DesCartes
(Combined)

Subject: General Science
Goal: Physical Science

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
Structure, Properties and Changes of Matter	**Structure, Properties and Changes of Matter**
• Sorts natural and manufactured materials by weight* • Classifies objects as liquids*	• 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*
Position, Motion of Objects, Motion and Forces	**Position, Motion of Objects, Motion and Forces**
• Recognizes that pushing or pulling an object can cause a change in the object's position and motion*	• 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*
Energy Forms, Transfer, Conservation, Interact	**Energy Forms, Transfer, Conservation, Interact**
• Recognizes that things that give off light often also give off heat* • Identifies objects that produce color from white light*	• 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*

* 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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	• 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*
New Vocabulary: cloud, fog, gas, hail, ice, sleet, smog, snow	*New Vocabulary:* 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
New Signs and Symbols: none	*New Signs and Symbols:* none

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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
Structure, Properties and Changes of Matter	**Structure, Properties and Changes of Matter**	**Structure, Properties and Changes of Matter**
• Sorts natural and manufactured materials by weight* • Classifies objects as liquids*	• 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*	• 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*
Position, Motion of Objects, Motion and Forces	**Position, Motion of Objects, Motion and Forces**	**Position, Motion of Objects, Motion and Forces**
• Recognizes that pushing or pulling an object can cause a change in the object's position and motion*	• 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	• 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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	objects* • Describes how sound is transmitted*	• 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**
• Recognizes that things that give off light often also give off heat* • Identifies objects that produce color from white light*	• 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*	• 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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		• 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*
New Vocabulary: cloud, fog, gas, hail, ice, sleet, smog, snow	*New Vocabulary:* 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	*New Vocabulary:* 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
New Signs and Symbols: none	*New Signs and Symbols:* none	*New Signs and Symbols:* N north, S south

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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
Structure, Properties and Changes of Matter	**Structure, Properties and Changes of Matter**	**Structure, Properties and Changes of Matter**
• 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*	• 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*	• 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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		• 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**
• 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*	• 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*	• 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*

* 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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	• 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**
• 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*	• 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	• 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*	• 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*
New Vocabulary: 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	*New Vocabulary:* 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	*New Vocabulary:* 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
New Signs and Symbols: none	*New Signs and Symbols:* N north, S south	*New Signs and Symbols:* $C_6H_{12}O_6$ (glucose), Ca (Calcium), C carbon, CO (carbon monoxide), . decimal point, H_2O, H hydrogen, O oxygen, S sulfur

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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
Structure, Properties and Changes of Matter	**Structure, Properties and Changes of Matter**	**Structure, Properties and Changes of Matter**
• 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*	• 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*	• 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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	• 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*	• 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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		• 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**
• 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*	• 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*	• 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**
• Compares electrical insulating ability of different materials* • Gives examples of electrical conductors* • Analyzes parallel circuits*	• Analyzes direct current electrical circuits* • Gives examples of electrical insulators* • Analyzes the parts of a light bulb* • Distinguishes between open and closed circuits*	• 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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• 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*	• 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*	• 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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		• Applies Newton's laws of motion to explain movement due to gravity*
New Vocabulary: 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	*New Vocabulary:* 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	*New Vocabulary:* 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
New Signs and Symbols: N north, S south	*New Signs and Symbols:* $C_6H_{12}O_6$ (glucose), Ca (Calcium), C carbon, CO (carbon monoxide), . decimal point, H_2O, H hydrogen, O oxygen, S sulfur	*New Signs and Symbols:* Co (Cobalt), Cr (chromium), Cs (Cesium), kg kilogram, mL milliliter/millilitre

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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
Structure, Properties and Changes of Matter	**Structure, Properties and Changes of Matter**	**Structure, Properties and Changes of Matter**
• 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*	• 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	• 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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• 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*	• 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*	• 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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	• 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*	• 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**
• 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*	• 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*	• 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**
• Analyzes direct current electrical circuits*	• Explains that energy cannot be created or destroyed,	• Describes the law of conservation of mass*

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• 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*	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*	• 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 come 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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	• 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*	remain the same* • Applies Newton's laws of motion to explain movement due to gravity* • Calculates gravitational forces of objects in space*
New Vocabulary: 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	*New Vocabulary:* 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	*New Vocabulary:* 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
New Signs and Symbols: $C_6H_{12}O_6$ (glucose), Ca (Calcium), C carbon, CO (carbon monoxide), . decimal point, H_2O, H hydrogen, O oxygen, S sulfur	*New Signs and Symbols:* Co (Cobalt), Cr (chromium), Cs (Cesium), kg kilogram, mL milliliter/millilitre	*New Signs and Symbols:* g gram, − negative, pH

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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
Structure, Properties and Changes of Matter	**Structure, Properties and Changes of Matter**	**Structure, Properties and Changes of Matter**
• 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	• 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	• 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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• 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*	• 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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• 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*	• 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**
• 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*	• 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*	• 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**
• Explains that energy cannot be created or destroyed,	• Describes the law of conservation of mass*	• Understands how conservation of mass is expressed in

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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*	• 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 come 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	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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• 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*	remain the same* • Applies Newton's laws of motion to explain movement due to gravity* • Calculates gravitational forces of objects in space*	
New Vocabulary: 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	*New Vocabulary:* 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	*New Vocabulary:* none
New Signs and Symbols: Co (Cobalt), Cr (chromium), Cs (Cesium), kg kilogram, mL milliliter/millilitre	*New Signs and Symbols:* g gram, − negative, pH	*New Signs and Symbols:* none

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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
Structure, Properties and Changes of Matter	**Structure, Properties and Changes of Matter**	**Structure, Properties and Changes of Matter**
• 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	• 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*	• 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 in obtained*

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• 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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• 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**
• 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*	• Relates changes in speed or direction to unbalanced forces (2-D)*	• Applies Newton's laws to examine action and reaction* • Calculates frequency of waves when given wavelength and speed*
Energy Forms, Transfer, Conservation, Interact	**Energy Forms, Transfer, Conservation, Interact**	**Energy Forms, Transfer, Conservation, Interact**
• 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*	• 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*	• 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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• 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 come 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*		
New Vocabulary: 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	*New Vocabulary:* none	*New Vocabulary:* none

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New Signs and Symbols: g gram, – negative, pH	*New Signs and Symbols:* none	*New Signs and Symbols:* 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
Structure, Properties and Changes of Matter	**Structure, Properties and Changes of Matter**	**Structure, Properties and Changes of Matter**
• 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*	• 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 in obtained*	• Analyzes data about phase changes in matter*
Position, Motion of Objects, Motion and Forces	**Position, Motion of Objects, Motion and Forces**	**Position, Motion of Objects, Motion and Forces**
• Relates changes in speed or direction to unbalanced forces (2-D)*	• Applies Newton's laws to examine action and reaction* • Calculates frequency of waves when given wavelength and speed*	

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Energy Forms, Transfer, Conservation, Interact	Energy Forms, Transfer, Conservation, Interact	Energy Forms, Transfer, Conservation, Interact
• 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*	• Recognizes that in a closed system, the total number of atoms always remains the same, regardless of how the atoms are arranged into molecules*	
New Vocabulary: none	*New Vocabulary:* none	*New Vocabulary:* none
New Signs and Symbols: none	*New Signs and Symbols:* none	*New Signs and Symbols:* none

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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
Structure, Properties and Changes of Matter	**Structure, Properties and Changes of Matter**
• 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 in obtained*	• Analyzes data about phase changes in matter*
Position, Motion of Objects, Motion and Forces	**Position, Motion of Objects, Motion and Forces**
• Applies Newton's laws to examine action and reaction* • Calculates frequency of waves when given wavelength and speed*	
Energy Forms, Transfer, Conservation, Interact	**Energy Forms, Transfer, Conservation, Interact**
• Recognizes that in a closed system, the total number of atoms always remains the same, regardless of how the atoms are arranged into molecules*	
New Vocabulary: none	*New Vocabulary:* none
New Signs and Symbols: none	*New Signs and Symbols:* none

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