

General Science

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Subject: General Science
 Goal Strand: Physical Science
 RIT Score Range: Below 181

| Skills and Concepts to Develop Below 181 | Skills and Concepts to Introduce 181 - 190 |
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| <p>Structure, Properties and Changes of Matter</p> <ul style="list-style-type: none"> • Sorts natural and manufactured materials by weight* • Classifies objects as liquids* | <p>Structure, Properties and Changes of Matter</p> <ul style="list-style-type: none"> • Classifies materials according to their magnetism* • Recognizes that physical properties can be measured using tools* • Identifies tools used to measure length • Recognizes that temperature is measured in degrees* • Gives examples of gases* • Classifies objects as liquids* • Classifies objects as gases • Gives examples of water in each state of matter • Explains that the amount of water in an open container will decrease because it goes into the air, but the amount of water in a closed container will remain the same* • Interprets data related to freezing* |
| <p>Position, Motion of Objects, Motion and Forces</p> <ul style="list-style-type: none"> • Recognizes that pushing or pulling an object can cause a change in the object's position and motion* | <p>Position, Motion of Objects, Motion and Forces</p> <ul style="list-style-type: none"> • Relates movement of objects to the application of force* • Describes everyday situations in terms of forces* • Infers how the size and structure of a wheel determines its usefulness* • Recognizes that wheels make it easier to push heavy objects* • Describes how sound is transmitted* |
| <p>Energy Forms, Transfer, Conservation, Interact</p> <ul style="list-style-type: none"> • Recognizes that things that give off light often also give off heat* • Identifies objects that produce color from white light* | <p>Energy Forms, Transfer, Conservation, Interact</p> <ul style="list-style-type: none"> • Gives examples of forms of energy* • Explains that energy is needed to do work* • Identifies uses of energy* • Infers that shiny objects reflect light* • Recognizes that magnets can move some things without touching them* • Generalizes that magnets attract only certain types of metals (e.g., iron) • Recognizes that magnets attract certain other types of materials* • Recognizes that electricity creates magnetic fields* |

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| | <ul style="list-style-type: none"> • Describes sources of magnetic fields* • Recognizes that the force of gravity acts at a distance, without touching, pulling all objects toward Earth* • Explains that gravity pulls on all objects on or near Earth towards Earth's center* |
| <i>New Vocabulary:</i> cloud, fog, gas, hail, ice, sleet, smog, snow | <i>New Vocabulary:</i> attract, balance (scale), calorie, cohesion, conservation, Coriolis force, degree, efficiency, electrical force, friction, load, magnet, magnetic field, magnetism, magnifying glass, measuring cup, metal, polarization, sand, spring scale, surface, tool, unit of measure, work |
| <i>New Signs and Symbols:</i> none | <i>New Signs and Symbols:</i> none |

Subject: General Science
Goal Strand: Physical Science
RIT Score Range: 181 - 190

| Skills and Concepts to Enhance Below 181 | Skills and Concepts to Develop 181 - 190 | Skills and Concepts to Introduce 191 - 200 |
|---|--|---|
| <p>Structure, Properties and Changes of Matter</p> <ul style="list-style-type: none"> • Sorts natural and manufactured materials by weight* • Classifies objects as liquids* | <p>Structure, Properties and Changes of Matter</p> <ul style="list-style-type: none"> • Classifies materials according to their magnetism* • Recognizes that physical properties can be measured using tools* • Identifies tools used to measure length • Recognizes that temperature is measured in degrees* • Gives examples of gases* • Classifies objects as liquids* • Classifies objects as gases • Gives examples of water in each state of matter • Explains that the amount of water in an open container will decrease because it goes into the air, but the amount of water in a closed container will remain the same* • Interprets data related to freezing* | <p>Structure, Properties and Changes of Matter</p> <ul style="list-style-type: none"> • Generalizes that all physical objects are made of matter • Infers that the more matter in an object, the greater the mass of that object* • Classifies materials according to their magnetism* • Determines the volume of an object using the displacement method* • Recognizes that adding an object to a container of water will raise the water level within the container* • Relates density to the ability to sink or float* • Infers the mass of objects with identical volume, based on their buoyancy* • Distinguishes between chemical and physical changes* • Describes ways to separate mixtures* • Names the three different states of matter • Describes basic properties of solids, liquids, and gases • Gives examples of solids* • Classifies objects as solids, liquids, or gases* • Recognizes that water can undergo changes in state (e.g., solid, liquid, gas)* • Recognizes that ice is the solid form of water* • Describes the process of evaporation* • Describes the process of melting • Makes inferences about phase changes in matter • Gives examples of forms of matter which have undergone a change from liquid to solid form* • Explains that all matter is made of tiny particles called atoms* • Describes the shape of crystals* |
| <p>Position, Motion of Objects, Motion and Forces</p> <ul style="list-style-type: none"> • Recognizes that pushing or pulling an object can cause a change in the object's position and motion* | <p>Position, Motion of Objects, Motion and Forces</p> <ul style="list-style-type: none"> • Relates movement of objects to the application of force* • Describes everyday situations in terms of forces* • Infers how the size and structure of a wheel determines its usefulness* • Recognizes that wheels make it easier to push heavy | <p>Position, Motion of Objects, Motion and Forces</p> <ul style="list-style-type: none"> • Interprets graphs of motion* • Defines a force as a push or pull on an object • Applies Newton's second law (the interrelationship between force, mass, and acceleration) to everyday objects, such as teeter-totters/see-saws* • Gives examples of simple machines* |

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* Both data from test items and review by NWEA curriculum specialists are used to place learning continuum statements into appropriate RIT ranges.

Blank cells indicate data are limited or unavailable for this range or document version.

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| | <ul style="list-style-type: none"> objects* Describes how sound is transmitted* | <ul style="list-style-type: none"> Describes parts of a first class lever* Classifies machines as simple or complex* Predicts how a lever will act in a given situation* Calculates work* Understands that work is dependent on force and distance Explains how sound is produced Makes inferences about echoes* Understands that longer tubes and strings produce "lower" sounds than shorter tubes and strings (term "pitch" not used)* Explains that sound moves through objects by causing particles to vibrate* Defines volume* Defines vibration* Explains that the observed speed at which an object is moving can vary, depending on how fast the observer is moving; however, for light this is not true* |
| Energy Forms, Transfer, Conservation, Interact | Energy Forms, Transfer, Conservation, Interact | Energy Forms, Transfer, Conservation, Interact |
| <ul style="list-style-type: none"> Recognizes that things that give off light often also give off heat* Identifies objects that produce color from white light* | <ul style="list-style-type: none"> Gives examples of forms of energy* Explains that energy is needed to do work* Identifies uses of energy* Infers that shiny objects reflect light* Recognizes that magnets can move some things without touching them* Generalizes that magnets attract only certain types of metals (e.g., iron) Recognizes that magnets attract certain other types of materials* Recognizes that electricity creates magnetic fields* Describes sources of magnetic fields* Recognizes that the force of gravity acts at a distance, without touching, pulling all objects toward Earth* Explains that gravity pulls on all objects on or near Earth towards Earth's center* | <ul style="list-style-type: none"> Compares electrical insulating ability of different materials* Gives examples of electrical conductors* Analyzes parallel circuits* Makes inferences about the working of circuits Recognizes a simple circuit* Gives examples of objects that use electrical energy* Explains that energy is needed to do work* Explains that we can see objects that do not give off light because these objects reflect light* Understands that black objects absorb more light than lighter colored objects Explains why light-colored objects feel cooler than dark colored objects* Recognizes that an electrically charged substance will attract or repel other charged materials* Gives examples of static electricity* Analyzes the charging of objects due to transfer of electrons by friction* Recognizes that magnets' forces can pass through paper, glass, and water* Selects evidence that supports the idea that magnets attract only some kinds of metal* Makes predictions about the interaction of magnets |

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| | | <ul style="list-style-type: none"> • Defines gravity* • Infers that there is a force that keeps us connected to Earth* • Explains that gravity pulls on all objects on or near Earth towards Earth's center* |
| <i>New Vocabulary:</i> cloud, fog, gas, hail, ice, sleet, smog, snow | <i>New Vocabulary:</i> attract, balance (scale), calorie, cohesion, conservation, Coriolis force, degree, efficiency, electrical force, friction, load, magnet, magnetic field, magnetism, magnifying glass, measuring cup, metal, polarization, sand, spring scale, surface, tool, unit of measure, work | <i>New Vocabulary:</i> attraction, bar magnet, boil, broken (circuit), circuit, circuit breaker, circuit overload, complete (circuit), compound, condense, container, cubic, diffuse, direct (sunlight), discharge, dissolve, echo, electrical conductor, electrical energy, electrical outlet, electromagnetism, element, equilibrium, evaporate, field, fulcrum, fuse, fused (circuit), ground, ground wire, heat energy, high-pitched, hydrogen, insulate, lever, light switch, lightning, loud, low-pitched, lubricant, melt, mix, nitrogen, nonmetal, particle, penetrate, phase, physical universe, pitch, polar attraction, polarize, pulley, reflect, refract, repel, screw, simple circuit, simple machine, solute, solvent, speed of light, speed of sound, state, states of matter, static electricity, substance, thaw, thunder, turning point, vapor, vibrate, vibration, volcanic eruption, waterwheel, wave, wedge, wheel and axle |
| <i>New Signs and Symbols:</i> none | <i>New Signs and Symbols:</i> none | <i>New Signs and Symbols:</i> N north, S south |

Subject: General Science
Goal Strand: Physical Science
RIT Score Range: 191 - 200

| Skills and Concepts to Enhance 181 - 190 | Skills and Concepts to Develop 191 - 200 | Skills and Concepts to Introduce 201 - 210 |
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| <p>Structure, Properties and Changes of Matter</p> <ul style="list-style-type: none"> Classifies materials according to their magnetism* Recognizes that physical properties can be measured using tools* Identifies tools used to measure length Recognizes that temperature is measured in degrees* Gives examples of gases* Classifies objects as liquids* Classifies objects as gases Gives examples of water in each state of matter Explains that the amount of water in an open container will decrease because it goes into the air, but the amount of water in a closed container will remain the same* Interprets data related to freezing* | <p>Structure, Properties and Changes of Matter</p> <ul style="list-style-type: none"> Generalizes that all physical objects are made of matter Infers that the more matter in an object, the greater the mass of that object* Classifies materials according to their magnetism* Determines the volume of an object using the displacement method* Recognizes that adding an object to a container of water will raise the water level within the container* Relates density to the ability to sink or float* Infers the mass of objects with identical volume, based on their buoyancy* Distinguishes between chemical and physical changes* Describes ways to separate mixtures* Names the three different states of matter Describes basic properties of solids, liquids, and gases Gives examples of solids* Classifies objects as solids, liquids, or gases* Recognizes that water can undergo changes in state (e.g., solid, liquid, gas)* Recognizes that ice is the solid form of water* Describes the process of evaporation* Describes the process of melting Makes inferences about phase changes in matter Gives examples of forms of matter which have undergone a change from liquid to solid form* Explains that all matter is made of tiny particles called atoms* Describes the shape of crystals* | <p>Structure, Properties and Changes of Matter</p> <ul style="list-style-type: none"> Defines matter as anything that takes up space and has mass* Recognizes that a magnifier allows one to see details that are not otherwise visible* Compares objects in terms of mass* Determines the volume of an object using the displacement method* Estimates length of common objects using metric units* Compares objects in terms of density* Predicts how changes in temperature will affect the density of an object* Defines density* Recognizes that when one divides mass by volume, one is calculating density* Infers that an object is more dense than an object with the same volume, based on differences in mass (as measured by a double-pan balance) Gives examples of changes in which new substances with new chemical properties are produced* Describes properties of acids (e.g., sour taste, one or more hydrogen atoms, turns blue litmus red)* Describes how litmus paper is used to determine whether a substance is an acid or a base* Recognizes properties of acids (e.g., sour taste, turns blue litmus paper red, contains one or more hydrogen atoms)* Predicts which household substance will turn blue litmus paper red* Defines mixture* Names the three different states of matter Describes how water exists in three states Recognizes that water expands as it freezes* Describes the process of evaporation* Recognizes that evaporation changes a liquid to a gas* |

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| | | <ul style="list-style-type: none"> • Gives examples of evaporation* • Relates surface area to evaporation • Describes the process of evaporation in terms of the changes to the molecules involved* • Describes the process of freezing • Describes applications of differential expansion of metals* • Explains that heating or cooling materials can cause their state to change* • Explains that matter can change from one physical state to another* • Predicts, using real-life data, how changes in temperature will affect the volume of a gas* • Explains that as heat is applied to a substance, the particles making up the substance increase their motion • Explains that the periodic table is organized into rows and columns* • Describes characteristics of each subatomic particle* • Explains that all matter is made of tiny particles called atoms* • Recognizes that atoms are composed of smaller particles (e.g., protons, neutrons, and electrons)* • Describes characteristics of elements* • Identifies elements based on their physical characteristics* • Recognizes symbols for elements and compounds* • Determines the number of atoms in a compound when given its formula* • Recognizes signs of a chemical reaction (e.g., formation of gas, color change, precipitate) • Infers that a chemical reaction has occurred* |
| Position, Motion of Objects, Motion and Forces | Position, Motion of Objects, Motion and Forces | Position, Motion of Objects, Motion and Forces |
| <ul style="list-style-type: none"> • Relates movement of objects to the application of force* • Describes everyday situations in terms of forces* • Infers how the size and structure of a wheel determines its usefulness* • Recognizes that wheels make it easier to push heavy objects* • Describes how sound is transmitted* | <ul style="list-style-type: none"> • Interprets graphs of motion* • Defines a force as a push or pull on an object • Applies Newton's second law (the interrelationship between force, mass, and acceleration) to everyday objects, such as teeter-totters/see-saws* • Gives examples of simple machines* • Describes parts of a first class lever* • Classifies machines as simple or complex* • Predicts how a lever will act in a given situation* • Calculates work* | <ul style="list-style-type: none"> • Describes how forces may create equilibrium for an object* • Analyzes how air resistance influences the relative motion of objects* • Explains how frictional forces affect motion* • Identifies types of simple machines* • Gives examples of simple machines* • Defines echo* • Recognizes that animals may be able to sense pitch outside of human hearing ability* |

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| | <ul style="list-style-type: none"> • Understands that work is dependent on force and distance • Explains how sound is produced • Makes inferences about echoes* • Understands that longer tubes and strings produce "lower" sounds than shorter tubes and strings (term "pitch" not used)* • Explains that sound moves through objects by causing particles to vibrate* • Defines volume* • Defines vibration* • Explains that the observed speed at which an object is moving can vary, depending on how fast the observer is moving; however, for light this is not true* | |
| Energy Forms, Transfer, Conservation, Interact | Energy Forms, Transfer, Conservation, Interact | Energy Forms, Transfer, Conservation, Interact |
| <ul style="list-style-type: none"> • Gives examples of forms of energy* • Explains that energy is needed to do work* • Identifies uses of energy* • Infers that shiny objects reflect light* • Recognizes that magnets can move some things without touching them* • Generalizes that magnets attract only certain types of metals (e.g., iron) • Recognizes that magnets attract certain other types of materials* • Recognizes that electricity creates magnetic fields* • Describes sources of magnetic fields* • Recognizes that the force of gravity acts at a distance, without touching, pulling all objects toward Earth* • Explains that gravity pulls on all objects on or near Earth towards Earth's center* | <ul style="list-style-type: none"> • Compares electrical insulating ability of different materials* • Gives examples of electrical conductors* • Analyzes parallel circuits* • Makes inferences about the working of circuits • Recognizes a simple circuit* • Gives examples of objects that use electrical energy* • Explains that energy is needed to do work* • Explains that we can see objects that do not give off light because these objects reflect light* • Understands that black objects absorb more light than lighter colored objects • Explains why light-colored objects feel cooler than dark colored objects* • Recognizes that an electrically charged substance will attract or repel other charged materials* • Gives examples of static electricity* • Analyzes the charging of objects due to transfer of electrons by friction* • Recognizes that magnets' forces can pass through paper, glass, and water* • Selects evidence that supports the idea that magnets attract only some kinds of metal* • Makes predictions about the interaction of magnets • Defines gravity* • Infers that there is a force that keeps us connected to Earth* • Explains that gravity pulls on all objects on or near | <ul style="list-style-type: none"> • Analyzes direct current electrical circuits* • Gives examples of electrical insulators* • Analyzes the parts of a light bulb* • Distinguishes between open and closed circuits* • Explains how fuses are used in electrical circuits* • Understands that sound is a form of energy* • Relates kinetic energy to the speed of an object* • Interprets diagrams showing conversions between potential and kinetic energy* • Recognizes that heat can move from object to object by conduction* • Compares ability of materials to conduct heat • Predicts how well different volumes of liquid will retain heat* • Defines an insulator as a material that blocks the transfer of heat* • Makes predictions about the transformation between kinetic and potential energy* • Describes the transformations of energy that may occur in electrical systems* • Explains that a turbine is a machine that is used in the transformation of mechanical to electrical energy* • Understands that black objects absorb more light than lighter colored objects • Explains why light-colored objects feel cooler than dark colored objects* • Describes the order of colors produced as white light passes through a prism* |

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| | Earth towards Earth's center* | <ul style="list-style-type: none"> • Explains why magnets attract or repel other magnets* • Recognizes that like poles of magnets will repel and that unlike poles will attract* • Explains that a compass needle will align to Earth's magnetic north and south poles* • Explains why a compass can be used to find north* • Determines the relative gravitational attraction among planets based on mass and/or distance* • Relates weight to gravity (e.g., if the gravity acting on an object increases, due to a change in distance or a change in mass of the other object, the weight of an object of constant mass will also increase)* • Describes the effects of Earth's gravity on objects* |
| <i>New Vocabulary:</i> attract, balance (scale), calorie, cohesion, conservation, Coriolis force, degree, efficiency, electrical force, friction, load, magnet, magnetic field, magnetism, magnifying glass, measuring cup, metal, polarization, sand, spring scale, surface, tool, unit of measure, work | <i>New Vocabulary:</i> attraction, bar magnet, boil, broken (circuit), circuit, circuit breaker, circuit overload, complete (circuit), compound, condense, container, cubic, diffuse, direct (sunlight), discharge, dissolve, echo, electrical conductor, electrical energy, electrical outlet, electromagnetism, element, equilibrium, evaporate, field, fulcrum, fuse, fused (circuit), ground, ground wire, heat energy, high-pitched, hydrogen, insulate, lever, light switch, lightning, loud, low-pitched, lubricant, melt, mix, nitrogen, nonmetal, particle, penetrate, phase, physical universe, pitch, polar attraction, polarize, pulley, reflect, refract, repel, screw, simple circuit, simple machine, solute, solvent, speed of light, speed of sound, state, states of matter, static electricity, substance, thaw, thunder, turning point, vapor, vibrate, vibration, volcanic eruption, waterwheel, wave, wedge, wheel and axle | <i>New Vocabulary:</i> air resistance, atomic structure, carbon, chemical property, collide, column, compass, compass needle, compound machine, conduct, conductor, contract, convect, convert, dense, distilled water, electric current, expand, filament, fluctuate, generator, glucose, gravitational attraction, hardness, inclined plane, insulation, insulator, kilowatt hour, kinetic, litmus paper, magnesium, material, mercury (element), minimize, mixture, molecular motion, natural gas, neutral, newton, parallel circuit, percolating, physical union, pole, positively charged, prism, radiate, react, reaction, room temperature, sea level, selenium, series circuit, silver, sound energy, spectrum, stationary, sugar, sulfur/sulphur, texture, thermos jug, tin, transfer, turbine, vaporize, vertical row, vocal cords |
| <i>New Signs and Symbols:</i> none | <i>New Signs and Symbols:</i> N north, S south | <i>New Signs and Symbols:</i> C ₆ H ₁₂ O ₆ (glucose), Ca (Calcium), C carbon, CO (carbon monoxide), . decimal point, H ₂ O, H hydrogen, O oxygen, S sulfur |

Subject: General Science
Goal Strand: Physical Science
RIT Score Range: 201 - 210

| Skills and Concepts to Enhance 191 - 200 | Skills and Concepts to Develop 201 - 210 | Skills and Concepts to Introduce 211 - 220 |
|---|--|---|
| <p>Structure, Properties and Changes of Matter</p> <ul style="list-style-type: none"> • Generalizes that all physical objects are made of matter • Infers that the more matter in an object, the greater the mass of that object* • Classifies materials according to their magnetism* • Determines the volume of an object using the displacement method* • Recognizes that adding an object to a container of water will raise the water level within the container* • Relates density to the ability to sink or float* • Infers the mass of objects with identical volume, based on their buoyancy* • Distinguishes between chemical and physical changes* • Describes ways to separate mixtures* • Names the three different states of matter • Describes basic properties of solids, liquids, and gases • Gives examples of solids* • Classifies objects as solids, liquids, or gases* • Recognizes that water can undergo changes in state (e.g., solid, liquid, gas)* • Recognizes that ice is the solid form of water* • Describes the process of evaporation* • Describes the process of melting • Makes inferences about phase changes in matter • Gives examples of forms of matter which have undergone a change from liquid to solid form* • Explains that all matter is made of tiny particles called atoms* • Describes the shape of crystals* | <p>Structure, Properties and Changes of Matter</p> <ul style="list-style-type: none"> • Defines matter as anything that takes up space and has mass* • Recognizes that a magnifier allows one to see details that are not otherwise visible* • Compares objects in terms of mass* • Determines the volume of an object using the displacement method* • Estimates length of common objects using metric units* • Compares objects in terms of density* • Predicts how changes in temperature will affect the density of an object* • Defines density* • Recognizes that when one divides mass by volume, one is calculating density* • Infers that an object is more dense than an object with the same volume, based on differences in mass (as measured by a double-pan balance) • Gives examples of changes in which new substances with new chemical properties are produced* • Describes properties of acids (e.g., sour taste, one or more hydrogen atoms, turns blue litmus red)* • Describes how litmus paper is used to determine whether a substance is an acid or a base* • Recognizes properties of acids (e.g., sour taste, turns blue litmus paper red, contains one or more hydrogen atoms)* • Predicts which household substance will turn blue litmus paper red* • Defines mixture* • Names the three different states of matter • Describes how water exists in three states • Recognizes that water expands as it freezes* • Describes the process of evaporation* • Recognizes that evaporation changes a liquid to a gas* | <p>Structure, Properties and Changes of Matter</p> <ul style="list-style-type: none"> • Identifies the tools and units used to measure weight* • Makes inferences about the relative mass of objects based on data* • Recognizes that on a given planet, objects with the same weight will also have the same mass* • Recognizes that volume is measured in milliliters or liters* • Measures the volume of liquid in a graduated cylinder* • Understands that in the SI system, length is measured in meters, kilometers, centimeters* • Estimates length of common objects using metric units* • Recognizes that base unit for length in the SI system is the meter* • Predicts how changes in temperature will affect the density of an object* • Predicts how objects of differing density will behave when combined* • Explains that objects of differing density will layer when combined* • Defines melting point* • Defines boiling point* • Describes characteristics of physical change* • Describes characteristics of a chemical change* • Gives examples of chemical change • Describes properties of acids (e.g., sour taste, one or more hydrogen atoms, turns blue litmus red)* • Describes properties of bases (e.g., slippery, bitter tasting, contain oxygen and hydrogen, turn litmus paper blue)* • Describes how litmus paper is used to determine whether a substance is an acid or a base* • Defines pH as a measurement of acidity* • Describes properties of solutions* • Describes properties of mixtures |

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| | <ul style="list-style-type: none"> • Gives examples of evaporation* • Relates surface area to evaporation • Describes the process of evaporation in terms of the changes to the molecules involved* • Describes the process of freezing • Describes applications of differential expansion of metals* • Explains that heating or cooling materials can cause their state to change* • Explains that matter can change from one physical state to another* • Predicts, using real-life data, how changes in temperature will affect the volume of a gas* • Explains that as heat is applied to a substance, the particles making up the substance increase their motion • Explains that the periodic table is organized into rows and columns* • Describes characteristics of each subatomic particle* • Explains that all matter is made of tiny particles called atoms* • Recognizes that atoms are composed of smaller particles (e.g., protons, neutrons, and electrons)* • Describes characteristics of elements* • Identifies elements based on their physical characteristics* • Recognizes symbols for elements and compounds* • Determines the number of atoms in a compound when given its formula* • Recognizes signs of a chemical reaction (e.g., formation of gas, color change, precipitate) • Infers that a chemical reaction has occurred* | <ul style="list-style-type: none"> • Gives examples of mixtures* • Understands that evaporation can be used to separate solutions* • Describes properties of gases* • Classifies unknown substances as liquids, based on their properties* • Recognizes properties of gases* • Describes the process of condensation* • Describes the process of freezing in terms of phase changes* • Explains that removing heat will cause a substance to change from gas to liquid or from liquid to solid form* • Gives examples of substances which have undergone a change of state* • Describes how changes in temperature affect the pressure of a gas in a container where volume is held constant* • Describes the relative freedom of motion of particles in solids, liquids, and gases • Explains that as heat is applied to a substance, the particles making up the substance move farther apart • Recognizes that as heat is applied to a solid, its molecules move farther and farther apart* • Interprets diagrams showing the relative spacing and movement of matter in different phases* • Describes how elements are ordered by atomic number in the periodic table* • Determines the number of neutrons in an atom of an element given the atomic mass of the element* • Names contributions of scientists to the development of the periodic table of the elements* • Recognizes the subatomic structure of the atom • Describes the locations where each atomic particle may be found • Understands that the nucleus consists of protons and neutrons • Explains that all matter is made of tiny particles called atoms* • Uses models to show the structure of the atom • Recognizes that elements do not break down under normal lab conditions* • Describes characteristics of elements* • Gives an example of an element • Recognizes symbols for elements and compounds* |
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| | | <ul style="list-style-type: none"> • Understands the rules of scientific nomenclature of elements and compounds • Determines the number of atoms in a compound when given its formula* • Describes characteristics of compounds • Describes how intermolecular forces affect the chemical properties of covalently bonded compounds • Recognizes that products formed by chemical reactions have different properties from the reactants* • Recognizes that atoms interact by transferring or sharing valence electrons* • Defines reactant* |
| Position, Motion of Objects, Motion and Forces | Position, Motion of Objects, Motion and Forces | Position, Motion of Objects, Motion and Forces |
| <ul style="list-style-type: none"> • Interprets graphs of motion* • Defines a force as a push or pull on an object • Applies Newton's second law (the interrelationship between force, mass, and acceleration) to everyday objects, such as teeter-totters/see-saws* • Gives examples of simple machines* • Describes parts of a first class lever* • Classifies machines as simple or complex* • Predicts how a lever will act in a given situation* • Calculates work* • Understands that work is dependent on force and distance • Explains how sound is produced • Makes inferences about echoes* • Understands that longer tubes and strings produce "lower" sounds than shorter tubes and strings (term "pitch" not used)* • Explains that sound moves through objects by causing particles to vibrate* • Defines volume* • Defines vibration* • Explains that the observed speed at which an object is moving can vary, depending on how fast the observer is moving; however, for light this is not true* | <ul style="list-style-type: none"> • Describes how forces may create equilibrium for an object* • Analyzes how air resistance influences the relative motion of objects* • Explains how frictional forces affect motion* • Identifies types of simple machines* • Gives examples of simple machines* • Defines echo* • Recognizes that animals may be able to sense pitch outside of human hearing ability* | <ul style="list-style-type: none"> • Calculates the distance an object has traveled, using geometry* • Compares the acceleration of falling objects* • Recognizes that for two interacting objects, the force that the first object applies to the second object is equal to the force the second object applies to the first (equal and opposite force)* • Explains how frictional forces affect motion* • Classifies forces as caused by friction* • Explains that simple machines make work easier* • Makes inferences about the type of simple machine that will be most useful in a given situation* • Locates simple machines and their components in applied settings • Relates distance of a load from the fulcrum to mechanical advantage* • Explains that work is not dependent on time, but on force and distance only* • Infers that work is dependent on mass and velocity (momentum)* • Understands that longer tubes and strings produce lower pitched sounds than shorter tubes and strings* • Relates pitch of a sound to wavelength* • Relates amplitude, frequency, wavelength, speed, and period of waves* |
| Energy Forms, Transfer, Conservation, Interact | Energy Forms, Transfer, Conservation, Interact | Energy Forms, Transfer, Conservation, Interact |
| <ul style="list-style-type: none"> • Compares electrical insulating ability of different materials* • Gives examples of electrical conductors* • Analyzes parallel circuits* | <ul style="list-style-type: none"> • Analyzes direct current electrical circuits* • Gives examples of electrical insulators* • Analyzes the parts of a light bulb* • Distinguishes between open and closed circuits* | <ul style="list-style-type: none"> • Explains that energy cannot be created or destroyed, only changed from one form to another* • Compares electrical conducting ability of various materials • Analyzes series circuits* |

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* Both data from test items and review by NWEA curriculum specialists are used to place learning continuum statements into appropriate RIT ranges.

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| <ul style="list-style-type: none"> • Makes inferences about the working of circuits • Recognizes a simple circuit* • Gives examples of objects that use electrical energy* • Explains that energy is needed to do work* • Explains that we can see objects that do not give off light because these objects reflect light* • Understands that black objects absorb more light than lighter colored objects • Explains why light-colored objects feel cooler than dark colored objects* • Recognizes that an electrically charged substance will attract or repel other charged materials* • Gives examples of static electricity* • Analyzes the charging of objects due to transfer of electrons by friction* • Recognizes that magnets' forces can pass through paper, glass, and water* • Selects evidence that supports the idea that magnets attract only some kinds of metal* • Makes predictions about the interaction of magnets • Defines gravity* • Infers that there is a force that keeps us connected to Earth* • Explains that gravity pulls on all objects on or near Earth towards Earth's center* | <ul style="list-style-type: none"> • Explains how fuses are used in electrical circuits* • Understands that sound is a form of energy* • Relates kinetic energy to the speed of an object* • Interprets diagrams showing conversions between potential and kinetic energy* • Recognizes that heat can move from object to object by conduction* • Compares ability of materials to conduct heat • Predicts how well different volumes of liquid will retain heat* • Defines an insulator as a material that blocks the transfer of heat* • Makes predictions about the transformation between kinetic and potential energy* • Describes the transformations of energy that may occur in electrical systems* • Explains that a turbine is a machine that is used in the transformation of mechanical to electrical energy* • Understands that black objects absorb more light than lighter colored objects • Explains why light-colored objects feel cooler than dark colored objects* • Describes the order of colors produced as white light passes through a prism* • Explains why magnets attract or repel other magnets* • Recognizes that like poles of magnets will repel and that unlike poles will attract* • Explains that a compass needle will align to Earth's magnetic north and south poles* • Explains why a compass can be used to find north* • Determines the relative gravitational attraction among planets based on mass and/or distance* • Relates weight to gravity (e.g., if the gravity acting on an object increases, due to a change in distance or a change in mass of the other object, the weight of an object of constant mass will also increase)* • Describes the effects of Earth's gravity on objects* | <ul style="list-style-type: none"> • Uses analogies to explain the flow of current in an electrical wire* • Explains that batteries change chemical energy into electrical energy* • Relates the wattage of appliances to the cost of electricity* • Defines kinetic energy* • Relates kinetic energy to the speed of an object* • Calculates calories given mass and temperature change* • Describes hazards of radioactivity • Explains that the Sun's energy travels to Earth in a variety of wavelengths (e.g., visible light, radio, infrared, UV, microwaves)* • Recognizes that heat can move from object to object by conduction* • Classifies examples of heat transfer as conduction* • Understands that heat flows from warmer to cooler objects until both reach equilibrium* • Gives examples of energy transfer through radiation* • Defines an insulator as a material that blocks the transfer of heat* • Analyzes applications of thermal conductors and insulators* • Describes ways that energy may be changed as a result of a chemical reaction* • Explains that when energy is converted from one form to another, heat is often produced as a by-product* • Recognizes that mechanical machines produce heat* • Understands that humans perceive differences in the wavelength of visible light as differences in color* • Describes ways that light interacts with matter (e.g., transmission, refraction, absorption, scattering, and reflection)* • Recognizes that a prism can be used to separate light into its component colors* • Makes comparisons related to static electricity* • Describes the usefulness of a compass to detect magnetic fields* • Describes magnetic fields* • Explains that gravitational force is hard to detect unless at least one of the objects has a lot of mass* • Explains how changes in mass and distance affect gravitational force* |
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| | | <ul style="list-style-type: none"> • Applies Newton's laws of motion to explain movement due to gravity* |
| <p><i>New Vocabulary:</i> attraction, bar magnet, boil, broken (circuit), circuit, circuit breaker, circuit overload, complete (circuit), compound, condense, container, cubic, diffuse, direct (sunlight), discharge, dissolve, echo, electrical conductor, electrical energy, electrical outlet, electromagnetism, element, equilibrium, evaporate, field, fulcrum, fuse, fused (circuit), ground, ground wire, heat energy, high-pitched, hydrogen, insulate, lever, light switch, lightning, loud, low-pitched, lubricant, melt, mix, nitrogen, nonmetal, particle, penetrate, phase, physical universe, pitch, polar attraction, polarize, pulley, reflect, refract, repel, screw, simple circuit, simple machine, solute, solvent, speed of light, speed of sound, state, states of matter, static electricity, substance, thaw, thunder, turning point, vapor, vibrate, vibration, volcanic eruption, waterwheel, wave, wedge, wheel and axle</p> | <p><i>New Vocabulary:</i> air resistance, atomic structure, carbon, chemical property, collide, column, compass, compass needle, compound machine, conduct, conductor, contract, convect, convert, dense, distilled water, electric current, expand, filament, fluctuate, generator, glucose, gravitational attraction, hardness, inclined plane, insulation, insulator, kilowatt hour, kinetic, litmus paper, magnesium, material, mercury (element), minimize, mixture, molecular motion, natural gas, neutral, newton, parallel circuit, percolating, physical union, pole, positively charged, prism, radiate, react, reaction, room temperature, sea level, selenium, series circuit, silver, sound energy, spectrum, stationary, sugar, sulfur/sulphur, texture, thermos jug, tin, transfer, turbine, vaporize, vertical row, vocal cords</p> | <p><i>New Vocabulary:</i> acid rain, alpha particle, amplitude, area of influence, arm (parts of balance), atomic mass, atomic number, average atomic mass, balance, base (parts of balance), battery, beta particle, boiling point, brake, catalyst, centi-, change of phase, change of state, chemical bond, chemical change, chemical reaction, chlorine, circuit tester, closed container, corrosion, current, dimmer (electrical), Dmitri Mendeleev, dry cell battery, dry ice, effort, electrical shock, electrical wire, electron affinity, explosion, first class lever, focal length, focal point, gear, helium, illumination, infrared, intensity, isotope, lithium, long-range effect, mass number, measurable, melting point, milli-, negatively charged, nuclear explosion, nuclear power, nuclear reactor, pan (parts of balance), phase change, phenolphthalein, physical change, radiation, radioactive waste, reactant, reactor site, S.I. system, satellite, saturation point, solubility point, sublimate, transmission, ultraviolet, valence, visible spectrum, watt, wavelength</p> |
| <p><i>New Signs and Symbols:</i> N north, S south</p> | <p><i>New Signs and Symbols:</i> C₆H₁₂O₆ (glucose), Ca (Calcium), C carbon, CO (carbon monoxide), . decimal point, H₂O, H hydrogen, O oxygen, S sulfur</p> | <p><i>New Signs and Symbols:</i> Co (Cobalt), Cr (chromium), Cs (Cesium), kg kilogram, mL milliliter/millilitre</p> |

Subject: General Science
Goal Strand: Physical Science
RIT Score Range: 211 - 220

| Skills and Concepts to Enhance 201 - 210 | Skills and Concepts to Develop 211 - 220 | Skills and Concepts to Introduce 221 - 230 |
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| <p>Structure, Properties and Changes of Matter</p> <ul style="list-style-type: none"> • Defines matter as anything that takes up space and has mass* • Recognizes that a magnifier allows one to see details that are not otherwise visible* • Compares objects in terms of mass* • Determines the volume of an object using the displacement method* • Estimates length of common objects using metric units* • Compares objects in terms of density* • Predicts how changes in temperature will affect the density of an object* • Defines density* • Recognizes that when one divides mass by volume, one is calculating density* • Infers that an object is more dense than an object with the same volume, based on differences in mass (as measured by a double-pan balance) • Gives examples of changes in which new substances with new chemical properties are produced* • Describes properties of acids (e.g., sour taste, one or more hydrogen atoms, turns blue litmus red)* • Describes how litmus paper is used to determine whether a substance is an acid or a base* • Recognizes properties of acids (e.g., sour taste, turns blue litmus paper red, contains one or more hydrogen atoms)* • Predicts which household substance will turn blue litmus paper red* • Defines mixture* • Names the three different states of matter • Describes how water exists in three states • Recognizes that water expands as it freezes* • Describes the process of evaporation* • Recognizes that evaporation changes a liquid to a gas* | <p>Structure, Properties and Changes of Matter</p> <ul style="list-style-type: none"> • Identifies the tools and units used to measure weight* • Makes inferences about the relative mass of objects based on data* • Recognizes that on a given planet, objects with the same weight will also have the same mass* • Recognizes that volume is measured in milliliters or liters* • Measures the volume of liquid in a graduated cylinder* • Understands that in the SI system, length is measured in meters, kilometers, centimeters* • Estimates length of common objects using metric units* • Recognizes that base unit for length in the SI system is the meter* • Predicts how changes in temperature will affect the density of an object* • Predicts how objects of differing density will behave when combined* • Explains that objects of differing density will layer when combined* • Defines melting point* • Defines boiling point* • Describes characteristics of physical change* • Describes characteristics of a chemical change* • Gives examples of chemical change • Describes properties of acids (e.g., sour taste, one or more hydrogen atoms, turns blue litmus red)* • Describes properties of bases (e.g., slippery, bitter tasting, contain oxygen and hydrogen, turn litmus paper blue)* • Describes how litmus paper is used to determine whether a substance is an acid or a base* • Defines pH as a measurement of acidity* • Describes properties of solutions* • Describes properties of mixtures | <p>Structure, Properties and Changes of Matter</p> <ul style="list-style-type: none"> • Understands that air and other gases have mass* • Evaluates to determine the best substance for a given application based on data describing physical properties of substances* • Makes inferences about appropriate uses of materials from results of tests of properties (e.g., hardness, tensile strength, conductivity)* • Describes objects in terms of mass* • Recognizes that mass is measured in grams* • Identifies the tools needed to determine the volume of an irregularly shaped object* • Identifies tools needed to calculate the density of an irregularly-shaped object* • Calculates density of objects, using supplied data* • Recognizes that conductivity of a substance depends on the freedom of electrons to move from ion to ion of the substance* • Performs metric conversions (e.g., milliliters to microliters)* • Describes physical changes in matter (e.g., changes in size, shape, freezing, melting, dissolving)* • Explains how the addition or loss of heat changes matter (e.g., physical change)* • Describes examples of physical change • Gives examples of chemical change • Infers that a chemical change has occurred* • Describes chemical properties of substances* • Describes properties of acids (e.g., sour taste, one or more hydrogen atoms, turns blue litmus red)* • Describes properties of bases (e.g., slippery, bitter tasting, contain oxygen and hydrogen, turn litmus paper blue)* • Gives examples of acids and bases, using household liquids (e.g., bleach, vinegar)* • Compares pH of strong and weak acids and bases |

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| <ul style="list-style-type: none"> • Gives examples of evaporation* • Relates surface area to evaporation • Describes the process of evaporation in terms of the changes to the molecules involved* • Describes the process of freezing • Describes applications of differential expansion of metals* • Explains that heating or cooling materials can cause their state to change* • Explains that matter can change from one physical state to another* • Predicts, using real-life data, how changes in temperature will affect the volume of a gas* • Explains that as heat is applied to a substance, the particles making up the substance increase their motion • Explains that the periodic table is organized into rows and columns* • Describes characteristics of each subatomic particle* • Explains that all matter is made of tiny particles called atoms* • Recognizes that atoms are composed of smaller particles (e.g., protons, neutrons, and electrons)* • Describes characteristics of elements* • Identifies elements based on their physical characteristics* • Recognizes symbols for elements and compounds* • Determines the number of atoms in a compound when given its formula* • Recognizes signs of a chemical reaction (e.g., formation of gas, color change, precipitate) • Infers that a chemical reaction has occurred* | <ul style="list-style-type: none"> • Gives examples of mixtures* • Understands that evaporation can be used to separate solutions* • Describes properties of gases* • Classifies unknown substances as liquids, based on their properties* • Recognizes properties of gases* • Describes the process of condensation* • Describes the process of freezing in terms of phase changes* • Explains that removing heat will cause a substance to change from gas to liquid or from liquid to solid form* • Gives examples of substances which have undergone a change of state* • Describes how changes in temperature affect the pressure of a gas in a container where volume is held constant* • Describes the relative freedom of motion of particles in solids, liquids, and gases • Explains that as heat is applied to a substance, the particles making up the substance move farther apart • Recognizes that as heat is applied to a solid, its molecules move farther and farther apart* • Interprets diagrams showing the relative spacing and movement of matter in different phases* • Describes how elements are ordered by atomic number in the periodic table* • Determines the number of neutrons in an atom of an element given the atomic mass of the element* • Names contributions of scientists to the development of the periodic table of the elements* • Recognizes the subatomic structure of the atom • Describes the locations where each atomic particle may be found • Understands that the nucleus consists of protons and neutrons • Explains that all matter is made of tiny particles called atoms* • Uses models to show the structure of the atom • Recognizes that elements do not break down under normal lab conditions* • Describes characteristics of elements* • Gives an example of an element • Recognizes symbols for elements and compounds* | <ul style="list-style-type: none"> • Draws conclusion from data related to indicators and pH of household acids, bases and neutral substances* • Explains that removing heat will cause a substance to change from gas to liquid or from liquid to solid form* • Generalizes how changes in temperature affect the behavior of gas • Describes changes in the pressure of gas in terms of particle behavior* • Describes the relative spacing of particles in solids, liquids, and gases* • Recognizes that atomic number represents the number of protons found in the nucleus of a particular type of element* • Describes the relationship between atomic number and atomic mass* • Determines the number of protons in an atom of an element when given that atom's atomic number* • Determines the number of neutrons in an atom of an element given the atomic mass of the element* • Determines the atomic mass of an atom, given the number of protons, electrons and neutrons for this atom* • Predicts properties of elements using information about their classification (e.g., metals, non-metals)* • Understands that elements are grouped according to similarities in their properties* • Describes the properties shared by specific families or groups of elements* • Describes the electron cloud (quantum) model of atomic structure* • Makes predictions of reactivity based on electron configuration* • Determines the electrical charge of an atom or ion • Describes physical properties of metals* • Recognizes that for an element, the number of protons and electrons remains the same, but the number of neutrons may vary* • Describes the forces which hold together the components of an ionic substance* • Recognizes that compounds contain two or more types of atoms bonded together* • Explains that coefficients may be adjusted to balance chemical equations* • Defines inert chemical* |
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| | <ul style="list-style-type: none"> • Understands the rules of scientific nomenclature of elements and compounds • Determines the number of atoms in a compound when given its formula* • Describes characteristics of compounds • Describes how intermolecular forces affect the chemical properties of covalently bonded compounds • Recognizes that products formed by chemical reactions have different properties from the reactants* • Recognizes that atoms interact by transferring or sharing valence electrons* • Defines reactant* | <ul style="list-style-type: none"> • Infers that a new compound has been formed when new properties result after combining reagents* |
| Position, Motion of Objects, Motion and Forces | Position, Motion of Objects, Motion and Forces | Position, Motion of Objects, Motion and Forces |
| <ul style="list-style-type: none"> • Describes how forces may create equilibrium for an object* • Analyzes how air resistance influences the relative motion of objects* • Explains how frictional forces affect motion* • Identifies types of simple machines* • Gives examples of simple machines* • Defines echo* • Recognizes that animals may be able to sense pitch outside of human hearing ability* | <ul style="list-style-type: none"> • Calculates the distance an object has traveled, using geometry* • Compares the acceleration of falling objects* • Recognizes that for two interacting objects, the force that the first object applies to the second object is equal to the force the second object applies to the first (equal and opposite force)* • Explains how frictional forces affect motion* • Classifies forces as caused by friction* • Explains that simple machines make work easier* • Makes inferences about the type of simple machine that will be most useful in a given situation* • Locates simple machines and their components in applied settings • Relates distance of a load from the fulcrum to mechanical advantage* • Explains that work is not dependent on time, but on force and distance only* • Infers that work is dependent on mass and velocity (momentum)* • Understands that longer tubes and strings produce lower pitched sounds than shorter tubes and strings* • Relates pitch of a sound to wavelength* • Relates amplitude, frequency, wavelength, speed, and period of waves* | <ul style="list-style-type: none"> • Applies $F=ma$ to calculate the magnitude of a change in motion* • Analyzes examples of accelerated motion using Newton's laws* • Explains how frictional forces affect motion* • Gives examples to support the idea that an object will remain at rest or move in a straight line at constant speed if it is not subjected to an unbalanced force* • Explains how an object that is not being subjected to an outside force will move with constant velocity in a straight line* • Applies Newton's first law (inertia) to real world objects* • Defines inertia* • Determines whether a simple machine is used to multiply force or change the direction of an applied force* • Describes the relationship between a screw and an inclined plane* • Recognizes that a screw is an inclined plane wrapped around a center post* • Compares the movement of sound through air, water, and/or solids* • Understands that pitch of a sound is dependent on the frequency of the vibration producing the sound* • Recognizes that loudness of sound is measured in decibels* • Recognizes the types of waves which comprise the electromagnetic spectrum* |
| Energy Forms, Transfer, Conservation, Interact | Energy Forms, Transfer, Conservation, Interact | Energy Forms, Transfer, Conservation, Interact |
| <ul style="list-style-type: none"> • Analyzes direct current electrical circuits* | <ul style="list-style-type: none"> • Explains that energy cannot be created or destroyed, | <ul style="list-style-type: none"> • Describes the law of conservation of mass* |

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* Both data from test items and review by NWEA curriculum specialists are used to place learning continuum statements into appropriate RIT ranges.

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| <ul style="list-style-type: none"> • Gives examples of electrical insulators* • Analyzes the parts of a light bulb* • Distinguishes between open and closed circuits* • Explains how fuses are used in electrical circuits* • Understands that sound is a form of energy* • Relates kinetic energy to the speed of an object* • Interprets diagrams showing conversions between potential and kinetic energy* • Recognizes that heat can move from object to object by conduction* • Compares ability of materials to conduct heat • Predicts how well different volumes of liquid will retain heat* • Defines an insulator as a material that blocks the transfer of heat* • Makes predictions about the transformation between kinetic and potential energy* • Describes the transformations of energy that may occur in electrical systems* • Explains that a turbine is a machine that is used in the transformation of mechanical to electrical energy* • Understands that black objects absorb more light than lighter colored objects • Explains why light-colored objects feel cooler than dark colored objects* • Describes the order of colors produced as white light passes through a prism* • Explains why magnets attract or repel other magnets* • Recognizes that like poles of magnets will repel and that unlike poles will attract* • Explains that a compass needle will align to Earth's magnetic north and south poles* • Explains why a compass can be used to find north* • Determines the relative gravitational attraction among planets based on mass and/or distance* • Relates weight to gravity (e.g., if the gravity acting on an object increases, due to a change in distance or a change in mass of the other object, the weight of an object of constant mass will also increase)* • Describes the effects of Earth's gravity on objects* | <p>only changed from one form to another*</p> <ul style="list-style-type: none"> • Compares electrical conducting ability of various materials • Analyzes series circuits* • Uses analogies to explain the flow of current in an electrical wire* • Explains that batteries change chemical energy into electrical energy* • Relates the wattage of appliances to the cost of electricity* • Defines kinetic energy* • Relates kinetic energy to the speed of an object* • Calculates calories given mass and temperature change* • Describes hazards of radioactivity • Explains that the Sun's energy travels to Earth in a variety of wavelengths (e.g., visible light, radio, infrared, UV, microwaves)* • Recognizes that heat can move from object to object by conduction* • Classifies examples of heat transfer as conduction* • Understands that heat flows from warmer to cooler objects until both reach equilibrium* • Gives examples of energy transfer through radiation* • Defines an insulator as a material that blocks the transfer of heat* • Analyzes applications of thermal conductors and insulators* • Describes ways that energy may be changed as a result of a chemical reaction* • Explains that when energy is converted from one form to another, heat is often produced as a by-product* • Recognizes that mechanical machines produce heat* • Understands that humans perceive differences in the wavelength of visible light as differences in color* • Describes ways that light interacts with matter (e.g., transmission, refraction, absorption, scattering, and reflection)* • Recognizes that a prism can be used to separate light into its component colors* • Makes comparisons related to static electricity* • Describes the usefulness of a compass to detect magnetic fields* • Describes magnetic fields* | <ul style="list-style-type: none"> • Recognizes that the mass of a material remains the same when the material is divided or changes shape* • Understands how conservation of mass is expressed in chemical formulas and equations* • Balances equations to reflect conservation of mass* • Differentiates between parallel and series circuits* • Recognizes the major forms of energy* • Defines kinetic energy* • Gives examples of kinetic energy* • Gives examples of potential energy* • Defines a calorie as heat needed to increase the temperature of one gram of water one degree Celsius* • Recognizes that the Sun's energy from millions of years ago is trapped in fossil fuels* • Defines an insulator as a material that blocks the transfer of heat* • Analyzes applications of thermal conductors and insulators* • Classifies examples of chemical changes that show release or absorption of energy* • Gives examples that show that some chemical reactions release energy while others require input of energy* • Recognizes that light is produced by vibrations of electrons* • Describes properties of ultraviolet light* • Explains that when light shines on a colored filter, light of the color of the filter passes through, while the other portions are absorbed* • Explains that opaque items may absorb some colors of light and reflect others, so that the color seen is the color reflected by the object* • Explains that negatively charged materials have an excess of negative charges* • Describes properties of magnets* • Determines the polarity of a magnet based on its interaction with other magnets* • Explains how to build a simple compass* • Describes the usefulness of a compass to detect magnetic fields* • Describes magnetic fields* • Describes ways to increase the strength of an electromagnet* • Understands that weight of an object may change due to a change in gravity, but the mass of this object will |
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| | <ul style="list-style-type: none"> • Explains that gravitational force is hard to detect unless at least one of the objects has a lot of mass* • Explains how changes in mass and distance affect gravitational force* • Applies Newton's laws of motion to explain movement due to gravity* | <ul style="list-style-type: none"> • remain the same* • Applies Newton's laws of motion to explain movement due to gravity* • Calculates gravitational forces of objects in space* |
| <p><i>New Vocabulary:</i> air resistance, atomic structure, carbon, chemical property, collide, column, compass, compass needle, compound machine, conduct, conductor, contract, convect, convert, dense, distilled water, electric current, expand, filament, fluctuate, generator, glucose, gravitational attraction, hardness, inclined plane, insulation, insulator, kilowatt hour, kinetic, litmus paper, magnesium, material, mercury (element), minimize, mixture, molecular motion, natural gas, neutral, newton, parallel circuit, percolating, physical union, pole, positively charged, prism, radiate, react, reaction, room temperature, sea level, selenium, series circuit, silver, sound energy, spectrum, stationary, sugar, sulfur/sulphur, texture, thermos jug, tin, transfer, turbine, vaporize, vertical row, vocal cords</p> | <p><i>New Vocabulary:</i> acid rain, alpha particle, amplitude, area of influence, arm (parts of balance), atomic mass, atomic number, average atomic mass, balance, base (parts of balance), battery, beta particle, boiling point, brake, catalyst, centi-, change of phase, change of state, chemical bond, chemical change, chemical reaction, chlorine, circuit tester, closed container, corrosion, current, dimmer (electrical), Dmitri Mendeleev, dry cell battery, dry ice, effort, electrical shock, electrical wire, electron affinity, explosion, first class lever, focal length, focal point, gear, helium, illumination, infrared, intensity, isotope, lithium, long-range effect, mass number, measurable, melting point, milli-, negatively charged, nuclear explosion, nuclear power, nuclear reactor, pan (parts of balance), phase change, phenolphthalein, physical change, radiation, radioactive waste, reactant, reactor site, S.I. system, satellite, saturation point, solubility point, sublimate, transmission, ultraviolet, valence, visible spectrum, watt, wavelength</p> | <p><i>New Vocabulary:</i> alternating circuit, basic, centrifugal force, charge, conservation of mass, decibel, electric, evacuate (container), grams, hertz, ionic, iron filings, joule, loudness, metal plate, neutralize, nuclear fission, overtone, pH, phosphorous, reaction force, sodium chloride</p> |
| <p><i>New Signs and Symbols:</i> C₆H₁₂O₆ (glucose), Ca (Calcium), C carbon, CO (carbon monoxide), . decimal point, H₂O, H hydrogen, O oxygen, S sulfur</p> | <p><i>New Signs and Symbols:</i> Co (Cobalt), Cr (chromium), Cs (Cesium), kg kilogram, mL milliliter/millilitre</p> | <p><i>New Signs and Symbols:</i> g gram, – negative, pH</p> |

Subject: General Science
Goal Strand: Physical Science
RIT Score Range: 221 - 230

| Skills and Concepts to Enhance 211 - 220 | Skills and Concepts to Develop 221 - 230 | Skills and Concepts to Introduce 231 - 240 |
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| <p>Structure, Properties and Changes of Matter</p> <ul style="list-style-type: none"> Identifies the tools and units used to measure weight* Makes inferences about the relative mass of objects based on data* Recognizes that on a given planet, objects with the same weight will also have the same mass* Recognizes that volume is measured in milliliters or liters* Measures the volume of liquid in a graduated cylinder* Understands that in the SI system, length is measured in meters, kilometers, centimeters* Estimates length of common objects using metric units* Recognizes that base unit for length in the SI system is the meter* Predicts how changes in temperature will affect the density of an object* Predicts how objects of differing density will behave when combined* Explains that objects of differing density will layer when combined* Defines melting point* Defines boiling point* Describes characteristics of physical change* Describes characteristics of a chemical change* Gives examples of chemical change Describes properties of acids (e.g., sour taste, one or more hydrogen atoms, turns blue litmus red)* Describes properties of bases (e.g., slippery, bitter tasting, contain oxygen and hydrogen, turn litmus paper blue)* Describes how litmus paper is used to determine whether a substance is an acid or a base* Defines pH as a measurement of acidity* Describes properties of solutions* Describes properties of mixtures | <p>Structure, Properties and Changes of Matter</p> <ul style="list-style-type: none"> Understands that air and other gases have mass* Evaluates to determine the best substance for a given application based on data describing physical properties of substances* Makes inferences about appropriate uses of materials from results of tests of properties (e.g., hardness, tensile strength, conductivity)* Describes objects in terms of mass* Recognizes that mass is measured in grams* Identifies the tools needed to determine the volume of an irregularly shaped object* Identifies tools needed to calculate the density of an irregularly-shaped object* Calculates density of objects, using supplied data* Recognizes that conductivity of a substance depends on the freedom of electrons to move from ion to ion of the substance* Performs metric conversions (e.g., milliliters to microliters)* Describes physical changes in matter (e.g., changes in size, shape, freezing, melting, dissolving)* Explains how the addition or loss of heat changes matter (e.g., physical change)* Describes examples of physical change Gives examples of chemical change Infers that a chemical change has occurred* Describes chemical properties of substances* Describes properties of acids (e.g., sour taste, one or more hydrogen atoms, turns blue litmus red)* Describes properties of bases (e.g., slippery, bitter tasting, contain oxygen and hydrogen, turn litmus paper blue)* Gives examples of acids and bases, using household liquids (e.g., bleach, vinegar)* Compares pH of strong and weak acids and bases | <p>Structure, Properties and Changes of Matter</p> <ul style="list-style-type: none"> Selects the appropriate relationship to convert units using dimensional analysis strategies* Describes constancy of mass during a physical or chemical change in a system* Defines chemical property* Distinguishes among examples of physical and chemical properties* Compares strength of strong and weak acids and bases* Describes properties of bases (e.g., slippery, bitter tasting, contain oxygen and hydrogen, turn litmus paper blue)* Draws conclusion from data related to indicators and pH of household acids, bases and neutral substances* Classifies mixtures based on their properties* Defines solute* Determines the number of neutrons in an atom of an element given the atomic mass of the element* Relates trends seen in the periodic table to bonding of elements* Describes the properties shared by specific families or groups of elements* Describes how atoms with similar numbers of valence electrons are grouped together on the periodic chart* Interprets data related to electron configuration* Recognizes characteristics of compounds* Makes inferences from data about the formation of ionic compounds* Identifies reactants and products of a combustion reaction* Describes factors that can increase or decrease reaction rates* |

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| <ul style="list-style-type: none"> • Gives examples of mixtures* • Understands that evaporation can be used to separate solutions* • Describes properties of gases* • Classifies unknown substances as liquids, based on their properties* • Recognizes properties of gases* • Describes the process of condensation* • Describes the process of freezing in terms of phase changes* • Explains that removing heat will cause a substance to change from gas to liquid or from liquid to solid form* • Gives examples of substances which have undergone a change of state* • Describes how changes in temperature affect the pressure of a gas in a container where volume is held constant* • Describes the relative freedom of motion of particles in solids, liquids, and gases • Explains that as heat is applied to a substance, the particles making up the substance move farther apart • Recognizes that as heat is applied to a solid, its molecules move farther and farther apart* • Interprets diagrams showing the relative spacing and movement of matter in different phases* • Describes how elements are ordered by atomic number in the periodic table* • Determines the number of neutrons in an atom of an element given the atomic mass of the element* • Names contributions of scientists to the development of the periodic table of the elements* • Recognizes the subatomic structure of the atom • Describes the locations where each atomic particle may be found • Understands that the nucleus consists of protons and neutrons • Explains that all matter is made of tiny particles called atoms* • Uses models to show the structure of the atom • Recognizes that elements do not break down under normal lab conditions* • Describes characteristics of elements* • Gives an example of an element • Recognizes symbols for elements and compounds* | <ul style="list-style-type: none"> • Draws conclusion from data related to indicators and pH of household acids, bases and neutral substances* • Explains that removing heat will cause a substance to change from gas to liquid or from liquid to solid form* • Generalizes how changes in temperature affect the behavior of gas • Describes changes in the pressure of gas in terms of particle behavior* • Describes the relative spacing of particles in solids, liquids, and gases* • Recognizes that atomic number represents the number of protons found in the nucleus of a particular type of element* • Describes the relationship between atomic number and atomic mass* • Determines the number of protons in an atom of an element when given that atom's atomic number* • Determines the number of neutrons in an atom of an element given the atomic mass of the element* • Determines the atomic mass of an atom, given the number of protons, electrons and neutrons for this atom* • Predicts properties of elements using information about their classification (e.g., metals, non-metals)* • Understands that elements are grouped according to similarities in their properties* • Describes the properties shared by specific families or groups of elements* • Describes the electron cloud (quantum) model of atomic structure* • Makes predictions of reactivity based on electron configuration* • Determines the electrical charge of an atom or ion • Describes physical properties of metals* • Recognizes that for an element, the number of protons and electrons remains the same, but the number of neutrons may vary* • Describes the forces which hold together the components of an ionic substance* • Recognizes that compounds contain two or more types of atoms bonded together* • Explains that coefficients may be adjusted to balance chemical equations* • Defines inert chemical* | |
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| <ul style="list-style-type: none"> • Understands the rules of scientific nomenclature of elements and compounds • Determines the number of atoms in a compound when given its formula* • Describes characteristics of compounds • Describes how intermolecular forces affect the chemical properties of covalently bonded compounds • Recognizes that products formed by chemical reactions have different properties from the reactants* • Recognizes that atoms interact by transferring or sharing valence electrons* • Defines reactant* | <ul style="list-style-type: none"> • Infers that a new compound has been formed when new properties result after combining reagents* | |
| Position, Motion of Objects, Motion and Forces | Position, Motion of Objects, Motion and Forces | Position, Motion of Objects, Motion and Forces |
| <ul style="list-style-type: none"> • Calculates the distance an object has traveled, using geometry* • Compares the acceleration of falling objects* • Recognizes that for two interacting objects, the force that the first object applies to the second object is equal to the force the second object applies to the first (equal and opposite force)* • Explains how frictional forces affect motion* • Classifies forces as caused by friction* • Explains that simple machines make work easier* • Makes inferences about the type of simple machine that will be most useful in a given situation* • Locates simple machines and their components in applied settings • Relates distance of a load from the fulcrum to mechanical advantage* • Explains that work is not dependent on time, but on force and distance only* • Infers that work is dependent on mass and velocity (momentum)* • Understands that longer tubes and strings produce lower pitched sounds than shorter tubes and strings* • Relates pitch of a sound to wavelength* • Relates amplitude, frequency, wavelength, speed, and period of waves* | <ul style="list-style-type: none"> • Applies $F=ma$ to calculate the magnitude of a change in motion* • Analyzes examples of accelerated motion using Newton's laws* • Explains how frictional forces affect motion* • Gives examples to support the idea that an object will remain at rest or move in a straight line at constant speed if it is not subjected to an unbalanced force* • Explains how an object that is not being subjected to an outside force will move with constant velocity in a straight line* • Applies Newton's first law (inertia) to real world objects* • Defines inertia* • Determines whether a simple machine is used to multiply force or change the direction of an applied force* • Describes the relationship between a screw and an inclined plane* • Recognizes that a screw is an inclined plane wrapped around a center post* • Compares the movement of sound through air, water, and/or solids* • Understands that pitch of a sound is dependent on the frequency of the vibration producing the sound* • Recognizes that loudness of sound is measured in decibels* • Recognizes the types of waves which comprise the electromagnetic spectrum* | <ul style="list-style-type: none"> • Relates changes in speed or direction to unbalanced forces (2-D)* |
| Energy Forms, Transfer, Conservation, Interact | Energy Forms, Transfer, Conservation, Interact | Energy Forms, Transfer, Conservation, Interact |
| <ul style="list-style-type: none"> • Explains that energy cannot be created or destroyed, | <ul style="list-style-type: none"> • Describes the law of conservation of mass* | <ul style="list-style-type: none"> • Understands how conservation of mass is expressed in |

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| <ul style="list-style-type: none"> only changed from one form to another* Compares electrical conducting ability of various materials Analyzes series circuits* Uses analogies to explain the flow of current in an electrical wire* Explains that batteries change chemical energy into electrical energy* Relates the wattage of appliances to the cost of electricity* Defines kinetic energy* Relates kinetic energy to the speed of an object* Calculates calories given mass and temperature change* Describes hazards of radioactivity Explains that the Sun's energy travels to Earth in a variety of wavelengths (e.g., visible light, radio, infrared, UV, microwaves)* Recognizes that heat can move from object to object by conduction* Classifies examples of heat transfer as conduction* Understands that heat flows from warmer to cooler objects until both reach equilibrium* Gives examples of energy transfer through radiation* Defines an insulator as a material that blocks the transfer of heat* Analyzes applications of thermal conductors and insulators* Describes ways that energy may be changed as a result of a chemical reaction* Explains that when energy is converted from one form to another, heat is often produced as a by-product* Recognizes that mechanical machines produce heat* Understands that humans perceive differences in the wavelength of visible light as differences in color* Describes ways that light interacts with matter (e.g., transmission, refraction, absorption, scattering, and reflection)* Recognizes that a prism can be used to separate light into its component colors* Makes comparisons related to static electricity* Describes the usefulness of a compass to detect magnetic fields* Describes magnetic fields* | <ul style="list-style-type: none"> Recognizes that the mass of a material remains the same when the material is divided or changes shape* Understands how conservation of mass is expressed in chemical formulas and equations* Balances equations to reflect conservation of mass* Differentiates between parallel and series circuits* Recognizes the major forms of energy* Defines kinetic energy* Gives examples of kinetic energy* Gives examples of potential energy* Defines a calorie as heat needed to increase the temperature of one gram of water one degree Celsius* Recognizes that the Sun's energy from millions of years ago is trapped in fossil fuels* Defines an insulator as a material that blocks the transfer of heat* Analyzes applications of thermal conductors and insulators* Classifies examples of chemical changes that show release or absorption of energy* Gives examples that show that some chemical reactions release energy while others require input of energy* Recognizes that light is produced by vibrations of electrons* Describes properties of ultraviolet light* Explains that when light shines on a colored filter, light of the color of the filter passes through, while the other portions are absorbed* Explains that opaque items may absorb some colors of light and reflect others, so that the color seen is the color reflected by the object* Explains that negatively charged materials have an excess of negative charges* Describes properties of magnets* Determines the polarity of a magnet based on its interaction with other magnets* Explains how to build a simple compass* Describes the usefulness of a compass to detect magnetic fields* Describes magnetic fields* Describes ways to increase the strength of an electromagnet* Understands that weight of an object may change due to a change in gravity, but the mass of this object will | <ul style="list-style-type: none"> chemical formulas and equations* Gives examples of potential energy* Recognizes that only radiation can transfer heat through empty space* Applies Coulomb's law* Explains how a magnet can be used to produce electric current* |
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| <ul style="list-style-type: none"> • Explains that gravitational force is hard to detect unless at least one of the objects has a lot of mass* • Explains how changes in mass and distance affect gravitational force* • Applies Newton's laws of motion to explain movement due to gravity* | <p>remain the same*</p> <ul style="list-style-type: none"> • Applies Newton's laws of motion to explain movement due to gravity* • Calculates gravitational forces of objects in space* | |
| <p><i>New Vocabulary:</i> acid rain, alpha particle, amplitude, area of influence, arm (parts of balance), atomic mass, atomic number, average atomic mass, balance, base (parts of balance), battery, beta particle, boiling point, brake, catalyst, centi-, change of phase, change of state, chemical bond, chemical change, chemical reaction, chlorine, circuit tester, closed container, corrosion, current, dimmer (electrical), Dmitri Mendeleev, dry cell battery, dry ice, effort, electrical shock, electrical wire, electron affinity, explosion, first class lever, focal length, focal point, gear, helium, illumination, infrared, intensity, isotope, lithium, long-range effect, mass number, measurable, melting point, milli-, negatively charged, nuclear explosion, nuclear power, nuclear reactor, pan (parts of balance), phase change, phenolphthalein, physical change, radiation, radioactive waste, reactant, reactor site, S.I. system, satellite, saturation point, solubility point, sublimate, transmission, ultraviolet, valence, visible spectrum, watt, wavelength</p> | <p><i>New Vocabulary:</i> alternating circuit, basic, centrifugal force, charge, conservation of mass, decibel, electric, evacuate (container), grams, hertz, ionic, iron filings, joule, loudness, metal plate, neutralize, nuclear fission, overtone, pH, phosphorous, reaction force, sodium chloride</p> | <p><i>New Vocabulary:</i> none</p> |
| <p><i>New Signs and Symbols:</i> Co (Cobalt), Cr (chromium), Cs (Cesium), kg kilogram, mL milliliter/millilitre</p> | <p><i>New Signs and Symbols:</i> g gram, – negative, pH</p> | <p><i>New Signs and Symbols:</i> none</p> |

Subject: General Science
Goal Strand: Physical Science
RIT Score Range: 231 - 240

| Skills and Concepts to Enhance 221 - 230 | Skills and Concepts to Develop 231 - 240 | Skills and Concepts to Introduce 241 - 250 |
|---|--|---|
| <p>Structure, Properties and Changes of Matter</p> <ul style="list-style-type: none"> • Understands that air and other gases have mass* • Evaluates to determine the best substance for a given application based on data describing physical properties of substances* • Makes inferences about appropriate uses of materials from results of tests of properties (e.g., hardness, tensile strength, conductivity)* • Describes objects in terms of mass* • Recognizes that mass is measured in grams* • Identifies the tools needed to determine the volume of an irregularly shaped object* • Identifies tools needed to calculate the density of an irregularly-shaped object* • Calculates density of objects, using supplied data* • Recognizes that conductivity of a substance depends on the freedom of electrons to move from ion to ion of the substance* • Performs metric conversions (e.g., milliliters to microliters)* • Describes physical changes in matter (e.g., changes in size, shape, freezing, melting, dissolving)* • Explains how the addition or loss of heat changes matter (e.g., physical change)* • Describes examples of physical change • Gives examples of chemical change • Infers that a chemical change has occurred* • Describes chemical properties of substances* • Describes properties of acids (e.g., sour taste, one or more hydrogen atoms, turns blue litmus red)* • Describes properties of bases (e.g., slippery, bitter tasting, contain oxygen and hydrogen, turn litmus paper blue)* • Gives examples of acids and bases, using household liquids (e.g., bleach, vinegar)* • Compares pH of strong and weak acids and bases | <p>Structure, Properties and Changes of Matter</p> <ul style="list-style-type: none"> • Selects the appropriate relationship to convert units using dimensional analysis strategies* • Describes constancy of mass during a physical or chemical change in a system* • Defines chemical property* • Distinguishes among examples of physical and chemical properties* • Compares strength of strong and weak acids and bases* • Describes properties of bases (e.g., slippery, bitter tasting, contain oxygen and hydrogen, turn litmus paper blue)* • Draws conclusion from data related to indicators and pH of household acids, bases and neutral substances* • Classifies mixtures based on their properties* • Defines solute* • Determines the number of neutrons in an atom of an element given the atomic mass of the element* • Relates trends seen in the periodic table to bonding of elements* • Describes the properties shared by specific families or groups of elements* • Describes how atoms with similar numbers of valence electrons are grouped together on the periodic chart* • Interprets data related to electron configuration* • Recognizes characteristics of compounds* • Makes inferences from data about the formation of ionic compounds* • Identifies reactants and products of a combustion reaction* • Describes factors that can increase or decrease reaction rates* | <p>Structure, Properties and Changes of Matter</p> <ul style="list-style-type: none"> • Describes ductility* • Distinguishes between acids and bases based on their molecular composition* • Gives examples of acids and bases, using scientific names (e.g., sodium hydroxide)* • Gives examples of solutions* • Evaluates strategies for the qualitative analysis of a given mixture* • Describes the properties shared by specific families or groups of elements* • Utilizes classification systems for elements* • Explains that when an acid is combined in equal molar quantities with a base, a neutral solution of salt in water is obtained* |

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| <ul style="list-style-type: none"> • Draws conclusion from data related to indicators and pH of household acids, bases and neutral substances* • Explains that removing heat will cause a substance to change from gas to liquid or from liquid to solid form* • Generalizes how changes in temperature affect the behavior of gas • Describes changes in the pressure of gas in terms of particle behavior* • Describes the relative spacing of particles in solids, liquids, and gases* • Recognizes that atomic number represents the number of protons found in the nucleus of a particular type of element* • Describes the relationship between atomic number and atomic mass* • Determines the number of protons in an atom of an element when given that atom's atomic number* • Determines the number of neutrons in an atom of an element given the atomic mass of the element* • Determines the atomic mass of an atom, given the number of protons, electrons and neutrons for this atom* • Predicts properties of elements using information about their classification (e.g., metals, non-metals)* • Understands that elements are grouped according to similarities in their properties* • Describes the properties shared by specific families or groups of elements* • Describes the electron cloud (quantum) model of atomic structure* • Makes predictions of reactivity based on electron configuration* • Determines the electrical charge of an atom or ion • Describes physical properties of metals* • Recognizes that for an element, the number of protons and electrons remains the same, but the number of neutrons may vary* • Describes the forces which hold together the components of an ionic substance* • Recognizes that compounds contain two or more types of atoms bonded together* • Explains that coefficients may be adjusted to balance chemical equations* • Defines inert chemical* | | |
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| <ul style="list-style-type: none"> • Infers that a new compound has been formed when new properties result after combining reagents* | | |
| Position, Motion of Objects, Motion and Forces <ul style="list-style-type: none"> • Applies $F=ma$ to calculate the magnitude of a change in motion* • Analyzes examples of accelerated motion using Newton's laws* • Explains how frictional forces affect motion* • Gives examples to support the idea that an object will remain at rest or move in a straight line at constant speed if it is not subjected to an unbalanced force* • Explains how an object that is not being subjected to an outside force will move with constant velocity in a straight line* • Applies Newton's first law (inertia) to real world objects* • Defines inertia* • Determines whether a simple machine is used to multiply force or change the direction of an applied force* • Describes the relationship between a screw and an inclined plane* • Recognizes that a screw is an inclined plane wrapped around a center post* • Compares the movement of sound through air, water, and/or solids* • Understands that pitch of a sound is dependent on the frequency of the vibration producing the sound* • Recognizes that loudness of sound is measured in decibels* • Recognizes the types of waves which comprise the electromagnetic spectrum* | Position, Motion of Objects, Motion and Forces <ul style="list-style-type: none"> • Relates changes in speed or direction to unbalanced forces (2-D)* | Position, Motion of Objects, Motion and Forces <ul style="list-style-type: none"> • Applies Newton's laws to examine action and reaction* • Calculates frequency of waves when given wavelength and speed* |
| Energy Forms, Transfer, Conservation, Interact <ul style="list-style-type: none"> • Describes the law of conservation of mass* • Recognizes that the mass of a material remains the same when the material is divided or changes shape* • Understands how conservation of mass is expressed in chemical formulas and equations* • Balances equations to reflect conservation of mass* • Differentiates between parallel and series circuits* • Recognizes the major forms of energy* • Defines kinetic energy* • Gives examples of kinetic energy* • Gives examples of potential energy* | Energy Forms, Transfer, Conservation, Interact <ul style="list-style-type: none"> • Understands how conservation of mass is expressed in chemical formulas and equations* • Gives examples of potential energy* • Recognizes that only radiation can transfer heat through empty space* • Applies Coulomb's law* • Explains how a magnet can be used to produce electric current* | Energy Forms, Transfer, Conservation, Interact <ul style="list-style-type: none"> • Recognizes that in a closed system, the total number of atoms always remains the same, regardless of how the atoms are arranged into molecules* |

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* Both data from test items and review by NWEA curriculum specialists are used to place learning continuum statements into appropriate RIT ranges.

Blank cells indicate data are limited or unavailable for this range or document version.

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| <ul style="list-style-type: none"> • Defines a calorie as heat needed to increase the temperature of one gram of water one degree Celsius* • Recognizes that the Sun's energy from millions of years ago is trapped in fossil fuels* • Defines an insulator as a material that blocks the transfer of heat* • Analyzes applications of thermal conductors and insulators* • Classifies examples of chemical changes that show release or absorption of energy* • Gives examples that show that some chemical reactions release energy while others require input of energy* • Recognizes that light is produced by vibrations of electrons* • Describes properties of ultraviolet light* • Explains that when light shines on a colored filter, light of the color of the filter passes through, while the other portions are absorbed* • Explains that opaque items may absorb some colors of light and reflect others, so that the color seen is the color reflected by the object* • Explains that negatively charged materials have an excess of negative charges* • Describes properties of magnets* • Determines the polarity of a magnet based on its interaction with other magnets* • Explains how to build a simple compass* • Describes the usefulness of a compass to detect magnetic fields* • Describes magnetic fields* • Describes ways to increase the strength of an electromagnet* • Understands that weight of an object may change due to a change in gravity, but the mass of this object will remain the same* • Applies Newton's laws of motion to explain movement due to gravity* • Calculates gravitational forces of objects in space* | | |
| <p><i>New Vocabulary:</i> alternating circuit, basic, centrifugal force, charge, conservation of mass, decibel, electric, evacuate (container), grams, hertz, ionic, iron filings, joule, loudness, metal plate, neutralize, nuclear fission, overtone, pH, phosphorous, reaction force, sodium chloride</p> | <p><i>New Vocabulary:</i> none</p> | <p><i>New Vocabulary:</i> none</p> |

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| <i>New Signs and Symbols:</i> g gram, – negative, pH | <i>New Signs and Symbols:</i> none | <i>New Signs and Symbols:</i> none |
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Subject: General Science
Goal Strand: Physical Science
RIT Score Range: 241 - 250

| Skills and Concepts to Enhance 231 - 240 | Skills and Concepts to Develop 241 - 250 | Skills and Concepts to Introduce Above 250 |
|--|---|--|
| <p>Structure, Properties and Changes of Matter</p> <ul style="list-style-type: none"> • Selects the appropriate relationship to convert units using dimensional analysis strategies* • Describes constancy of mass during a physical or chemical change in a system* • Defines chemical property* • Distinguishes among examples of physical and chemical properties* • Compares strength of strong and weak acids and bases* • Describes properties of bases (e.g., slippery, bitter tasting, contain oxygen and hydrogen, turn litmus paper blue)* • Draws conclusion from data related to indicators and pH of household acids, bases and neutral substances* • Classifies mixtures based on their properties* • Defines solute* • Determines the number of neutrons in an atom of an element given the atomic mass of the element* • Relates trends seen in the periodic table to bonding of elements* • Describes the properties shared by specific families or groups of elements* • Describes how atoms with similar numbers of valence electrons are grouped together on the periodic chart* • Interprets data related to electron configuration* • Recognizes characteristics of compounds* • Makes inferences from data about the formation of ionic compounds* • Identifies reactants and products of a combustion reaction* • Describes factors that can increase or decrease reaction rates* | <p>Structure, Properties and Changes of Matter</p> <ul style="list-style-type: none"> • Describes ductility* • Distinguishes between acids and bases based on their molecular composition* • Gives examples of acids and bases, using scientific names (e.g., sodium hydroxide)* • Gives examples of solutions* • Evaluates strategies for the qualitative analysis of a given mixture* • Describes the properties shared by specific families or groups of elements* • Utilizes classification systems for elements* • Explains that when an acid is combined in equal molar quantities with a base, a neutral solution of salt in water is obtained* | <p>Structure, Properties and Changes of Matter</p> <ul style="list-style-type: none"> • Analyzes data about phase changes in matter* |
| <p>Position, Motion of Objects, Motion and Forces</p> <ul style="list-style-type: none"> • Relates changes in speed or direction to unbalanced forces (2-D)* | <p>Position, Motion of Objects, Motion and Forces</p> <ul style="list-style-type: none"> • Applies Newton's laws to examine action and reaction* • Calculates frequency of waves when given wavelength and speed* | <p>Position, Motion of Objects, Motion and Forces</p> |

| Energy Forms, Transfer, Conservation, Interact | Energy Forms, Transfer, Conservation, Interact | Energy Forms, Transfer, Conservation, Interact |
|---|---|--|
| <ul style="list-style-type: none"> • Understands how conservation of mass is expressed in chemical formulas and equations* • Gives examples of potential energy* • Recognizes that only radiation can transfer heat through empty space* • Applies Coulomb's law* • Explains how a magnet can be used to produce electric current* | <ul style="list-style-type: none"> • Recognizes that in a closed system, the total number of atoms always remains the same, regardless of how the atoms are arranged into molecules* | |
| <i>New Vocabulary:</i> none | <i>New Vocabulary:</i> none | <i>New Vocabulary:</i> none |
| <i>New Signs and Symbols:</i> none | <i>New Signs and Symbols:</i> none | <i>New Signs and Symbols:</i> none |

Subject: General Science
Goal Strand: Physical Science
RIT Score Range: Above 250

| Skills and Concepts to Enhance 241 - 250 | Skills and Concepts to Develop Above 250 |
|---|--|
| <p>Structure, Properties and Changes of Matter</p> <ul style="list-style-type: none"> • Describes ductility* • Distinguishes between acids and bases based on their molecular composition* • Gives examples of acids and bases, using scientific names (e.g., sodium hydroxide)* • Gives examples of solutions* • Evaluates strategies for the qualitative analysis of a given mixture* • Describes the properties shared by specific families or groups of elements* • Utilizes classification systems for elements* • Explains that when an acid is combined in equal molar quantities with a base, a neutral solution of salt in water is obtained* | <p>Structure, Properties and Changes of Matter</p> <ul style="list-style-type: none"> • Analyzes data about phase changes in matter* |
| <p>Position, Motion of Objects, Motion and Forces</p> <ul style="list-style-type: none"> • Applies Newton's laws to examine action and reaction* • Calculates frequency of waves when given wavelength and speed* | <p>Position, Motion of Objects, Motion and Forces</p> |
| <p>Energy Forms, Transfer, Conservation, Interact</p> <ul style="list-style-type: none"> • Recognizes that in a closed system, the total number of atoms always remains the same, regardless of how the atoms are arranged into molecules* | <p>Energy Forms, Transfer, Conservation, Interact</p> |
| <p><i>New Vocabulary: none</i></p> | <p><i>New Vocabulary: none</i></p> |
| <p><i>New Signs and Symbols: none</i></p> | <p><i>New Signs and Symbols: none</i></p> |

Subject: General Science
 Goal Strand: Earth and Space Science
 RIT Score Range: Below 171

| Skills and Concepts to Develop Below 171 | Skills and Concepts to Introduce 171 - 180 |
|--|--|
| Structure and Interactions in the Earth System | Structure and Interactions in the Earth System |
| | <ul style="list-style-type: none"> • Gives examples of materials that are natural or non-natural parts of Earth* • Relates the type of weather experienced to personal choices and activities (e.g., dressing warmly in cold weather, sunglasses on sunny days)* • Explains that temperature is a measurement of how hot or cold something is* • Recognizes that wind is air that is moving around us* |
| Structure, Interactions in Sky, Solar Sys, Univ | Structure, Interactions in Sky, Solar Sys, Univ |
| <ul style="list-style-type: none"> • Recognizes that the Sun can only be seen in the daytime* | <ul style="list-style-type: none"> • Recognizes that the Sun is not a planet* • Describes the Sun, Moon, stars, and Earth* |
| <i>New Vocabulary: none</i> | <i>New Vocabulary: atmosphere, carbon dioxide, cloud, cool, dew, hot, weather</i> |
| <i>New Signs and Symbols: none</i> | <i>New Signs and Symbols: none</i> |

Subject: General Science

Goal Strand: Earth and Space Science

RIT Score Range: 171 - 180

| Skills and Concepts to Enhance Below 171 | Skills and Concepts to Develop 171 - 180 | Skills and Concepts to Introduce 181 - 190 |
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| <p>Structure and Interactions in the Earth System</p> | <p>Structure and Interactions in the Earth System</p> <ul style="list-style-type: none"> • Gives examples of materials that are natural or non-natural parts of Earth* • Relates the type of weather experienced to personal choices and activities (e.g., dressing warmly in cold weather, sunglasses on sunny days)* • Explains that temperature is a measurement of how hot or cold something is* • Recognizes that wind is air that is moving around us* | <p>Structure and Interactions in the Earth System</p> <ul style="list-style-type: none"> • Recognizes that Earth is made of land masses surrounded by large bodies of water, and that most of the Earth's surface is covered by water* • Recognizes that oceans are bodies of salt water* • Interprets data related to the composition of the ocean* • Recognizes processes that make up the water cycle* • Describes different types of Earth materials • Analyzes precipitation in weather systems* • Draws conclusions about the role of clouds in reflecting the Sun's light* • Interprets data to identify existing weather conditions • Compares weather from season to season* • Describes seasonal patterns in weather* • Measures air temperature* • Chooses the appropriate tool to measure changes in air temperature (term not used)* • Recognizes that wind is air that is moving around us* • Recognizes that the Sun produces heat and light energy* • Recognizes that the Sun's energy can be stored in objects as heat* • Labels a diagram of Earth to show Earth's core* • Explains that tiny rocks come from the weathering and breakage of larger rocks* |
| <p>Structure, Interactions in Sky, Solar Sys, Univ</p> <ul style="list-style-type: none"> • Recognizes that the Sun can only be seen in the daytime* | <p>Structure, Interactions in Sky, Solar Sys, Univ</p> <ul style="list-style-type: none"> • Recognizes that the Sun is not a planet* • Describes the Sun, Moon, stars, and Earth* | <p>Structure, Interactions in Sky, Solar Sys, Univ</p> <ul style="list-style-type: none"> • Recognizes that day and night are caused by the Earth's rotation on its axis* • Explains how the Earth's rotation on its axis causes day and night* • Describes how the Earth's tilt affects seasons* • Explains how Earth's tilt affects the length of daylight during the year* • Explains how Earth's tilt affects the heating of Earth's surface* |

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| | | <ul style="list-style-type: none"> • Describes components of the solar system* • Identifies the location of planets relative to the sun* • Describes the order of planets and the asteroid belt in the solar system* • Recognizes that stars (like the Sun) are the source of light for all bright objects in space* |
| <i>New Vocabulary: none</i> | <i>New Vocabulary: atmosphere, carbon dioxide, cloud, cool, dew, hot, weather</i> | <i>New Vocabulary: anemometer, autumn, axis, barometer, beach, body of water, condensation, cross section, crystal, daylight, evaporation, fossil, grain, hydrometer, hygrometer, Jupiter, land, Mars, Mercury (planet), metal, night, ocean floor, planet, Pluto, precipitation, revolve, rotate, sand, Saturn, seasonal change, shadow, shell, solar system, stone, store, stratosphere, stream, tar, tilt, Uranus, water cycle, winter</i> |
| <i>New Signs and Symbols: none</i> | <i>New Signs and Symbols: none</i> | <i>New Signs and Symbols: none</i> |

Subject: General Science

Goal Strand: Earth and Space Science

RIT Score Range: 181 - 190

| Skills and Concepts to Enhance 171 - 180 | Skills and Concepts to Develop 181 - 190 | Skills and Concepts to Introduce 191 - 200 |
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| <p>Structure and Interactions in the Earth System</p> <ul style="list-style-type: none"> • Gives examples of materials that are natural or non-natural parts of Earth* • Relates the type of weather experienced to personal choices and activities (e.g., dressing warmly in cold weather, sunglasses on sunny days)* • Explains that temperature is a measurement of how hot or cold something is* • Recognizes that wind is air that is moving around us* | <p>Structure and Interactions in the Earth System</p> <ul style="list-style-type: none"> • Recognizes that Earth is made of land masses surrounded by large bodies of water, and that most of the Earth's surface is covered by water* • Recognizes that oceans are bodies of salt water* • Interprets data related to the composition of the ocean* • Recognizes processes that make up the water cycle* • Describes different types of Earth materials • Analyzes precipitation in weather systems* • Draws conclusions about the role of clouds in reflecting the Sun's light* • Interprets data to identify existing weather conditions • Compares weather from season to season* • Describes seasonal patterns in weather* • Measures air temperature* • Chooses the appropriate tool to measure changes in air temperature (term not used)* • Recognizes that wind is air that is moving around us* • Recognizes that the Sun produces heat and light energy* • Recognizes that the Sun's energy can be stored in objects as heat* • Labels a diagram of Earth to show Earth's core* • Explains that tiny rocks come from the weathering and breakage of larger rocks* | <p>Structure and Interactions in the Earth System</p> <ul style="list-style-type: none"> • Describes the distribution of water on Earth • Analyzes processes which comprise the water cycle* • Identifies rock types* • Recognizes that clouds and fog are made up of tiny water droplets (condensed from vapor or gaseous form)* • Describes how clouds form* • Gives examples of forms of precipitation* • Classifies rain, sleet, snow, etc., as precipitation* • Recognizes that climate depends on an interaction of factors (e.g., latitude, atmospheric composition, prevailing wind, ocean temperature, pollution)* • Explains how volcanoes cause pollution* • Recognizes that "empty" spaces and containers are not really empty, because they contain air* • Recognizes that air may contain water and particulate pollutants (e.g., pollen, smoke, dust)* • Compares properties of different wind forms (e.g., tornadoes, gusts, breezes, drafts, gales)* • Explains that the Sun is the major source of heat and light for Earth* • Describes the Sun as the major source of energy for Earth* • Explains that the Sun is the major energy source for Earth* • Recognizes that the Sun's light energy is transformed to heat energy upon hitting Earth's surface* • Defines atmosphere as the air surrounding Earth* • Recognizes Earth's three layers* • Orders Earth's three layers* • Analyzes a model that shows Earth's internal structure* • Labels a diagram of Earth to show Earth's core* • Labels a diagram of Earth to show its crust* • Understands that life on Earth would not be able to exist in Earth's mantle and core* |

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| | | <ul style="list-style-type: none"> • Describes weathering* • Explains how weather can cause changes in rocks • Makes inferences about the causes of a change to rock* • Defines erosion as the wearing away or removal of rock or soil from a site* • Recognizes that rapid processes which change Earth's surface include landslides, volcanic eruptions, and earthquakes* • Explains how plate movement produces earthquakes* • Explains how magma and lava are involved in volcanic eruptions |
| Structure, Interactions in Sky, Solar Sys, Univ | Structure, Interactions in Sky, Solar Sys, Univ | Structure, Interactions in Sky, Solar Sys, Univ |
| <ul style="list-style-type: none"> • Recognizes that the Sun is not a planet* • Describes the Sun, Moon, stars, and Earth* | <ul style="list-style-type: none"> • Recognizes that day and night are caused by the Earth's rotation on its axis* • Explains how the Earth's rotation on its axis causes day and night* • Describes how the Earth's tilt affects seasons* • Explains how Earth's tilt affects the length of daylight during the year* • Explains how Earth's tilt affects the heating of Earth's surface* • Describes components of the solar system* • Identifies the location of planets relative to the sun* • Describes the order of planets and the asteroid belt in the solar system* • Recognizes that stars (like the Sun) are the source of light for all bright objects in space* | <ul style="list-style-type: none"> • Recognizes that day and night are caused by the Earth's rotation on its axis* • Explains that a small object that is close to Earth may appear larger than a bigger object that is more distant from Earth* • Recognizes that the Sun is a medium-sized star • Compares the Sun to other stars and star systems • Describes components of the solar system* • Recognizes that the solar system includes the Sun, nine planets including Earth, the Moon and satellites orbiting other planets, asteroids, and comets* • Describes characteristics of the planet Mars* • Describes the motion of Earth around the Sun* • Analyzes the motion of the Moon around Earth* • Compares Earth to other planets in terms of size* • Describes distance of individual planets from the Sun • Identifies characteristics of planets* • Recognizes that Earth is somewhat unique in its characteristics* • Explains that the Moon and planets shine by reflected sunlight, not their own light* • Identifies daily patterns caused by Earth's rotation* • Explains that gravity is a force producing attraction between matter* |
| <i>New Vocabulary:</i> atmosphere, carbon dioxide, cloud, cool, dew, hot, weather | <i>New Vocabulary:</i> anemometer, autumn, axis, barometer, beach, body of water, condensation, cross section, crystal, daylight, evaporation, fossil, grain, hydrometer, hygrometer, Jupiter, land, Mars, Mercury (planet), metal, night, ocean floor, planet, Pluto, precipitation, revolve, rotate, sand, Saturn, seasonal change, shadow, shell, solar system, stone, store, stratosphere, stream, tar, tilt, Uranus, water cycle, winter | <i>New Vocabulary:</i> asteroid, breeze, comet, condense, crack, decay, dust, Earth's surface, erosion, evaporate, flood, fresh water, galaxy, gale, geographic area, granite, ground, gust, humidity, individual consumption, irrigation, latitude, lava, layer, lightning, lignite, magma, melt, meteor, moon (satellite), nebula, Neptune, obsidian, ocean current, particle, Polaris, prevailing wind, process, reflect, reservoir, Sirius, slate, sublimation, thunder, tide, |

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| | | tornado, transpiration, Venus, water supply, wave, wearing away/down, weathering, wind form |
| <i>New Signs and Symbols: none</i> | <i>New Signs and Symbols: none</i> | <i>New Signs and Symbols: none</i> |

Subject: General Science

Goal Strand: Earth and Space Science

RIT Score Range: 191 - 200

| Skills and Concepts to Enhance 181 - 190 | Skills and Concepts to Develop 191 - 200 | Skills and Concepts to Introduce 201 - 210 |
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| <p>Structure and Interactions in the Earth System</p> <ul style="list-style-type: none"> • Recognizes that Earth is made of land masses surrounded by large bodies of water, and that most of the Earth's surface is covered by water* • Recognizes that oceans are bodies of salt water* • Interprets data related to the composition of the ocean* • Recognizes processes that make up the water cycle* • Describes different types of Earth materials • Analyzes precipitation in weather systems* • Draws conclusions about the role of clouds in reflecting the Sun's light* • Interprets data to identify existing weather conditions • Compares weather from season to season* • Describes seasonal patterns in weather* • Measures air temperature* • Chooses the appropriate tool to measure changes in air temperature (term not used)* • Recognizes that wind is air that is moving around us* • Recognizes that the Sun produces heat and light energy* • Recognizes that the Sun's energy can be stored in objects as heat* • Labels a diagram of Earth to show Earth's core* • Explains that tiny rocks come from the weathering and breakage of larger rocks* | <p>Structure and Interactions in the Earth System</p> <ul style="list-style-type: none"> • Describes the distribution of water on Earth • Analyzes processes which comprise the water cycle* • Identifies rock types* • Recognizes that clouds and fog are made up of tiny water droplets (condensed from vapor or gaseous form)* • Describes how clouds form* • Gives examples of forms of precipitation* • Classifies rain, sleet, snow, etc., as precipitation* • Recognizes that climate depends on an interaction of factors (e.g., latitude, atmospheric composition, prevailing wind, ocean temperature, pollution)* • Explains how volcanoes cause pollution* • Recognizes that "empty" spaces and containers are not really empty, because they contain air* • Recognizes that air may contain water and particulate pollutants (e.g., pollen, smoke, dust)* • Compares properties of different wind forms (e.g., tornadoes, gusts, breezes, drafts, gales)* • Explains that the Sun is the major source of heat and light for Earth* • Describes the Sun as the major source of energy for Earth* • Explains that the Sun is the major energy source for Earth* • Recognizes that the Sun's light energy is transformed to heat energy upon hitting Earth's surface* • Defines atmosphere as the air surrounding Earth* • Recognizes Earth's three layers* • Orders Earth's three layers* • Analyzes a model that shows Earth's internal structure* • Labels a diagram of Earth to show Earth's core* • Labels a diagram of Earth to show its crust* • Understands that life on Earth would not be able to exist in Earth's mantle and core* | <p>Structure and Interactions in the Earth System</p> <ul style="list-style-type: none"> • Defines a spring as underground water which seeps onto the Earth's surface* • Describes physical properties of the ocean* • Describes the movement of water through a complete turn of the water cycle* • Describes the water cycle • Interprets models that show how water is recycled in the Earth system* • Explains why non-renewable resources should not be wasted* • Describes formation of fossil fuels • Describes physical characteristics of different rocks and minerals (e.g., color, hardness, texture, pattern, layering, particle size)* • Describes the process of sedimentary rock formation* • Describes how dew forms on surfaces* • Defines humidity* • Understands that meteorologists use multiple measurements of weather conditions to make forecasts* • Describes how changes in the composition of the atmosphere can affect Earth's climate* • Recognizes that air takes up space • Recognizes that air can cause changes in the environment* • Recognizes that uneven heating of air by the Sun causes convection currents* • Labels diagrams of Earth (three layers) to show Earth's mantle* • Recognizes Earth's three layers* • Orders Earth's three layers* • Describes characteristics of Earth's three layers* • Recognizes characteristics of each layer of Earth (e.g., cold brittle lithosphere, hot convecting mantle, dense metallic core) |

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| | <ul style="list-style-type: none"> • Describes weathering* • Explains how weather can cause changes in rocks • Makes inferences about the causes of a change to rock* • Defines erosion as the wearing away or removal of rock or soil from a site* • Recognizes that rapid processes which change Earth's surface include landslides, volcanic eruptions, and earthquakes* • Explains how plate movement produces earthquakes* • Explains how magma and lava are involved in volcanic eruptions | <ul style="list-style-type: none"> • Recognizes that the Earth is spherical in shape* • Explains why the equator is used to divide the Earth into two hemispheres* • Defines the rock cycle* • Describes ways in which rocks undergo changes from physical weathering • Gives examples of chemical weathering* • Predicts how sediments of different sizes will sort* • Describes how Earth materials erode • Recognizes major agents of erosion* • Interprets data related to the continuous modification of rocks in the rock cycle* • Recognizes that rapid processes which change Earth's surface include landslides, volcanic eruptions, and earthquakes* • Distinguishes among processes that do and do not change Earth's surface* • Infers that Earth's surface is constantly changing* • Describes how destructive forces create land forms* • Explains how processes such as erosion, weathering, and flow cause slow change to Earth's surface features* • Infers that effects of an earthquake depend on its strength* • Understands that earthquakes cause differences in the movement of land* • Describes causes of earthquakes* • Describes tools used to measure earthquakes* • Describes folding and faulting* • Recognizes that plate tectonics is the theory that accounts for the movement of the continents* • Draws conclusions about the past from fossils or fossil data* • Explains how sedimentary rocks record events of Earth's history* • Uses the law of superposition to determine the relative ages of rock layers* • Describes relative dating techniques* |
| Structure, Interactions in Sky, Solar Sys, Univ | Structure, Interactions in Sky, Solar Sys, Univ | Structure, Interactions in Sky, Solar Sys, Univ |
| <ul style="list-style-type: none"> • Recognizes that day and night are caused by the Earth's rotation on its axis* • Explains how the Earth's rotation on its axis causes day and night* • Describes how the Earth's tilt affects seasons* | <ul style="list-style-type: none"> • Recognizes that day and night are caused by the Earth's rotation on its axis* • Explains that a small object that is close to Earth may appear larger than a bigger object that is more distant from Earth* | <ul style="list-style-type: none"> • Relates the Earth's rotation on its axis to the length of a day* • Explains how Earth's tilt causes seasons* • Explains how the Earth's tilt affects the intensity of sunlight in summer and winter* |

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| <ul style="list-style-type: none"> • Explains how Earth's tilt affects the length of daylight during the year* • Explains how Earth's tilt affects the heating of Earth's surface* • Describes components of the solar system* • Identifies the location of planets relative to the sun* • Describes the order of planets and the asteroid belt in the solar system* • Recognizes that stars (like the Sun) are the source of light for all bright objects in space* | <ul style="list-style-type: none"> • Recognizes that the Sun is a medium-sized star • Compares the Sun to other stars and star systems • Describes components of the solar system* • Recognizes that the solar system includes the Sun, nine planets including Earth, the Moon and satellites orbiting other planets, asteroids, and comets* • Describes characteristics of the planet Mars* • Describes the motion of Earth around the Sun* • Analyzes the motion of the Moon around Earth* • Compares Earth to other planets in terms of size* • Describes distance of individual planets from the Sun • Identifies characteristics of planets* • Recognizes that Earth is somewhat unique in its characteristics* • Explains that the Moon and planets shine by reflected sunlight, not their own light* • Identifies daily patterns caused by Earth's rotation* • Explains that gravity is a force producing attraction between matter* | <ul style="list-style-type: none"> • Analyzes diagrams showing how the relative intensity of sunlight differs in summer and winter* • Explains that astronomical objects are separated by great distances* • Recognizes that the Sun, Moon and planets are spherical in shape* • Describes characteristics of comets* • Compares characteristics of meteors and meteorites* • Describes formation of meteors* • Recognizes how meteor showers are produced* • Describes the relationship between the Moon and the Earth (the Moon is a satellite of the Earth, and therefore orbits around the Earth)* • Recognizes that it takes about 29 days for the Moon to orbit Earth* • Describes how the Moon's surface has been affected by meteorites* • Defines satellite as one body which orbits around another* • Orders the planets in terms of distance from the Sun* • Explains that Earth is the only planet in our solar system that contains water in liquid form* • Explains that the Moon and planets shine by reflected sunlight, not their own light* • Defines constellation* • Explains the concept of a year in terms of a planet's motion* • Explains the concept of a full day and night in terms of Earth's motion* • Explains the phases of the Moon* • Infers that an object thrown up from a planet will not travel as far as an object thrown with the same force from a planet with less gravity* |
| <p><i>New Vocabulary:</i> anemometer, autumn, axis, barometer, beach, body of water, condensation, cross section, crystal, daylight, evaporation, fossil, grain, hydrometer, hygrometer, Jupiter, land, Mars, Mercury (planet), metal, night, ocean floor, planet, Pluto, precipitation, revolve, rotate, sand, Saturn, seasonal change, shadow, shell, solar system, stone, store, stratosphere, stream, tar, tilt, Uranus, water cycle, winter</p> | <p><i>New Vocabulary:</i> asteroid, breeze, comet, condense, crack, decay, dust, Earth's surface, erosion, evaporate, flood, fresh water, galaxy, gale, geographic area, granite, ground, gust, humidity, individual consumption, irrigation, latitude, lava, layer, lightning, lignite, magma, melt, meteor, moon (satellite), nebula, Neptune, obsidian, ocean current, particle, Polaris, prevailing wind, process, reflect, reservoir, Sirius, slate, sublimation, thunder, tide, tornado, transpiration, Venus, water supply, wave, wearing away/down, weathering, wind form</p> | <p><i>New Vocabulary:</i> air pressure, angstrom, basalt, canyon, cavern, compaction, constellation, crater, dam, deposition, Earth's crust, ecological cycle, ellipse, equinox, fault line, faulting, fission, float, folding, forecast, formation, fossil fuel, frost, full moon, funnel, fusion, gaseous, glaciation, glacier, greenhouse effect, igneous rock, landslide, light-year, marble, metamorphic rock, meteorite, meteorologist, new moon, nitrogen cycle, nova, oil well, parent material, porous rock, pumice, rainfall, relative age, rock cycle, rock layer, running water, salinity, sand dune, saturation, sea level, sediment,</p> |

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| | | sedimentary rock, sedimentation, seismograph, sinkhole, tidal wave, trace elements, uranium, vegetation, water pressure, well, wind speed |
| <i>New Signs and Symbols: none</i> | <i>New Signs and Symbols: none</i> | <i>New Signs and Symbols: none</i> |

Subject: General Science

Goal Strand: Earth and Space Science

RIT Score Range: 201 - 210

| Skills and Concepts to Enhance 191 - 200 | Skills and Concepts to Develop 201 - 210 | Skills and Concepts to Introduce 211 - 220 |
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| <p>Structure and Interactions in the Earth System</p> <ul style="list-style-type: none"> • Describes the distribution of water on Earth • Analyzes processes which comprise the water cycle* • Identifies rock types* • Recognizes that clouds and fog are made up of tiny water droplets (condensed from vapor or gaseous form)* • Describes how clouds form* • Gives examples of forms of precipitation* • Classifies rain, sleet, snow, etc., as precipitation* • Recognizes that climate depends on an interaction of factors (e.g., latitude, atmospheric composition, prevailing wind, ocean temperature, pollution)* • Explains how volcanoes cause pollution* • Recognizes that "empty" spaces and containers are not really empty, because they contain air* • Recognizes that air may contain water and particulate pollutants (e.g., pollen, smoke, dust)* • Compares properties of different wind forms (e.g., tornadoes, gusts, breezes, drafts, gales)* • Explains that the Sun is the major source of heat and light for Earth* • Describes the Sun as the major source of energy for Earth* • Explains that the Sun is the major energy source for Earth* • Recognizes that the Sun's light energy is transformed to heat energy upon hitting Earth's surface* • Defines atmosphere as the air surrounding Earth* • Recognizes Earth's three layers* • Orders Earth's three layers* • Analyzes a model that shows Earth's internal structure* • Labels a diagram of Earth to show Earth's core* • Labels a diagram of Earth to show its crust* • Understands that life on Earth would not be able to exist in Earth's mantle and core* | <p>Structure and Interactions in the Earth System</p> <ul style="list-style-type: none"> • Defines a spring as underground water which seeps onto the Earth's surface* • Describes physical properties of the ocean* • Describes the movement of water through a complete turn of the water cycle* • Describes the water cycle • Interprets models that show how water is recycled in the Earth system* • Explains why non-renewable resources should not be wasted* • Describes formation of fossil fuels • Describes physical characteristics of different rocks and minerals (e.g., color, hardness, texture, pattern, layering, particle size)* • Describes the process of sedimentary rock formation* • Describes how dew forms on surfaces* • Defines humidity* • Understands that meteorologists use multiple measurements of weather conditions to make forecasts* • Describes how changes in the composition of the atmosphere can affect Earth's climate* • Recognizes that air takes up space • Recognizes that air can cause changes in the environment* • Recognizes that uneven heating of air by the Sun causes convection currents* • Labels diagrams of Earth (three layers) to show Earth's mantle* • Recognizes Earth's three layers* • Orders Earth's three layers* • Describes characteristics of Earth's three layers* • Recognizes characteristics of each layer of Earth (e.g., cold brittle lithosphere, hot convecting mantle, dense metallic core) | <p>Structure and Interactions in the Earth System</p> <ul style="list-style-type: none"> • Differentiates among artesian wells, springs and geysers* • Describes the composition of the Earth's bodies of water* • Describes geologic features of the ocean • Orders steps of the water cycle* • Describes processes that make up the water cycle* • Classifies natural resources as renewable or non-renewable • Defines non-renewable natural resources* • Gives examples of renewable and non-renewable resources* • Describes the source of geothermal energy* • Gives examples of igneous rocks* • Describes the process of igneous rock formation* • Recognizes that petrification is the replacement of bone by minerals* • Describes characteristics of sedimentary rock* • Makes inferences about where igneous rocks may be found* • Classifies rocks according to the forces which formed them • Describes humus* • Describes cloud formation in weather systems* • Describes the structure of weather systems (e.g., hurricanes)* • Analyzes humidity in weather systems* • Describes how weather conditions are measured* • Explains how barometric pressure is interpreted • Defines climate* • Explains how uneven heating at the shore/ocean interface by the Sun creates winds* • Analyzes the role of temperature in producing ocean currents* • Describes results of interacting air masses* |

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| <ul style="list-style-type: none"> • Describes weathering* • Explains how weather can cause changes in rocks • Makes inferences about the causes of a change to rock* • Defines erosion as the wearing away or removal of rock or soil from a site* • Recognizes that rapid processes which change Earth's surface include landslides, volcanic eruptions, and earthquakes* • Explains how plate movement produces earthquakes* • Explains how magma and lava are involved in volcanic eruptions | <ul style="list-style-type: none"> • Recognizes that the Earth is spherical in shape* • Explains why the equator is used to divide the Earth into two hemispheres* • Defines the rock cycle* • Describes ways in which rocks undergo changes from physical weathering • Gives examples of chemical weathering* • Predicts how sediments of different sizes will sort* • Describes how Earth materials erode • Recognizes major agents of erosion* • Interprets data related to the continuous modification of rocks in the rock cycle* • Recognizes that rapid processes which change Earth's surface include landslides, volcanic eruptions, and earthquakes* • Distinguishes among processes that do and do not change Earth's surface* • Infers that Earth's surface is constantly changing* • Describes how destructive forces create land forms* • Explains how processes such as erosion, weathering, and flow cause slow change to Earth's surface features* • Infers that effects of an earthquake depend on its strength* • Understands that earthquakes cause differences in the movement of land* • Describes causes of earthquakes* • Describes tools used to measure earthquakes* • Describes folding and faulting* • Recognizes that plate tectonics is the theory that accounts for the movement of the continents* • Draws conclusions about the past from fossils or fossil data* • Explains how sedimentary rocks record events of Earth's history* • Uses the law of superposition to determine the relative ages of rock layers* • Describes relative dating techniques* | <ul style="list-style-type: none"> • Recognizes the Sun's role in the water cycle* • Recognizes the sources of geothermal energy* • Labels a diagram of Earth (four layers) to show Earth's outer core* • Labels a diagram of Earth (four layers) to show Earth's mantle* • Compares weathering and erosion* • Compares agents of erosion* • Describes sequences within the rock cycle that minerals could pass through* • Describes how slow and rapid processes cause the Earth's surface to change constantly • Describes how constructive forces create land forms* • Analyzes the role of destructive forces in shaping Earth's surface* • Gives examples of fault zones* • Recognizes that faults are breakages in rock associated with movement of Earth's plates* • Explains how mountain building is caused by movement of tectonic plates* • Relates plate movement to geologic events • Explains how plate tectonic theory accounts for movement of landforms over time* • Defines magma* • Recognizes that in most fossils, living tissue is replaced with minerals, but in certain fossils (e.g., amber, frozen organisms), biological matter (DNA) may remain* • Describes conditions that are usually needed for a fossil to form • Explains that the geologic processes we observe today have also occurred in the geologic past* |
| <p>Structure, Interactions in Sky, Solar Sys, Univ</p> | <p>Structure, Interactions in Sky, Solar Sys, Univ</p> | <p>Structure, Interactions in Sky, Solar Sys, Univ</p> |
| <ul style="list-style-type: none"> • Recognizes that day and night are caused by the Earth's rotation on its axis* • Explains that a small object that is close to Earth may appear larger than a bigger object that is more distant from Earth* | <ul style="list-style-type: none"> • Relates the Earth's rotation on its axis to the length of a day* • Explains how Earth's tilt causes seasons* • Explains how the Earth's tilt affects the intensity of sunlight in summer and winter* | <ul style="list-style-type: none"> • Defines rotation of planets* • Explains that the direction of Earth's rotation is west to east* • Analyzes diagrams showing the effect of Earth's tilt on seasons* |

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| <ul style="list-style-type: none"> • Recognizes that the Sun is a medium-sized star • Compares the Sun to other stars and star systems • Describes components of the solar system* • Recognizes that the solar system includes the Sun, nine planets including Earth, the Moon and satellites orbiting other planets, asteroids, and comets* • Describes characteristics of the planet Mars* • Describes the motion of Earth around the Sun* • Analyzes the motion of the Moon around Earth* • Compares Earth to other planets in terms of size* • Describes distance of individual planets from the Sun • Identifies characteristics of planets* • Recognizes that Earth is somewhat unique in its characteristics* • Explains that the Moon and planets shine by reflected sunlight, not their own light* • Identifies daily patterns caused by Earth's rotation* • Explains that gravity is a force producing attraction between matter* | <ul style="list-style-type: none"> • Analyzes diagrams showing how the relative intensity of sunlight differs in summer and winter* • Explains that astronomical objects are separated by great distances* • Recognizes that the Sun, Moon and planets are spherical in shape* • Describes characteristics of comets* • Compares characteristics of meteors and meteorites* • Describes formation of meteors* • Recognizes how meteor showers are produced* • Describes the relationship between the Moon and the Earth (the Moon is a satellite of the Earth, and therefore orbits around the Earth)* • Recognizes that it takes about 29 days for the Moon to orbit Earth* • Describes how the Moon's surface has been affected by meteorites* • Defines satellite as one body which orbits around another* • Orders the planets in terms of distance from the Sun* • Explains that Earth is the only planet in our solar system that contains water in liquid form* • Explains that the Moon and planets shine by reflected sunlight, not their own light* • Defines constellation* • Explains the concept of a year in terms of a planet's motion* • Explains the concept of a full day and night in terms of Earth's motion* • Explains the phases of the Moon* • Infers that an object thrown up from a planet will not travel as far as an object thrown with the same force from a planet with less gravity* | <ul style="list-style-type: none"> • Describes chemical and physical characteristics of stars* • Compares characteristics of stars and star systems (e.g., temperature, color, size, elements, energy, number of stars in system)* • Identifies arrangement of bodies within our galaxy* • Describes characteristics of meteors • Classifies asteroids, comets, and meteors, meteoroids and meteorites by location* • Recognizes characteristics of meteorites* • Describes characteristics of the planet Mercury* • Recognizes that the Moon is a natural satellite of Earth* • Compares size of astronomical planets* • Explains the concept of seasons in terms of Earth's motion* • Relates the regular predictable motion of the Earth to the regular length of a year • Identifies the phase of the moon during which a lunar eclipse may occur* • Explains how both the relative mass of the Moon and Sun, as well as their distance from Earth, result in differences in the effect each has on Earth's tides* • Explains the effect of gravity on orbital shape and speed* • Analyzes the effect of gravity on tides • Recognizes that changes in the energy output of the Sun would cause significant changes in Earth processes that depend on the Sun's energy* |
| <p><i>New Vocabulary:</i> asteroid, breeze, comet, condense, crack, decay, dust, Earth's surface, erosion, evaporate, flood, fresh water, galaxy, gale, geographic area, granite, ground, gust, humidity, individual consumption, irrigation, latitude, lava, layer, lightning, lignite, magma, melt, meteor, moon (satellite), nebula, Neptune, obsidian, ocean current, particle, Polaris, prevailing wind, process, reflect, reservoir, Sirius, slate, sublimation, thunder, tide, tornado, transpiration, Venus, water supply, wave, wearing away/down, weathering, wind form</p> | <p><i>New Vocabulary:</i> air pressure, angstrom, basalt, canyon, cavern, compaction, constellation, crater, dam, deposition, Earth's crust, ecological cycle, ellipse, equinox, fault line, faulting, fission, float, folding, forecast, formation, fossil fuel, frost, full moon, funnel, fusion, gaseous, glaciation, glacier, greenhouse effect, igneous rock, landslide, light-year, marble, metamorphic rock, meteorite, meteorologist, new moon, nitrogen cycle, nova, oil well, parent material, porous rock, pumice, rainfall, relative age, rock cycle, rock layer, running water, salinity, sand dune, saturation, sea level, sediment,</p> | <p><i>New Vocabulary:</i> abyssal floor, abyssal plain, agent, air mass, amber, artesian well, ash, atoll, atomic energy, biomass, boundary, cirrus, cold front, continental margin, continental shelf, continental slope, cosmic rays, crustal plate, cyclone, deep-water zone, Earth process, electrical field, erode, eye of a hurricane, fair (weather), falling star, fault, fault zone, fixed orbit, front, geyser, ground water, Halley's Comet, humid, hurricane, igneous, inner core, mercury barometer, mercury thermometer, meteoroid, mid-ocean ridge, Milky Way Galaxy, mudstone, nonrenewable, Northern Hemisphere, nuclear reaction,</p> |

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| | sedimentary rock, sedimentation, seismograph, sinkhole, tidal wave, trace elements, uranium, vegetation, water pressure, well, wind speed | ore, outer core, period of revolution, petrified wood, petroleum, plains, plant matter, plate, preserve, reef, region, renewable, renewable energy, renewable resource, replacement, rift valley, San Andreas fault, sandstone, satellite, sea floor, seamount, seawater, sedimentary, shale, shallow-water zone, shore, submerge, tectonic plate, tidal, tidal forces, tide action, trench, undisturbed, valley, warm front, white dwarf |
| <i>New Signs and Symbols: none</i> | <i>New Signs and Symbols: none</i> | <i>New Signs and Symbols: Ca (Calcium), Cl (Chlorine), Cu (Copper), K (potassium), → leads to (geochemical cycle), Na (sodium), NO₃ (nitrate)</i> |

Subject: General Science

Goal Strand: Earth and Space Science

RIT Score Range: 211 - 220

| Skills and Concepts to Enhance 201 - 210 | Skills and Concepts to Develop 211 - 220 | Skills and Concepts to Introduce 221 - 230 |
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| <p>Structure and Interactions in the Earth System</p> <ul style="list-style-type: none"> • Defines a spring as underground water which seeps onto the Earth's surface* • Describes physical properties of the ocean* • Describes the movement of water through a complete turn of the water cycle* • Describes the water cycle • Interprets models that show how water is recycled in the Earth system* • Explains why non-renewable resources should not be wasted* • Describes formation of fossil fuels • Describes physical characteristics of different rocks and minerals (e.g., color, hardness, texture, pattern, layering, particle size)* • Describes the process of sedimentary rock formation* • Describes how dew forms on surfaces* • Defines humidity* • Understands that meteorologists use multiple measurements of weather conditions to make forecasts* • Describes how changes in the composition of the atmosphere can affect Earth's climate* • Recognizes that air takes up space • Recognizes that air can cause changes in the environment* • Recognizes that uneven heating of air by the Sun causes convection currents* • Labels diagrams of Earth (three layers) to show Earth's mantle* • Recognizes Earth's three layers* • Orders Earth's three layers* • Describes characteristics of Earth's three layers* • Recognizes characteristics of each layer of Earth (e.g., cold brittle lithosphere, hot convecting mantle, dense metallic core) | <p>Structure and Interactions in the Earth System</p> <ul style="list-style-type: none"> • Differentiates among artesian wells, springs and geysers* • Describes the composition of the Earth's bodies of water* • Describes geologic features of the ocean • Orders steps of the water cycle* • Describes processes that make up the water cycle* • Classifies natural resources as renewable or non-renewable • Defines non-renewable natural resources* • Gives examples of renewable and non-renewable resources* • Describes the source of geothermal energy* • Gives examples of igneous rocks* • Describes the process of igneous rock formation* • Recognizes that petrification is the replacement of bone by minerals* • Describes characteristics of sedimentary rock* • Makes inferences about where igneous rocks may be found* • Classifies rocks according to the forces which formed them • Describes humus* • Describes cloud formation in weather systems* • Describes the structure of weather systems (e.g., hurricanes)* • Analyzes humidity in weather systems* • Describes how weather conditions are measured* • Explains how barometric pressure is interpreted • Defines climate* • Explains how uneven heating at the shore/ocean interface by the Sun creates winds* • Analyzes the role of temperature in producing ocean currents* • Describes results of interacting air masses* | <p>Structure and Interactions in the Earth System</p> <ul style="list-style-type: none"> • Describes chemical properties of the ocean* • Orders steps of the water cycle* • Describes runoff as movement of water across Earth's surface as streams and rivers* • Classifies natural resources as renewable or non-renewable • Relates renewable and non-renewable energy resources to methods of energy production (e.g., tidal power, nuclear energy)* • Describes the makeup of minerals* • Recognizes that each mineral has a specific chemical composition and structure which give it specific physical properties* • Explains that specific properties of a mineral are due to its chemical composition and structure* • Identifies rocks and minerals based on physical properties* • Describes the process of metamorphic rock formation* • Identifies minerals using established methods • Recognizes that the organic material in soil is called humus* • Describes how living things contribute to erosion resistance* • Classifies clouds by composition, height, and type of precipitation* • Explains how uneven heating at the shore/ocean interface by the Sun creates winds* • Relates differences in air pressure to movement of surface winds* • Identifies diagrams illustrating convection* • Describes the composition of Earth's atmosphere* • Interprets data related to formation of Earth materials* • Describes the formation of extrusive and intrusive rocks* • Describes how sedimentation occurs* |

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| <ul style="list-style-type: none"> • Recognizes that the Earth is spherical in shape* • Explains why the equator is used to divide the Earth into two hemispheres* • Defines the rock cycle* • Describes ways in which rocks undergo changes from physical weathering • Gives examples of chemical weathering* • Predicts how sediments of different sizes will sort* • Describes how Earth materials erode • Recognizes major agents of erosion* • Interprets data related to the continuous modification of rocks in the rock cycle* • Recognizes that rapid processes which change Earth's surface include landslides, volcanic eruptions, and earthquakes* • Distinguishes among processes that do and do not change Earth's surface* • Infers that Earth's surface is constantly changing* • Describes how destructive forces create land forms* • Explains how processes such as erosion, weathering, and flow cause slow change to Earth's surface features* • Infers that effects of an earthquake depend on its strength* • Understands that earthquakes cause differences in the movement of land* • Describes causes of earthquakes* • Describes tools used to measure earthquakes* • Describes folding and faulting* • Recognizes that plate tectonics is the theory that accounts for the movement of the continents* • Draws conclusions about the past from fossils or fossil data* • Explains how sedimentary rocks record events of Earth's history* • Uses the law of superposition to determine the relative ages of rock layers* • Describes relative dating techniques* | <ul style="list-style-type: none"> • Recognizes the Sun's role in the water cycle* • Recognizes the sources of geothermal energy* • Labels a diagram of Earth (four layers) to show Earth's outer core* • Labels a diagram of Earth (four layers) to show Earth's mantle* • Compares weathering and erosion* • Compares agents of erosion* • Describes sequences within the rock cycle that minerals could pass through* • Describes how slow and rapid processes cause the Earth's surface to change constantly • Describes how constructive forces create land forms* • Analyzes the role of destructive forces in shaping Earth's surface* • Gives examples of fault zones* • Recognizes that faults are breakages in rock associated with movement of Earth's plates* • Explains how mountain building is caused by movement of tectonic plates* • Relates plate movement to geologic events • Explains how plate tectonic theory accounts for movement of landforms over time* • Defines magma* • Recognizes that in most fossils, living tissue is replaced with minerals, but in certain fossils (e.g., amber, frozen organisms), biological matter (DNA) may remain* • Describes conditions that are usually needed for a fossil to form • Explains that the geologic processes we observe today have also occurred in the geologic past* | <ul style="list-style-type: none"> • Describes sequences within the rock cycle that minerals could pass through* • Analyzes the role of destructive forces in shaping Earth's surface* • Sequences events that occur during a volcanic eruption* • Explains that faults are associated with earthquakes* • Explains that seismographs measure the energy released during an earthquake* • Explains how sea floor spreading is caused by movement of tectonic plates* • Predicts the landform that will result from the collision of two continental plates* • Interprets diagrams showing divergent plate movement • Recognizes that the mid-Atlantic ridge is the result of sea-floor spreading* • Explains features of the Earth's surface using plate tectonic theory* • Recognizes that most of the world's volcanoes are located along the Pacific rim* • Describes the carbon cycle* • Describes the structure of the geological time scale* |
| Structure, Interactions in Sky, Solar Sys, Univ | Structure, Interactions in Sky, Solar Sys, Univ | Structure, Interactions in Sky, Solar Sys, Univ |
| <ul style="list-style-type: none"> • Relates the Earth's rotation on its axis to the length of a day* • Explains how Earth's tilt causes seasons* • Explains how the Earth's tilt affects the intensity of sunlight in summer and winter* | <ul style="list-style-type: none"> • Defines rotation of planets* • Explains that the direction of Earth's rotation is west to east* • Analyzes diagrams showing the effect of Earth's tilt on seasons* | <ul style="list-style-type: none"> • Describes how the Earth's tilt affects weather patterns* • Names the characteristics used to classify stars* • Explains that part of the Milky Way galaxy can be seen as a bright band of light in the night sky* • Describes characteristics of the planet Jupiter* |

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| <ul style="list-style-type: none"> Analyzes diagrams showing how the relative intensity of sunlight differs in summer and winter* Explains that astronomical objects are separated by great distances* Recognizes that the Sun, Moon and planets are spherical in shape* Describes characteristics of comets* Compares characteristics of meteors and meteorites* Describes formation of meteors* Recognizes how meteor showers are produced* Describes the relationship between the Moon and the Earth (the Moon is a satellite of the Earth, and therefore orbits around the Earth)* Recognizes that it takes about 29 days for the Moon to orbit Earth* Describes how the Moon's surface has been affected by meteorites* Defines satellite as one body which orbits around another* Orders the planets in terms of distance from the Sun* Explains that Earth is the only planet in our solar system that contains water in liquid form* Explains that the Moon and planets shine by reflected sunlight, not their own light* Defines constellation* Explains the concept of a year in terms of a planet's motion* Explains the concept of a full day and night in terms of Earth's motion* Explains the phases of the Moon* Infers that an object thrown up from a planet will not travel as far as an object thrown with the same force from a planet with less gravity* | <ul style="list-style-type: none"> Describes chemical and physical characteristics of stars* Compares characteristics of stars and star systems (e.g., temperature, color, size, elements, energy, number of stars in system)* Identifies arrangement of bodies within our galaxy* Describes characteristics of meteors Classifies asteroids, comets, and meteors, meteoroids and meteorites by location* Recognizes characteristics of meteorites* Describes characteristics of the planet Mercury* Recognizes that the Moon is a natural satellite of Earth* Compares size of astronomical planets* Explains the concept of seasons in terms of Earth's motion* Relates the regular predictable motion of the Earth to the regular length of a year Identifies the phase of the moon during which a lunar eclipse may occur* Explains how both the relative mass of the Moon and Sun, as well as their distance from Earth, result in differences in the effect each has on Earth's tides* Explains the effect of gravity on orbital shape and speed* Analyzes the effect of gravity on tides Recognizes that changes in the energy output of the Sun would cause significant changes in Earth processes that depend on the Sun's energy* | <ul style="list-style-type: none"> Explains that during a solar eclipse, the Moon's shadow falls on the Earth* Identifies the phases of the Moon* Calculates the weight of an object on various planets, when given the acceleration due to gravity for each planet* Analyzes the formation of the solar system* |
| <p><i>New Vocabulary:</i> air pressure, angstrom, basalt, canyon, cavern, compaction, constellation, crater, dam, deposition, Earth's crust, ecological cycle, ellipse, equinox, fault line, faulting, fission, float, folding, forecast, formation, fossil fuel, frost, full moon, funnel, fusion, gaseous, glaciation, glacier, greenhouse effect, igneous rock, landslide, light-year, marble, metamorphic rock, meteorite, meteorologist, new moon, nitrogen cycle, nova, oil well, parent material, porous rock, pumice, rainfall, relative age, rock cycle, rock layer, running water, salinity, sand dune, saturation, sea level, sediment,</p> | <p><i>New Vocabulary:</i> abyssal floor, abyssal plain, agent, air mass, amber, artesian well, ash, atoll, atomic energy, biomass, boundary, cirrus, cold front, continental margin, continental shelf, continental slope, cosmic rays, crustal plate, cyclone, deep-water zone, Earth process, electrical field, erode, eye of a hurricane, fair (weather), falling star, fault, fault zone, fixed orbit, front, geyser, ground water, Halley's Comet, humid, hurricane, igneous, inner core, mercury barometer, mercury thermometer, meteoroid, mid-ocean ridge, Milky Way Galaxy, mudstone, nonrenewable, Northern Hemisphere, nuclear reaction,</p> | <p><i>New Vocabulary:</i> aquifer, asteroid belt, breccia, convergent plate boundary, cover crop, cumulus, delta, divergent plate boundary, embed, erupt, extrusive, flow, fracture, gold, hydroelectric power, location, lowland, metallic, methane, Milky Way, nimbus, oceanic crust, oil deposit, rock face, runoff, seashell, separate, settle, sift, solar power, star cluster, stratus, streak (test), subduction boundary, subsoil, surface wind, thunderhead, tidal power, volcanic action</p> |

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| sedimentary rock, sedimentation, seismograph, sinkhole, tidal wave, trace elements, uranium, vegetation, water pressure, well, wind speed | ore, outer core, period of revolution, petrified wood, petroleum, plains, plant matter, plate, preserve, reef, region, renewable, renewable energy, renewable resource, replacement, rift valley, San Andreas fault, sandstone, satellite, sea floor, seamount, seawater, sedimentary, shale, shallow-water zone, shore, submerge, tectonic plate, tidal, tidal forces, tide action, trench, undisturbed, valley, warm front, white dwarf | |
| <i>New Signs and Symbols:</i> none | <i>New Signs and Symbols:</i> Ca (Calcium), Cl (Chlorine), Cu (Copper), K (potassium), → leads to (geochemical cycle), Na (sodium), NO ₃ (nitrate) | <i>New Signs and Symbols:</i> none |

Subject: General Science

Goal Strand: Earth and Space Science

RIT Score Range: 221 - 230

| Skills and Concepts to Enhance 211 - 220 | Skills and Concepts to Develop 221 - 230 | Skills and Concepts to Introduce 231 - 240 |
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| <p>Structure and Interactions in the Earth System</p> <ul style="list-style-type: none"> • Differentiates among artesian wells, springs and geysers* • Describes the composition of the Earth's bodies of water* • Describes geologic features of the ocean • Orders steps of the water cycle* • Describes processes that make up the water cycle* • Classifies natural resources as renewable or non-renewable • Defines non-renewable natural resources* • Gives examples of renewable and non-renewable resources* • Describes the source of geothermal energy* • Gives examples of igneous rocks* • Describes the process of igneous rock formation* • Recognizes that petrification is the replacement of bone by minerals* • Describes characteristics of sedimentary rock* • Makes inferences about where igneous rocks may be found* • Classifies rocks according to the forces which formed them • Describes humus* • Describes cloud formation in weather systems* • Describes the structure of weather systems (e.g., hurricanes)* • Analyzes humidity in weather systems* • Describes how weather conditions are measured* • Explains how barometric pressure is interpreted • Defines climate* • Explains how uneven heating at the shore/ocean interface by the Sun creates winds* • Analyzes the role of temperature in producing ocean currents* • Describes results of interacting air masses* | <p>Structure and Interactions in the Earth System</p> <ul style="list-style-type: none"> • Describes chemical properties of the ocean* • Orders steps of the water cycle* • Describes runoff as movement of water across Earth's surface as streams and rivers* • Classifies natural resources as renewable or non-renewable • Relates renewable and non-renewable energy resources to methods of energy production (e.g., tidal power, nuclear energy)* • Describes the makeup of minerals* • Recognizes that each mineral has a specific chemical composition and structure which give it specific physical properties* • Explains that specific properties of a mineral are due to its chemical composition and structure* • Identifies rocks and minerals based on physical properties* • Describes the process of metamorphic rock formation* • Identifies minerals using established methods • Recognizes that the organic material in soil is called humus* • Describes how living things contribute to erosion resistance* • Classifies clouds by composition, height, and type of precipitation* • Explains how uneven heating at the shore/ocean interface by the Sun creates winds* • Relates differences in air pressure to movement of surface winds* • Identifies diagrams illustrating convection* • Describes the composition of Earth's atmosphere* • Interprets data related to formation of Earth materials* • Describes the formation of extrusive and intrusive rocks* • Describes how sedimentation occurs* | <p>Structure and Interactions in the Earth System</p> <ul style="list-style-type: none"> • Orders steps of the water cycle* • Relates the characteristics of igneous rocks to the conditions of their formation* • Classifies rocks according to composition* • Makes inferences from data about dew formation* • Predicts the movement of air that will result from uneven heating of air at the ocean shore interface* • Describes climate conditions accompanying high and low pressure systems* • Recognizes that oxygen is an agent of chemical weathering* • Recognizes agents of chemical weathering* • Describes the measurement of an earthquake's magnitude using the Richter scale* • Explains how volcanic eruptions are caused by movement of tectonic plates* • Explains how sea floor spreading is caused by movement of tectonic plates* • Explains how plate movement produces sea floor spreading* • Predicts what will result from the collision of two oceanic plates* • Recognizes the carbon cycle* |

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| <ul style="list-style-type: none"> • Recognizes the Sun's role in the water cycle* • Recognizes the sources of geothermal energy* • Labels a diagram of Earth (four layers) to show Earth's outer core* • Labels a diagram of Earth (four layers) to show Earth's mantle* • Compares weathering and erosion* • Compares agents of erosion* • Describes sequences within the rock cycle that minerals could pass through* • Describes how slow and rapid processes cause the Earth's surface to change constantly • Describes how constructive forces create land forms* • Analyzes the role of destructive forces in shaping Earth's surface* • Gives examples of fault zones* • Recognizes that faults are breakages in rock associated with movement of Earth's plates* • Explains how mountain building is caused by movement of tectonic plates* • Relates plate movement to geologic events • Explains how plate tectonic theory accounts for movement of landforms over time* • Defines magma* • Recognizes that in most fossils, living tissue is replaced with minerals, but in certain fossils (e.g., amber, frozen organisms), biological matter (DNA) may remain* • Describes conditions that are usually needed for a fossil to form • Explains that the geologic processes we observe today have also occurred in the geologic past* | <ul style="list-style-type: none"> • Describes sequences within the rock cycle that minerals could pass through* • Analyzes the role of destructive forces in shaping Earth's surface* • Sequences events that occur during a volcanic eruption* • Explains that faults are associated with earthquakes* • Explains that seismographs measure the energy released during an earthquake* • Explains how sea floor spreading is caused by movement of tectonic plates* • Predicts the landform that will result from the collision of two continental plates* • Interprets diagrams showing divergent plate movement • Recognizes that the mid-Atlantic ridge is the result of sea-floor spreading* • Explains features of the Earth's surface using plate tectonic theory* • Recognizes that most of the world's volcanoes are located along the Pacific rim* • Describes the carbon cycle* • Describes the structure of the geological time scale* | |
| Structure, Interactions in Sky, Solar Sys, Univ | Structure, Interactions in Sky, Solar Sys, Univ | Structure, Interactions in Sky, Solar Sys, Univ |
| <ul style="list-style-type: none"> • Defines rotation of planets* • Explains that the direction of Earth's rotation is west to east* • Analyzes diagrams showing the effect of Earth's tilt on seasons* • Describes chemical and physical characteristics of stars* • Compares characteristics of stars and star systems (e.g., temperature, color, size, elements, energy, number of stars in system)* • Identifies arrangement of bodies within our galaxy* • Describes characteristics of meteors | <ul style="list-style-type: none"> • Describes how the Earth's tilt affects weather patterns* • Names the characteristics used to classify stars* • Explains that part of the Milky Way galaxy can be seen as a bright band of light in the night sky* • Describes characteristics of the planet Jupiter* • Explains that during a solar eclipse, the Moon's shadow falls on the Earth* • Identifies the phases of the Moon* • Calculates the weight of an object on various planets, when given the acceleration due to gravity for each planet* | <ul style="list-style-type: none"> • Describes the relationship between the Coriolis effect and wind patterns* • Describes characteristics of the solar system* • Classifies comets and asteroids by the shape of their orbits* • Compares composition of planets* • Determines how the Earth moves in relation to the Moon* • Uses models to show how the relative location of the Sun, Moon, and Earth are responsible for tides* • Recognizes that the planets are kept in orbit around the Sun due to gravity and inertia* |

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* Both data from test items and review by NWEA curriculum specialists are used to place learning continuum statements into appropriate RIT ranges.

Blank cells indicate data are limited or unavailable for this range or document version.

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| <ul style="list-style-type: none"> • Classifies asteroids, comets, and meteors, meteoroids and meteorites by location* • Recognizes characteristics of meteorites* • Describes characteristics of the planet Mercury* • Recognizes that the Moon is a natural satellite of Earth* • Compares size of astronomical planets* • Explains the concept of seasons in terms of Earth's motion* • Relates the regular predictable motion of the Earth to the regular length of a year • Identifies the phase of the moon during which a lunar eclipse may occur* • Explains how both the relative mass of the Moon and Sun, as well as their distance from Earth, result in differences in the effect each has on Earth's tides* • Explains the effect of gravity on orbital shape and speed* • Analyzes the effect of gravity on tides • Recognizes that changes in the energy output of the Sun would cause significant changes in Earth processes that depend on the Sun's energy* | <ul style="list-style-type: none"> • Analyzes the formation of the solar system* | <ul style="list-style-type: none"> • Describes the effects of gravity on Earth's motion* • Infers that a spacecraft or object attempting to leave a larger planet will require more force than when leaving a smaller planet, due to differences in gravity between the two planets* • Describes the life cycle of a star (stellar evolution)* |
| <p><i>New Vocabulary:</i> abyssal floor, abyssal plain, agent, air mass, amber, artesian well, ash, atoll, atomic energy, biomass, boundary, cirrus, cold front, continental margin, continental shelf, continental slope, cosmic rays, crustal plate, cyclone, deep-water zone, Earth process, electrical field, erode, eye of a hurricane, fair (weather), falling star, fault, fault zone, fixed orbit, front, geyser, ground water, Halley's Comet, humid, hurricane, igneous, inner core, mercury barometer, mercury thermometer, meteoroid, mid-ocean ridge, Milky Way Galaxy, mudstone, nonrenewable, Northern Hemisphere, nuclear reaction, ore, outer core, period of revolution, petrified wood, petroleum, plains, plant matter, plate, preserve, reef, region, renewable, renewable energy, renewable resource, replacement, rift valley, San Andreas fault, sandstone, satellite, sea floor, seamount, seawater, sedimentary, shale, shallow-water zone, shore, submerge, tectonic plate, tidal, tidal forces, tide action, trench, undisturbed, valley, warm front, white dwarf</p> | <p><i>New Vocabulary:</i> aquifer, asteroid belt, breccia, convergent plate boundary, cover crop, cumulus, delta, divergent plate boundary, embed, erupt, extrusive, flow, fracture, gold, hydroelectric power, location, lowland, metallic, methane, Milky Way, nimbus, oceanic crust, oil deposit, rock face, runoff, seashell, separate, settle, sift, solar power, star cluster, stratus, streak (test), subduction boundary, subsoil, surface wind, thunderhead, tidal power, volcanic action</p> | <p><i>New Vocabulary:</i> climate condition, conglomerate, deep-sea trench, ebb tide, flood tide, high pressure system, high tide, low tide, Richter scale, siltstone</p> |
| <p><i>New Signs and Symbols:</i> Ca (Calcium), Cl (Chlorine), Cu (Copper), K (potassium), → leads to (geochemical cycle), Na (sodium), NO₃ (nitrate)</p> | <p><i>New Signs and Symbols:</i> none</p> | <p><i>New Signs and Symbols:</i> none</p> |

Subject: General Science

Goal Strand: Earth and Space Science

RIT Score Range: 231 - 240

| Skills and Concepts to Enhance 221 - 230 | Skills and Concepts to Develop 231 - 240 | Skills and Concepts to Introduce 241 - 250 |
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| <p>Structure and Interactions in the Earth System</p> <ul style="list-style-type: none"> • Describes chemical properties of the ocean* • Orders steps of the water cycle* • Describes runoff as movement of water across Earth's surface as streams and rivers* • Classifies natural resources as renewable or non-renewable • Relates renewable and non-renewable energy resources to methods of energy production (e.g., tidal power, nuclear energy)* • Describes the makeup of minerals* • Recognizes that each mineral has a specific chemical composition and structure which give it specific physical properties* • Explains that specific properties of a mineral are due to its chemical composition and structure* • Identifies rocks and minerals based on physical properties* • Describes the process of metamorphic rock formation* • Identifies minerals using established methods • Recognizes that the organic material in soil is called humus* • Describes how living things contribute to erosion resistance* • Classifies clouds by composition, height, and type of precipitation* • Explains how uneven heating at the shore/ocean interface by the Sun creates winds* • Relates differences in air pressure to movement of surface winds* • Identifies diagrams illustrating convection* • Describes the composition of Earth's atmosphere* • Interprets data related to formation of Earth materials* • Describes the formation of extrusive and intrusive rocks* • Describes how sedimentation occurs* | <p>Structure and Interactions in the Earth System</p> <ul style="list-style-type: none"> • Orders steps of the water cycle* • Relates the characteristics of igneous rocks to the conditions of their formation* • Classifies rocks according to composition* • Makes inferences from data about dew formation* • Predicts the movement of air that will result from uneven heating of air at the ocean shore interface* • Describes climate conditions accompanying high and low pressure systems* • Recognizes that oxygen is an agent of chemical weathering* • Recognizes agents of chemical weathering* • Describes the measurement of an earthquake's magnitude using the Richter scale* • Explains how volcanic eruptions are caused by movement of tectonic plates* • Explains how sea floor spreading is caused by movement of tectonic plates* • Explains how plate movement produces sea floor spreading* • Predicts what will result from the collision of two oceanic plates* • Recognizes the carbon cycle* | <p>Structure and Interactions in the Earth System</p> <ul style="list-style-type: none"> • Describes the relative abundance of minerals in Earth's crust* • Compares wind speed of storms* • Predicts where sedimentation will occur in a meandering stream* • Predicts what will result from the collision of two oceanic plates* • Describes oxygen cycle* |

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| <ul style="list-style-type: none"> • Describes sequences within the rock cycle that minerals could pass through* • Analyzes the role of destructive forces in shaping Earth's surface* • Sequences events that occur during a volcanic eruption* • Explains that faults are associated with earthquakes* • Explains that seismographs measure the energy released during an earthquake* • Explains how sea floor spreading is caused by movement of tectonic plates* • Predicts the landform that will result from the collision of two continental plates* • Interprets diagrams showing divergent plate movement • Recognizes that the mid-Atlantic ridge is the result of sea-floor spreading* • Explains features of the Earth's surface using plate tectonic theory* • Recognizes that most of the world's volcanoes are located along the Pacific rim* • Describes the carbon cycle* • Describes the structure of the geological time scale* | | |
| Structure, Interactions in Sky, Solar Sys, Univ | Structure, Interactions in Sky, Solar Sys, Univ | Structure, Interactions in Sky, Solar Sys, Univ |
| <ul style="list-style-type: none"> • Describes how the Earth's tilt affects weather patterns* • Names the characteristics used to classify stars* • Explains that part of the Milky Way galaxy can be seen as a bright band of light in the night sky* • Describes characteristics of the planet Jupiter* • Explains that during a solar eclipse, the Moon's shadow falls on the Earth* • Identifies the phases of the Moon* • Calculates the weight of an object on various planets, when given the acceleration due to gravity for each planet* • Analyzes the formation of the solar system* | <ul style="list-style-type: none"> • Describes the relationship between the Coriolis effect and wind patterns* • Describes characteristics of the solar system* • Classifies comets and asteroids by the shape of their orbits* • Compares composition of planets* • Determines how the Earth moves in relation to the Moon* • Uses models to show how the relative location of the Sun, Moon, and Earth are responsible for tides* • Recognizes that the planets are kept in orbit around the Sun due to gravity and inertia* • Describes the effects of gravity on Earth's motion* • Infers that a spacecraft or object attempting to leave a larger planet will require more force than when leaving a smaller planet, due to differences in gravity between the two planets* • Describes the life cycle of a star (stellar evolution)* | |
| <i>New Vocabulary:</i> aquifer, asteroid belt, breccia, convergent plate boundary, cover crop, cumulus, delta, divergent plate boundary, embed, erupt, extrusive, flow, | <i>New Vocabulary:</i> climate condition, conglomerate, deep-sea trench, ebb tide, flood tide, high pressure system, high tide, low tide, Richter scale, siltstone | <i>New Vocabulary:</i> none |

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| fracture, gold, hydroelectric power, location, lowland, metallic, methane, Milky Way, nimbus, oceanic crust, oil deposit, rock face, runoff, seashell, separate, settle, sift, solar power, star cluster, stratus, streak (test), subduction boundary, subsoil, surface wind, thunderhead, tidal power, volcanic action | | |
| <i>New Signs and Symbols: none</i> | <i>New Signs and Symbols: none</i> | <i>New Signs and Symbols: none</i> |

Subject: General Science

Goal Strand: Earth and Space Science

RIT Score Range: 241 - 250

| Skills and Concepts to Enhance 231 - 240 | Skills and Concepts to Develop 241 - 250 | Skills and Concepts to Introduce Above 250 |
|--|--|---|
| <p>Structure and Interactions in the Earth System</p> <ul style="list-style-type: none"> • Orders steps of the water cycle* • Relates the characteristics of igneous rocks to the conditions of their formation* • Classifies rocks according to composition* • Makes inferences from data about dew formation* • Predicts the movement of air that will result from uneven heating of air at the ocean shore interface* • Describes climate conditions accompanying high and low pressure systems* • Recognizes that oxygen is an agent of chemical weathering* • Recognizes agents of chemical weathering* • Describes the measurement of an earthquake's magnitude using the Richter scale* • Explains how volcanic eruptions are caused by movement of tectonic plates* • Explains how sea floor spreading is caused by movement of tectonic plates* • Explains how plate movement produces sea floor spreading* • Predicts what will result from the collision of two oceanic plates* • Recognizes the carbon cycle* | <p>Structure and Interactions in the Earth System</p> <ul style="list-style-type: none"> • Describes the relative abundance of minerals in Earth's crust* • Compares wind speed of storms* • Predicts where sedimentation will occur in a meandering stream* • Predicts what will result from the collision of two oceanic plates* • Describes oxygen cycle* | <p>Structure and Interactions in the Earth System</p> <ul style="list-style-type: none"> • Describes the movement of P, S, and L waves through the Earth* |
| <p>Structure, Interactions in Sky, Solar Sys, Univ</p> <ul style="list-style-type: none"> • Describes the relationship between the Coriolis effect and wind patterns* • Describes characteristics of the solar system* • Classifies comets and asteroids by the shape of their orbits* • Compares composition of planets* • Determines how the Earth moves in relation to the Moon* • Uses models to show how the relative location of the Sun, Moon, and Earth are responsible for tides* • Recognizes that the planets are kept in orbit around the | <p>Structure, Interactions in Sky, Solar Sys, Univ</p> | <p>Structure, Interactions in Sky, Solar Sys, Univ</p> |

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| <p>Sun due to gravity and inertia*</p> <ul style="list-style-type: none"> • Describes the effects of gravity on Earth's motion* • Infers that a spacecraft or object attempting to leave a larger planet will require more force than when leaving a smaller planet, due to differences in gravity between the two planets* • Describes the life cycle of a star (stellar evolution)* | | |
| <p><i>New Vocabulary:</i> climate condition, conglomerate, deep-sea trench, ebb tide, flood tide, high pressure system, high tide, low tide, Richter scale, siltstone</p> | <p><i>New Vocabulary:</i> none</p> | <p><i>New Vocabulary:</i> none</p> |
| <p><i>New Signs and Symbols:</i> none</p> | <p><i>New Signs and Symbols:</i> none</p> | <p><i>New Signs and Symbols:</i> none</p> |

Subject: General Science

Goal Strand: Earth and Space Science

RIT Score Range: Above 250

| Skills and Concepts to Enhance 241 - 250 | Skills and Concepts to Develop Above 250 |
|--|---|
| <p>Structure and Interactions in the Earth System</p> <ul style="list-style-type: none"> • Describes the relative abundance of minerals in Earth's crust* • Compares wind speed of storms* • Predicts where sedimentation will occur in a meandering stream* • Predicts what will result from the collision of two oceanic plates* • Describes oxygen cycle* | <p>Structure and Interactions in the Earth System</p> <ul style="list-style-type: none"> • Describes the movement of P, S, and L waves through the Earth* |
| <p>Structure, Interactions in Sky, Solar Sys, Univ</p> | <p>Structure, Interactions in Sky, Solar Sys, Univ</p> |
| <p><i>New Vocabulary: none</i></p> | <p><i>New Vocabulary: none</i></p> |
| <p><i>New Signs and Symbols: none</i></p> | <p><i>New Signs and Symbols: none</i></p> |

Subject: General Science

Goal Strand: Environmental and Life Science

RIT Score Range: Below 171

| Skills and Concepts to Develop Below 171 | Skills and Concepts to Introduce 171 - 180 |
|--|--|
| Characteristics and Structure-Function | Characteristics and Structure-Function |
| | <ul style="list-style-type: none"> • Identifies external parts of plants • Describes the large scale external anatomy of humans* • Explains how physical characteristics of organisms help them to survive in their environments and reproduce* • Describes functions of specific organs* |
| Life Cycles, Reproduction and Heredity | Life Cycles, Reproduction and Heredity |
| <ul style="list-style-type: none"> • Orders the stages of a vertebrate life cycle showing metamorphosis (e.g., frog, salamander)* | <ul style="list-style-type: none"> • Describes simple life cycles of animals • Analyzes the life cycle of plants from reproduction and growth, through maturation and death* • Compares the process of reproduction in the major phyla of living things* |
| Interactions with Environment; Biol Evolution | Interactions with Environment; Biol Evolution |
| <ul style="list-style-type: none"> • Classifies animals as mammals* • Recognizes characteristics of birds* | <ul style="list-style-type: none"> • Recognizes similarities and differences in diverse species* • Groups organisms based on similarities* • Classifies animals as mammals* • Classifies an unknown animal as a fish, based on listed characteristics* • Identifies habitats of various organisms* • Describes behavioral adaptations (terminology not used) that allow an organism to survive in a particular environment* • Compares features of organisms (e.g., appendages, reproductive rates, camouflage, defensive structures) for their adaptive potential* • Names the biome where a specific species is found* • Describes applied uses of natural resources (e.g., trees)* • Explains that to be able to live and grow, plants and animals require resources (e.g., food, water, light, and air)* • Describes the basic needs of plants and animals* |
| <i>New Vocabulary:</i> life cycle | <i>New Vocabulary:</i> bean, body, breathe, bud, burrow, cat, caterpillar, cave, cycle, den, drown, enemy, fall, feline, forest, frog, gasoline, gill, grow, head, hibernate, hind, jungle, neck, need, nest, ocean, protect, seed, seedling, |

| | |
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| | shoulder, spider, spring, stage, summer, toad, turtle, waist, wolf, worm |
| <i>New Signs and Symbols: none</i> | <i>New Signs and Symbols: none</i> |

Subject: General Science

Goal Strand: Environmental and Life Science

RIT Score Range: 171 - 180

| Skills and Concepts to Enhance Below 171 | Skills and Concepts to Develop 171 - 180 | Skills and Concepts to Introduce 181 - 190 |
|--|--|--|
| Characteristics and Structure-Function | Characteristics and Structure-Function | Characteristics and Structure-Function |
| | <ul style="list-style-type: none"> • Identifies external parts of plants • Describes the large scale external anatomy of humans* • Explains how physical characteristics of organisms help them to survive in their environments and reproduce* • Describes functions of specific organs* | <ul style="list-style-type: none"> • Identifies characteristics of organisms* • Describes functions of structures of animals • Describes the large scale external anatomy of humans* • Explains that the function of a plant's root is to absorb water* • Explains how physical characteristics of organisms help them to survive in their environments and reproduce* • Gives examples of features that help plants and animals survive in different places* • Recognizes that the heart acts as a pump* • Describes the structure and basic functions (movement and support) of the skeletal system • Describes characteristics of each of the human senses* • Describes how tools enhance the senses* • Compares basic needs of different organisms in their environment* • Recognizes the importance of oxygen to the survival of animals* • Sorts organisms and objects as living or non-living • Differentiates among living and nonliving things* |
| Life Cycles, Reproduction and Heredity | Life Cycles, Reproduction and Heredity | Life Cycles, Reproduction and Heredity |
| <ul style="list-style-type: none"> • Orders the stages of a vertebrate life cycle showing metamorphosis (e.g., frog, salamander)* | <ul style="list-style-type: none"> • Describes simple life cycles of animals • Analyzes the life cycle of plants from reproduction and growth, through maturation and death* • Compares the process of reproduction in the major phyla of living things* | |
| Interactions with Environment; Biol Evolution | Interactions with Environment; Biol Evolution | Interactions with Environment; Biol Evolution |
| <ul style="list-style-type: none"> • Classifies animals as mammals* • Recognizes characteristics of birds* | <ul style="list-style-type: none"> • Recognizes similarities and differences in diverse species* • Groups organisms based on similarities* • Classifies animals as mammals* • Classifies an unknown animal as a fish, based on listed characteristics* • Identifies habitats of various organisms* • Describes behavioral adaptations (terminology not | <ul style="list-style-type: none"> • Classifies commonly-known organisms (e.g., cat, dog, apple) based on external characteristics • Groups organisms based on similarities* • Sorts living and non-living things using different characteristics* • Classifies an unknown animal as a mammal, based on listed characteristics* • Classifies major groups of organisms using the five |

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| | <p>used) that allow an organism to survive in a particular environment*</p> <ul style="list-style-type: none"> • Compares features of organisms (e.g., appendages, reproductive rates, camouflage, defensive structures) for their adaptive potential* • Names the biome where a specific species is found* • Describes applied uses of natural resources (e.g., trees)* • Explains that to be able to live and grow, plants and animals require resources (e.g., food, water, light, and air)* • Describes the basic needs of plants and animals* | <p>kingdom system*</p> <ul style="list-style-type: none"> • Classifies living things as carnivores* • Describes how environmental changes cause species to evolve over time, thus producing new species* • Describes the niche of a particular plant or animal* • Recognizes the characteristics of the desert biome* • Predicts how life forms will maintain homeostasis through particular changes* • Makes inferences about the effect of pollution on living things* • Explains that most pollution results from human activities* • Recognizes that air pollution is caused by things that dirty the air* • Explains how recycling protects the environment* • Gives examples of natural resources* • Gives examples of foods that come from plants* |
| <i>New Vocabulary:</i> life cycle | <i>New Vocabulary:</i> bean, body, breathe, bud, burrow, cat, caterpillar, cave, cycle, den, drown, enemy, fall, feline, forest, frog, gasoline, gill, grow, head, hibernate, hind, jungle, neck, need, nest, ocean, protect, seed, seedling, shoulder, spider, spring, stage, summer, toad, turtle, waist, wolf, worm | <i>New Vocabulary:</i> absorb, active, adapt, alive, bank, bone, bristle, bush, camouflage, carnivore, circulation, clam, claw, climate, defense, drink, earthquake, feel, growth, hear, heart, herb, herbivore, intestines, knee, living, lung, magnifying glass, mate, meat-eater, milk, mineral, mouth, movement, natural resource, nectar, plant-eater, polluted, pollution, protection, pump, recycle, reproduction, rib, see, segment, sense, shell, shrub, sight, signal, skeleton, sleep, smell, spears, stomach, swim, taste, touch, vine, vitamin, woods |
| <i>New Signs and Symbols:</i> none | <i>New Signs and Symbols:</i> none | <i>New Signs and Symbols:</i> none |

Subject: General Science

Goal Strand: Environmental and Life Science

RIT Score Range: 181 - 190

| Skills and Concepts to Enhance 171 - 180 | Skills and Concepts to Develop 181 - 190 | Skills and Concepts to Introduce 191 - 200 |
|--|---|---|
| <p>Characteristics and Structure-Function</p> <ul style="list-style-type: none"> Identifies external parts of plants Describes the large scale external anatomy of humans* Explains how physical characteristics of organisms help them to survive in their environments and reproduce* Describes functions of specific organs* | <p>Characteristics and Structure-Function</p> <ul style="list-style-type: none"> Identifies characteristics of organisms* Describes functions of structures of animals Describes the large scale external anatomy of humans* Explains that the function of a plant's root is to absorb water* Explains how physical characteristics of organisms help them to survive in their environments and reproduce* Gives examples of features that help plants and animals survive in different places* Recognizes that the heart acts as a pump* Describes the structure and basic functions (movement and support) of the skeletal system Describes characteristics of each of the human senses* Describes how tools enhance the senses* Compares basic needs of different organisms in their environment* Recognizes the importance of oxygen to the survival of animals* Sorts organisms and objects as living or non-living Differentiates among living and nonliving things* | <p>Characteristics and Structure-Function</p> <ul style="list-style-type: none"> Recognizes that a flower will turn into the fruit and produce seeds Describes seed dispersal in plants* Describes the basic structures which make up a seed (e.g., seed coat)* Describes the function of the backbone in vertebrates* Explains how physical characteristics of organisms help them to survive in their environments and reproduce* Explains how physical features of organisms help them to survive in their environments* Recognizes that one function of a plant root is support* Predicts how a change to one organ or system will affect another organ or system* Describes the function of the circulatory system Recognizes the components which make up the digestive system* Describes how things feel to the touch* Infers the type of resources needed for an animal to survive* Recognizes that all living organisms are made up of cells Explains why cells are called "building blocks"* Infers that a cell is a plant cell because it contains chloroplasts and a cell wall* Recognizes that energy is required for the chemical reactions in cells to occur* |
| <p>Life Cycles, Reproduction and Heredity</p> <ul style="list-style-type: none"> Describes simple life cycles of animals Analyzes the life cycle of plants from reproduction and growth, through maturation and death* Compares the process of reproduction in the major phyla of living things* | <p>Life Cycles, Reproduction and Heredity</p> | <p>Life Cycles, Reproduction and Heredity</p> <ul style="list-style-type: none"> Recognizes that animals pass through a life cycle consisting of birth, growth and development to adulthood, reproduction, and death Orders the four stages of an insect life cycle (complete metamorphosis) Explains that mammals give birth to live young* |

| Interactions with Environment; Biol Evolution | Interactions with Environment; Biol Evolution | Interactions with Environment; Biol Evolution |
|--|---|--|
| <ul style="list-style-type: none"> • Recognizes similarities and differences in diverse species* • Groups organisms based on similarities* • Classifies animals as mammals* • Classifies an unknown animal as a fish, based on listed characteristics* • Identifies habitats of various organisms* • Describes behavioral adaptations (terminology not used) that allow an organism to survive in a particular environment* • Compares features of organisms (e.g., appendages, reproductive rates, camouflage, defensive structures) for their adaptive potential* • Names the biome where a specific species is found* • Describes applied uses of natural resources (e.g., trees)* • Explains that to be able to live and grow, plants and animals require resources (e.g., food, water, light, and air)* • Describes the basic needs of plants and animals* | <ul style="list-style-type: none"> • Classifies commonly-known organisms (e.g., cat, dog, apple) based on external characteristics • Groups organisms based on similarities* • Sorts living and non-living things using different characteristics* • Classifies an unknown animal as a mammal, based on listed characteristics* • Classifies major groups of organisms using the five kingdom system* • Classifies living things as carnivores* • Describes how environmental changes cause species to evolve over time, thus producing new species* • Describes the niche of a particular plant or animal* • Recognizes the characteristics of the desert biome* • Predicts how life forms will maintain homeostasis through particular changes* • Makes inferences about the effect of pollution on living things* • Explains that most pollution results from human activities* • Recognizes that air pollution is caused by things that dirty the air* • Explains how recycling protects the environment* • Gives examples of natural resources* • Gives examples of foods that come from plants* | <ul style="list-style-type: none"> • Recognizes that living organisms can be classified using different characteristics* • Recognizes characteristics of vertebrates* • Recognizes characteristics of invertebrates* • Compares characteristics of mammals* • Describes characteristics of mammals • Recognizes characteristics of reptiles* • Describes characteristics of reptiles • Describes characteristics of fish* • Describes characteristics of insects • Classifies an unknown animal as an amphibian, based on listed characteristics* • Classifies living things as carnivores* • Classifies living things as plant eaters • Classifies organisms by their external characteristics* • Defines classification* • Describes the concept of extinction* • Gives examples of extinct organisms* • Recognizes that biological adaptations include structural, behavioral, or physiological changes* • Explains that fossils provide evidence about organisms that lived long ago* • Recognizes that plants and animals are often hidden* • Describes structural adaptations that allow an organism to survive in a particular environment* • Explains how behavioral characteristics of organisms help them to survive in their environment* • Explains how the specific adaptations of an organism allow it survive in a particular environment* • Recognizes that camouflage allows an organism to blend in with its surroundings* • Describes ways that living things respond to changes in their environment (e.g., shedding, hibernation, migration)* • Infers that the behavior of an animal may change due to a change in its environment* • Describes how light affects the growth of plants* • Gives examples of actions and events that produce pollution* • Describes effects of pollution on living things • Makes inferences about the effect of pollution on living things* |

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| | | <ul style="list-style-type: none"> • Explains how wind can cause pollution (dust)* • Describes basic characteristics of polluted air* • Explains how human population growth modifies the environment* • Classifies a species interaction as a predator-prey relationship • Infers effects of animals' interaction with plants on the life of the animal* • Recognizes that food chains (generally) begin with a plant* • Describes the organization of a simple food web* • Explains that green plants can make their own food from sunlight* • Locates the producer in an ecological pyramid* |
| <p><i>New Vocabulary:</i> bean, body, breathe, bud, burrow, cat, caterpillar, cave, cycle, den, drown, enemy, fall, feline, forest, frog, gasoline, gill, grow, head, hibernate, hind, jungle, neck, need, nest, ocean, protect, seed, seedling, shoulder, spider, spring, stage, summer, toad, turtle, waist, wolf, worm</p> | <p><i>New Vocabulary:</i> absorb, active, adapt, alive, bank, bone, bristle, bush, camouflage, carnivore, circulation, clam, claw, climate, defense, drink, earthquake, feel, growth, hear, heart, herb, herbivore, intestines, knee, living, lung, magnifying glass, mate, meat-eater, milk, mineral, mouth, movement, natural resource, nectar, plant-eater, polluted, pollution, protection, pump, recycle, reproduction, rib, see, segment, sense, shell, shrub, sight, signal, skeleton, sleep, smell, spears, stomach, swim, taste, touch, vine, vitamin, woods</p> | <p><i>New Vocabulary:</i> abdomen, antenna, backbone, bark, body part, body section, body segments, cell wall, cephalothorax, characteristic, circulatory system, classification, cold-blooded, constant, consumer, developmental sequence, digestion, digestive system, esophagus, exercise, experimentation, extinct, female, field, food chain, food web, four-chambered heart, habitat, hibernation, hide, host, hunger, hypothesize, inference, ingestion, internal, intestine, invertebrate, jointed leg, larva, muscular system, nervous system, nocturnal, nymph, obtain, organ, parasite, petal, petrification, plant cell, predator, prey, producer, protective coloration, pupa, rabbit, rate, relationship, remains, reproduce, reproductive system, respiratory, respiratory system, response, rest, scale, scatter, sea, seed coat, sewage, spinal cord, spines (bristles), stages of growth, system, thorax, vacuole, vertebrate, warm-blooded, waste, weather cycle</p> |
| <p><i>New Signs and Symbols:</i> none</p> | <p><i>New Signs and Symbols:</i> none</p> | <p><i>New Signs and Symbols:</i> none</p> |

Subject: General Science

Goal Strand: Environmental and Life Science

RIT Score Range: 191 - 200

| Skills and Concepts to Enhance 181 - 190 | Skills and Concepts to Develop 191 - 200 | Skills and Concepts to Introduce 201 - 210 |
|---|---|--|
| <p>Characteristics and Structure-Function</p> <ul style="list-style-type: none"> • Identifies characteristics of organisms* • Describes functions of structures of animals • Describes the large scale external anatomy of humans* • Explains that the function of a plant's root is to absorb water* • Explains how physical characteristics of organisms help them to survive in their environments and reproduce* • Gives examples of features that help plants and animals survive in different places* • Recognizes that the heart acts as a pump* • Describes the structure and basic functions (movement and support) of the skeletal system • Describes characteristics of each of the human senses* • Describes how tools enhance the senses* • Compares basic needs of different organisms in their environment* • Recognizes the importance of oxygen to the survival of animals* • Sorts organisms and objects as living or non-living • Differentiates among living and nonliving things* | <p>Characteristics and Structure-Function</p> <ul style="list-style-type: none"> • Recognizes that a flower will turn into the fruit and produce seeds • Describes seed dispersal in plants* • Describes the basic structures which make up a seed (e.g., seed coat)* • Describes the function of the backbone in vertebrates* • Explains how physical characteristics of organisms help them to survive in their environments and reproduce* • Explains how physical features of organisms help them to survive in their environments* • Recognizes that one function of a plant root is support* • Predicts how a change to one organ or system will affect another organ or system* • Describes the function of the circulatory system • Recognizes the components which make up the digestive system* • Describes how things feel to the touch* • Infers the type of resources needed for an animal to survive* • Recognizes that all living organisms are made up of cells • Explains why cells are called "building blocks"* • Infers that a cell is a plant cell because it contains chloroplasts and a cell wall* • Recognizes that energy is required for the chemical reactions in cells to occur* | <p>Characteristics and Structure-Function</p> <ul style="list-style-type: none"> • Recognizes that the function of a plant's stem is to carry water, minerals, and food to other parts of the plant* • Identifies the external structures that perform particular functions in animals* • Explains that the major functions of a plant's root are to carry absorbed water and minerals and to provide support • Infers that a plant may not be able to live if its roots cannot absorb minerals* • Relates structures involved in embryonic and fetal development to their functions* • Describes the structure and function of the organs making up a flower (e.g., stigma, anthers, petals, pistil)* • Describes structures that allow an organism to obtain information from its environment* • Recognizes that examining the structural characteristics of organisms can help one determine the environment in which an organism lives* • Recognizes that the function of a plant leaf is to take in light and air* • Describes the structure and function of the respiratory system* • Describes the structure and function of the human reproductive system* • Describes the structure and function of the muscular system* • Describes the function of skeletal muscle* • Recognizes that the skeletal system's functions include production of red blood cells, support, protection of organs and movement* • Orders the organs of the digestive system to show how food travels within it* • Recognizes the components which make up the digestive system* |

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| | | <ul style="list-style-type: none"> • Traces the path that food takes as it is digested* • Describes the events that take place as food is digested* • Describes the structure and function of the excretory system* • Describes the structure and function of the nervous system (large scale)* • Describes the idea that in complex, multi-cellular organisms, cells have specialized functions, communicate with each other, and are mutually dependent* • Identifies the nucleus when given its function within the cell • Identifies the nucleus in a cell diagram when given its name only • Identifies DNA when given its function within the cell* • Identifies the cell membrane in a cell diagram when given its function only* • Identifies the cell membrane in a cell diagram when given its name only* • Predicts how oxygen and carbon dioxide levels within a system are affected by respiration* • Recognizes that photosynthesis is the process plants use to produce food using the energy of the Sun • Gives examples of lipids* |
| Life Cycles, Reproduction and Heredity | Life Cycles, Reproduction and Heredity | Life Cycles, Reproduction and Heredity |
| | <ul style="list-style-type: none"> • Recognizes that animals pass through a life cycle consisting of birth, growth and development to adulthood, reproduction, and death • Orders the four stages of an insect life cycle (complete metamorphosis) • Explains that mammals give birth to live young* | <ul style="list-style-type: none"> • Describes the process of development for members of different animal phyla* • Differentiates between examples of insect life cycles showing incomplete and complete metamorphosis* • Orders the three stages of an insect life cycle (incomplete metamorphosis)* • Recognizes that egg and sperm unite to produce a new individual* |
| Interactions with Environment; Biol Evolution | Interactions with Environment; Biol Evolution | Interactions with Environment; Biol Evolution |
| <ul style="list-style-type: none"> • Classifies commonly-known organisms (e.g., cat, dog, apple) based on external characteristics • Groups organisms based on similarities* • Sorts living and non-living things using different characteristics* • Classifies an unknown animal as a mammal, based on listed characteristics* • Classifies major groups of organisms using the five kingdom system* • Classifies living things as carnivores* | <ul style="list-style-type: none"> • Recognizes that living organisms can be classified using different characteristics* • Recognizes characteristics of vertebrates* • Recognizes characteristics of invertebrates* • Compares characteristics of mammals* • Describes characteristics of mammals • Recognizes characteristics of reptiles* • Describes characteristics of reptiles • Describes characteristics of fish* | <ul style="list-style-type: none"> • Describes characteristics of fungi (e.g., shape, structure, abundance, habitat) • Classifies organisms (using common names) as vertebrates and invertebrates • Classifies animals as amphibians* • Classifies animals as warm-blooded or cold-blooded • Compares characteristics of mammals* • Compares characteristics of birds • Describes characteristics of reptiles |

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| <ul style="list-style-type: none"> • Describes how environmental changes cause species to evolve over time, thus producing new species* • Describes the niche of a particular plant or animal* • Recognizes the characteristics of the desert biome* • Predicts how life forms will maintain homeostasis through particular changes* • Makes inferences about the effect of pollution on living things* • Explains that most pollution results from human activities* • Recognizes that air pollution is caused by things that dirty the air* • Explains how recycling protects the environment* • Gives examples of natural resources* • Gives examples of foods that come from plants* | <ul style="list-style-type: none"> • Describes characteristics of insects • Classifies an unknown animal as an amphibian, based on listed characteristics* • Classifies living things as carnivores* • Classifies living things as plant eaters • Classifies organisms by their external characteristics* • Defines classification* • Describes the concept of extinction* • Gives examples of extinct organisms* • Recognizes that biological adaptations include structural, behavioral, or physiological changes* • Explains that fossils provide evidence about organisms that lived long ago* • Recognizes that plants and animals are often hidden* • Describes structural adaptations that allow an organism to survive in a particular environment* • Explains how behavioral characteristics of organisms help them to survive in their environment* • Explains how the specific adaptations of an organism allow it survive in a particular environment* • Recognizes that camouflage allows an organism to blend in with its surroundings* • Describes ways that living things respond to changes in their environment (e.g., shedding, hibernation, migration)* • Infers that the behavior of an animal may change due to a change in its environment* • Describes how light affects the growth of plants* • Gives examples of actions and events that produce pollution* • Describes effects of pollution on living things • Makes inferences about the effect of pollution on living things* • Explains how wind can cause pollution (dust)* • Describes basic characteristics of polluted air* • Explains how human population growth modifies the environment* • Classifies a species interaction as a predator-prey relationship • Infers effects of animals' interaction with plants on the life of the animal* • Recognizes that food chains (generally) begin with a plant* • Describes the organization of a simple food web* | <ul style="list-style-type: none"> • Describes characteristics of insects • Describes characteristics of amphibians • Explains what criteria must be met for an animal to be classified as a vertebrate* • Compares characteristics of insects* • Recognizes characteristics of amphibians* • Classifies an unknown animal as a reptile, based on listed characteristics* • Classifies living things based on role played within ecosystem* • Classifies living things as decomposers • Classifies living things as herbivores* • Classifies organisms by their internal characteristics* • Recognizes biological evolution as a type of change over time* • Describes how the present form and function of an organism could have evolved from prior form and function* • Compares adaptations of plants and animals in different biomes* • Recognizes that the fossil record gives geological evidence that documents when many life forms appeared, diversified, and went extinct* • Describes how environmental conditions affect the growth of plants* • Infers that living things must be adapted to their environment to be able to survive* • Assesses features of organisms (e.g., appendages, reproductive rates, camouflage, defensive structures) for their survival potential* • Predicts how light will affect the growth of a plant* • Recognizes ways that humans have attempted to control pollution* • Describes how human activities affect air quality* • Gives examples of substances that decrease the quality of air and/or produce smog • Gives examples of pollutants* • Explains how animals depend on plants • Explains that without plants (or other producers such as algae) animals could not survive on Earth* • Makes inferences about the effect of changes to a predator-prey relationship* • Describes cooperation within species* • Describes parasite/host relationship* |
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| | <ul style="list-style-type: none"> • Explains that green plants can make their own food from sunlight* • Locates the producer in an ecological pyramid* | <ul style="list-style-type: none"> • Evaluates problems associated with population growth (e.g., waste disposal, supply of food, control of disease, resource availability, transportation)* • Analyzes factors that influence the size and stability of populations within ecosystems • Describes the role of biotic factors in limiting the size of populations* • Describes a community as all of the interacting populations existing in a particular region • Describes curbside recycling* • Recognizes applied uses of water (use in making electricity, transportation, recreation)* • Recognizes simple conservation measures used to protect the environment (e.g., recycling, water conservation)* • Gives examples of foods produced by plants* • Explains how energy is supplied to an ecosystem primarily as sunlight • Describes how energy flows through a food web, from producers to consumers* • Builds a simple food chain, using a given set of organisms • Recognizes the producer in a food chain* • Differentiates between consumers that eat plants and consumers that eat other consumers* • Understands that the role of a decomposer is to recycle matter from dead plants and animals* • Gives examples of decomposers* • Matches a decomposer to its specific role in an ecosystem* • Describes the organization of a pyramid of numbers* |
| <p><i>New Vocabulary:</i> absorb, active, adapt, alive, bank, bone, bristle, bush, camouflage, carnivore, circulation, clam, claw, climate, defense, drink, earthquake, feel, growth, hear, heart, herb, herbivore, intestines, knee, living, lung, magnifying glass, mate, meat-eater, milk, mineral, mouth, movement, natural resource, nectar, plant-eater, polluted, pollution, protection, pump, recycle, reproduction, rib, see, segment, sense, shell, shrub, sight, signal, skeleton, sleep, smell, spears, stomach, swim, taste, touch, vine, vitamin, woods</p> | <p><i>New Vocabulary:</i> abdomen, antenna, backbone, bark, body part, body section, body segments, cell wall, cephalothorax, characteristic, circulatory system, classification, cold-blooded, constant, consumer, developmental sequence, digestion, digestive system, esophagus, exercise, experimentation, extinct, female, field, food chain, food web, four-chambered heart, habitat, hibernation, hide, host, hunger, hypothesize, inference, ingestion, internal, intestine, invertebrate, jointed leg, larva, muscular system, nervous system, nocturnal, nymph, obtain, organ, parasite, petal, petrification, plant cell, predator, prey, producer, protective coloration, pupa, rabbit, rate, relationship, remains, reproduce, reproductive system, respiratory,</p> | <p><i>New Vocabulary:</i> absorption, air quality, algae, amphibious, animal cell, anus, arthropod, ATP, biome, birth rate, bladder, blue-green algae, body system, carbon monoxide, cell membrane, change over time, chemical, chlorophyll, circulate, commodity, community, complete metamorphosis, consume, crustacean, cytoplasm, death rate, decompose, development, digest, droplet, echinoderm, ecology, ecosystem, eliminate, embryo, evolution, excrete, exhale, fertilization, food pyramid (ecological), food supply, four-legged, fungi, generation, genetics, hereditary information, heredity, inert, jellyfish, kidney, large intestine, life zone, liver, membrane, message, migrate, mollusk, mushroom, native, niche, nitrogen dioxide, nuclear membrane, osmosis, ovary,</p> |

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| | respiratory system, response, rest, scale, scatter, sea, seed coat, sewage, spinal cord, spines (bristles), stages of growth, system, thorax, vacuole, vertebrate, warm-blooded, waste, weather cycle | overpopulate, paramecia, pest, photosynthesis, pistil, pollen, pollination, pollutant, prairie dog, red blood cell, regulate, respiration, rodent, scale (skin), scales, skeletal system, skull, small intestine, social, source of energy, species, sperm, spore, stamen, succession, sugar, sulfur dioxide, symbiosis, synthesis, transport, trout, tube, umbilical cord, urinary bladder, uterus, vein, virus, web, yeast, yolk sac |
| <i>New Signs and Symbols: none</i> | <i>New Signs and Symbols: none</i> | <i>New Signs and Symbols: none</i> |

Subject: General Science

Goal Strand: Environmental and Life Science

RIT Score Range: 201 - 210

| Skills and Concepts to Enhance 191 - 200 | Skills and Concepts to Develop 201 - 210 | Skills and Concepts to Introduce 211 - 220 |
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| <p>Characteristics and Structure-Function</p> <ul style="list-style-type: none"> • Recognizes that a flower will turn into the fruit and produce seeds • Describes seed dispersal in plants* • Describes the basic structures which make up a seed (e.g., seed coat)* • Describes the function of the backbone in vertebrates* • Explains how physical characteristics of organisms help them to survive in their environments and reproduce* • Explains how physical features of organisms help them to survive in their environments* • Recognizes that one function of a plant root is support* • Predicts how a change to one organ or system will affect another organ or system* • Describes the function of the circulatory system • Recognizes the components which make up the digestive system* • Describes how things feel to the touch* • Infers the type of resources needed for an animal to survive* • Recognizes that all living organisms are made up of cells • Explains why cells are called "building blocks"* • Infers that a cell is a plant cell because it contains chloroplasts and a cell wall* • Recognizes that energy is required for the chemical reactions in cells to occur* | <p>Characteristics and Structure-Function</p> <ul style="list-style-type: none"> • Recognizes that the function of a plant's stem is to carry water, minerals, and food to other parts of the plant* • Identifies the external structures that perform particular functions in animals* • Explains that the major functions of a plant's root are to carry absorbed water and minerals and to provide support • Infers that a plant may not be able to live if its roots cannot absorb minerals* • Relates structures involved in embryonic and fetal development to their functions* • Describes the structure and function of the organs making up a flower (e.g., stigma, anthers, petals, pistil)* • Describes structures that allow an organism to obtain information from its environment* • Recognizes that examining the structural characteristics of organisms can help one determine the environment in which an organism lives* • Recognizes that the function of a plant leaf is to take in light and air* • Describes the structure and function of the respiratory system* • Describes the structure and function of the human reproductive system* • Describes the structure and function of the muscular system* • Describes the function of skeletal muscle* • Recognizes that the skeletal system's functions include production of red blood cells, support, protection of organs and movement* • Orders the organs of the digestive system to show how food travels within it* • Recognizes the components which make up the digestive system* | <p>Characteristics and Structure-Function</p> <ul style="list-style-type: none"> • Recognizes that the function of a plant's stem is to carry water, minerals, and food to other parts of the plant* • Identifies the external structures that perform particular functions in animals* • Recognizes that photosynthesis/energy capture occurs within a plant's leaves* • Describes the structure and function of the organs making up a flower (e.g., stigma, anthers, petals, pistil)* • Sequences the levels of organization in an organism to relate the parts to each other and to the whole* • Describes the relationship between structure and function at the organ's level of organization • Describes the organization seen within the plant reproductive system* • Recognizes structures of the respiratory system* • Describes the structure and function of the cells and tissues which make up the circulatory system • Describes the structure and function of a plant's reproductive system* • Describes the function of the digestive system • Recognizes that the nervous system interacts with other systems of the body* • Recognizes that all single cells have differences which allow specialization of function* • Recognizes that a microscope must be used to observe something as small as a cell* • Describes the cell theory* • Recognizes that cells are the fundamental units and building blocks of life (the cell is the smallest unit which can reproduce itself) • Gives examples of cells which perform specialized functions* • Contrasts active transport and osmosis* |

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| | <ul style="list-style-type: none"> • Traces the path that food takes as it is digested* • Describes the events that take place as food is digested* • Describes the structure and function of the excretory system* • Describes the structure and function of the nervous system (large scale)* • Describes the idea that in complex, multi-cellular organisms, cells have specialized functions, communicate with each other, and are mutually dependent* • Identifies the nucleus when given its function within the cell • Identifies the nucleus in a cell diagram when given its name only • Identifies DNA when given its function within the cell* • Identifies the cell membrane in a cell diagram when given its function only* • Identifies the cell membrane in a cell diagram when given its name only* • Predicts how oxygen and carbon dioxide levels within a system are affected by respiration* • Recognizes that photosynthesis is the process plants use to produce food using the energy of the Sun • Gives examples of lipids* | <ul style="list-style-type: none"> • Describes features common to all cells* • Compares plant and animal cells in terms of the organelles found in each • Uses analogies to represent the function of organelles within the cell* • Differentiates between the functions of the nucleus and the nucleolus* • Identifies the cell membrane when given its function within the cell* • Identifies the plant cell wall when given its function within the cell* • Identifies the chloroplast when given its function within the cell* • Identifies the chloroplast in a cell diagram when given its function only* • Describes the process of embryo growth and differentiation* • Compares the process of meiosis with the process of mitosis* • Describes how somatic cells are produced (mitosis)* • Recognizes that the outcome of mitosis is production of two genetically identical daughter cells* • Describes how sex cells are produced (meiosis)* • Defines metabolism as the sum of chemical reactions in the body* • Describes the role of enzymes in digestion* • Explains that cells obtain food and oxygen from the outside environment* • Describes the process of photosynthesis in terms of its location within the cell, reactants, and products* • Recognizes that oxygen is an essential product of photosynthesis* • Gives examples of carbohydrates* • Classifies biomolecules as carbohydrates* |
| Life Cycles, Reproduction and Heredity | Life Cycles, Reproduction and Heredity | Life Cycles, Reproduction and Heredity |
| <ul style="list-style-type: none"> • Recognizes that animals pass through a life cycle consisting of birth, growth and development to adulthood, reproduction, and death • Orders the four stages of an insect life cycle (complete metamorphosis) • Explains that mammals give birth to live young* | <ul style="list-style-type: none"> • Describes the process of development for members of different animal phyla* • Differentiates between examples of insect life cycles showing incomplete and complete metamorphosis* • Orders the three stages of an insect life cycle (incomplete metamorphosis)* • Recognizes that egg and sperm unite to produce a new individual* | <ul style="list-style-type: none"> • Identifies examples of inherited traits* • Defines mutation* • Predicts patterns of inheritance for simple-dominant recessive alleles in dihybrid crosses (Mendelian inheritance)* • Explains that sex chromosomes determine the gender of a human (two copies of the X chromosome produce a female, one copy of X plus one copy of Y produce a male)* |

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| | | <ul style="list-style-type: none"> • Explains that the sex of a child is determined by the presence or absence of a Y chromosome in the sperm* • Defines fertilization* |
| Interactions with Environment; Biol Evolution | Interactions with Environment; Biol Evolution | Interactions with Environment; Biol Evolution |
| <ul style="list-style-type: none"> • Recognizes that living organisms can be classified using different characteristics* • Recognizes characteristics of vertebrates* • Recognizes characteristics of invertebrates* • Compares characteristics of mammals* • Describes characteristics of mammals • Recognizes characteristics of reptiles* • Describes characteristics of reptiles • Describes characteristics of fish* • Describes characteristics of insects • Classifies an unknown animal as an amphibian, based on listed characteristics* • Classifies living things as carnivores* • Classifies living things as plant eaters • Classifies organisms by their external characteristics* • Defines classification* • Describes the concept of extinction* • Gives examples of extinct organisms* • Recognizes that biological adaptations include structural, behavioral, or physiological changes* • Explains that fossils provide evidence about organisms that lived long ago* • Recognizes that plants and animals are often hidden* • Describes structural adaptations that allow an organism to survive in a particular environment* • Explains how behavioral characteristics of organisms help them to survive in their environment* • Explains how the specific adaptations of an organism allow it survive in a particular environment* • Recognizes that camouflage allows an organism to blend in with its surroundings* • Describes ways that living things respond to changes in their environment (e.g., shedding, hibernation, migration)* • Infers that the behavior of an animal may change due to a change in its environment* • Describes how light affects the growth of plants* • Gives examples of actions and events that produce pollution* | <ul style="list-style-type: none"> • Describes characteristics of fungi (e.g., shape, structure, abundance, habitat) • Classifies organisms (using common names) as vertebrates and invertebrates • Classifies animals as amphibians* • Classifies animals as warm-blooded or cold-blooded • Compares characteristics of mammals* • Compares characteristics of birds • Describes characteristics of reptiles • Describes characteristics of insects • Describes characteristics of amphibians • Explains what criteria must be met for an animal to be classified as a vertebrate* • Compares characteristics of insects* • Recognizes characteristics of amphibians* • Classifies an unknown animal as a reptile, based on listed characteristics* • Classifies living things based on role played within ecosystem* • Classifies living things as decomposers • Classifies living things as herbivores* • Classifies organisms by their internal characteristics* • Recognizes biological evolution as a type of change over time* • Describes how the present form and function of an organism could have evolved from prior form and function* • Compares adaptations of plants and animals in different biomes* • Recognizes that the fossil record gives geological evidence that documents when many life forms appeared, diversified, and went extinct* • Describes how environmental conditions affect the growth of plants* • Infers that living things must be adapted to their environment to be able to survive* • Assesses features of organisms (e.g., appendages, reproductive rates, camouflage, defensive structures) for their survival potential* | <ul style="list-style-type: none"> • Describes characteristics of arthropods • Classifies organisms as arthropods (based on external characteristics)* • Classifies taxonomic groups of organisms as vertebrates and invertebrates* • Classifies animals to phylum arthropoda* • Describes characteristics of the five kingdoms* • Compares characteristics of organisms based on their position within the five kingdom classification hierarchy* • Describes characteristics of eubacteria* • Makes inferences about the roles of heterotrophs and autotrophs* • Classifies living things as producers (term defined)* • Describes the process of classification of living things* • Predicts how variations provide an advantage in survival and reproduction • Defines a gene pool as the collection of inheritable genes in a population* • Explains how DNA from ancient species can be compared with modern species to determine evolutionary relationships* • Defines ecology as the interaction of living things with each other and with the non-living (abiotic) environment* • Describes how the structure of a plant or animal complements the environment in which it is found* • Explains how an organism's body structures allow it to survive in a given environment* • Assesses features of organisms (e.g., appendages, reproductive rates, camouflage, defensive structures) for their adaptive potential* • Describes how climate influences the type of biome seen in a particular geographic area • Recognizes the characteristics of the tundra biome* • Evaluates impacts of activities that modify the environment* • Describes how human activities affect air quality* • Explains how global warming modifies the environment* |

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| <ul style="list-style-type: none"> • Describes effects of pollution on living things • Makes inferences about the effect of pollution on living things* • Explains how wind can cause pollution (dust)* • Describes basic characteristics of polluted air* • Explains how human population growth modifies the environment* • Classifies a species interaction as a predator-prey relationship • Infers effects of animals' interaction with plants on the life of the animal* • Recognizes that food chains (generally) begin with a plant* • Describes the organization of a simple food web* • Explains that green plants can make their own food from sunlight* • Locates the producer in an ecological pyramid* | <ul style="list-style-type: none"> • Predicts how light will affect the growth of a plant* • Recognizes ways that humans have attempted to control pollution* • Describes how human activities affect air quality* • Gives examples of substances that decrease the quality of air and/or produce smog • Gives examples of pollutants* • Explains how animals depend on plants • Explains that without plants (or other producers such as algae) animals could not survive on Earth* • Makes inferences about the effect of changes to a predator-prey relationship* • Describes cooperation within species* • Describes parasite/host relationship* • Evaluates problems associated with population growth (e.g., waste disposal, supply of food, control of disease, resource availability, transportation)* • Analyzes factors that influence the size and stability of populations within ecosystems • Describes the role of biotic factors in limiting the size of populations* • Describes a community as all of the interacting populations existing in a particular region • Describes curbside recycling* • Recognizes applied uses of water (use in making electricity, transportation, recreation)* • Recognizes simple conservation measures used to protect the environment (e.g., recycling, water conservation)* • Gives examples of foods produced by plants* • Explains how energy is supplied to an ecosystem primarily as sunlight • Describes how energy flows through a food web, from producers to consumers* • Builds a simple food chain, using a given set of organisms • Recognizes the producer in a food chain* • Differentiates between consumers that eat plants and consumers that eat other consumers* • Understands that the role of a decomposer is to recycle matter from dead plants and animals* • Gives examples of decomposers* • Matches a decomposer to its specific role in an ecosystem* | <ul style="list-style-type: none"> • Describes how plants and animals in an ecosystem interact with each other • Makes inferences about the effect of changes to a predator-prey relationship* • Explains that different species occupying the same environment may compete, if their needs are similar and resources are limited* • Applies the idea that all members of a species that occur in the same place at the same time comprise a population* • Predicts how biotic factors will affect population density* • Recognizes abiotic and biotic factors can affect all levels of an ecosystem, from individual to community* • Predicts the plant stage likely to succeed a given plant stage in the succession of a particular ecosystem* • Understands that communities differ from other collections of animals (such as herds and flocks), in that communities are comprised of multiple interacting species* • Understands that for alternative energy resources to be most useful, they must be renewable, or based on different non-renewable resources than are currently in use • Defines (environmental) conservation • Describes how capture of light by plants serves as the basis of all food chains* • Explains how organisms are related within food chains* • Infers how changes in one portion of a food chain will affect other parts of the food chain • Explains why numbers of organisms decrease as trophic level within a food chain increases* • Predicts which link in a food chain will be made up of the fewest number of organisms* • Describes how producers, carnivores, herbivores and decomposers interact to form a food chain* |
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| | <ul style="list-style-type: none"> • Describes the organization of a pyramid of numbers* | |
| <p><i>New Vocabulary:</i> abdomen, antenna, backbone, bark, body part, body section, body segments, cell wall, cephalothorax, characteristic, circulatory system, classification, cold-blooded, constant, consumer, developmental sequence, digestion, digestive system, esophagus, exercise, experimentation, extinct, female, field, food chain, food web, four-chambered heart, habitat, hibernation, hide, host, hunger, hypothesize, inference, ingestion, internal, intestine, invertebrate, jointed leg, larva, muscular system, nervous system, nocturnal, nymph, obtain, organ, parasite, petal, petrification, plant cell, predator, prey, producer, protective coloration, pupa, rabbit, rate, relationship, remains, reproduce, reproductive system, respiratory, respiratory system, response, rest, scale, scatter, sea, seed coat, sewage, spinal cord, spines (bristles), stages of growth, system, thorax, vacuole, vertebrate, warm-blooded, waste, weather cycle</p> | <p><i>New Vocabulary:</i> absorption, air quality, algae, amphibious, animal cell, anus, arthropod, ATP, biome, birth rate, bladder, blue-green algae, body system, carbon monoxide, cell membrane, change over time, chemical, chlorophyll, circulate, commodity, community, complete metamorphosis, consume, crustacean, cytoplasm, death rate, decompose, development, digest, droplet, echinoderm, ecology, ecosystem, eliminate, embryo, evolution, excrete, exhale, fertilization, food pyramid (ecological), food supply, four-legged, fungi, generation, genetics, hereditary information, heredity, inert, jellyfish, kidney, large intestine, life zone, liver, membrane, message, migrate, mollusk, mushroom, native, niche, nitrogen dioxide, nuclear membrane, osmosis, ovary, overpopulate, paramecia, pest, photosynthesis, pistil, pollen, pollination, pollutant, prairie dog, red blood cell, regulate, respiration, rodent, scale (skin), scales, skeletal system, skull, small intestine, social, source of energy, species, sperm, spore, stamen, succession, sugar, sulfur dioxide, symbiosis, synthesis, transport, trout, tube, umbilical cord, urinary bladder, uterus, vein, virus, web, yeast, yolk sac</p> | <p><i>New Vocabulary:</i> anatomy, artery, arthropoda, atmospheric pollution, behavior, body fat, capillary, carbohydrate, cellulose, centriole, chromosome, cleavage, colony, conception, coniferous tree, conjugation, constitute, cross (genetic), crossing over, dominant, duplicate, environmental condition, enzyme, excretory system, exoskeleton, external appendage, fat, fertilized, fin, flatworm, gastrulation, gene, gene frequency, gene pool, genetic material, genotype, gestation, implantation, infectious disease, inherited, interphase, interrelationship, involuntary responses, lichen, lipids, live birth, lubricate, lymphatic system, meiosis, mitosis, moisture, moss, mutation, natural resources, nucleic acid, nucleolus, oak, overcrowding, ovulation, ovule, phenotype, physical environment, pigment, plasma, plasma membrane, platelet, population growth, prehistoric, protoplasm, protozoa, recessive, recycling, reduction division, renewable resource, section, selective breeding, sex, single-celled, sponge, starch, stigma, stinging cell, stress, synthesize, taxonomy, trait, white blood cell, xylem</p> |
| <p><i>New Signs and Symbols:</i> none</p> | <p><i>New Signs and Symbols:</i> none</p> | <p><i>New Signs and Symbols:</i> → flow of energy (food chains)</p> |

Subject: General Science

Goal Strand: Environmental and Life Science

RIT Score Range: 211 - 220

| Skills and Concepts to Enhance 201 - 210 | Skills and Concepts to Develop 211 - 220 | Skills and Concepts to Introduce 221 - 230 |
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| <p>Characteristics and Structure-Function</p> <ul style="list-style-type: none"> Recognizes that the function of a plant's stem is to carry water, minerals, and food to other parts of the plant* Identifies the external structures that perform particular functions in animals* Explains that the major functions of a plant's root are to carry absorbed water and minerals and to provide support Infers that a plant may not be able to live if its roots cannot absorb minerals* Relates structures involved in embryonic and fetal development to their functions* Describes the structure and function of the organs making up a flower (e.g., stigma, anthers, petals, pistil)* Describes structures that allow an organism to obtain information from its environment* Recognizes that examining the structural characteristics of organisms can help one determine the environment in which an organism lives* Recognizes that the function of a plant leaf is to take in light and air* Describes the structure and function of the respiratory system* Describes the structure and function of the human reproductive system* Describes the structure and function of the muscular system* Describes the function of skeletal muscle* Recognizes that the skeletal system's functions include production of red blood cells, support, protection of organs and movement* Orders the organs of the digestive system to show how food travels within it* Recognizes the components which make up the digestive system* | <p>Characteristics and Structure-Function</p> <ul style="list-style-type: none"> Recognizes that the function of a plant's stem is to carry water, minerals, and food to other parts of the plant* Identifies the external structures that perform particular functions in animals* Recognizes that photosynthesis/energy capture occurs within a plant's leaves* Describes the structure and function of the organs making up a flower (e.g., stigma, anthers, petals, pistil)* Sequences the levels of organization in an organism to relate the parts to each other and to the whole* Describes the relationship between structure and function at the organ's level of organization Describes the organization seen within the plant reproductive system* Recognizes structures of the respiratory system* Describes the structure and function of the cells and tissues which make up the circulatory system Describes the structure and function of a plant's reproductive system* Describes the function of the digestive system Recognizes that the nervous system interacts with other systems of the body* Recognizes that all single cells have differences which allow specialization of function* Recognizes that a microscope must be used to observe something as small as a cell* Describes the cell theory* Recognizes that cells are the fundamental units and building blocks of life (the cell is the smallest unit which can reproduce itself) Gives examples of cells which perform specialized functions* Contrasts active transport and osmosis* | <p>Characteristics and Structure-Function</p> <ul style="list-style-type: none"> Understands that a plant's roots generally do not produce food via photosynthesis* Recognizes that the ovary of a plant will develop into a fruit* Recognizes that seeds contain embryos* Describes the structure and specialization of function of the cells and tissues found within a typical plant leaf* Describes transpiration in plants* Describes the function of tissues within the respiratory system* Defines neuron* Describes the characteristics shared by all living organisms Describes the unique features of viruses that allow them to be classified as living or non-living at different times* Describes the idea that cells of multicellular organisms have specialized functions* Infers that most cell functions involve chemical reactions* Analyzes the structures, functions, and processes used by the cell in information feedback* Describes ways in which materials enter the cell* Compares features of plant and animal cells* Compares plant and animal cells in terms of the organelles found in each Describes the function of the ribosome Describes the functions of the nucleus within the cell* Identifies the chromosomes when given their function within the cell* Identifies the cell membrane when given its function within the cell* Describes the composition of plant cell walls* Describes how homologous chromosomes are |

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| <ul style="list-style-type: none"> • Traces the path that food takes as it is digested* • Describes the events that take place as food is digested* • Describes the structure and function of the excretory system* • Describes the structure and function of the nervous system (large scale)* • Describes the idea that in complex, multi-cellular organisms, cells have specialized functions, communicate with each other, and are mutually dependent* • Identifies the nucleus when given its function within the cell • Identifies the nucleus in a cell diagram when given its name only • Identifies DNA when given its function within the cell* • Identifies the cell membrane in a cell diagram when given its function only* • Identifies the cell membrane in a cell diagram when given its name only* • Predicts how oxygen and carbon dioxide levels within a system are affected by respiration* • Recognizes that photosynthesis is the process plants use to produce food using the energy of the Sun • Gives examples of lipids* | <ul style="list-style-type: none"> • Describes features common to all cells* • Compares plant and animal cells in terms of the organelles found in each • Uses analogies to represent the function of organelles within the cell* • Differentiates between the functions of the nucleus and the nucleolus* • Identifies the cell membrane when given its function within the cell* • Identifies the plant cell wall when given its function within the cell* • Identifies the chloroplast when given its function within the cell* • Identifies the chloroplast in a cell diagram when given its function only* • Describes the process of embryo growth and differentiation* • Compares the process of meiosis with the process of mitosis* • Describes how somatic cells are produced (mitosis)* • Recognizes that the outcome of mitosis is production of two genetically identical daughter cells* • Describes how sex cells are produced (meiosis)* • Defines metabolism as the sum of chemical reactions in the body* • Describes the role of enzymes in digestion* • Explains that cells obtain food and oxygen from the outside environment* • Describes the process of photosynthesis in terms of its location within the cell, reactants, and products* • Recognizes that oxygen is an essential product of photosynthesis* • Gives examples of carbohydrates* • Classifies biomolecules as carbohydrates* | <p>separated during meiosis, to produce sex cells containing half as many chromosomes as a somatic cell*</p> <ul style="list-style-type: none"> • Describes how sex cells are produced (meiosis)* • Describes the role of enzymes in cellular reactions* • Describes the structure and mechanism of action of enzymes* • Describes the chemical reactions used by the cell in respiration • Compares respiration in plant and animal cells* • Compares the process of anaerobic respiration in different organisms* • Compares the processes of photosynthesis and respiration • Recognizes that hormones are chemical messengers* |
| <p>Life Cycles, Reproduction and Heredity</p> <ul style="list-style-type: none"> • Describes the process of development for members of different animal phyla* • Differentiates between examples of insect life cycles showing incomplete and complete metamorphosis* • Orders the three stages of an insect life cycle (incomplete metamorphosis)* • Recognizes that egg and sperm unite to produce a new individual* | <p>Life Cycles, Reproduction and Heredity</p> <ul style="list-style-type: none"> • Identifies examples of inherited traits* • Defines mutation* • Predicts patterns of inheritance for simple-dominant recessive alleles in dihybrid crosses (Mendelian inheritance)* • Explains that sex chromosomes determine the gender of a human (two copies of the X chromosome produce a female, one copy of X plus one copy of Y produce a male)* | <p>Life Cycles, Reproduction and Heredity</p> <ul style="list-style-type: none"> • Recognizes terminology used to describe the stages of embryo development* • Recognizes that replication is the cellular process in which DNA is copied* • Classifies examples of mutations as inversions, deletions, substitutions and point mutations* • Describes patterns of inheritance seen for single gene traits* • Determines the parents involved in a monohybrid |

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| | <ul style="list-style-type: none"> • Explains that the sex of a child is determined by the presence or absence of a Y chromosome in the sperm* • Defines fertilization* | <p>cross, given the outcome of that cross and the genotype and/or phenotype of the other parent*</p> <ul style="list-style-type: none"> • Predicts patterns of inheritance for simple-dominant recessive alleles in dihybrid crosses (Mendelian inheritance)* • Predicts probabilities of inheritance for sex-linked alleles* |
| Interactions with Environment; Biol Evolution | Interactions with Environment; Biol Evolution | Interactions with Environment; Biol Evolution |
| <ul style="list-style-type: none"> • Describes characteristics of fungi (e.g., shape, structure, abundance, habitat) • Classifies organisms (using common names) as vertebrates and invertebrates • Classifies animals as amphibians* • Classifies animals as warm-blooded or cold-blooded • Compares characteristics of mammals* • Compares characteristics of birds • Describes characteristics of reptiles • Describes characteristics of insects • Describes characteristics of amphibians • Explains what criteria must be met for an animal to be classified as a vertebrate* • Compares characteristics of insects* • Recognizes characteristics of amphibians* • Classifies an unknown animal as a reptile, based on listed characteristics* • Classifies living things based on role played within ecosystem* • Classifies living things as decomposers • Classifies living things as herbivores* • Classifies organisms by their internal characteristics* • Recognizes biological evolution as a type of change over time* • Describes how the present form and function of an organism could have evolved from prior form and function* • Compares adaptations of plants and animals in different biomes* • Recognizes that the fossil record gives geological evidence that documents when many life forms appeared, diversified, and went extinct* • Describes how environmental conditions affect the growth of plants* • Infers that living things must be adapted to their environment to be able to survive* | <ul style="list-style-type: none"> • Describes characteristics of arthropods • Classifies organisms as arthropods (based on external characteristics)* • Classifies taxonomic groups of organisms as vertebrates and invertebrates* • Classifies animals to phylum arthropoda* • Describes characteristics of the five kingdoms* • Compares characteristics of organisms based on their position within the five kingdom classification hierarchy* • Describes characteristics of eubacteria* • Makes inferences about the roles of heterotrophs and autotrophs* • Classifies living things as producers (term defined)* • Describes the process of classification of living things* • Predicts how variations provide an advantage in survival and reproduction • Defines a gene pool as the collection of inheritable genes in a population* • Explains how DNA from ancient species can be compared with modern species to determine evolutionary relationships* • Defines ecology as the interaction of living things with each other and with the non-living (abiotic) environment* • Describes how the structure of a plant or animal complements the environment in which it is found* • Explains how an organism's body structures allow it to survive in a given environment* • Assesses features of organisms (e.g., appendages, reproductive rates, camouflage, defensive structures) for their adaptive potential* • Describes how climate influences the type of biome seen in a particular geographic area • Recognizes the characteristics of the tundra biome* • Evaluates impacts of activities that modify the | <ul style="list-style-type: none"> • Classifies taxonomic groups of organisms as vertebrates and invertebrates* • Recognizes characteristics of mollusks* • Classifies animals to the phylum mollusca* • Classifies animals to phylum cnidaria* • Describes characteristics of protists* • Classifies organisms as protists* • Classifies living things as producers (term defined)* • Classifies organisms into a hierarchical structure based on observable characteristics* • Describes the hierarchical structure of the five kingdom classification system* • Recognizes that Linnaeus developed the binomial classification system on which modern taxonomy is based* • Describes how new varieties of plants and animals are produced through selective breeding (artificial selection)* • Recognizes factors that allow speciation to occur* • Gives examples of vestigial structures in humans* • Recognizes examples of mimicry* • Evaluates survival of organisms in particular environmental conditions* • Explains how a given form of an organism may be more likely to survive in a particular ecosystem, causing a change in the abundance of that form of the organism within that population* • Gives an example of a vestigial structure* • Predicts how interaction of biotic and abiotic factors will affect an ecosystem* • Assesses features of organisms (e.g., appendages, reproductive rates, camouflage, defensive structures) for their competitive potential* • Recognizes characteristics of the tropical rainforest biome* • Compares the characteristics of land biomes* |

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| <ul style="list-style-type: none"> Assesses features of organisms (e.g., appendages, reproductive rates, camouflage, defensive structures) for their survival potential* Predicts how light will affect the growth of a plant* Recognizes ways that humans have attempted to control pollution* Describes how human activities affect air quality* Gives examples of substances that decrease the quality of air and/or produce smog Gives examples of pollutants* Explains how animals depend on plants Explains that without plants (or other producers such as algae) animals could not survive on Earth* Makes inferences about the effect of changes to a predator-prey relationship* Describes cooperation within species* Describes parasite/host relationship* Evaluates problems associated with population growth (e.g., waste disposal, supply of food, control of disease, resource availability, transportation)* Analyzes factors that influence the size and stability of populations within ecosystems Describes the role of biotic factors in limiting the size of populations* Describes a community as all of the interacting populations existing in a particular region Describes curbside recycling* Recognizes applied uses of water (use in making electricity, transportation, recreation)* Recognizes simple conservation measures used to protect the environment (e.g., recycling, water conservation)* Gives examples of foods produced by plants* Explains how energy is supplied to an ecosystem primarily as sunlight Describes how energy flows through a food web, from producers to consumers* Builds a simple food chain, using a given set of organisms Recognizes the producer in a food chain* Differentiates between consumers that eat plants and consumers that eat other consumers* Understands that the role of a decomposer is to recycle matter from dead plants and animals* | <p>environment*</p> <ul style="list-style-type: none"> Describes how human activities affect air quality* Explains how global warming modifies the environment* Describes how plants and animals in an ecosystem interact with each other Makes inferences about the effect of changes to a predator-prey relationship* Explains that different species occupying the same environment may compete, if their needs are similar and resources are limited* Applies the idea that all members of a species that occur in the same place at the same time comprise a population* Predicts how biotic factors will affect population density* Recognizes abiotic and biotic factors can affect all levels of an ecosystem, from individual to community* Predicts the plant stage likely to succeed a given plant stage in the succession of a particular ecosystem* Understands that communities differ from other collections of animals (such as herds and flocks), in that communities are comprised of multiple interacting species* Understands that for alternative energy resources to be most useful, they must be renewable, or based on different non-renewable resources than are currently in use Defines (environmental) conservation Describes how capture of light by plants serves as the basis of all food chains* Explains how organisms are related within food chains* Infers how changes in one portion of a food chain will affect other parts of the food chain Explains why numbers of organisms decrease as trophic level within a food chain increases* Predicts which link in a food chain will be made up of the fewest number of organisms* Describes how producers, carnivores, herbivores and decomposers interact to form a food chain* | <ul style="list-style-type: none"> Describes the characteristics of the desert biome* Gives an example of a biome* Identifies responses in organisms to external stimuli found in the environment (e.g., the presence or absence of light)* Defines homeostasis* Explains how algal blooms are produced* Explains how inversions can affect air quality* Explains that organisms occupying the same niche may compete for resources* Compares types of symbiosis (commensalism, mutualism, parasitism)* Classifies an interaction between species as symbiosis* Applies the idea that all members of a species that occur in the same place at the same time comprise a population* Recognizes factors that affect the number of organisms an ecosystem is able to support* Recognizes that living organisms are capable of producing populations of infinite size, but are limited by the amount of resources available in the environment (i.e., carrying capacity and limiting factors)* Identifies biotic factors in an environment that affect population density* Classifies abiotic and biotic factors in an environment Describes responses of an ecosystem to the events that cause it to change* Gives examples of communities* Understands that communities differ from other collections of animals (such as herds and flocks), in that communities are comprised of multiple interacting species* Explains that the most important reason to conserve fossil fuels is to allow time for the development of alternative energy sources* Recognizes that plants convert light energy into stored energy* Classifies organisms according to the function they serve in a food chain* Explains why numbers of organisms decrease as trophic level within a food chain increases* Predicts which link in a food chain will be made up of the fewest number of organisms* |
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| <ul style="list-style-type: none"> • Gives examples of decomposers* • Matches a decomposer to its specific role in an ecosystem* • Describes the organization of a pyramid of numbers* | | <ul style="list-style-type: none"> • Recognizes that food webs are comprised of more than one food chain* • Recognizes that individual food chains occur within a food web* |
| <p><i>New Vocabulary:</i> absorption, air quality, algae, amphibious, animal cell, anus, arthropod, ATP, biome, birth rate, bladder, blue-green algae, body system, carbon monoxide, cell membrane, change over time, chemical, chlorophyll, circulate, commodity, community, complete metamorphosis, consume, crustacean, cytoplasm, death rate, decompose, development, digest, droplet, echinoderm, ecology, ecosystem, eliminate, embryo, evolution, excrete, exhale, fertilization, food pyramid (ecological), food supply, four-legged, fungi, generation, genetics, hereditary information, heredity, inert, jellyfish, kidney, large intestine, life zone, liver, membrane, message, migrate, mollusk, mushroom, native, niche, nitrogen dioxide, nuclear membrane, osmosis, ovary, overpopulate, paramecia, pest, photosynthesis, pistil, pollen, pollination, pollutant, prairie dog, red blood cell, regulate, respiration, rodent, scale (skin), scales, skeletal system, skull, small intestine, social, source of energy, species, sperm, spore, stamen, succession, sugar, sulfur dioxide, symbiosis, synthesis, transport, trout, tube, umbilical cord, urinary bladder, uterus, vein, virus, web, yeast, yolk sac</p> | <p><i>New Vocabulary:</i> anatomy, artery, arthropoda, atmospheric pollution, behavior, body fat, capillary, carbohydrate, cellulose, centriole, chromosome, cleavage, colony, conception, coniferous tree, conjugation, constitute, cross (genetic), crossing over, dominant, duplicate, environmental condition, enzyme, excretory system, exoskeleton, external appendage, fat, fertilized, fin, flatworm, gastrulation, gene, gene frequency, gene pool, genetic material, genotype, gestation, implantation, infectious disease, inherited, interphase, interrelationship, involuntary responses, lichen, lipids, live birth, lubricate, lymphatic system, meiosis, mitosis, moisture, moss, mutation, natural resources, nucleic acid, nucleolus, oak, overcrowding, ovulation, ovule, phenotype, physical environment, pigment, plasma, plasma membrane, platelet, population growth, prehistoric, protoplasm, protozoa, recessive, recycling, reduction division, renewable resource, section, selective breeding, sex, single-celled, sponge, starch, stigma, stinging cell, stress, synthesize, taxonomy, trait, white blood cell, xylem</p> | <p><i>New Vocabulary:</i> (plant) cell wall, abiotic factor, additive, adrenalin, algal bloom, alternative energy source, amino acid, amoeba, artificial selection, axon, bacteria of decay, biologist, blood sugar level, brain, breeder, cellular respiration, cellular structure, chitin, cilia, class, class (taxonomy), conservation biologist, conserve, Darwin, DDT, deletion, diffusion, electrochemical impulse, energy releasing process, estrogen, family, fermentation, flagella, follicle-stimulating hormone, genus, grassland, guard cell, holdfast, hormone, inorganic, insulin, inversion, kingdom, Leeuwenhoek, life span, Linnaeus, locomotion, natural selection, neuron, neurotransmitter, pancreas, parathormone, Pasteur, phagocytosis, phototropism, pinocytosis, plasmodium, protein synthesis, protist, pseudopod, rate of entry, Schwann, specialization, specimen, stimulus, stomate, subdivision, substitution, substratum, synapse, translocation, transportation, vestigial structure</p> |
| <p><i>New Signs and Symbols:</i> none</p> | <p><i>New Signs and Symbols:</i> → flow of energy (food chains)</p> | <p><i>New Signs and Symbols:</i> none</p> |

Subject: General Science

Goal Strand: Environmental and Life Science

RIT Score Range: 221 - 230

| Skills and Concepts to Enhance 211 - 220 | Skills and Concepts to Develop 221 - 230 | Skills and Concepts to Introduce 231 - 240 |
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| <p>Characteristics and Structure-Function</p> <ul style="list-style-type: none"> • Recognizes that the function of a plant's stem is to carry water, minerals, and food to other parts of the plant* • Identifies the external structures that perform particular functions in animals* • Recognizes that photosynthesis/energy capture occurs within a plant's leaves* • Describes the structure and function of the organs making up a flower (e.g., stigma, anthers, petals, pistil)* • Sequences the levels of organization in an organism to relate the parts to each other and to the whole* • Describes the relationship between structure and function at the organ's level of organization • Describes the organization seen within the plant reproductive system* • Recognizes structures of the respiratory system* • Describes the structure and function of the cells and tissues which make up the circulatory system • Describes the structure and function of a plant's reproductive system* • Describes the function of the digestive system • Recognizes that the nervous system interacts with other systems of the body* • Recognizes that all single cells have differences which allow specialization of function* • Recognizes that a microscope must be used to observe something as small as a cell* • Describes the cell theory* • Recognizes that cells are the fundamental units and building blocks of life (the cell is the smallest unit which can reproduce itself) • Gives examples of cells which perform specialized functions* • Contrasts active transport and osmosis* | <p>Characteristics and Structure-Function</p> <ul style="list-style-type: none"> • Understands that a plant's roots generally do not produce food via photosynthesis* • Recognizes that the ovary of a plant will develop into a fruit* • Recognizes that seeds contain embryos* • Describes the structure and specialization of function of the cells and tissues found within a typical plant leaf* • Describes transpiration in plants* • Describes the function of tissues within the respiratory system* • Defines neuron* • Describes the characteristics shared by all living organisms • Describes the unique features of viruses that allow them to be classified as living or non-living at different times* • Describes the idea that cells of multicellular organisms have specialized functions* • Infers that most cell functions involve chemical reactions* • Analyzes the structures, functions, and processes used by the cell in information feedback* • Describes ways in which materials enter the cell* • Compares features of plant and animal cells* • Compares plant and animal cells in terms of the organelles found in each • Describes the function of the ribosome • Describes the functions of the nucleus within the cell* • Identifies the chromosomes when given their function within the cell* • Identifies the cell membrane when given its function within the cell* • Describes the composition of plant cell walls* • Describes how homologous chromosomes are | <p>Characteristics and Structure-Function</p> <ul style="list-style-type: none"> • Describes the major function of a plant's leaves* • Describes the purpose for the germination of pollen and growth of pollen tubes* • Describes the relationship between structure and function at the tissue level of organization* • Compares the function of mitochondria and chloroplast within the cell* • Describes the structures, functions, and processes used by the cell in enabling cellular movement (unicellular organisms)* • Determines the function of a cell based on the presence and abundance of organelles found in that cell* • Orders the molecules and organelles involved in the stages of protein synthesis* • Describes characteristics of the cell membrane that allow it to regulate import and export of cellular materials* • Identifies the mitochondrion when given its function within the cell • Describes the function of the mitochondrion within the cell* • Identifies the ribosome when given its function within the cell* • Describes the makeup of cytoplasm* • Analyzes the structures, functions, and processes used in cellular reproduction* • Recognizes that in mitosis, the daughter cells produced contain the same number of chromosomes as the parent cell (both parent and daughter cells are diploid)* • Describes how homologous chromosomes are separated during meiosis, to produce sex cells containing half as many chromosomes as a somatic cell* • Relates errors in meiosis to disorders caused by nondisjunction (e.g., Klinefelter's syndrome)* |

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| <ul style="list-style-type: none"> • Describes features common to all cells* • Compares plant and animal cells in terms of the organelles found in each • Uses analogies to represent the function of organelles within the cell* • Differentiates between the functions of the nucleus and the nucleolus* • Identifies the cell membrane when given its function within the cell* • Identifies the plant cell wall when given its function within the cell* • Identifies the chloroplast when given its function within the cell* • Identifies the chloroplast in a cell diagram when given its function only* • Describes the process of embryo growth and differentiation* • Compares the process of meiosis with the process of mitosis* • Describes how somatic cells are produced (mitosis)* • Recognizes that the outcome of mitosis is production of two genetically identical daughter cells* • Describes how sex cells are produced (meiosis)* • Defines metabolism as the sum of chemical reactions in the body* • Describes the role of enzymes in digestion* • Explains that cells obtain food and oxygen from the outside environment* • Describes the process of photosynthesis in terms of its location within the cell, reactants, and products* • Recognizes that oxygen is an essential product of photosynthesis* • Gives examples of carbohydrates* • Classifies biomolecules as carbohydrates* | <p>separated during meiosis, to produce sex cells containing half as many chromosomes as a somatic cell*</p> <ul style="list-style-type: none"> • Describes how sex cells are produced (meiosis)* • Describes the role of enzymes in cellular reactions* • Describes the structure and mechanism of action of enzymes* • Describes the chemical reactions used by the cell in respiration • Compares respiration in plant and animal cells* • Compares the process of anaerobic respiration in different organisms* • Compares the processes of photosynthesis and respiration • Recognizes that hormones are chemical messengers* | <ul style="list-style-type: none"> • Compares photosynthesis and respiration in terms of reactants and products* • Describes the structure of lipids* • Describes the structure of amino acids and proteins* |
| <p>Life Cycles, Reproduction and Heredity</p> | <p>Life Cycles, Reproduction and Heredity</p> | <p>Life Cycles, Reproduction and Heredity</p> |
| <ul style="list-style-type: none"> • Identifies examples of inherited traits* • Defines mutation* • Predicts patterns of inheritance for simple-dominant recessive alleles in dihybrid crosses (Mendelian inheritance)* • Explains that sex chromosomes determine the gender of a human (two copies of the X chromosome produce a female, one copy of X plus one copy of Y produce a male)* | <ul style="list-style-type: none"> • Recognizes terminology used to describe the stages of embryo development* • Recognizes that replication is the cellular process in which DNA is copied* • Classifies examples of mutations as inversions, deletions, substitutions and point mutations* • Describes patterns of inheritance seen for single gene traits* • Determines the parents involved in a monohybrid | <ul style="list-style-type: none"> • Describes simple life cycles of plants* • Gives examples of environmental conditions that may influence the characteristics of an organism* • Evaluates the importance of mutation in producing genetic variation* • Predicts probabilities of inheritance for simple dominant-recessive alleles in monohybrid crosses (Mendelian inheritance)* • Describes incomplete dominance* |

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| <ul style="list-style-type: none"> • Explains that the sex of a child is determined by the presence or absence of a Y chromosome in the sperm* • Defines fertilization* | <p>cross, given the outcome of that cross and the genotype and/or phenotype of the other parent*</p> <ul style="list-style-type: none"> • Predicts patterns of inheritance for simple-dominant recessive alleles in dihybrid crosses (Mendelian inheritance)* • Predicts probabilities of inheritance for sex-linked alleles* | <ul style="list-style-type: none"> • Classifies given characteristics as examples of phenotype* |
| <p>Interactions with Environment; Biol Evolution</p> | <p>Interactions with Environment; Biol Evolution</p> | <p>Interactions with Environment; Biol Evolution</p> |
| <ul style="list-style-type: none"> • Describes characteristics of arthropods • Classifies organisms as arthropods (based on external characteristics)* • Classifies taxonomic groups of organisms as vertebrates and invertebrates* • Classifies animals to phylum arthropoda* • Describes characteristics of the five kingdoms* • Compares characteristics of organisms based on their position within the five kingdom classification hierarchy* • Describes characteristics of eubacteria* • Makes inferences about the roles of heterotrophs and autotrophs* • Classifies living things as producers (term defined)* • Describes the process of classification of living things* • Predicts how variations provide an advantage in survival and reproduction • Defines a gene pool as the collection of inheritable genes in a population* • Explains how DNA from ancient species can be compared with modern species to determine evolutionary relationships* • Defines ecology as the interaction of living things with each other and with the non-living (abiotic) environment* • Describes how the structure of a plant or animal complements the environment in which it is found* • Explains how an organism's body structures allow it to survive in a given environment* • Assesses features of organisms (e.g., appendages, reproductive rates, camouflage, defensive structures) for their adaptive potential* • Describes how climate influences the type of biome seen in a particular geographic area • Recognizes the characteristics of the tundra biome* • Evaluates impacts of activities that modify the | <ul style="list-style-type: none"> • Classifies taxonomic groups of organisms as vertebrates and invertebrates* • Recognizes characteristics of mollusks* • Classifies animals to the phylum mollusca* • Classifies animals to phylum cnidaria* • Describes characteristics of protists* • Classifies organisms as protists* • Classifies living things as producers (term defined)* • Classifies organisms into a hierarchical structure based on observable characteristics* • Describes the hierarchical structure of the five kingdom classification system* • Recognizes that Linnaeus developed the binomial classification system on which modern taxonomy is based* • Describes how new varieties of plants and animals are produced through selective breeding (artificial selection)* • Recognizes factors that allow speciation to occur* • Gives examples of vestigial structures in humans* • Recognizes examples of mimicry* • Evaluates survival of organisms in particular environmental conditions* • Explains how a given form of an organism may be more likely to survive in a particular ecosystem, causing a change in the abundance of that form of the organism within that population* • Gives an example of a vestigial structure* • Predicts how interaction of biotic and abiotic factors will affect an ecosystem* • Assesses features of organisms (e.g., appendages, reproductive rates, camouflage, defensive structures) for their competitive potential* • Recognizes characteristics of the tropical rainforest biome* • Compares the characteristics of land biomes* | <ul style="list-style-type: none"> • Classifies an organism as a fungus, based on observable or listed characteristics* • Recognizes characteristics of echinoderms* • Classifies animals to phylum platyhelminthes* • Classifies living things as producers (term not defined)* • Describes assumptions of the theory of evolution (e.g., species vary, tendency of species to produce more offspring than the environment will support)* • Interprets evolutionary tree diagrams to determine ancestors of a given group of organisms* • Predicts how interaction of biotic and abiotic factors will affect an ecosystem* • Names the plants that are found in the tropical rainforest biome* • Explains how land biomes are named* • Recognizes the characteristics of the taiga biome* • Recognizes that gravity can affect the growth of plants* • Recognizes that population size fluctuates depending on relative rates of birth, death, emigration, and immigration* • Recognizes the stages of succession seen in an ecosystem (e.g., pioneer, climax, etc.)* • Gives examples of pioneer plants* • Defines climax community* • Recognizes that producers convert light energy into chemical energy* • Describes the organization of a pyramid of biomass* |

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| <p>environment*</p> <ul style="list-style-type: none"> • Describes how human activities affect air quality* • Explains how global warming modifies the environment* • Describes how plants and animals in an ecosystem interact with each other • Makes inferences about the effect of changes to a predator-prey relationship* • Explains that different species occupying the same environment may compete, if their needs are similar and resources are limited* • Applies the idea that all members of a species that occur in the same place at the same time comprise a population* • Predicts how biotic factors will affect population density* • Recognizes abiotic and biotic factors can affect all levels of an ecosystem, from individual to community* • Predicts the plant stage likely to succeed a given plant stage in the succession of a particular ecosystem* • Understands that communities differ from other collections of animals (such as herds and flocks), in that communities are comprised of multiple interacting species* • Understands that for alternative energy resources to be most useful, they must be renewable, or based on different non-renewable resources than are currently in use • Defines (environmental) conservation • Describes how capture of light by plants serves as the basis of all food chains* • Explains how organisms are related within food chains* • Infers how changes in one portion of a food chain will affect other parts of the food chain • Explains why numbers of organisms decrease as trophic level within a food chain increases* • Predicts which link in a food chain will be made up of the fewest number of organisms* • Describes how producers, carnivores, herbivores and decomposers interact to form a food chain* | <ul style="list-style-type: none"> • Describes the characteristics of the desert biome* • Gives an example of a biome* • Identifies responses in organisms to external stimuli found in the environment (e.g., the presence or absence of light)* • Defines homeostasis* • Explains how algal blooms are produced* • Explains how inversions can affect air quality* • Explains that organisms occupying the same niche may compete for resources* • Compares types of symbiosis (commensalism, mutualism, parasitism)* • Classifies an interaction between species as symbiosis* • Applies the idea that all members of a species that occur in the same place at the same time comprise a population* • Recognizes factors that affect the number of organisms an ecosystem is able to support* • Recognizes that living organisms are capable of producing populations of infinite size, but are limited by the amount of resources available in the environment (i.e., carrying capacity and limiting factors)* • Identifies biotic factors in an environment that affect population density* • Classifies abiotic and biotic factors in an environment • Describes responses of an ecosystem to the events that cause it to change* • Gives examples of communities* • Understands that communities differ from other collections of animals (such as herds and flocks), in that communities are comprised of multiple interacting species* • Explains that the most important reason to conserve fossil fuels is to allow time for the development of alternative energy sources* • Recognizes that plants convert light energy into stored energy* • Classifies organisms according to the function they serve in a food chain* • Explains why numbers of organisms decrease as trophic level within a food chain increases* • Predicts which link in a food chain will be made up of the fewest number of organisms* | |
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| | <ul style="list-style-type: none"> • Recognizes that food webs are comprised of more than one food chain* • Recognizes that individual food chains occur within a food web* | |
| <p><i>New Vocabulary:</i> anatomy, artery, arthropoda, atmospheric pollution, behavior, body fat, capillary, carbohydrate, cellulose, centriole, chromosome, cleavage, colony, conception, coniferous tree, conjugation, constitute, cross (genetic), crossing over, dominant, duplicate, environmental condition, enzyme, excretory system, exoskeleton, external appendage, fat, fertilized, fin, flatworm, gastrulation, gene, gene frequency, gene pool, genetic material, genotype, gestation, implantation, infectious disease, inherited, interphase, interrelationship, involuntary responses, lichen, lipids, live birth, lubricate, lymphatic system, meiosis, mitosis, moisture, moss, mutation, natural resources, nucleic acid, nucleolus, oak, overcrowding, ovulation, ovule, phenotype, physical environment, pigment, plasma, plasma membrane, platelet, population growth, prehistoric, protoplasm, protozoa, recessive, recycling, reduction division, renewable resource, section, selective breeding, sex, single-celled, sponge, starch, stigma, stinging cell, stress, synthesize, taxonomy, trait, white blood cell, xylem</p> | <p><i>New Vocabulary:</i> (plant) cell wall, abiotic factor, additive, adrenalin, algal bloom, alternative energy source, amino acid, amoeba, artificial selection, axon, bacteria of decay, biologist, blood sugar level, brain, breeder, cellular respiration, cellular structure, chitin, cilia, class, class (taxonomy), conservation biologist, conserve, Darwin, DDT, deletion, diffusion, electrochemical impulse, energy releasing process, estrogen, family, fermentation, flagella, follicle-stimulating hormone, genus, grassland, guard cell, holdfast, hormone, inorganic, insulin, inversion, kingdom, Leeuwenhoek, life span, Linnaeus, locomotion, natural selection, neuron, neurotransmitter, pancreas, parathormone, Pasteur, phagocytosis, phototropism, pinocytosis, plasmodium, protein synthesis, protist, pseudopod, rate of entry, Schwann, specialization, specimen, stimulus, stomate, subdivision, substitution, substratum, synapse, translocation, transportation, vestigial structure</p> | <p><i>New Vocabulary:</i> coelenterata, daughter cell, genetic structure, geotropism, germination, liverfluke, maturation, mineral content, nematoda, pioneer (plant), plastid, tundra</p> |
| <p><i>New Signs and Symbols:</i> → flow of energy (food chains)</p> | <p><i>New Signs and Symbols:</i> none</p> | <p><i>New Signs and Symbols:</i> none</p> |

Subject: General Science

Goal Strand: Environmental and Life Science

RIT Score Range: 231 - 240

| Skills and Concepts to Enhance 221 - 230 | Skills and Concepts to Develop 231 - 240 | Skills and Concepts to Introduce Above 240 |
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| <p>Characteristics and Structure-Function</p> <ul style="list-style-type: none"> • Understands that a plant's roots generally do not produce food via photosynthesis* • Recognizes that the ovary of a plant will develop into a fruit* • Recognizes that seeds contain embryos* • Describes the structure and specialization of function of the cells and tissues found within a typical plant leaf* • Describes transpiration in plants* • Describes the function of tissues within the respiratory system* • Defines neuron* • Describes the characteristics shared by all living organisms • Describes the unique features of viruses that allow them to be classified as living or non-living at different times* • Describes the idea that cells of multicellular organisms have specialized functions* • Infers that most cell functions involve chemical reactions* • Analyzes the structures, functions, and processes used by the cell in information feedback* • Describes ways in which materials enter the cell* • Compares features of plant and animal cells* • Compares plant and animal cells in terms of the organelles found in each • Describes the function of the ribosome • Describes the functions of the nucleus within the cell* • Identifies the chromosomes when given their function within the cell* • Identifies the cell membrane when given its function within the cell* • Describes the composition of plant cell walls* • Describes how homologous chromosomes are | <p>Characteristics and Structure-Function</p> <ul style="list-style-type: none"> • Describes the major function of a plant's leaves* • Describes the purpose for the germination of pollen and growth of pollen tubes* • Describes the relationship between structure and function at the tissue level of organization* • Compares the function of mitochondria and chloroplast within the cell* • Describes the structures, functions, and processes used by the cell in enabling cellular movement (unicellular organisms)* • Determines the function of a cell based on the presence and abundance of organelles found in that cell* • Orders the molecules and organelles involved in the stages of protein synthesis* • Describes characteristics of the cell membrane that allow it to regulate import and export of cellular materials* • Identifies the mitochondrion when given its function within the cell • Describes the function of the mitochondrion within the cell* • Identifies the ribosome when given its function within the cell* • Describes the makeup of cytoplasm* • Analyzes the structures, functions, and processes used in cellular reproduction* • Recognizes that in mitosis, the daughter cells produced contain the same number of chromosomes as the parent cell (both parent and daughter cells are diploid)* • Describes how homologous chromosomes are separated during meiosis, to produce sex cells containing half as many chromosomes as a somatic cell* • Relates errors in meiosis to disorders caused by nondisjunction (e.g., Klinefelter's syndrome)* | <p>Characteristics and Structure-Function</p> <ul style="list-style-type: none"> • Describes the structures, functions, and processes used by the cell in enabling cellular movement (unicellular organisms)* • Describes how mRNA is transcribed from DNA* • Draws conclusions from data relating to osmosis in cells and cell models* • Differentiates between biomolecules in terms of structure and function within the cell* |

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| <ul style="list-style-type: none"> separated during meiosis, to produce sex cells containing half as many chromosomes as a somatic cell* Describes how sex cells are produced (meiosis)* Describes the role of enzymes in cellular reactions* Describes the structure and mechanism of action of enzymes* Describes the chemical reactions used by the cell in respiration Compares respiration in plant and animal cells* Compares the process of anaerobic respiration in different organisms* Compares the processes of photosynthesis and respiration Recognizes that hormones are chemical messengers* | <ul style="list-style-type: none"> Compares photosynthesis and respiration in terms of reactants and products* Describes the structure of lipids* Describes the structure of amino acids and proteins* | |
| Life Cycles, Reproduction and Heredity | Life Cycles, Reproduction and Heredity | Life Cycles, Reproduction and Heredity |
| <ul style="list-style-type: none"> Recognizes terminology used to describe the stages of embryo development* Recognizes that replication is the cellular process in which DNA is copied* Classifies examples of mutations as inversions, deletions, substitutions and point mutations* Describes patterns of inheritance seen for single gene traits* Determines the parents involved in a monohybrid cross, given the outcome of that cross and the genotype and/or phenotype of the other parent* Predicts patterns of inheritance for simple-dominant recessive alleles in dihybrid crosses (Mendelian inheritance)* Predicts probabilities of inheritance for sex-linked alleles* | <ul style="list-style-type: none"> Describes simple life cycles of plants* Gives examples of environmental conditions that may influence the characteristics of an organism* Evaluates the importance of mutation in producing genetic variation* Predicts probabilities of inheritance for simple dominant-recessive alleles in monohybrid crosses (Mendelian inheritance)* Describes incomplete dominance* Classifies given characteristics as examples of phenotype* | |
| Interactions with Environment; Biol Evolution | Interactions with Environment; Biol Evolution | Interactions with Environment; Biol Evolution |
| <ul style="list-style-type: none"> Classifies taxonomic groups of organisms as vertebrates and invertebrates* Recognizes characteristics of mollusks* Classifies animals to the phylum mollusca* Classifies animals to phylum cnidaria* Describes characteristics of protists* Classifies organisms as protists* Classifies living things as producers (term defined)* Classifies organisms into a hierarchical structure based on observable characteristics* Describes the hierarchical structure of the five kingdom | <ul style="list-style-type: none"> Classifies an organism as a fungus, based on observable or listed characteristics* Recognizes characteristics of echinoderms* Classifies animals to phylum platyhelminthes* Classifies living things as producers (term not defined)* Describes assumptions of the theory of evolution (e.g., species vary, tendency of species to produce more offspring than the environment will support)* Interprets evolutionary tree diagrams to determine ancestors of a given group of organisms* | <ul style="list-style-type: none"> Recognizes that the major form of pollution produced by nuclear reactors is heat* Understands that renewable energy sources may be of limited usefulness because of their basis in energy sources that are not in constant supply (e.g., solar power, tidal dams)* |

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| <p>classification system*</p> <ul style="list-style-type: none"> • Recognizes that Linnaeus developed the binomial classification system on which modern taxonomy is based* • Describes how new varieties of plants and animals are produced through selective breeding (artificial selection)* • Recognizes factors that allow speciation to occur* • Gives examples of vestigial structures in humans* • Recognizes examples of mimicry* • Evaluates survival of organisms in particular environmental conditions* • Explains how a given form of an organism may be more likely to survive in a particular ecosystem, causing a change in the abundance of that form of the organism within that population* • Gives an example of a vestigial structure* • Predicts how interaction of biotic and abiotic factors will affect an ecosystem* • Assesses features of organisms (e.g., appendages, reproductive rates, camouflage, defensive structures) for their competitive potential* • Recognizes characteristics of the tropical rainforest biome* • Compares the characteristics of land biomes* • Describes the characteristics of the desert biome* • Gives an example of a biome* • Identifies responses in organisms to external stimuli found in the environment (e.g., the presence or absence of light)* • Defines homeostasis* • Explains how algal blooms are produced* • Explains how inversions can affect air quality* • Explains that organisms occupying the same niche may compete for resources* • Compares types of symbiosis (commensalism, mutualism, parasitism)* • Classifies an interaction between species as symbiosis* • Applies the idea that all members of a species that occur in the same place at the same time comprise a population* • Recognizes factors that affect the number of organisms an ecosystem is able to support* • Recognizes that living organisms are capable of | <ul style="list-style-type: none"> • Predicts how interaction of biotic and abiotic factors will affect an ecosystem* • Names the plants that are found in the tropical rainforest biome* • Explains how land biomes are named* • Recognizes the characteristics of the taiga biome* • Recognizes that gravity can affect the growth of plants* • Recognizes that population size fluctuates depending on relative rates of birth, death, emigration, and immigration* • Recognizes the stages of succession seen in an ecosystem (e.g., pioneer, climax, etc.)* • Gives examples of pioneer plants* • Defines climax community* • Recognizes that producers convert light energy into chemical energy* • Describes the organization of a pyramid of biomass* | |
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| <p>producing populations of infinite size, but are limited by the amount of resources available in the environment (i.e., carrying capacity and limiting factors)*</p> <ul style="list-style-type: none"> • Identifies biotic factors in an environment that affect population density* • Classifies abiotic and biotic factors in an environment • Describes responses of an ecosystem to the events that cause it to change* • Gives examples of communities* • Understands that communities differ from other collections of animals (such as herds and flocks), in that communities are comprised of multiple interacting species* • Explains that the most important reason to conserve fossil fuels is to allow time for the development of alternative energy sources* • Recognizes that plants convert light energy into stored energy* • Classifies organisms according to the function they serve in a food chain* • Explains why numbers of organisms decrease as trophic level within a food chain increases* • Predicts which link in a food chain will be made up of the fewest number of organisms* • Recognizes that food webs are comprised of more than one food chain* • Recognizes that individual food chains occur within a food web* | | |
| <p><i>New Vocabulary:</i> (plant) cell wall, abiotic factor, additive, adrenalin, algal bloom, alternative energy source, amino acid, amoeba, artificial selection, axon, bacteria of decay, biologist, blood sugar level, brain, breeder, cellular respiration, cellular structure, chitin, cilia, class, class (taxonomy), conservation biologist, conserve, Darwin, DDT, deletion, diffusion, electrochemical impulse, energy releasing process, estrogen, family, fermentation, flagella, follicle-stimulating hormone, genus, grassland, guard cell, holdfast, hormone, inorganic, insulin, inversion, kingdom, Leeuwenhoek, life span, Linnaeus, locomotion, natural selection, neuron, neurotransmitter, pancreas, parathormone, Pasteur, phagocytosis, phototropism, pinocytosis, plasmodium, protein synthesis, protist, pseudopod, rate of entry, Schwann, specialization, specimen, stimulus, stomate, subdivision, substitution,</p> | <p><i>New Vocabulary:</i> coelenterata, daughter cell, genetic structure, geotropism, germination, liverfluke, maturation, mineral content, nematoda, pioneer (plant), plastid, tundra</p> | <p><i>New Vocabulary:</i> none</p> |

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| substratum, synapse, translocation, transportation, vestigial structure | | |
| <i>New Signs and Symbols: none</i> | <i>New Signs and Symbols: none</i> | <i>New Signs and Symbols: none</i> |

Subject: General Science

Goal Strand: Environmental and Life Science

RIT Score Range: Above 240

| Skills and Concepts to Enhance 231 - 240 | Skills and Concepts to Develop Above 240 |
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| <p>Characteristics and Structure-Function</p> <ul style="list-style-type: none"> • Describes the major function of a plant's leaves* • Describes the purpose for the germination of pollen and growth of pollen tubes* • Describes the relationship between structure and function at the tissue level of organization* • Compares the function of mitochondria and chloroplast within the cell* • Describes the structures, functions, and processes used by the cell in enabling cellular movement (unicellular organisms)* • Determines the function of a cell based on the presence and abundance of organelles found in that cell* • Orders the molecules and organelles involved in the stages of protein synthesis* • Describes characteristics of the cell membrane that allow it to regulate import and export of cellular materials* • Identifies the mitochondrion when given its function within the cell • Describes the function of the mitochondrion within the cell* • Identifies the ribosome when given its function within the cell* • Describes the makeup of cytoplasm* • Analyzes the structures, functions, and processes used in cellular reproduction* • Recognizes that in mitosis, the daughter cells produced contain the same number of chromosomes as the parent cell (both parent and daughter cells are diploid)* • Describes how homologous chromosomes are separated during meiosis, to produce sex cells containing half as many chromosomes as a somatic cell* • Relates errors in meiosis to disorders caused by nondisjunction (e.g., Klinefelter's syndrome)* | <p>Characteristics and Structure-Function</p> <ul style="list-style-type: none"> • Describes the structures, functions, and processes used by the cell in enabling cellular movement (unicellular organisms)* • Describes how mRNA is transcribed from DNA* • Draws conclusions from data relating to osmosis in cells and cell models* • Differentiates between biomolecules in terms of structure and function within the cell* |

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| <ul style="list-style-type: none"> • Compares photosynthesis and respiration in terms of reactants and products* • Describes the structure of lipids* • Describes the structure of amino acids and proteins* | |
| Life Cycles, Reproduction and Heredity | Life Cycles, Reproduction and Heredity |
| <ul style="list-style-type: none"> • Describes simple life cycles of plants* • Gives examples of environmental conditions that may influence the characteristics of an organism* • Evaluates the importance of mutation in producing genetic variation* • Predicts probabilities of inheritance for simple dominant-recessive alleles in monohybrid crosses (Mendelian inheritance)* • Describes incomplete dominance* • Classifies given characteristics as examples of phenotype* | |
| Interactions with Environment; Biol Evolution | Interactions with Environment; Biol Evolution |
| <ul style="list-style-type: none"> • Classifies an organism as a fungus, based on observable or listed characteristics* • Recognizes characteristics of echinoderms* • Classifies animals to phylum platyhelminthes* • Classifies living things as producers (term not defined)* • Describes assumptions of the theory of evolution (e.g., species vary, tendency of species to produce more offspring than the environment will support)* • Interprets evolutionary tree diagrams to determine ancestors of a given group of organisms* • Predicts how interaction of biotic and abiotic factors will affect an ecosystem* • Names the plants that are found in the tropical rainforest biome* • Explains how land biomes are named* • Recognizes the characteristics of the taiga biome* • Recognizes that gravity can affect the growth of plants* • Recognizes that population size fluctuates depending on relative rates of birth, death, emigration, and immigration* • Recognizes the stages of succession seen in an ecosystem (e.g., pioneer, climax, etc.)* • Gives examples of pioneer plants* • Defines climax community* • Recognizes that producers convert light energy into | <ul style="list-style-type: none"> • Recognizes that the major form of pollution produced by nuclear reactors is heat* • Understands that renewable energy sources may be of limited usefulness because of their basis in energy sources that are not in constant supply (e.g., solar power, tidal dams)* |

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| chemical energy* • Describes the organization of a pyramid of biomass* | |
| <i>New Vocabulary:</i> coelenterata, daughter cell, genetic structure, geotropism, germination, liverfluke, maturation, mineral content, nematoda, pioneer (plant), plastid, tundra | <i>New Vocabulary:</i> none |
| <i>New Signs and Symbols:</i> none | <i>New Signs and Symbols:</i> none |