, Weather; **(2)** Insects, Soils; **(3)** Water**Additional Unit Ideas:** Autumn Leaves; Be a Friend to Trees; From Seed to Plant; Habitats; Melting Snow and Thermometers; Pollution; Reasons for Flowers; Recycling and Reusing; Snowflakes; Taking Care of the Earth**Real life application:** Recycling; Conserving energy; Feeding and watering plants; Picking up trash and not littering; Cleaning up after yourself; Collecting insects; Planting seeds; Turning off the lights and electronic devices; Going fishing; Collecting leaves; Maintaining a fish tank or aquarium

Science terms used in this standard:

GBE page 20

Conservation of matter- the notion that matter can be neither created nor destroyed

Environment- the surroundings and conditions that determine how living things grow and develop

Matter- something that occupies space, has mass, and exists as a solid, liquid, or gas

Organism- a single form of life, such as a plant, animal, or fungus that is able to grow and reproduce

Overcrowding- a state of being filled with more people or things than is desired

Recycle- to collect and reuse materials such as glass, paper, and plastic

Science

4-5

23

Nature and Application of Science and Technology

4-5

Covered in this standard: (Essential bolded)

GBE page 23

Collect, record, and compare data (5.3)

Integrate reading, writing, math, or technology into scientific investigations (5.6)

Conduct a multi-step investigation (5.2)

Questions and predictions about the natural world (5.1)

Explanations based on data (5.4)

Report and explain procedures and data (5.5)

Science Kits: (4) Land and Water, Magnetism and Electricity, Sky Watchers, Solar System, Structures of Life; **(5)** Ecosystems, Mixtures and Solutions, Motion and Design

Additional Unit Ideas: Air Pressure or Wind Directions; Changing Seasons; Collecting and Presenting Weather Data; Measuring Rainfall Amounts; Recording Wind Speed

Real life application: Making predictions; Collecting data; Graphing; Expressing opinions; Tracking personal information (age, weight, height); Playing video games; Using a calculator

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Science terms used in this standard:

GBE page 23

Data- information that is used to make a decision or come to a conclusion

Investigation- a detailed inquiry or systematic examination

Prediction- an educated guess

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Materials and Their Properties

4-5

Covered in this standard: (Essential bolded)

GBE page 24/25

Concept of mass (5.4)

Physical properties of mixtures (5.1)**Conductors and insulators (4.1)****Properties of solutions (5.3)****Conservation of mass (5.1)****Recycling (5.1)****Evaporation and condensation (4.3)****Saturation and solubility (5.5)**

Magnetism (4.2)

Separation of mixtures (5.2)

Science Kits: (4) Magnetism and Electricity; **(5)** Mixtures and Solutions

Additional Unit Ideas: Batteries; Conductors and Insulators; Mass and Weight; Reuse and Recycle; Static and Current Electricity; The Water Cycle; Volume

Real life application: Following a recipe; Using a microwave safely; Household chemical safety; Using a magnet; Recycling; Charging hand-held electronics or video game systems; Wearing a coat; Using batteries; Using a scale; Making a drink mix; Having a lemonade stand; Throwing away trash

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Science terms used in this standard:

GBE page 24/25

Component- a part or element of a larger whole**Condensation-** the change of a gas or vapor into liquid either by cooling or being exposed to greater pressure**Conductor-** a material that an electric current can pass through easily**Conservation of mass-** the notion that matter can be neither created nor destroyed**Evaporation-** the change of liquid into a vapor when the liquid is below its boiling point**Insulator-** a material that a current cannot pass through easily**Magnetism-** a property of matter which produces a field of attractive and repulsive forces**Mass-** the amount of matter contained in an object**Mixture-** a combination of two or more pure substances that are not chemically combined**Physical properties-** properties that can be observed or measured without changing an object**Recycling-** to collect and reuse materials such as glass, paper, and plastic**Saturation-** to soak thoroughly or dissolve the greatest possible amount of a substance in a solution**Solubility-** a measure of the amount of a material that will dissolve in another material**Solution-** a mixture in which the particles of different kinds of matter are mixed evenly with each other and particles do not settle out

Energy and Its Effects

Covered in this standard: (Essential bolded)

GBE page 26/29

Components of sunlight (5.2)

Motion of sound energy (5.8)

Components of white light (5.3)

Pitch and volume (5.7)

Conductivity of electricity (4.3)**Solar energy (5.1)**

Electrical circuits (4.1)

Sound as a form of energy (5.5)**Energy from the Sun (5.1)****Speed's impact on energy (5.9)****Force and motion (5.2)****Storing energy (5.10)**

Heat energy (5.3)

Ultraviolet and infrared light energy (5.4)

Interaction of light and objects (5.1/5.2)**Vibration's impact on volume (5.6)**

Measurement of speed (5.1)

Science Kits: (4) Magnetism and Electricity, Solar and Alternative Energy; **(5)** Motion and Design**Additional Unit Ideas:** Batteries; Conductors; Pulleys; Roller Coasters; Sound and Vibrations; Speed; Sports; Sun; The Ear**Real life application:** Using a microwave safely; Using a magnet; Safely using electrical devices; Charging hand-held electronics or video game systems; Playing with toy cars/racetrack; Conserving energy; Playing sports; Putting away groceries (refrigerator vs. cabinet); Using sunscreen; Playing an instrument; Protecting yourself from the sun (hat, sunglasses); Riding a roller coaster; Riding a boogie or skate board

Science terms used in this standard:

GBE page 26/29

Absorption of light- the stopping of light when it hits a wall or other opaque object

Axis- an imaginary line which runs through both poles of a planet

Circuit- a path that is made for an electric current

Component- a part or element of a larger whole

Conductivity- the degree to which heat, electricity, or sound flows through a substance

Conductor- a material that an electric current can pass through easily

Electrical energy- a form of energy produced by particles that have charge, especially electrons

Energy- the capacity for activity or the exertion of power

Force- something that causes an object to move, change its shape, change its speed or direction if it is moving (gravity, weight, and friction)

Heat energy- energy that flows from one place to another as a result of the difference in temperature

Infrared light- electromagnetic radiation that is invisible and has wavelengths that are longer than those of visible light but shorter than those of microwaves

Insulator- a material that a current cannot pass through easily

Light energy- a form of energy emitted by luminous objects like the Sun; it travels as waves in straight lines away from its source

Pitch- the level of a sound's perceived highness or lowness; the pitch depends on the frequency of vibration of the sound waves

Prism- a transparent object that breaks up light passing through it into a spectrum of colors

Reflection of light- the bouncing of light off an object

Solar energy- energy that comes from the Sun

Science terms used in this standard: (continued)

GBE page 26/29

Sound energy- a type of energy that travels as waves and can be detected by the ears

Speed- a measure of how far something moves during a period of time

State of matter- one of the conditions in which matter exists (solid, liquid, gas)

Transfer of energy- occurs when energy is passed from one object to another

Transformation of energy- occurs when energy changes from one form to another

Transparency- relating to a medium or substance that light can travel through

Ultraviolet- electromagnetic radiation that has wavelengths shorter than those of visible light but longer than those of X-rays

Vibrations- waves that carry sound through the air and some solids and liquids

Volume- the amount of space that matter takes up

White light- apparently colorless light, such as ordinary daylight; it contains all the wavelengths of the visible spectrum at equal intensity

Earth in Space**4-5****Covered in this standard: (Essential bolded)**

GBE page 30/31

Earth's rotation (4.2)**Solar System (4.2)****Phases of the Moon (4.3)****Sun is a star (4.3)****Planets (4.1)**

Sun's path (4.1)

Relationship between size and distance (4.4)

Technology and the Solar System (4.1)**Science Kits: (4)** Sky Watchers, Solar System

Additional Unit Ideas: Astronomy and Heavenly Bodies; Astronauts; Black Holes; Eclipses; Rockets; Satellites; Seasons and Calendars; Space Travel; Sun, Stars, and Constellations; Telling Time by the Moon or the Sun; Tides; Travel to Planets

Real life application: Star gazing; Telling time; Using a calendar; Gardening; Planning for the seasons; Visiting a planetarium; Watching the weather on TV; Creating a model of the Solar System; Safely viewing an eclipse; Swimming in the ocean

Science terms used in this standard:

GBE page 30/31

Earth- the third planet from the Sun; the planet on which humans live

Moon phase- a stage in the changing shape that the moon seems to have when it is viewed from Earth (e.g., full, third quarter, new, first quarter)

Planet- a large body that travels in orbit around a star

Rotation- the act of spinning on an axis

Solar System- a group of objects in space that move around a central star

Star- a huge ball of glowing gas that appears as a bright point in the night sky

Covered in this standard: (Essential bolded)

GBE page 32/34

Environmental modifications (4.5)

Types of landforms (4.6)

Landform changes (4.1)

Water cycles (4.1)

Properties of soil (4.1)

Water flow (4.2/4.3/4.4)

Storm systems (4.8)

Weather (4.9)

Stream table investigations (4.2)

Weather patterns (4.7)

Science Kits: (4) Land and Water, Landforms, Weather Systems

Additional Unit Ideas: Clouds; Environments and Habitats; Eye of the Storm; Kites; Landforms and Resources; Natural Disasters; Rain; Rain Forest; Stars; Weathering and Erosion; Worms

Real life application: Gardening; Composting; Dressing appropriately for the weather; Swimming safely; Preparing for a storm; Predicting the weather; Using a rain gauge; Watching the weather on TV; Shoveling or playing in the snow; Visiting a state or national park; Traveling; Collecting gems and minerals

Science terms used in this standard:

GBE page 32/34

- Condensation-** the change of a gas or a vapor into liquid either by cooling or being exposed to greater pressure
- Deposition-** soil and rocks dropped by flowing water, moving ice, or blowing wind
- Environmental modification-** changes in the ecosystem resulting from human activities
- Erosion-** the gradual wearing away of soil and rock from Earth's surface
- Evaporation-** the change of liquid into a vapor when the liquid is below its boiling point
- Landform-** a natural feature of the Earth's surface
- Precipitation-** water that falls to Earth as rain, snow, sleet, or hail
- Storm system-** atmospheric disturbance manifested in strong winds accompanied by rain, snow, or other precipitation and often thunder and lightning
- Stream table-** a table that shows how streams flow through a watershed and how they behave when the water levels change
- Water cycle-** the constant recycling of water on Earth
- Watershed-** a region that includes a river and all its tributaries

Covered in this standard: (Essential bolded)

GBE page 35/36

- | | |
|---|--|
| <ul style="list-style-type: none"> Alterations of environment (5.2) Animal and human digestive systems (5.4) Digestive systems (5.3) Healthy digestive systems (5.2) | <ul style="list-style-type: none"> Injury prevention (5.1) Living things get energy from food (5.1) Organisms' responses to the environment (5.2) Structures and behaviors of organisms (5.1) |
|---|--|

Science Kits: (4) Structures of Life; **(5)** Ecosystems, Health and Safety, Nutrition

Additional Unit Ideas: Bacteria and Hand Washing; Digestion; Disease Prevention; First Aid; How a Virus Travels; How to Take Care of Plants; Inside the Human Body; Nutrition; What's on Your Plate

Real life application: Eating balanced meals; Understanding good nutrition; Participating in health and fitness activities; Caring for a pet; Feeding and watering plants; Protecting yourself from injury (bike helmet, knee pads); Recognizing safety signs; Reading nutritional labels; Learning first aid; Getting a flu shot or vaccination; Wearing a seat belt

Science terms used in this standard:

GBE page 35/36

Digestive system- the system that breaks down food into nutrients that can be used by the body

Ecosystem- a group of living things and the environment they live in

Energy- the capacity for activity or the exertion of power

Organism- a single form of life, such as a plant, animal, or fungus that is able to grow and reproduce

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Diversity and Continuity of Living Things

Covered in this standard: (Essential bolded)

GBE page 37

Ecosystems (5.1)

Passing traits from parents to offspring (4.1)

Non-inherited characteristics (4.2)

Vertebrates and invertebrates (5.1)

Science Kits: (4) Family Tree, Structures of Life; (5) Ecosystems

Additional Unit Ideas: Algae; All the Fish in the Sea; DNA “Breaking the Code”; Family Trees; Fish Market; Hereditary Features; Living and Non-Living Things; Ocean Animals; Vertebrates and Invertebrates; Whales

Real life application: Creating a family tree; Visiting a zoo or aquarium; Caring for a pet; Fishing and crabbing; Going to the beach; Recycling; Creating a photo album; Taking family photos

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Science terms used in this standard:

GBE page 37

Ecosystem- a group of living things and the environment they live in**Inherited-** to receive a specific body trait from one's parents**Invertebrate-** an animal without a backbone**Offspring-** the young of a living thing, especially a plant or animal**Trait-** something in the appearance, activity, or behavior of a living thing that is determined by genes**Vertebrate-**an animal with a spine or backbone**Ecology****Covered in this standard: (Essential bolded)**

GBE page 38/39

Ecosystem comparisons (5.1)**Interdependence of ecosystems (5.1)****Energy in a food chain (5.3)**

Man-made and natural changes (5.1)

Growth and reproduction of environment (5.4)

Movement of organisms from one ecosystem to another (5.2)

Habitat (5.2)**Role of organisms in an ecosystem (5.2)****Impact of population size on ecosystems (5.3)****Science Kits: (4)** Structures of Life; **(5)** Ecosystems, Food Chains and Webs**Additional Unit Ideas:** Air Quality; Animals in Ecosystems; Man-made or Not; Pollution; Taking Care of the Earth; Trash and Recycling**Real life application:** Fishing; Collecting insects; Recycling; Picking up trash and not littering; Cleaning up after yourself; Caring for and cleaning up after a pet (guinea pig cage, cat litter); Packing for a trip; Playing virtual video games (SimCity)

Science terms used in this standard:

GBE page 38/39

Consumer- a living thing, especially an animal that feeds on other living things in the food chain

Decomposer- a type of consumer that gets food by breaking down animal waste and the remains of dead plants and animals

Ecosystem- a group of living things and the environment they live in

Energy- the capacity for activity or the exertion of power

Environment- the surroundings and conditions that determine how living things grow and develop

Food chain- a grouping of living things in a community in which each member feeds on the member below it in the chain

Habitat- the area in which an animal or plant normally lives

Interdependence- a reciprocal relationship between living things

Organism- a single form of life, such as a plant, animal, or fungus that is able to grow and reproduce

Population size- the total number of people or organisms in one place or group

Producer- an animal that makes its own food

Reproduction- the process by which living things create more of their own kind

Territory- an area of land that is occupied by an animal or a group of animals

Science

6-8

43

Nature and Application of Science and Technology

6-8

Covered in this standard: (Essential bolded)

GBE page 43

Collect, record, and compare data (8.3)

Generate hypotheses (8.1)

Conduct an investigation on a hypothesis (8.2)

Integrate reading, writing, math, or technology into scientific investigations (8.6)

Explanations based on data (8.4)

Report and explain scientific procedures and data (8.5)

Science Kits: (6) Earth History, Electrical Energy, Force and Motion, My Body and Me, Simple Machines; (7) Delaware Watersheds, Diversity of Life, Genetics, Properties of Matter; (8) Ecosystems, Planetary Systems, Transformation of Energy, Weather and Climate

Additional Unit Ideas: Charts and Graphs; Collecting and Presenting Data; Collecting Weather Data; Tables; Think Like a Scientist

Real life application: Expressing an opinion; Making predictions; Communicating results of an experiment; Using a computer; Searching the internet for information; Using Excel and PowerPoint; Collecting data; Identifying personal information; Reading directions/instructions

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Science terms used in this standard:

GBE page 43

Data- information that is used to make a decision or come to a conclusion

Hypothesis- a statement that explains a set of facts and can be tested to determine if it is false or not accurate

Investigation- a detailed inquiry or systematic examination

Scientific procedure- a series of steps followed to collect data when testing a hypothesis

45

Materials and Their Properties

6-8

Covered in this standard: (Essential bolded)

GBE page 44/45

Conservation of mass (7.1)

Insulators and conductors (8.2)

Diffusion (7.5)

Insulators impact on temperature (8.3)**Effects of temperature on physical properties (8.1)****Particle arrangement (7.1)**

Functions of materials (7.1)

Properties of a solution (7.2)

Homogeneous and heterogeneous mixtures (7.1)

Rate of solubility (7.3)

Human effects on the environment (7.2)

Solubility and saturation (7.4)

Science Kits: (6) Electrical Energy; **(7)** Properties of Matter; **(8)** Transformation of Energy, Weather and Climate

Additional Unit Ideas: Atoms; Food Safety; Freezing Points; Good and Poor Conductors; Mixing Liquids; Solar Power; Solutions; The Effects of Temperature on Solids; The Matter Around Me; Types of Interactions and Reactions; Waste Not, Want Not

Real life application: Selecting appropriate attire; Cooking and baking; Using a microwave and oven safely; Safely using household chemicals/cleaning solutions; Creating a chart or graph; Disposing of expired food; Being green; Making drink mixes; Packing your lunch in an insulated bag; Refrigerating cold foods; Using a cooler or thermal mug

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Science terms used in this standard:

GBE page 44/45

Conductor- a material that an electric current can pass through easily

Conservation of mass- the notion that matter can be neither created nor destroyed

Diffusion- the spreading out of atoms or molecules of one substance among those of another

Heterogeneous mixture- a mixture made of different components

High concentration- a high amount of one substance dissolved in another

Homogenous mixture- a type of mixture in which the composition is uniform and every part of the solution has the same properties

Insulator- a material that a current cannot pass through easily

Low concentration- a low amount of one substance dissolved in another

Mass- the amount of matter contained in an object

Particle- a tiny bit of matter, such as a molecule or atom, or a subatomic particle

Physical properties- properties that can be observed or measured without changing an object

Rate- a quantity measured to another quantity, usually a period of time

Saturation- to soak thoroughly or dissolve the greatest possible amount of a substance in a solution

Soluble- able to be dissolved

Solution- a mixture in which the particles of different kinds of matter are mixed evenly with each other and particles do not settle out

Solvent- a substance that can dissolve other substances

Covered in this standard: (Essential bolded)

GBE page 46/51

Absorption of electromagnetic waves (8.7)

Heat energy and sound energy (8.11)

Alternative energy (8.1)

High and low frequencies (8.7)

Amplitude and frequency (8.6)

Kinetic energy (8.2)

Conduction and convection (8.9)

Light energy (8.5/8.6)

Conductors of heat (8.8)

Mechanical energy (8.4)

Earth's absorption of energy (8.10)

Mechanical energy of an object (8.6)

Electromagnetic wavelengths (8.13)

Mechanical energy of sounds (8.9)

Energy flow (8.4)

Mechanical waves (8.5)

Energy of the Sun (8.12)

Particle expansion (8.11)

Energy transfer and motion (8.3)

Pitch and loudness (8.10)

Energy transfer and transformation (8.2)

Properties of light (8.8/8.9)

Energy transformation (8.1)

Temperature's relationship to particle motion (8.8)

Force of gravity (8.1)

Transfer of energy (8.2/8.4)

Gravitational potential energy (8.3)

Transfer of heat energy (8.11)

Heat energy (8.7/8.12)

UV and IR waves (8.14)

Covered in this standard: (continued)

GBE page 46/51

Science Kits: (6) Electrical Energy, Force and Motion, Simple Machines; (7) Delaware Watersheds, Properties of Matter; (8) Transformation of Energy

Additional Unit Ideas: Alternate Energy Sources; Center of Gravity; Earthquakes and Tsunamis; Electricity; Gravity; Gravity and Motion; Lightning; Major Sources of Energy; Sound Waves; Keeping the Environment Clean; Race Cars; Speed and Distance; Sun; Wave Types and Patterns

Real life application: Safely using electrical devices; Using a microwave and oven safely; Following safety procedures for lifting/moving an item; Using sunscreen and sunglasses; Pushing a shopping cart; Following a diagram; Using a thermometer; Charging hand-held electronics or video game systems; Playing sports; Racing remote control cars; Bowling; Doing the wave at an event; Surfing or boogie boarding; Skiing, sledding or snow boarding; Taking your temperature; Playing baseball; Golfing; Visiting a space museum

Science terms used in this standard:

GBE page 46/51

Absorption- the process in which one substance or living thing takes in or soaks up another

Amplitude- the strength or distance from the highest point to the lowest point of a vibrating wave

Conduction- the movement of energy through a substance

Convection- the movement of heat from one place to another in a liquid or gas by the movement of molecules

Electromagnetic waves- waves of electrical and magnetic force created by the vibration of electrons

Energy- the capacity for activity or the exertion of power

Force- something that causes an object to move, change its shape, or change its speed or direction if it is moving (gravity, weight, and friction)

Frequency- the number of complete cycles per second of sound, radio, or light waves

Gravitational force- the force of attraction between all masses in the universe

Gravitational potential energy- the energy of position that depends on the object's mass and height above the ground

Gravity- an invisible force that pulls all objects toward each other

Heat energy- energy that flows from one place to another as a result of the difference in temperature

Kinetic energy- the energy that an object has as a result of being in motion

Light energy- a form of energy emitted by luminous objects like the Sun; it travels as waves in straight lines away from its source

Mass- the amount of matter contained in an object

Mechanical energy- the energy stored in an object that is either moving or can move

Motion- the act of changing position or place

Pitch- the level of a sound's perceived highness or lowness; the pitch depends on the frequency of vibration of the sound waves

Science terms used in this standard: (continued)

Sound energy- a type of energy that travels as waves and can be detected by the ears

Sound waves- the vibrations that carry sound through the air and some solids and liquids

Transfer of energy- occurs when energy is passed from one object to another

Transformation of energy- occurs when energy changes from one form to another

Ultraviolet- electromagnetic radiation that has wavelengths shorter than those of visible light, but longer than those of X-rays

Covered in this standard: (Essential bolded)

GBE page 52/53

Components of the Solar System (8.1)

Earth is round (8.1)

Everyday applications of scientific technology (8.2)

Force of gravity (8.5)

Length of daylight (8.2)

Light energy results in seasons (8.4)**Motion of objects in the Solar System (8.3)****Patterns of the Moon (8.3)**

Physical properties of planets (8.2)

Positional relationship between the Sun, Earth, Moon (8.4)

Technology and scientific knowledge (8.1)

Tides (8.5)

Science Kits: (6) Force and Motion; (8) Gravity, Planetary Systems, Weather and Climate

Additional Unit Ideas: Center of Gravity; Earth's Journey Around the Sun; Finding Balances; NASA; Phases of the Moon; Reasons for the Seasons; Rockets; Scientific Technology; Sir Isaac Newton; Solar System; Storm Systems; Sun's Path; Telling Time by the Moon; Tides and Lunar Cycles; Working on the Moon

Real life application: Star gazing; Telling time; Playing sports; Throwing a ball; Using a calendar; Using a globe; Building a model of the Solar System; Participating in water activities (fishing, swimming, boating) during high or low tide; Viewing an eclipse safely; Visiting a space museum or planetarium; Riding on a roller coaster

Science terms used in this standard:

GBE page 52/53

Earth- the third planet from the Sun; the planet on which humans live

Force- something that causes an object to move, change its shape, change its speed or direction if it is moving (gravity, weight, and friction)

Gravity- an invisible force that pulls all objects toward each other

Light energy- a form of energy emitted by luminous objects like the Sun; it travels as waves in straight lines away from its source

Moon phase- a stage in the changing shape that the Moon seems to have when it is viewed from Earth (e.g., full, third quarter, new, first quarter)

Orbit- the path of one heavenly body around another

Physical properties- properties that can be observed or measured without changing an object

Planet- a large body that travels in orbit around a star

Solar System- a group of objects in space that move around a central star

Tide- the regular rise and fall of ocean water caused by the pull of the Moon and Sun’s gravity

Earth’s Dynamic Systems

Covered in this standard: (Essential bolded)

GBE page 54/57

Characteristics of storm systems (8.8)

States of water (7.2)

Cloud characteristics (8.11)

Storm system characteristics and heat transfer (8.7)

Cloud formation (8.10)

Sun energy and water cycles (8.4)

Earth’s components and weather patterns (8.2)

Types of water (7.1)

Erosion processes (6.2)

Water circulation (7.1)

Heat transfer in the ocean (8.5)

Watersheds and land elevation (7.1)

Impact of human activity on watersheds (7.4)

Weather (8.1)

Isobars and wind (8.1)

Weather and climate (8.6)

Measuring weather properties (8.2)

Weather maps (8.3)

Origin of storm formation (8.9)

Weather patterns (8.5)

Satellite imagery and weather patterns (8.4)

Science Kits: (6) Earth History; (7) Delaware Watersheds; (8) Weather and Climate

Additional Unit Ideas: Clouds; Healthy Ecosystems; Hurricanes; Satellite Imagery; Storm Chasing; Tornados and Earthquakes; Wind

Real life application: Preparing for a storm; Creating an emergency kit; Gardening; Using a rain gauge; Predicting weather; Watching the weather on TV; Skiing or sledding; Making/using ice; Observing a wind chime; Visiting a water park; Drinking filtered water

Science terms used in this standard:

GBE page 54/57

Atmosphere- the air that surrounds Earth and other planets

Circulation- movement in a circle or cycle

Climate- the usual weather in a certain area over many years

Cloud formation- the process by which various types of clouds are formed (e.g., cirrus, cumulus, nimbostratus, stratus)

Condensation- the change of a gas or a vapor into liquid, either by cooling or being exposed to greater pressure

Dew point- the temperature at which the moisture in the air begins to condense into fog, clouds, frost, or dew

Erosion- the gradual wearing away of soil and rock from Earth's surface

Evaporation- the change of liquid into a vapor when the liquid is below its boiling point

Heat transfer- the movement of heat from one place to another

High pressure- an area where the atmospheric pressure is higher than the area surrounding it; usually associated with clear, cool weather

Isobar- a line on a weather bar that connects places with the same atmospheric pressure

Land elevation- the height of a point on the Earth's surface above sea level

Low pressure- an area where the atmospheric pressure is lower than the area surrounding it; usually associated with heavy precipitation and overcast conditions

Meteorological map- a map or chart depicting the meteorological conditions over a specific geographic area at a specific time

Particle- a tiny bit of matter, such as a molecule or atom, or a subatomic particle

Precipitation- water that falls to Earth as rain, snow, sleet, or hail

States of water- solid, liquid, or gas

Science terms used in this standard: (continued)

GBE page 54/57

Station model- a symbolic illustration showing the weather occurring at a given reporting station

Storm system- atmospheric disturbance manifested in strong winds accompanied by rain, snow, or other precipitation and often thunder and lightning

Topographic map- a map that shows the surface features of an area, including mountains, rivers, roads, and cities

Watershed- a region that includes a river and all its tributaries

Life Processes**6-8****Covered in this standard: (Essential bolded)**

GBE page 58/59

Cells and organisms (7.3)

Maintenance of a stable internal environment (8.1)

Cell types (7.5)**Multi-cellular organisms (7.4)****Effects of diet and exercise (6.2)****Plants use energy to make food (7.1)****Food provides energy to organisms (7.2)****Regulatory and behavioral responses of organisms (8.2)****Kingdoms (7.2)**

Technology improves understanding of cells (7.6)

Living versus nonliving (7.1)**Science Kits: (6)** My Body and Me; **(7)** Diversity of Life; **(8)** Ecosystems**Additional Unit Ideas:** Benefits of Exercise; Cells and Microscopes; Digestive System; Diversity of Plants; Food Plate; Heart and Circulatory System; Living or Not; Mold; Nerves in You; Nutrition; Staying Healthy; Structure and Function of Cells; You and Your Body**Real life application:** Keeping a food diary; Selecting balanced meals/good nutrition; Understanding the difference between wants and needs; Exercising; Following safety procedures; Feeding and watering plants; Gardening; Taking medicine; Using a microscope or magnifying glass; Going to the doctor

Science terms used in this standard:

GBE page 57/59

Behavioral response- the actions of a person or animal in response to external or internal stimuli

Body system- a group of organs with coordinated activities, achieving the same general function in the body

Cell- the smallest unit of a living thing that can grow, reproduce, and die

Cell types- there are two main types of cells: prokaryotic and eukaryotic; they differ in their appearance, structure, reproduction, and metabolism

External stimuli- something environmental that causes an automatic response in a body part or living thing

Internal environment- the conditions that prevail within the body of an organism

Internal stimuli- a stimulus that comes from within the body

Kingdoms- the largest group in the biological classification system

Multi-cellular- made of many cells

Organism- a single form of life, such as a plant, animal, or fungus that is able to grow and reproduce

Organ- a part of a living thing that has a particular function

Photosynthesis- the process by which plant cells use energy from the Sun to make food for plant growth

Regulatory response- temporary behavioral and physiological adaptations an organism makes in response to the environment

Stable environment- an environment where conditions are generally constant

Unstable environment- an environment where conditions change

Diversity and Continuity of Living Things

Covered in this standard: (Essential bolded)

GBE page 60/62

Acquired traits (8.1)

Physical adaptations (8.4)

Competition for basic needs (8.6)

Punnett squares and dominant and recessive genes (7.9)

Extinction (8.3)

Selective breeding (7.1)

Genetic disorders in families (7.2)

Short versus long term physiological changes (8.5)

Genetics (7.6)

Species classifications (8.7)

Offspring's life span (8.1/8.2)

Traits influence on survival (8.2)

Science Kits: (6) My Body and Me; (7) Diversity of Life, Genetics; (8) Ecosystems

Additional Unit Ideas: Animal Breeding; Cell Division; Chromosomes; Diseases; DNA; Endangered Species; Extinction; Genealogy; Mapping Species; Patterns of Heredity

Real life application: Providing family medical history; Taking medicine; Administering first aid; Caring for a pet; Watching a dog show; Creating a family tree; Visiting a zoo or aquarium; Visiting a natural history museum; Fishing; Picking strawberries or blueberries

Science terms used in this standard:

GBE page 60/62

- Asexual reproduction-** reproduction in which an offspring develops from only one parent, without the joining together of sex cells
- Biological adaptation-** a change in the body of a species over many generations, making it better able to survive in its environment
- Chromosome-** a tiny threadlike structure found in the cells of all living things; they consist largely of strands of DNA
- DNA (Deoxyribonucleic Acid)-** the material that makes up genes and is found in all cells
- Dominant gene-** the one trait of a pair of inherited traits that appears in an animal or plant
- Extinction-** the dying out or disappearance of a plant or animal species
- Gene-** the part of a chromosome that determines one or more characteristics or group of characteristics that living things inherit from their parents
- Genetic disorder-** a condition caused by abnormalities in genes or chromosomes
- Genetics-** the scientific study of how traits are passed from parent to offspring
- Long term physiological change-** biological adaptations that make a species better able to survive its environment such as white coloration of polar bears and seed formation in plants
- Offspring-** the young of a living thing, especially a plant or animal
- Pedigree chart-** a chart of an individual's ancestors that shows the occurrence or appearance of a particular gene
- Physical adaptation-** a visible change in the body of a species over many generations, making it better able to survive in its environment such as protective camouflage, long neck for food gathering, and muscular legs for running
- Punnett Square-** a diagram that is used to predict an outcome of a particular cross or breeding experiment
- Recessive gene-** masked or not expressed in the offspring of a plant or animal
- Selective breeding-** the process of breeding plants and animals for particular traits

Science terms used in this standard: (continued)

GBE page 60/62

- Sexual reproduction-** the union of a female egg and a male sperm to produce an offspring
- Short term physiological change-** a temporary change in an organism such as skin tanning, muscle development, and formation of callouses
- Species-** one of the major groups in the classification of living things; members of a species are able to mate and produce offspring that are also able to mate and produce offspring
- Trait-** something in the appearance, activity, or behavior of a living thing that is determined by genes

Ecology**6-8****Covered in this standard: (Essential bolded)**

GBE page 63/64

Charting changing populations (8.4)

Diversity of ecosystems (8.1)

Ecological succession (8.7)

Food webs (8.1/8.2)**Human population and ecosystems (8.1)****Invasive species (8.2)**

Organisms in ecosystems (8.3)

Population growth and resources (8.5)

Role of organisms in an ecosystem (8.2)

Short versus long-term physiological changes (8.6)

Science Kits: **(6)** My Body and Me; **(7)** Delaware Watersheds, Diversity of Life; **(8)** Ecosystems, Planetary Systems, Transformation of Energy, Weather and Climate

Additional Unit Ideas: Food Plates; Insects; Life in the Food Chain; Mice; Necessities—Things We Can't Live Without

Real life application: Controlling home pests (stink bugs, mice); Fishing; Recycling; Visiting a wildlife preserve; Being green; Gardening and planting; Camping; Using bug repellent; Caring for insect bites

Science terms used in this standard:

GBE page 63/64

Consumer- a living thing, especially an animal, that feeds on other living things in the food chain

Diversity- the number and variety of species present in an area and their spatial distribution

Ecological succession- the gradual process of change in an ecosystem until it stabilizes

Ecosystem- a group of living things and the environment they live in

Food web- a group of food chains that are connected to each other in various ways within an ecosystem

Invasive species- organisms that are introduced into foreign ecosystems

Long term physiological change- biological adaptations that make a species better able to survive its environment such as white coloration of polar bears and seed formation in plants

Population growth- increases in the number of species inhabiting an ecosystem

Producer- an animal that makes its own food

Resources- the materials and energy that make life on Earth possible

Short term physiological change- a temporary change in an organism such as skin tanning, muscle development, and formation of callouses

Species- one of the major groups in the classification of living things; members of a species are able to mate and produce offspring that are also able to mate and produce offspring

Science

HS

67

Nature and Application of Science and Technology

HS

Covered in this standard: (Essential bolded)

GBE page 67

Collect, record, and compare data (10.3)

Generating hypotheses (10.1)

Conduct a scientific investigation (10.2)

Integrate reading, writing, math, or technology into scientific investigations (10.6)

Defending results of scientific investigations (10.5)

Scientific explanations based on evidence (10.4)

Science Kits: **(9)** Chemistry, Earth Systems, Energy; **(10)** Biology, Genetics and Biotechnology, Nature of Science and Evolution; **(11)** Chemistry, Physics; **(12)** Ecology

Additional Unit Ideas: Charts, Graphs and Tables; Collecting and Presenting Data; Collecting Weather Data

Real life application: Expressing an opinion; Making predictions; Communicating results of an experiment; Using a computer; Searching the internet for information; Using Excel and PowerPoint; Collecting and displaying data; Identifying personal information; Reading directions/instructions; Following a recipe; Charting your work hours; Keeping a fitness journal

68

Science terms used in this standard:

GBE page 67

Control- a part of a scientific experiment that stays the same while other parts are allowed to change

Data- information that is used to make a decision or come to a conclusion

Evidence- information used to prove or disprove something

Hypothesis- a statement that explains a set of facts and can be tested to determine if it is false or not accurate

Investigation- a detailed inquiry or systematic examination

Variable- a part of a scientific experiment that is allowed to change in order to test a hypothesis

Materials and Their Properties

Covered in this standard: (Essential bolded)

GBE page 68/72

Atoms and ions (9.12)

Balanced equations (9.2)

Changes in chemical composition create a new substance (9.1)

Chemical properties of manufactured goods (9.1)

Component properties and separation (9.3)

Conductivity based on the Periodic Table (9.14)

Conductivity of electricity in liquids (9.5)

Conservation of mass (9.1)

Conservation of matter (9.15)

Diffusion (9.4)

Elements and compounds (9.4)

Elements, compounds, and mixtures (9.5)

Isotopes (9.6)

Kinetic molecular theory (9.18)

Mixtures and pure substances (9.3)

Molecular and ionic compounds (9.17)

Parts of an atom (9.1)

Periodic Table (9.7)

pH of a solution (9.6)

Properties of elements (9.8)

Properties of elements and location on the Periodic Table (9.9)

Properties of metals (9.13)

Properties of water (9.19)

Separation of mixtures (9.1)

Solubility (9.7)

States of water (9.16)

Structure of an atom (9.2)

Water's polarity and solubility in substances (9.2)

Science Kits: (9) Chemistry, Energy, Mixtures and Solutions, Periodic Table, The Atomic Model

Additional Unit Ideas: Acids and Bases; Atoms and Ions; Chemical Reactions; Chemistry of Water; Elements; Liquid Measurement; Molecules; Particle Model; States of Matter

Real life application: Storing food safely (cooking temperature, expiration date, refrigeration); Cooking and baking; Boiling water; Making and using ice cubes; Safely using household chemicals/cleaning solutions; Using a microwave and oven safely; Following safety procedures (home, school); Caring for a fish tank or aquarium (pH)

Acid- a chemical compound that tastes sour and has a tendency to eat away at other substances

Adhesion- a force that holds two surfaces or different substances together

Atom- the smallest part of a chemical element that has all the properties of that element

Atomic number- the number of protons in the nucleus of an atom

Base- a chemical compound that tastes bitter and feels slippery when mixed with water

Boiling point- the temperature at which a heated liquid bubbles and changes into a gas or vapor

Chemical equation- a representation of a chemical reaction using symbols of the elements to indicate the amount of each substance

Chemical indicator- a substance that changes color to indicate the presence of an ion or substance

Chemical properties- any characteristic that gives a substance the ability to undergo a change that results in a new substance

Chemical reaction- a change in the arrangement of atoms or molecules of two or more substances that come into contact with each other

Component- a part or element of a larger whole

Compound- a substance made of atoms of two or more elements that are combined into molecules

Conductor- a material that an electric current can pass through easily

Conservation of matter- the notion that matter can be neither created nor destroyed

Density- a measure of how much matter there is in a certain amount of space

Diffusion- the spreading out of atoms or molecules of one substance among those of another

Electron- the particle in an atom that has a negative electrical charge and revolves around the nucleus

Element- a substance that contains only one type of atom and can not be broken down into simpler substances

Science terms used in this standard: (continued)

GBE page 68/72

Ion- an atom or group of atoms that has an electrical charge

Isotope- an atom that has a different atomic weight from other atoms of the same element

Kinetic molecular theory- the theory that all matter is made up of a large number of small particles, all of which are in constant random motion

Linear- arranged in or extending along a straight or nearly straight line

Luster- the shine or light reflecting from the surface of a mineral

Malleable- capable of being shaped or formed, especially by pressure or hammering

Mass number- the total number of protons and neutrons in the nucleus of an atom

Metalloid- an element that has some characteristics of metals and some of non-metals

Mixture- a combination of two or more pure substances that are not chemically combined

Negative charge- the electrical charge on a substance that has more electrons than normal

Neutron- a subatomic particle found within the nucleus of an atom that carries no electrical charge

Non-linear- not arranged in or extending along a straight or nearly straight line

Particle- a tiny bit of matter, such as a molecule or atom, or a subatomic particle

Periodic Table- a table that arranges all of the chemical elements in rows called periods and columns called groups

pH scale- a measure of the strength of an acid

Physical change- a change of matter from one form to another without becoming a new substance

Physical properties- properties that can be observed or measured without changing an object

Polarity- tendency of a molecule or compound to be attracted to or repelled by electrical charges

Science terms used in this standard: (continued)

GBE page 68/72

Positive charge- the electrical charge on a substance that has fewer electrons than normal

Proton- a subatomic particle with a positive electrical charge

Pure substance- a substance that has a definite composition and can not be broken down

Solubility- a measure of the amount of a material that will dissolve in another material

Solubility curve- a graph showing the relationship between solubility and temperature

Solute- a substance that dissolves in another substance to make a solution

Solution- a mixture in which the particles of different kinds of matter are mixed evenly with each other and particles do not settle out

Solvent- a substance that can dissolve other substances

Water properties- solid, liquid, or gas

Energy and Its Effects**HS****Covered in this standard: (Essential bolded)**

GBE page 73/78

Behavior of electromagnetic waves (9.7)

Chemical energy (9.8)

Elasticity (9.10)

Electromagnetic energy and electromagnetic waves (9.1)

Electromagnetic waves (9.2)**Energy efficiency in vehicles (9.1)**

Energy flow and transformation (9.3)

Energy transfer (9.12)**Energy transfer of mechanical waves (9.3)**

Energy transformation (9.11)

Forms of energy (9.12)**Friction and air resistance (9.10)****Gravity (9.5/9.6)****Heat energy (9.7)****Law of Conservation of Energy (9.1)****Mass and weight (9.9)**

Mechanical waves (9.4)

Motion of molecules (9.2)**Potential energy (9.4/9.5)****Power and work (9.15)****Reflection, transmission, and absorption of electromagnetic waves (9.5)****Selective absorption (9.9)**

Selective absorption of electromagnetic waves (9.8)

Selective absorption of mechanical waves (9.4)

Structure of an atom (9.16)

The impact of mass and speed on kinetic energy (9.3)**Transfer and transformation of energy (9.2)**

Transfer of electromagnetic waves (9.1)

Transfer of energy (9.11)

Wave behavior (9.6)

Science Kits: (9) Alternative Energy, Chemistry, Energy, Force and Energy, Gravity

Additional Unit Ideas: Fuel Efficiency; Hybrid Cars; Movement of Energy; Race Cars; Roller Coasters; Solar Energy; Speed and Momentum; Wave Types; Wind Turbines; Work, Power, and Machines

Real life application: Safely using electrical devices; Using a microwave and oven safely; Following safety procedures for lifting/moving an item; Protecting against UVA & UVB rays; Using sunscreen (SPF); Following a diagram; Using a thermometer; Charging hand-held electronics; Playing sports; Exercising; Practicing energy conservation; Skateboarding; Surfing and boogie boarding; Visiting an amusement park; Watching a car race; Operating a motorized tool (lawn mower); Participating in driver's education

Absorption- the process in which one substance or living thing takes in or soaks up another

Air resistance- the force that pushes back at something when in motion

Atom- the smallest part of a chemical element that has all the properties of that element

Chemical energy- energy in a substance that can be released by a chemical reaction

Disorganized energy- energy of motion in which particles are moving quickly and away from each other

Elasticity- the ability of a solid to return to its original size and shape after being squeezed, stretched, or bent

Electrical charge- a charge that can be positive, negative, or neutral in an atom

Electromagnetic waves- waves of electrical and magnetic force created by the vibration of electrons

Electron- a subatomic particle within an atom that carries a negative electrical charge

Energy chain- the sequence of events that lead one form of energy to change into another

Gravitational force- the force of attraction between all masses in the universe

Gravity- an invisible force that pulls all objects toward each other

Heat energy- energy that flows from one place to another as a result of the difference in temperature

Kinetic energy- the energy that an object has as a result of being in motion

Law of Conservation of Energy- a law in physics that states that energy can neither be created nor destroyed, just changed from one form to another

Mass- the amount of matter contained in an object

Mechanical wave- a wave that requires a medium to transport energy from one place to another (e.g., sound waves)

Molecule- a group of two or more atoms that are joined together by sharing electrons in a chemical bond

Science terms used in this standard: (continued)

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Molecule motion- the energy associated with the movement of molecules

Neutron- a subatomic particle found within the nucleus of an atom that carries no electrical charge

Organized energy- stored energy that has the capacity to become something else, currently in a dormant state

Physical system- an interconnection of physical components that perform a specific function

Potential energy- the energy that an object has stored up because of its position or condition

Power- the rate of doing work; measured in watts

Proton- a subatomic particle that has a positive electrical charge

Random kinetic energy- the movement of molecules that produces heat

Reflection- the change in direction of a wave bouncing off a surface

Selective absorption- the ability of materials to absorb some frequencies of electromagnetic waves but reflect others to allow them to transmit through material

Speed- a measure of how far something moves during a period of time

Transfer of energy- occurs when energy is passed from one object to another

Transformation of energy- occurs when energy changes from one form to another

Transmission- the sending of signals in the form of waves or impulses

Wave behavior- the way a wave behaves when it strikes a substance (e.g., reflection, refraction, diffraction)

Wavelength- the distance between the crests or peaks of a wave

Weight- the pull of gravity on an object

Covered in this standard: (Essential bolded)

GBE page 79

Earth's elements (9.2)

Science Kits: (9) Earth Systems

Additional Unit Ideas: Elements; Rock Cycle; Types of Rocks

Real life application: Rock collecting; Rock climbing; Visiting a state or national park

Science terms used in this standard:

GBE page 79

Layers of the Earth- the interior structure of the Earth that is made up of four layers (crust, mantle, outer core, inner core)

Covered in this standard: (Essential bolded)

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Characteristics of rocks (9.3)

Continental and oceanic rocks (9.7)

Earthquake consequences (9.5)

Earthquake energy and origins (9.4)

Earthquake energy and waves (9.3)

Earth's elements (9.2)

Igneous rocks (9.5)

Magma and volcanic characteristics (9.1)

Mineral properties (9.1)

Plate tectonics (9.6)

Scientific theory (9.9)

Sedimentary rocks (9.6)

Technology and earthquakes (9.3)

Thermal convection (9.7)

Volcanic characteristics (9.2)

Science Kits: (9) Earth Systems, Energy, Force and Motion, Natural Disasters

Additional Unit Ideas: Earthquakes and Tsunamis; Emergency Preparedness; Ocean Exploration; Periodic Table; Rocks and Minerals; Volcanos; Wonders of the World

Real life application: Emergency preparedness planning; Rock/gem collecting; Visiting a state or national park; Using a map; Rock climbing; Hiking

Science terms used in this standard:

GBE page 80/82

- Chemical properties-** any characteristic that gives a substance the ability to undergo a change that results in a new substance
- Earthquake-** a sudden movement or shift in the parts of the Earth's crust that usually occurs along a fault
- Earth's elements-** elements that make up the Earth's crust (e.g., oxygen, silicon, iron)
- Epicenter-** the point on the surface of the Earth directly above the center of an earthquake
- Igneous-** a rock that is formed by the cooling and hardening of magma or lava
- Magma-** the hot, liquid rock that is formed under the Earth's crust
- Metamorphic-** a rock formed from an older rock that has been changed because of heat or pressure in the Earth's crust
- Mineral-** one of many different solid chemical compounds found in rocks and soil (quartz, fluorite, calcite, gypsum)
- Periodic Table-** a table that arranges all of the chemical elements in rows called periods and columns called groups
- Physical properties-** properties that can be observed or measured without changing an object
- Plate tectonics-** a theory in geology that states that the Earth's crust is divided into a number of large, plate-like sections that move very slowly over the inner part of the Earth
- Sedimentary-** a type of rock that is formed when sediments are collected in one place by the action of water, wind, glaciers, or other forces, and are then pressed together
- Seismogram-** a record that is produced by a seismograph
- Seismograph-** an instrument that detects and records vibrations and movements in the Earth during an earthquake
- Theory-** a tested set of statements that explain how something works in the natural world
- Thermal convection-** the movement of heat from one place to another in a liquid or gas by the movement of molecules
- Volcano-** an opening in the Earth's surface through which lava, gases, ash, and rocks pour out

Covered in this standard: (Essential bolded)

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|--|---|
| <ul style="list-style-type: none"> Active and passive transport of molecules (10.7) Antibiotics (10.3) Biotechnology (10.1) Cells (10.9) Cell structure determines function (10.1) Communication of nerve cells (10.1) Compounds & elements found in food (10.2) Dehydration synthesis and hydrolysis (10.7) Digestion (10.5) Drugs and neurotransmission (10.2) Energy from food (10.13) Environmental factors and cellular functions (10.4) Enzymes (10.16) Factors of enzyme activity (10.17) Food energy as calories (10.12) | <ul style="list-style-type: none"> Functions of single and multi-cellular organisms (10.3) Immune system (10.3) Internal and external environment of the human body (10.10) Multi-cellular organisms (10.11) Osmosis (10.5) Photosynthesis (10.8/10.11) Photosynthesis and cellular respiration (10.9) Plasma membrane (10.4) Process used by autotrophs (10.6) Prokaryotic cells and eukaryotic cells (10.2) Stability within the body (10.2) Structure of the cell membrane (10.8) Synthesis reaction and decomposition (10.14) Unicellular organisms/chemical digestion (10.4) |
|--|---|

Science Kits: (9) Chemistry, Energy; (10) Biology, Cells, Genetics and Biotechnology, Health and Wellness

Additional Unit Ideas: Antibiotics; Benefits of Exercise; Blood Types; Body's Defenses; Digestive system; Diversity of Plants; Food Plate; Nutrition; Staying Healthy; Structure and Function of Cells; Understanding Photosynthesis; Viruses and Diseases

Real life application: Giving blood; Obtaining and taking prescription medication; Understanding the difference between prescription and over-the-counter medication; Creating and following a nutrition and exercise plan; Taking vitamins; Following safety procedures; Feeding and watering plants; Protecting yourself against viruses/disease; Practicing good hygiene; Understanding life insurance; Keeping a food diary to track calories

Active transport- movement of molecules across the cell membranes by a carrier protein that requires energy input

Antibiotic- a drug used to treat or prevent a disease that is caused by bacteria

ATP (Adenosine Triphosphate)- the energy storage molecule that fuels cellular processes

Autotroph- living organisms that make their own food and organic materials

Biotechnology- the use of microorganisms or biological substances to perform specific industrial or manufacturing processes

Calorie- a unit used to measure the amount of energy released by food as it is digested in the body

Cell- the smallest unit of a living thing that can grow, reproduce, and die

Cell membrane- the thin membrane that encloses the contents of a cell; nutrients and waste move into and out of the cell through the cell membrane

Cellular respiration- the aerobic breakdown of glucose that results in the production of ATP

Chemical digestion- the breakdown of food in the mouth, stomach, and intestines through the use of acids and enzymes

Chemical reaction- a change in the arrangement of the atoms or molecules of two or more substances that come into contact with each other

Decomposition reaction- separation of a substance into two or more substances that may differ from each other and from the original substance

Dehydration synthesis- the process by which water is removed from sugar molecules

Diffusion rate- the number of randomly moving molecules that pass through a unit area per second; diffusion rates increase with temperature, and decrease with increasing pressure, molecular weight, and size

Element- a substance that contains only one type of atom and can not be broken down into simpler substances

Enzyme- a molecule that helps start or speed up chemical reactions

Science terms used in this standard: (continued)

GBE page 83/87

- Eukaryote**- a member of a large group of living things that are made up of one or more cells, each having a cell nucleus
- Feedback mechanism**- a mechanism that regulates the action of something else; can be either positive or negative
- Homeostasis**- a state of stability within a living organism achieved by adjusting to changes in the outside environment
- Hydrolysis**- a chemical reaction in which water changes certain substances into other substances
- Immune system**- parts of the body that act together to protect the body against infection or disease
- Internal environment**- the conditions that prevail within the body of an organism
- Molecule**- a group of two or more atoms that are joined together by sharing electrons in a chemical bond
- Multi-cellular**- made of many cells
- Nerve cell**- a cell of the nervous system also called a neuron
- Neurotransmission**- the process of communication between nerve cells
- Osmosis**- the movement of a liquid from a less concentrated solution through a membrane into a more concentrated solution
- Passive transport**- the movement of a substance across a cell membrane without the expenditure of energy
- Periodic Table**- a table that arranges all of the chemical elements in rows called periods and columns called groups
- Photosynthesis**- the process by which plant cells use energy from the Sun to make food for plant growth
- Plasma membrane**- a thin membrane that controls the passage of ions in and out of a cell
- Prokaryote**- a member of a kingdom of living things that are made up of a single cell without a cell nucleus (e.g., bacteria)
- Reactant**- a chemical element or a chemical compound that takes part in a chemical reaction, especially one that is present at the start of the reaction
- Schematic diagram**- a diagram that represents the elements of a system using abstract, graphic symbols
- Synthesis**- the formation of a chemical compound by combining elements or simpler compounds

Diversity and Continuity of Living Things

Covered in this standard: (Essential bolded)

GBE page 88/92

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| Antibiotic resistance (10.13) | Geographical isolation (10.9) |
| Bacterial transformation (10.4) | Growth and development of cells (10.17) |
| Cell cycle growth and repair (10.14) | Homogeneous and heterogeneous populations (10.11) |
| DNA and amino acids (10.5) | Impact of environmental factors on development (10.18) |
| DNA evidence and ancestry (10.1) | Invasive species (10.14) |
| DNA mutation (10.10) | Karyotypes (10.7) |
| DNA replication (10.4) | Life cycle of cells (10.13) |
| Environmental disruptions impact on evolution (10.10) | Natural selection (10.7) |
| Environmental factors and genetic mutation (10.9) | Punnett squares and trait probability (10.6) |
| Evidence of common ancestry (10.3) | Similar traits within species (10.12) |
| Evolution (10.5/10.6) | Somatic cell mutation (10.12) |
| Gene mutation (10.11) | Species survival (10.2) |
| Genes and traits (10.2) | Species survival and reproductive advantage (10.1) |
| Genetic engineering technology (10.3) | Survival and reproductive success (10.8) |
| Genetic modification (10.2) | Transcription and translation of DNA (10.3) |
| Genetics (10.1) | Uses of DNA in identification and medicine (10.5) |

Science Kits: (10) Biology, Genetics and Biotechnology, Health and Wellness, Nature of Science and Evolution

Additional Unit Ideas: Adaptations; Ancestry; Animal Breeding; Cell Life Cycle; DNA; Evolution and Natural Selection; Genealogy

Real life application: Administering first aid; Taking prescription medications; Practicing good hygiene; Visiting a zoo or aquarium; Caring for a pet; Visiting a natural history museum; Emergency preparedness planning; Providing personal information (hair/eye color); Understanding medical terms (cancer, virus, diabetes); Providing medical history to doctor; Watching a dog show

Abnormal karyotype- a variation from the normal set of chromosomes characteristic of a species that are not presented in a systemic arrangement

Amino acid- the organic acids that form the proteins in living beings; made up mostly of carbon, oxygen, hydrogen, and nitrogen

Antibiotic resistance- a type of drug resistance where a microorganism is able to survive exposure to an antibiotic

Bacterial transformation- the genetic alteration of a bacterial cell by the introduction of DNA from another cell or from a virus

Chromosome- a tiny threadlike structure found in the cells of all living things; they consist largely of strands of DNA

DNA (Deoxyribonucleic Acid)- the material that makes up genes and that is in all cells

DNA sequencing- any process used to map out the sequence of nucleotides in a strand of DNA

DNA synthesis- the natural or artificial creation of DNA molecules

DNA transcription- the process by which the information in a strand of DNA is copied into a new molecule of messenger RNA (mRNA)

DNA translation- the conversion of an mRNA sequence into a chain of amino acids that form a protein

Dominant trait- the one trait of a pair of inherited traits that appears in a living thing

Gamete cell- a male or female sex cell

Gene- the part of a chromosome that determines one or more characteristics or group of characteristics that living things inherit from their parents

Genetic code- the arrangement of molecules that determines the type and action of each cell in the body

Genetic engineering- the science of changing the genes in the cells of a living thing

Genetic modification- any alteration of genetic material of an organism by means that could not occur naturally

Heritability- capable of being passed down from parent to offspring

Science terms used in this standard: (continued)

GBE page 89/92

Heterogeneous- consisting of dissimilar elements or parts

Homogeneous- composed of parts or elements that are all of the same kind

Hormone- a chemical compound produced in a gland that is carried to another part of the body by blood; act by causing and adjusting chemical reactions in the body

Indigenous species- a species native to certain region(s)

Invasive species- a non-native species whose introduction may cause harm

Karyotype- a set of chromosomes characteristic of a species that present in a systemic arrangement

Life cycle- the series of changes or stages in the life of a plant or animal

Mutation- a change in the genes or chromosomes that lead to new traits in an offspring

Natural selection- a slow, ongoing process in which living things best suited to their environment tend to survive, while those less suited tend to die off

Nucleotide- a group of molecules that form the building blocks of DNA and RNA when linked together

Protein- a molecule that is made up of long chains of chemical compounds called amino acids

Punnett Square- a diagram that is used to predict an outcome of a particular cross or breeding experiment

Radiation- energy in the form of electromagnetic waves or streams of particles

Recessive trait- a trait that does not appear in a living thing unless two genes for the same trait are inherited

Somatic cell- a cell that does not participate in the reproduction of gametes (sex cells)

Trait- something in the appearance, activity, or behavior of a living thing that is determined by genes

Covered in this standard: (Essential bolded)

GBE page 93/96

Biomagnification (12.9)

Limiting factors in an ecosystem (12.10)

Biotic and abiotic factors (12.9)

Matter in an ecosystem (12.2)

Energy in an ecosystem (12.3/12.4)

Natural disasters and ecosystems (12.6)

Environmental technology (12.5)

Niches impact on ecosystems (12.4)

Feedback loops (12.3)

Population growth (12.1/12.12)

Global interdependence (12.3)

Population growth and resources (12.2)

Health of an ecosystem (12.2)

Predator and prey (12.5)

Human effects on ecosystems (12.4)

Technological advancements (12.6)

Invasive species and native species (12.8)

Trophic levels (12.5)

Science Kits: (9) Earth Systems, Energy; **(10)** Genetics and Biotechnology, Nature of Science and Evolution; **(12)** Ecology

Additional Unit Ideas: Domestic versus Wild Animals; Ecosystems and Habitats; Energy Chain; Food Chain; Green Energy; Hunger and Famine; Organic Food; Sustainable Food Sources; Wildlife Conservation; World Population

Real life application: Being green; Eating sustainable foods; Maintaining a home aquarium or pond; Visiting a state or national park; Recycling; Composting; Buying or growing organic food; Participating in the census; Landscaping (native/non-native plants)

Science terms used in this standard:

GBE page 93/96

Abiotic- non-living

Biomagnification- the increasing concentration of a substance

Biotic- living

Closed ecosystem- a self-replenishing ecosystem where life can be maintained without external factors or outside aid

Ecosystem- groups of living things and the environment they live in

Exponential growth- a model of population growth that characterizes populations with unlimited resources

Feedback loop- a system where the input and output are continuous

Invasive species- organisms that are introduced into foreign ecosystems

Limiting factor- factors that affect the number or growth of organisms in an environment

Matter- something that occupies space, has mass, and exists as a solid, liquid, or gas

Native species- a species native to certain region(s)

Natural disaster- an event or force of nature that has catastrophic consequences

Niche- the position of an organism in its community or ecosystem

Population growth- increases in the number of species inhabiting an ecosystem

Predator- an animal that hunts another animal for food

Prey- an animal that is hunted by another animal for food

Resources- the materials and energy that make life on Earth possible

Toxin- a substance that is harmful or poisonous to living things

Trophic level- one of the different feeding levels in a food chain

References

American Heritage. (2010). *Children's science dictionary*. Boston, MA: Houghton Mifflin Harcourt.

American Heritage. (2010). *Science dictionary*. Boston, MA: Houghton Mifflin Harcourt. Retrieved from <http://www.science.yourdictionary.com>

Berger, M. (2000). *Scholastic science dictionary*. New York, NY: Scholastic.

Dictionary.com, LLC. (2013). Retrieved from <http://www.dictionary.com>

Harcourt, Inc. (2002). *Harcourt science: Grade 4*. Orlando, FL: Harcourt School Publishers.

Harcourt, Inc. (2002). *Harcourt science: Grade 6*. Orlando, FL: Harcourt School Publishers.

Hewitt, P., Lyons, S., Suchocki, J., & Yeh, J. (2007). *Conceptual integrated science*. San Francisco, CA: Pearson Education Inc.

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