

DIVERSITY OF LIFE

EALR 1 — Systems: The student knows and applies scientific concepts and principles to understand the properties, structures, and changes in physical, earth/space, and living systems.

Component 1.1 Properties: Understand how properties are used to identify, describe, and categorize substances, materials, and objects and how characteristics are used to categorize living things.

GLE 1.1.6 (ALSO IN 8TH GRADE ECOLOGY & EVOLUTION)

Characteristics of Living Matter

Understand how to classify organisms by their external and internal structures. W

- ___ Describe how organisms can be classified using similarities and differences in physical and functional characteristics (both internal and external).
- ___ Explain an inference about whether organisms have a biological relationship or common ancestry based on given characteristics.

Component 1.2 Structures: Understand how components, structures, organizations, and interconnections describe systems.

GLE 1.2.1 (IN ALL MS MODULES)

Structure of Physical Earth/Space and Living Systems

Analyze how the parts of a system interconnect and influence each other. W

- ___ Explain how the parts of a system interconnect and influence each other.
- ___ Describe the flow of matter and energy through a system (i.e., energy and matter inputs, outputs, transfers, transformations).
- ___ Describe the interactions and influences between two or more simple systems.

GLE 1.2.6 (ALSO IN 7TH GRADE HUMAN BODY SYSTEMS AND 8TH GRADE ECOLOGY & EVOLUTION)

Structure and Organization of Living Systems

Understand that specialized cells within multicellular organisms form different kinds of tissues, organs, and organ systems to carry out life functions. W

- ___ Describe and identify how plant and animal cells are similar and different in structure and function.
- ___ Describe basic cell functions (i.e., extracting energy from food, using energy, and getting rid of waste).
- ___ Describe the life function of specialized cells or tissues (e.g., red blood cells carry oxygen to body tissues; cells in plant leaves capture light energy).
- ___ Describe the life function of organs or organ systems (e.g., the stomach breaks down food and the intestines absorb food in the digestive system).

Component 1.3 Changes: Understand how interactions within and among systems cause changes in matter and energy.

GLE 1.3.8 (ALSO IN 7TH GRADE HUMAN BODY SYSTEMS AND 8TH GRADE ECOLOGY & EVOLUTION)

Life Processes and the Flow of Matter and Energy

Understand how individual organisms, including cells, obtain matter and energy for life processes. W

- ___ Describe the different sources of matter and energy required for life processes in plants and animals (e.g., seeds have energy for germination; green plants need light for energy).
- ___ Describe how organisms acquire materials needed for life processes.
- ___ Describe how systems interact to distribute materials and eliminate wastes produced by life processes.
- ___ Describe that both plants and animals extract energy from food but plants produce their own food from light, air, water, and mineral nutrients while animals consume energy-rich foods.

Note that science WASL test items are written from the bulleted “Evidence of Learning” statements (e.g., ___Describe the different sources...)

MAGNETS & MOTORS

EALR 1 — Systems: The student knows and applies scientific concepts and principles to understand the properties, structures, and changes in physical, earth/space, and living systems.

Component 1.1 Properties: Understand how properties are used to identify, describe, and categorize substances, materials, and objects and how characteristics are used to categorize living things.

GLE 1.1.4 (ALSO COVERED IN 7TH GRADE ENERGY, MACHINES & MOTION AND 8TH GRADE PROPERTIES OF MATTER)

Forms of Energy

Understand that energy is a property of matter, objects, and systems and comes in many forms (i.e., heat [thermal] energy, sound energy, light energy, electrical energy, kinetic energy, potential energy, and chemical energy). W

- ___ Describe the forms of energy present in matter, objects, and systems (i.e., heat [thermal] energy, sound energy, light energy, electrical energy, kinetic energy, potential energy, and chemical energy).
- ___ Describe the form of energy stored in a part of a system (i.e., energy can be stored in many forms, “stored energy” is not a form of energy).
- ___ Compare the potential and kinetic energy within a system at various locations or times (i.e., kinetic energy is an object’s energy of motion; potential energy is an object’s energy of position).

Component 1.2 Structures: Understand how components, structures, organizations, and interconnections describe systems.

GLE 1.2.1 (IN ALL MS MODULES)

Structure of Physical Earth/Space and Living Systems

Analyze how the parts of a system interconnect and influence each other. W

- ___ Explain how the parts of a system interconnect and influence each other.
- ___ Describe the flow of matter and energy through a system (i.e., energy and matter inputs, outputs, transfers, transformations).
- ___ Describe the interactions and influences between two or more simple systems.

GLE 1.2.2 (ALSO IN 7TH GRADE CATASTROPHIC EVENTS AND ENERGY, MACHINES & MOTION AND 8TH GRADE EARTH IN SPACE)

Energy Transfer and Transformation

Understand how various factors affect energy transfers and that energy can be transformed from one form of energy to another. W

- ___ Describe and determine the factors that affect heat energy transfer (e.g., properties of substances/materials [conductors, insulators], distance, direction, position).
- ___ Describe how an increase in one type of energy of an object or system results in a decrease in other types of energy within that object or system (e.g., a falling object’s potential energy decreases while its kinetic energy increases).
- ___ Describe how waves transfer energy (e.g., light waves transfer energy from sun to Earth; air transfers an object’s vibrations from one place to another as sound).
- ___ Explain the transfer and transformations of energy within a system (e.g., conduction and convection of heat [thermal] energy).

NOTE: Instructions for teaching Magnets & Motors in the Teacher Guide do not emphasize these standards at all. The teacher must integrate the ideas of Forms of Energy, Energy Transfer and Energy Transformation into the materials throughout the unit.

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SOLUTIONS & POLLUTION

EALR 1 — Systems: The student knows and applies scientific concepts and principles to understand the properties, structures, and changes in physical, earth/space, and living systems.

Component 1.1 Properties: Understand how properties are used to identify, describe, and categorize substances, materials, and objects and how characteristics are used to categorize living things.

GLE 1.1.1 (ALSO IN 8TH GRADE PROPERTIES OF MATTER)

Properties of Substances

Understand how to use physical and chemical properties to sort and identify substances. W

- ___ Identify, categorize, describe, and sort substances using physical and/or chemical properties (i.e., boiling point, density, freezing point, mass, acidity [pH], solubility, magnetism).
- ___ Identify an unknown substance using the properties of a known substance.
- ___ Recognize that the mass of an object is the same when measured anywhere in the universe at any normal speed.
- ___ Describe why substances with the same volume or same mass may have different densities.
- ___ Describe the volumetric properties of solids, liquids, and gases (e.g., a gas has the same volume as its container).

Component 1.2 Structures: Understand how components, structures, organizations, and interconnections describe systems.

GLE 1.2.1 (IN ALL MS MODULES)

Structure of Physical, Earth/Space and Living Systems

Analyze how the parts of a system interconnect and influence each other. W

- ___ Explain how the parts of a system interconnect and influence each other.
- ___ Describe the flow of matter and energy through a system (i.e., energy and matter inputs, outputs, transfers, transformations).
- ___ Describe the interactions and influences between two or more simple systems.

GLE 1.2.3 (ALSO IN 8TH GRADE PROPERTIES OF MATTER)

Structure of Matter

Understand that all matter is made of particles called atoms and that atoms may combine to form molecules and that atoms and molecules can form mixtures. W

- ___ Describe that matter is made of particles called atoms and molecules.
- ___ Describe that elements are made of one kind of atom.
- ___ Describe how atoms may be combined in various ways and ratios to form molecules.
- ___ Describe the different atoms and molecules in mixtures (e.g., dissolving carbon dioxide in water produces a type of mixture [solution] of CO₂ and H₂O molecules.)

GLE 1.2.3 HIGH SCHOOL [only the relevant parts are included below] (ALSO IN 8TH GRADE PROPERTIES OF MATTER)

Structure of Matter

Understand the structure of atoms, how atoms bond to form molecules, and that molecules form solutions.. W

- ___ Describe molecules forming a solution (e.g., salt added to water dissolves, forming a salt water solution, until saturation when no more salt will dissolve).
- ___ Describe how to separate mixtures and or solutions of several different kinds of substances (e.g., sand, sugar, iron filings).

Component 1.3 Changes: Understand how interactions within and among systems cause changes in matter and energy.

GLE 1.3.3 (ALSO IN 8TH GRADE PROPERTIES OF MATTER)

Conservation of Matter and Energy

Understand that matter is conserved during physical and chemical changes. W

- ___ Observe and describe evidence of physical and chemical changes of matter (e.g., change of state, size, shape, temperature, color, gas production, solid formation, light).
- ___ Observe and describe that substances undergoing physical changes produce matter with the same chemical properties as the original substance and the same total mass (e.g., tearing paper, freezing water, breaking wood, sugar dissolving in water).
- ___ Observe and describe that substances may react chemically to form new substances with different chemical properties and the same total mass (e.g., baking soda and vinegar; light stick mass before, during, and after reaction).

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CATASTROPHIC EVENTS

EALR 1 — Systems: The student knows and applies scientific concepts and principles to understand the properties, structures, and changes in physical, earth/space, and living systems.

Component 1.1 Properties: Understand how properties are used to identify, describe, and categorize substances, materials, and objects and how characteristics are used to categorize living things.

GLE 1.1.5 (ALSO IN 8TH GRADE EARTH IN SPACE)

Nature and Properties of Earth Materials

Understand how to classify rocks, soils, air, and water into groups based on their chemical and physical properties. W

- ___ Describe properties of minerals and rocks that give evidence of how they were formed (e.g., crystal size and arrangement, texture, luster, cleavage, hardness, layering, reaction to acid).
- ___ Describe properties of soils that give evidence of how the soils were formed (e.g., chemical composition such as acidic, types of particles, particle size, organic materials, layering).
- ___ Describe how Earth's water (i.e., oceans, fresh waters, glaciers, ground water) can have different properties (e.g., salinity, density).
- ___ Describe how the atmosphere has different properties at different elevations.

Component 1.2 Structures: Understand how components, structures, organizations, and interconnections describe systems.

GLE 1.2.1 (IN ALL MS MODULES)

Structure of Physical Earth/Space and Living Systems

Analyze how the parts of a system interconnect and influence each other. W

- ___ Explain how the parts of a system interconnect and influence each other.
- ___ Describe the flow of matter and energy through a system (i.e., energy and matter inputs, outputs, transfers, transformations).
- ___ Describe the interactions and influences between two or more simple systems.

GLE 1.2.2 (ALSO IN 6TH GRADE MAGNETS & MOTORS AND 7TH GRADE ENERGY, MACHINES & MOTION AND 8TH GRADE EARTH IN SPACE)

Energy Transfer and Transformation

Understand how various factors affect energy transfers and that energy can be transformed from one form of energy to another. W

- ___ Describe and determine the factors that affect heat energy transfer (e.g., properties of substances/materials [conductors, insulators], distance, direction, position).
- ___ Describe how an increase in one type of energy of an object or system results in a decrease in other types of energy within that object or system (e.g., a falling object's potential energy decreases while its kinetic energy increases).
- ___ Describe how waves transfer energy (e.g., light waves transfer energy from sun to Earth; air transfers an object's vibrations from one place to another as sound).
- ___ Explain the transfer and transformations of energy within a system (e.g., conduction and convection of heat [thermal] energy).

GLE 1.2.4

Components and Patterns of Earth Systems

Understand the components and interconnections of Earth's systems. W

- ___ Describe the components of the Earth's systems (i.e., the core, the mantle, oceanic and crustal plates, landforms, the hydrosphere and atmosphere).
- ___ Describe the interactions among the components of Earth's systems (i.e., the core, the mantle, oceanic and crustal plates, landforms, the hydrosphere and atmosphere).
- ___ Describe magma (i.e., magma comes from Earth's mantle and cools to form rocks).

Note that science WASL test items are written from the bulleted "Evidence of Learning" statements (e.g., ___Describe the different sources...)

Component 1.3 Changes: Understand how interactions within and among systems cause changes in matter and energy.

GLE 1.3.2 (ALSO IN 7TH GRADE ENERGY, MACHINES & MOTION)

Forces to Explain Motion

Understand how balanced and unbalanced forces can change the motion of objects. W

- ___ Describe how an unbalanced force changes the speed and/or direction of motion of different objects moving along a straight line, 2nd Law of Motion (e.g., a larger unbalanced force is needed to equally change the motion of more massive objects).
- ___ Describe how frictional forces act to stop the motion of objects.
- ___ Investigate and describe the balanced and unbalanced forces acting on an object (e.g., a model car speeding up on a table has both an unbalanced force pulling it forward and a gravitational force pulling it down balanced by the table pushing upward).
- ___ Investigate and describe pressure differences that result in unbalanced forces moving objects (e.g., pressure differences cause forces that move air masses, move blood through the heart, cause volcanic eruptions).

GLE 1.3.4

Processes and Interactions in the Earth System

Understand the processes that continually change the surface of the Earth. W

- ___ Describe the processes by which soils are formed (e.g., erosion and deposition in river systems).
- ___ Describe how heat (thermal) energy flow and movement (convection currents) beneath Earth's crust cause earthquakes and volcanoes.
- ___ Describe how constructive processes change landforms (e.g., crustal deformation, volcanic eruption, deposition of sediment).
- ___ Describe how destructive processes change landforms (e.g., rivers erode landforms).
- ___ Describe the processes involved in the rock cycle (e.g., magma cools into igneous rocks; rocks are eroded and deposited as sediments; sediments solidify into sedimentary rocks; rocks can be changed by heat and pressure to form metamorphic rocks).

GLE 1.3.6

Hydrosphere and Atmosphere

Analyze the relationship between weather and climate and how ocean currents and global atmospheric circulation affect weather and climate. W

- ___ Compare weather and climate.
- ___ Explain the effect of the water cycle on weather (e.g., cloud formation, storms).
- ___ Explain how ocean currents influence the atmosphere in terms of weather and climate.
- ___ Explain the causes of atmospheric circulation and oceanic currents (e.g., prevailing winds are the result of hot tropical regions, cold polar regions, and Earth's spin).

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ENERGY, MACHINES & MOTION

EALR 1 — Systems: The student knows and applies scientific concepts and principles to understand the properties, structures, and changes in physical, earth/space, and living systems.

Component 1.1 Properties: Understand how properties are used to identify, describe, and categorize substances, materials, and objects and how characteristics are used to categorize living things.

GLE 1.1.2

Motion of Objects

Understand the positions, relative speeds, and changes in speed of objects. W

- ___ Describe and measure the relative position or change in position of one or two objects.
- ___ Describe an object's motion as speeding up, slowing down, or moving with constant speed using models, numbers, words, diagrams, and graphs.
- ___ Measure and describe the speed of an object relative to the speed of another object.

GLE 1.1.4 (ALSO COVERED IN 6TH GRADE MAGNETS & MOTORS & 8TH GRADE PROPERTIES OF MATTER)

Forms of Energy

Understand that energy is a property of matter, objects, and systems and comes in many forms (i.e., heat [thermal] energy, sound energy, light energy, electrical energy, kinetic energy, potential energy, and chemical energy). W

- ___ Describe the forms of energy present in matter, objects, and systems (i.e., heat [thermal] energy, sound energy, light energy, electrical energy, kinetic energy, potential energy, and chemical energy).
- ___ Describe the form of energy stored in a part of a system (i.e., energy can be stored in many forms, "stored energy" is not a form of energy).
- ___ Compare the potential and kinetic energy within a system at various locations or times (i.e., kinetic energy is an object's energy of motion; potential energy is an object's energy of position).

Component 1.2 Structures: Understand how components, structures, organizations, and interconnections describe systems.

GLE 1.2.1 (IN ALL MS MODULES)

Structure of Physical Earth/Space and Living Systems

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- ___ Explain how the parts of a system interconnect and influence each other.
- ___ Describe the flow of matter and energy through a system (i.e., energy and matter inputs, outputs, transfers, transformations).
- ___ Describe the interactions and influences between two or more simple systems.

GLE 1.2.2 (ALSO IN 6TH GRADE MAGNETS & MOTORS AND 7TH GRADE CATASTROPHIC EVENTS AND 8TH GRADE EARTH IN SPACE)

Energy Transfer and Transformation

Understand how various factors affect energy transfers and that energy can be transformed from one form of energy to another. W

- ___ Describe and determine the factors that affect heat energy transfer (e.g., properties of substances/materials [conductors, insulators], distance, direction, position).
- ___ Describe how an increase in one type of energy of an object or system results in a decrease in other types of energy within that object or system (e.g., a falling object's potential energy decreases while its kinetic energy increases).
- ___ Describe how waves transfer energy (e.g., light waves transfer energy from sun to Earth; air transfers an object's vibrations from one place to another as sound).
- ___ Explain the transfer and transformations of energy within a system (e.g., conduction and convection of heat [thermal] energy).

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Component 1.3 Changes: Understand how interactions within and among systems cause changes in matter and energy.

GLE 1.3.1

Nature of Force

Understand factors that affect the strength and direction of forces. W

- ___ Observe and describe factors that affect the strength of forces (e.g., an object with a greater mass has a greater gravitational force [weight]; certain types of magnets have greater magnetic forces; a larger muscle can pull with a greater force).
- ___ Describe how forces acting on an object may balance each other (e.g., the downward force of gravity on an object sitting on a table is balanced by an upward force from the table).
- ___ Measure and describe how a simple machine can change the strength and/or direction of a force (i.e., levers and pulleys).
- ___ Describe pressure as a force (e.g., pressure increases result in greater forces acting on objects going deeper in a body of water).

GLE 1.3.2 (ALSO IN 7TH GRADE CATASTROPHIC EVENTS)

Forces to Explain Motion

Understand how balanced and unbalanced forces can change the motion of objects. W

- ___ Describe how an unbalanced force changes the speed and/or direction of motion of different objects moving along a straight line, 2nd Law of Motion (e.g., a larger unbalanced force is needed to equally change the motion of more massive objects).
- ___ Describe how frictional forces act to stop the motion of objects.
- ___ Investigate and describe the balanced and unbalanced forces acting on an object (e.g., a model car speeding up on a table has both an unbalanced force pulling it forward and a gravitational force pulling it down balanced by the table pushing upward).
- ___ Investigate and describe pressure differences that result in unbalanced forces moving objects (e.g., pressure differences cause forces that move air masses, move blood through the heart, cause volcanic eruptions).

Note that science WASL test items are written from the bulleted “Evidence of Learning” statements (e.g., ___Describe the different sources...)

HUMAN BODY SYSTEMS

EALR 1 — Systems: The student knows and applies scientific concepts and principles to understand the properties, structures, and changes in physical, earth/space, and living systems.

Component 1.2 Structures: Understand how components, structures, organizations, and interconnections describe systems.

GLE 1.2.1 (IN ALL MS MODULES)

Structure of Physical Earth/Space and Living Systems

Analyze how the parts of a system interconnect and influence each other. W

- ___ Explain how the parts of a system interconnect and influence each other.
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- ___ Describe the interactions and influences between two or more simple systems.

GLE 1.2.6 (ALSO IN 6TH GRADE DIVERSITY OF LIFE AND 8TH GRADE ECOLOGY & EVOLUTION)

Structure and Organization of Living Systems

Understand that specialized cells within multicellular organisms form different kinds of tissues, organs, and organ systems to carry out life functions. W

- ___ Describe and identify how plant and animal cells are similar and different in structure and function.
- ___ Describe basic cell functions (i.e., extracting energy from food, using energy, and getting rid of waste).
- ___ Describe the life function of specialized cells or tissues (e.g., red blood cells carry oxygen to body tissues; cells in plant leaves capture light energy).
- ___ Describe the life function of organs or organ systems (e.g., the stomach breaks down food and the intestines absorb food in the digestive system).

GLE 1.2.8

Human Biology

Understand human life functions and the interconnecting organ systems necessary to maintain human life. W

- ___ Describe the components and functions of the organ systems (i.e., circulatory, digestive, reproductive, excretory, nervous-sensory [brain, nerves, spinal cord, hearing, vision], respiratory, and muscular-skeletal systems).
- ___ Describe relationships among the organ systems of the human body (e.g., the role of the senses and the nervous system for human survival, the relationships between the digestive and excretory systems).
- ___ Compare human body systems to another organism's body system (e.g., human lungs to plant leaves, human skeletal or circulatory systems to plant stems).

Component 1.3 Changes: Understand how interactions within and among systems cause changes in matter and energy.

GLE 1.3.8 (ALSO IN 7TH GRADE HUMAN BODY SYSTEMS AND 8TH GRADE ECOLOGY & EVOLUTION)

Life Processes and the Flow of Matter and Energy

Understand how individual organisms, including cells, obtain matter and energy for life processes. W

- ___ Describe the different sources of matter and energy required for life processes in plants and animals (e.g., seeds have energy for germination; green plants need light for energy).
- ___ Describe how organisms acquire materials needed for life processes.
- ___ Describe how systems interact to distribute materials and eliminate wastes produced by life processes.
- ___ Describe that both plants and animals extract energy from food but plants produce their own food from light, air, water, and mineral nutrients while animals consume energy-rich foods.

Note that science WASL test items are written from the bulleted “Evidence of Learning” statements (e.g., ___Describe the different sources...)

EARTH IN SPACE

EALR 1 — Systems: The student knows and applies scientific concepts and principles to understand the properties, structures, and changes in physical, earth/space, and living systems.

Component 1.1 Properties: Understand how properties are used to identify, describe, and categorize substances, materials, and objects and how characteristics are used to categorize living things.

GLE 1.1.5 (ALSO IN 7TH GRADE CATASTROPHIC EVENTS)

Nature and Properties of Earth Materials

Understand how to classify rocks, soils, air, and water into groups based on their chemical and physical properties. W

- ___ Describe properties of minerals and rocks that give evidence of how they were formed (e.g., crystal size and arrangement, texture, luster, cleavage, hardness, layering, reaction to acid).
- ___ Describe properties of soils that give evidence of how the soils were formed (e.g., chemical composition such as acidic, types of particles, particle size, organic materials, layering).
- ___ Describe how Earth's water (i.e., oceans, fresh waters, glaciers, ground water) can have different properties (e.g., salinity, density).
- ___ Describe how the atmosphere has different properties at different elevations.

Component 1.2 Structures: Understand how components, structures, organizations, and interconnections describe systems.

GLE 1.2.1 (IN ALL MS MODULES)

Structure of Physical Earth/Space and Living Systems

Analyze how the parts of a system interconnect and influence each other. W

- ___ Explain how the parts of a system interconnect and influence each other.
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GLE 1.2.2 (ALSO IN 6TH GRADE MAGNETS & MOTORS AND 7TH GRADE CATASTROPHIC EVENTS AND ENERGY, MACHINES & MOTION)

Energy Transfer and Transformation

Understand how various factors affect energy transfers and that energy can be transformed from one form of energy to another. W

- ___ Describe and determine the factors that affect heat energy transfer (e.g., properties of substances/materials [conductors, insulators], distance, direction, position).
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- ___ Describe how waves transfer energy (e.g., light waves transfer energy from sun to Earth; air transfers an object's vibrations from one place to another as sound).
- ___ Explain the transfer and transformations of energy within a system (e.g., conduction and convection of heat [thermal] energy).

GLE 1.2.5

Components of the Solar System and Beyond (Universe)

Understand the structure of the Solar System. W

- ___ Describe how the Earth orbits the Sun and the Moon orbits the Earth.
- ___ Describe the Sun (i.e., a medium-size star, the largest body in our solar system, major source of energy for phenomena on Earth's surface).
- ___ Describe how planets, asteroids, and comets orbit the Sun.
- ___ Describe meteors (e.g., planetary and comet debris that collides with Earth).
- ___ Compare the relationships among the components of the solar system (e.g., composition, size, atmosphere, gravity, distance from the Sun, number of moons).

Note that science WASL test items are written from the bulleted "Evidence of Learning" statements (e.g., ___Describe the different sources...)

Component 1.3 Changes: Understand how interactions within and among systems cause changes in matter and energy.

GLE 1.3.5 (ALSO IN 8TH GRADE ECOLOGY & EVOLUTION)

History and Evolution of the Earth

Understand how fossils and other evidence are used to document life and environmental changes over time. W

- ___ Describe how fossils are formed.
- ___ Describe different kinds of evidence that are used to document past conditions on Earth (e.g., glacial markings, ash layers, tree rings, rock layers).
- ___ Describe how fossils and other artifacts provide evidence of how life has changed over time (e.g., extinction of species).

GLE 1.3.7

Interactions in the Solar System and Beyond (Universe)

Understand the effects of the regular and predictable motions of planets and moons in the Solar System. W

- ___ Describe the causes of seasonal changes on Earth and other planets (i.e., Earth's tilt causes different parts of Earth to point toward the Sun at different times of the year).
- ___ Describe the effects of the position of the Sun and Moon on Earth phenomena (i.e., Moon phases, solar and lunar eclipses, shadows on Earth, tides).
- ___ Describe how the spin of Earth and other planets accounts for the length of a day on those planets.
- ___ Describe how Earth's and other planets' orbits around the Sun account for the length of a year on those planets.

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ECOLOGY & EVOLUTION

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GLE 1.1.6 (ALSO IN 6TH GRADE DIVERSITY OF LIFE)

Characteristics of Living Matter

Understand how to classify organisms by their external and internal structures. W

- ___ Describe how organisms can be classified using similarities and differences in physical and functional characteristics (both internal and external).
- ___ Explain an inference about whether organisms have a biological relationship or common ancestry based on given characteristics.

Component 1.2 Structures: Understand how components, structures, organizations, and interconnections describe systems.

GLE 1.2.1 (IN ALL MS MODULES)

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GLE 1.2.6 (ALSO IN 6TH GRADE DIVERSITY OF LIFE AND 7TH HUMAN BODY SYSTEMS)

Structure and Organization of Living Systems

Understand that specialized cells within multicellular organisms form different kinds of tissues, organs, and organ systems to carry out life functions. W

- ___ Describe and identify how plant and animal cells are similar and different in structure and function.
- ___ Describe basic cell functions (i.e., extracting energy from food, using energy, and getting rid of waste).
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- ___ Describe how fossils are formed.
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GLE 1.3.8 (ALSO IN 7TH GRADE HUMAN BODY SYSTEMS AND 8TH GRADE ECOLOGY & EVOLUTION)

Life Processes and the Flow of Matter and Energy

Understand how individual organisms, including cells, obtain matter and energy for life processes. W

- ___ Describe the different sources of matter and energy required for life processes in plants and animals (e.g., seeds have energy for germination; green plants need light for energy).
- ___ Describe how organisms acquire materials needed for life processes.
- ___ Describe how systems interact to distribute materials and eliminate wastes produced by life processes.
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Note that science WASL test items are written from the bulleted “Evidence of Learning” statements (e.g., ___Describe the different sources...)

GLE 1.3.9

Biological Evolution

Understand how the theory of biological evolution accounts for species diversity, adaptation, natural selection, extinction, and change in species over time. W

- ___ Describe how fossils show that extinction is common and that most organisms that lived long ago have become extinct.
- ___ Describe how individual organisms with certain traits are more likely than others to survive and have offspring (i.e., natural selection, adaptation).
- ___ Describe how biological evolution accounts for the diversity of species developed through gradual processes over many generations.

GLE 1.3.10

Interdependence of Life

Understand how organisms in ecosystems interact with and respond to their environment and other organisms. W

- ___ Describe how energy flows through a food chain or web.
- ___ Describe how substances such as air, water, and mineral nutrients are continually cycled in ecosystems.
- ___ Explain the role of an organism in an ecosystem (e.g., predator, prey, consumer, producer, decomposer, scavenger, carnivore, herbivore, omnivore).
- ___ Describe how a population of an organism responds to a change in its environment.

Note that science WASL test items are written from the bulleted “Evidence of Learning” statements (e.g., ___Describe the different sources...)

PROPERTIES OF MATTER

EALR 1 — Systems: The student knows and applies scientific concepts and principles to understand the properties, structures, and changes in physical, earth/space, and living systems.

Component 1.1 Properties: Understand how properties are used to identify, describe, and categorize substances, materials, and objects and how characteristics are used to categorize living things.

GLE 1.1.1 (ALSO IN 6TH GRADE SOLUTIONS & POLLUTION)

Properties of Substances

Understand how to use physical and chemical properties to sort and identify substances. W

- ___ Identify, categorize, describe, and sort substances using physical and/or chemical properties (i.e., boiling point, density, freezing point, mass, acidity [pH], solubility, magnetism).
- ___ Identify an unknown substance using the properties of a known substance.
- ___ Recognize that the mass of an object is the same when measured anywhere in the universe at any normal speed.
- ___ Describe why substances with the same volume or same mass may have different densities.
- ___ Describe the volumetric properties of solids, liquids, and gases (e.g., a gas has the same volume as its container).

GLE 1.1.4 (ALSO COVERED IN 6TH GRADE MAGNETS & MOTORS & 7TH GRADE ENERGY, MACHINES & MOTION)

Forms of Energy

Understand that energy is a property of matter, objects, and systems and comes in many forms (i.e., heat [thermal] energy, sound energy, light energy, electrical energy, kinetic energy, potential energy, and chemical energy). W

- ___ Describe the forms of energy present in matter, objects, and systems (i.e., heat [thermal] energy, sound energy, light energy, electrical energy, kinetic energy, potential energy, and chemical energy).
- ___ Describe the form of energy stored in a part of a system (i.e., energy can be stored in many forms, “stored energy” is not a form of energy).
- ___ Compare the potential and kinetic energy within a system at various locations or times (i.e., kinetic energy is an object’s energy of motion; potential energy is an object’s energy of position).

Component 1.2 Structures: Understand how components, structures, organizations, and interconnections describe systems.

GLE 1.2.1 (IN ALL MS MODULES)

Structure of Physical, Earth/Space and Living Systems

Analyze how the parts of a system interconnect and influence each other. W

- ___ Explain how the parts of a system interconnect and influence each other.
- ___ Describe the flow of matter and energy through a system (i.e., energy and matter inputs, outputs, transfers, transformations).
- ___ Describe the interactions and influences between two or more simple systems.

GLE 1.2.3 (ALSO IN 6TH GRADE SOLUTIONS & POLLUTION)

Structure of Matter

Understand that all matter is made of particles called atoms and that atoms may combine to form molecules and that atoms and molecules can form mixtures. W

- ___ Describe that matter is made of particles called atoms and molecules.
- ___ Describe that elements are made of one kind of atom.
- ___ Describe how atoms may be combined in various ways and ratios to form molecules.
- ___ Describe the different atoms and molecules in mixtures (e.g., dissolving carbon dioxide in water produces a type of mixture [solution] of CO₂ and H₂O molecules.)

GLE 1.2.3 HIGH SCHOOL [only the relevant parts are included below] (ALSO IN 6TH GRADE SOLUTIONS & POLLUTION)

Structure of Matter

Understand the structure of atoms, how atoms bond to form molecules, and that molecules form solutions.. W

- ___ Describe molecules forming a solution (e.g., salt added to water dissolves, forming a salt water solution, until saturation when no more salt will dissolve).
- ___ Describe how to separate mixtures and or solutions of several different kinds of substances (e.g., sand, sugar, iron filings).

Note that science WASL test items are written from the bulleted “Evidence of Learning” statements (e.g., ___Describe the different sources...)

Component 1.3 Changes: Understand how interactions within and among systems cause changes in matter and energy.

GLE 1.3.3 (ALSO IN 6TH GRADE SOLUTIONS & POLLUTION)

Conservation of Matter and Energy

Understand that matter is conserved during physical and chemical changes. W

- ___ Observe and describe evidence of physical and chemical changes of matter (e.g., change of state, size, shape, temperature, color, gas production, solid formation, light).
- ___ Observe and describe that substances undergoing physical changes produce matter with the same chemical properties as the original substance and the same total mass (e.g., tearing paper, freezing water, breaking wood, sugar dissolving in water).
- ___ Observe and describe that substances may react chemically to form new substances with different chemical properties and the same total mass (e.g., baking soda and vinegar; light stick mass before, during, and after reaction).

Note that science WASL test items are written from the bulleted “Evidence of Learning” statements (e.g., ___Describe the different sources...)

NOT COVERED WITH MS MODULES

EALR 1 — Systems: The student knows and applies scientific concepts and principles to understand the properties, structures, and changes in physical, earth/space, and living systems.

Component 1.1 Properties: Understand how properties are used to identify, describe, and categorize substances, materials, and objects and how characteristics are used to categorize living things.

GLE 1.1.3

Wave Behavior

Understand sound waves, water waves, and light waves using wave properties, including amplitude, wavelength, and speed. Understand wave behaviors, including reflection, refraction, transmission, and absorption. W

- ___ Describe how sound waves and/or water waves affect the motion of the particles in the substance through which the wave is traveling (e.g., air molecules vibrate back and forth as sound waves move through air).
- ___ Describe the behavior of sound and water waves as the waves are reflected and/or absorbed by a substance.
- ___ Describe how the observed properties of light, sound, and water are related to amplitude, frequency, wavelength, and speed of waves (e.g., color and brightness of light, pitch and volume of sound, height of water waves, light waves are faster than sound waves).
- ___ Describe the behavior of light waves when light interacts with transparent, translucent, and opaque substances (e.g., blue objects appear blue in color because the object reflects mostly blue light and absorbs the other colors of light, transparent objects transmit most light through them, lenses refract light).
- ___ Describe the changes in speed and direction as a wave goes from one substance into another.

Component 1.2 Structures: Understand how components, structures, organizations, and interconnections describe systems.

GLE 1.2.7

Molecular Basis of Heredity

Understand that organisms pass on genetic information in their life cycle and that an organism's characteristics are determined by both genetic and environmental influences. W

- ___ Describe, analyze, and explain the life cycle of an organism.
- ___ Explain that organisms require a set of instructions for specifying their traits (i.e., heredity is the passage of these instructions from one generation to another).
- ___ Describe that genes inherited from parents are combined in their offspring to produce a new combination of characteristics.
- ___ Explain how physical characteristics of living things can be affected by genetic information and/or by interactions with the environment (e.g., nutrition, disease, sanitation).
- ___ Describe and compare sexual (two parents) and asexual (one parent) life cycles of plants and animals.

Note that science WASL test items are written from the bulleted “Evidence of Learning” statements (e.g., ___Describe the different sources...)

EALR 2 – Inquiry: The student knows and applies the skills, processes, and nature of scientific inquiry

Component 2.1 Investigating Systems: Develop the knowledge and skills necessary to do scientific inquiry.

GLE 2.1.1

Questioning

Understand how to generate a question that can be answered through scientific investigation. W

- ___ Generate multiple questions based on observations.
- ___ Generate a question that can be investigated scientifically.
- ___ Generate a new question that can be investigated with the same materials and/or data as a given investigation.

GLE 2.1.2

Planning and Conducting Safe Investigations

Understand how to plan and conduct scientific investigations. W

- ___ Make predictions (hypothesize) and give reasons.
- ___ Generate a logical plan for, and conduct, a scientific controlled investigation with the following attributes:
 - _ prediction (hypothesis)
 - _ appropriate materials, tools, and available computer technology
 - _ controlled variables (kept the same)
 - _ one manipulated (changed) variable
 - _ responding (dependent) variable
 - _ gather, record, and organize data using appropriate units, charts, and/or graphs
 - _ multiple trials
- ___ Generate a logical plan for a simple field investigation with the following attributes:
 - _ Identify multiple variables
 - _ Select observable or measurable variables related to the investigative question
- ___ Identify and explain safety requirements that would be needed in the investigation.

GLE 2.1.3

Explaining

Apply understanding of how to construct a scientific explanation using evidence and inferential logic. W

- ___ Generate a scientific conclusion including supporting data from an investigation using inferential logic (e.g., chewing gum loses more mass than bubble gum after being chewed for 5 minutes; chewing gum lost 2.00 grams while bubble gum only lost 1.47 grams).
- ___ Describe a reason for a given conclusion using evidence from an investigation.
- ___ Generate a scientific explanation of an observed phenomenon using given data.
- ___ Predict what logically might occur if an investigation lasted longer or changed.
- ___ Describe the difference between evidence (data) and conclusions.

GLE 2.1.4

Modeling

Analyze how models are used to investigate objects, events, systems, and processes. W

- ___ Compare models or computer simulations of phenomena to the actual phenomena.
- ___ Explain how models or computer simulations are used to investigate and predict the behavior of objects, events, systems, or processes.
- ___ Create a model or computer simulation to investigate and predict the behavior of objects, events, systems, or processes (e.g., phases of the Moon using a solar system model).
- ___ Explain the advantages and limitations of investigating with a model.

GLE 2.1.5

Communicating

Apply understanding of how to report investigations and explanations of objects, events, systems, and processes. W

- ___ Report observations of scientific investigations without making inferences.
- ___ Summarize an investigation by describing:
 - _ reasons for selecting the investigative plan
 - _ materials used in the investigation
 - _ observations, data, results
 - _ explanations and conclusions in written, mathematical, oral, and information technology presentation formats
 - _ ramifications of investigations
 - _ safety procedures used
- ___ Describe the difference between an objective summary of data and an inference made from data.

Component 2.2 Nature of Science: Understand the nature of scientific inquiry

GLE 2.2.1

Intellectual Honesty

Apply curiosity, honesty, skepticism, and openness when considering explanations and conducting investigations. W

- ___ Explain why an honest response to questionable results, conclusions, or explanations is important to the scientific enterprise.
- ___ Describe a flaw in a claim or a conclusion (i.e., limited data, flawed procedure, or overgeneralization).
- ___ Describe how scientists accurately and honestly record, report, and share observations and measurements without bias.
- ___ Explain why honest acknowledgement of the contributions of others and information sources are necessary.

Note that science WASL test items are written from the bulleted “Evidence of Learning” statements (e.g., ___Describe the different sources...)

GLE 2.2.2

Limitations of Science and Technology

Understand that scientific theories explain facts using inferential logic. W

- Describe how a principle or theory logically explains a given set of facts.
- Describe how new facts or evidence may result in the modification or rejection of a theory (e.g., caloric theory of heat, theory of acquired characteristics).

GLE 2.2.3

Evaluating Inconsistent Results

Analyze inconsistent results from scientific investigations to determine how the results can be explained. W

- Compare two or more similar investigations and explain why different results were produced (e.g., insufficient data could be interpreted as inconsistent results).
- Explain whether sufficient information has been obtained to make a conclusion.
- Explain why the results from a single investigation or demonstration are not sufficient to describe a phenomenon.

GLE 2.2.4

Evaluating Methods of Investigation

Understand how to make the results of scientific investigations reliable and how to make the methods of investigation valid. W

- Describe how the method of an investigation ensures reliable results (e.g., multiple trials ensure more reliable results).
- Describe how to increase the reliability of the results of an investigation (e.g., repeating an investigation exactly the same way increases the reliability of the results).
- Describe how the method of an investigation is valid (i.e., validity means that the investigation answered the investigative question with confidence; the manipulated variable caused the change in the responding or dependent variable).
- Describe the purpose of the steps and materials of an investigation's procedure in terms of the validity of the investigation.
- Modify an investigation to improve the validity of the investigation and explain how the modifications improved the validity (e.g., more controlled variables, more accurate measuring techniques, greater sample size).

GLE 2.2.5

Evolution of Scientific Ideas

Understand that increased comprehension of systems leads to new inquiry. W

- Describe how scientific inquiry results in new facts, evidence, unexpected findings, ideas, and explanations.
- Describe how results of scientific inquiry may change our understanding of the systems of the natural and constructed world.
- Describe how increased understanding of systems leads to new questions to be investigated.
- Describe how new ideas need repeated inquiries before acceptance.
- Describe how new investigative questions arise at the completion of scientific inquiry.

Note that science WASL test items are written from the bulleted "Evidence of Learning" statements (e.g., Describe the different sources...)

EALR 3 – Application: The student knows and applies science concepts and skills to develop solutions to human problems in societal contexts.

Component 3.1 Designing Solutions: Apply knowledge and skills of science and technology to design solutions to human problems or meet challenges.

GLE 3.1.1

Identifying Problems

Analyze common problems or challenges in which scientific design can be or has been used to design solutions. W

- ___ Describe how science and technology could be used to solve all or part of a human problem and vice versa (e.g., understanding erosion can be used to solve some flooding problems).
- ___ Describe the scientific concept, principle, or process used in a solution to a human problem (e.g., understanding of the relationship between electricity and magnetism has been used to make electric motors and generators).
- ___ Explain how to scientifically gather information to develop a solution (e.g., collect data by measuring all the factors and establish which are the most important to solve the problem).
- ___ Describe an appropriate question that could lead to a possible solution to a problem.

GLE 3.1.2

Designing and Testing Solutions

Apply the scientific design process to develop and implement solutions to problems or challenges. W

- ___ Propose, implement, and document the scientific design process used to solve a problem or challenge:
 - _ define the problem
 - _ scientifically gather information and collect measurable data
 - _ explore ideas
 - _ make a plan
 - _ list steps to do the plan
 - _ scientifically test solutions
 - _ document the scientific design process
- ___ Explain possible solutions to the problem (e.g., use pulleys instead of levers to lift a heavy object).
- ___ Explain the reason(s) for the effectiveness of a solution to a problem or challenge.

GLE 3.1.3

Evaluating Potential Solutions

Analyze multiple solutions to a problem or challenge. W

- ___ Describe the criteria to evaluate an acceptable solution to the problem or challenge.
- ___ Describe the reason(s) for the effectiveness of a solution to a problem or challenge using scientific concepts and principles.
- ___ Describe the consequences of the solution to the problem or challenge (e.g., using rocks on the edge of a stream to prevent erosion may destroy habitat).
- ___ Describe how to change a system to solve a problem or improve a solution to a problem.
- ___ Compare the effectiveness of different solutions to a problem or challenge based on criteria, using scientific concepts and principles.

Component 3.2 Science, Technology and Society: Analyze how science and technology are human endeavors, interrelated to each other, society, the workplace, and the environment.

GLE 3.2.1

All Peoples Contribute to Science and Technology

Analyze how science and technology have been developed, used, and affected by many diverse individuals, cultures, and societies throughout human history.

- ___ Explain how the contributions of diverse individuals have led to the development of science and technology.
- ___ Explain how science and technology have affected individuals, cultures, and societies throughout human history.

GLE 3.2.2

Relationship of Science and Technology

Analyze scientific inquiry and scientific design and understand how science supports technological development and vice versa. W

- ___ Describe how scientific investigations and scientific research support technology (e.g., investigation into materials led to Gortex and Kevlar).
- ___ Describe how technology supports scientific investigations and research (e.g., microscopes led to the discovery of unicellular organisms).
- ___ Describe how a scientifically designed solution to a human problem can lead to new tools that generate further inquiry (e.g., microscopes, telescopes, and computers).
- ___ Compare the processes of scientific inquiry and scientific design in terms of activities, results, and/or influence on individuals and/or society.

GLE 3.2.3

Careers and Occupations Using Science, Mathematics, and Technology

Analyze the use of science, mathematics, and technology within occupational/career areas of interest.

- ___ Examine scientific, mathematical, and technological knowledge and skills used in an occupation/career.
- ___ Research occupations/careers that require knowledge of science, mathematics, and technology.

Note that science WASL test items are written from the bulleted “Evidence of Learning” statements (e.g., ___Describe the different sources...)

GLE 3.2.4

Environmental and Resource Issues

Analyze how human societies' use of natural resources affects the quality of life and the health of ecosystems. W

- Discriminate between renewable and nonrenewable resources in an ecosystem.
- Explain the effects that the conservation of natural resources has on the quality of life and the health of ecosystems.
- Explain the effects of various human activities on the health of an ecosystem and/or the ability of organisms to survive in that ecosystem (e.g., consumption of natural resources; waste management; urban growth; land use decisions; pesticide, herbicide, or fertilizer use).

Note that science WASL test items are written from the bulleted “Evidence of Learning” statements (e.g., Describe the different sources...)