

Correlation to Utah Core Curriculum: 8th Grade Integrated Science
Integrated Science: An Investigative Approach
Student Text and Investigation Manual

Standard #: Curriculum	Standard	Objective	Indicator	Volume 1 Student Text page	Volume 2 Investigation Manual page	
gr8.I.1.a grade 8 Integrated Science	Students will understand the nature of changes in matter.	Describe the chemical and physical properties of various substances.	Differentiate between chemical and physical properties.	297	density is independent of amount of substance	146 investigate and observe chemical and physical changes in the lab
				298	elasticity is a physical property of matter	
				298	hardness is a physical property of matter	
				299	brittleness is a physical property of matter	
				300	tensile strength is a physical property of matter	
				300	malleability is a physical property of matter	
				300	development of Kevlar brand fiber	
				359	physical and chemical changes and digestion	
				361	physical and chemical changes in tire recycling	
				378	determine if changes are chemical or physical	
463	engineers use specific heat of substances to design better products					

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gr8.I.1.b grade 8 Integrated Science	Students will understand the nature of changes in matter.	Describe the chemical and physical properties of various substances.	Classify substances based on their chemical and physical properties (e.g., reacts with water, does not react with water, flammable or nonflammable, hard or soft, flexible or nonflexible, evaporates or melts at room temperature).	284	mixtures can be separated by physical means	114 separating a homogeneous mixture
				290	melting and boiling point explained	119 melting point of ice
				290	melting and boiling points	
				291	table of melting and boiling points	
				297	density is independent of amount of substance	
				298	elasticity is a physical property of matter	
				298	hardness is a physical property of matter	
				299	brittleness is a physical property of matter	
				300	tensile strength is a physical property of matter	
				300	malleability is a physical property of matter	
				300	development of Kevlar brand fiber	
				463	engineers use specific heat of substances to design better products	

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gr8.I.1.c grade 8 Integrated Science	Students will understand the nature of changes in matter.	Describe the chemical and physical properties of various substances.	Investigate and report on the chemical and physical properties of a particular substance.	300	development of Kevlar brand fiber	134	using a spectrometer
				325	fireworks displays and electron excitation	135	observing different light sources with a spectrometer
				339	plastics	162	investigating combustion reactions
				367	chemical reactions in living systems		
				384	combustion reactions		
				384	consumer chemistry		
				387	MRE ration heater reaction		
				401	chemistry of the atmosphere		
				401	chemistry of the atmosphere		
				403	carbon reactions		
				444	chemical reactions and the formation of acid rain		
				463	engineers use specific heat of substances to design better products		

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Standard #: Curriculum	Standard	Objective	Indicator	Volume 1 Student Text page		Volume 2 Investigation Manual page	
gr8.I.2.a grade 8 Integrated Science	Students will understand the nature of changes in matter.	Observe and evaluate evidence of chemical and physical change.	Identify observable evidence of a physical change (e.g., change in shape, size, phase).	290	changes of state	119	energy and phase changes
				359	physical and chemical changes and digestion	146	investigate and observe chemical and physical changes in the lab
				361	physical and chemical changes in tire recycling		
				378	determine if changes are chemical or physical		
				504	phases changes in the atmosphere		
gr8.I.2.b grade 8 Integrated Science	Students will understand the nature of changes in matter.	Observe and evaluate evidence of chemical and physical change.	Identify observable evidence of a chemical change (e.g., color change, heat or light given off, change in odor, gas given off).	359	physical and chemical changes and digestion	146	investigate and observe chemical and physical changes in the lab
				361	physical and chemical changes in tire recycling		
				363	combustion reaction		
				367	heartburn reaction		
				378	determine if changes are chemical or physical		

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gr8.I.2.c grade 8 Integrated Science	Students will understand the nature of changes in matter.	Observe and evaluate evidence of chemical and physical change.	Observe and describe chemical reactions involving atmospheric oxygen (e.g., rust, fire, respiration, photosynthesis).	363 combustion reaction 367 chemical reactions in living systems 367 heartburn reaction 384 combustion reactions 384 consumer chemistry 387 MRE ration heater reaction 401 chemistry of the atmosphere 401 chemistry of the atmosphere 403 carbon reactions 444 chemical reactions and the formation of acid rain	162 investigating combustion reactions
gr8.I.2.d grade 8 Integrated Science	Students will understand the nature of changes in matter.	Observe and evaluate evidence of chemical and physical change.	Investigate the effects of chemical change on physical properties of substances (e.g., cooking a raw egg, iron rusting, polymerization of a resin).	359 physical and chemical changes and digestion 360 new substances are formed when a chemical change occurs 361 physical and chemical changes in tire recycling 363 combustion reaction 367 heartburn reaction 378 determine if changes are chemical or physical	146 investigate and observe chemical and physical changes in the lab

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gr8.I.3.a grade 8 Integrated Science	Students will understand the nature of changes in matter.	Investigate and measure the effects of increasing or decreasing the amount of energy in a physical or chemical change, and relate the kind of energy added to the motion of the particles.	Identify the kinds of energy (e.g., heat, light, sound) given off or taken in when a substance undergoes a chemical or physical change.	290 changes of state 412 hydrogen bonding and the gaseous state of water 460 changes in temperature are directly related to changes in energy 504 phases changes in the atmosphere	119 investigate temperature and energy transfer in melting process 119 create a temperature vs. time graph of phase change 119 energy and phase changes 158 measure energy changes in 3 different reactions 188 investigate the increase of temperature of water as thermal energy is added 204 investigating latent heat and thermal buffering 204 compare the shape of the water line and the ice line on the temperature/time graph

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gr8.I.3.b grade 8 Integrated Science	Students will understand the nature of changes in matter.	Investigate and measure the effects of increasing or decreasing the amount of energy in a physical or chemical change, and relate the kind of energy added to the motion of the particles.	Relate the amount of energy added or taken away from a substance to the motion of molecules in the substance.	290	states of matter and arrangement of molecules	118	molecules in a liquid
				411	molecular structure of ice	118	investigate melting
				457	temperature is a measure of average kinetic energy	119	investigate temperature and energy transfer in melting process
				460	changes in temperature are directly related to changes in energy	188	investigate the increase of temperature of water as thermal energy is added
				461	examples of flow of heat		
				467	conduction and convection and radiation	188	investigate heating water with an immersion heater
gr8.I.3.c grade 8 Integrated Science	Students will understand the nature of changes in matter.	Investigate and measure the effects of increasing or decreasing the amount of energy in a physical or chemical change, and relate the kind of energy added to the motion of the particles.	Measure and graph the relationship between the states of water and changes in its temperature.	290	states of matter and arrangement of molecules	118	molecules in a liquid
				411	molecular structure of ice	118	investigate melting
				457	temperature is a measure of average kinetic energy	119	investigate temperature and energy transfer in melting process
				460	changes in temperature are directly related to changes in energy	119	create a temperature vs. time graph of phase change
				461	examples of flow of heat	188	investigate heating water with an immersion heater
				467	conduction and convection and radiation	188	investigate the increase of temperature of water as thermal energy is added
						204	compare the shape of the water line and the ice line on the temperature/time graph

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gr8.I.3.d grade 8 Integrated Science	Students will understand the nature of changes in matter.	Investigate and measure the effects of increasing or decreasing the amount of energy in a physical or chemical change, and relate the kind of energy added to the motion of the particles.	Cite evidence showing that heat may be given off or taken in during a chemical change (e.g., striking a match, mixing vinegar and antacid, mixing ammonium chloride and water).	387 exothermic reactions and MREs 388 endothermic reactions and cold packs	158 investigate energy changes in chemical reactions 158 measure energy changes in 3 different reactions
gr8.I.3.e grade 8 Integrated Science	Students will understand the nature of changes in matter.	Investigate and measure the effects of increasing or decreasing the amount of energy in a physical or chemical change, and relate the kind of energy added to the motion of the particles.	Plan and conduct an experiment, and report the effect of adding or removing energy on the chemical and physical changes.	387 exothermic reactions and MREs 388 endothermic reactions and cold packs 460 changes in temperature are directly related to changes in energy 461 examples of flow of heat 467 conduction and convection and radiation	119 investigate temperature and energy transfer in melting process 158 investigate energy changes in chemical reactions 158 measure energy changes in 3 different reactions 188 investigate the increase of temperature of water as thermal energy is added 188 investigate heating water with an immersion heater

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gr8.I.4.a grade 8 Integrated Science	Students will understand the nature of changes in matter.	Identify the observable features of chemical reactions.	Identify the reactants and products in a given chemical change and describe the presence of the same atoms in both the reactants and products.	363 chemical reactions involve rearrangement of atoms 365 balancing chemical equations 369 history of law of conservation of mass 377 which of the equations is balanced?	148 reactants and products 149 balance these equations 149 practice balancing equations 152 write the balanced equation 152 predict how much product formed given the reactants
gr8.I.4.b grade 8 Integrated Science	Students will understand the nature of changes in matter.	Identify the observable features of chemical reactions.	Cite examples of common significant chemical reactions (e.g., photosynthesis, respiration, combustion, rusting) in daily life.	363 combustion reaction 367 chemical reactions in living systems 367 heartburn reaction 384 combustion reactions 384 consumer chemistry 387 MRE ration heater reaction 401 chemistry of the atmosphere 401 chemistry of the atmosphere 403 carbon reactions 444 chemical reactions and the formation of acid rain	162 investigating combustion reactions

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gr8.I.4.c grade 8 Integrated Science	Students will understand the nature of changes in matter.	Identify the observable features of chemical reactions.	Demonstrate that mass is conserved in a chemical reaction (e.g., mix two solutions that result in a color change or formation of a precipitate and weigh the solutions before and after mixing).	369 history of law of conservation of mass 377 which of the equations is balanced?	149 balance these equations 150 investigate conservation of mass in effervescent tablet reaction
gr8.I.4.d grade 8 Integrated Science	Students will understand the nature of changes in matter.	Identify the observable features of chemical reactions.	Experiment with variables affecting the relative rates of chemical changes (e.g., heating, cooling, stirring, crushing, concentration).	418 effect of temperature on solubility 418 effect of nature of solvent on solubility 419 temperature-solubility graphs 420 effect of temperature on solubility of gasses 428 acids and bases and enzymes in digestion	170 design experiments to explore dissolving rate 170 solubility and temperature 172 investigate solubility of sugar

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gr8.I.4.e grade 8 Integrated Science	Students will understand the nature of changes in matter.	Identify the observable features of chemical reactions.	Research and report on how scientists or engineers have applied principles of chemistry to an application encountered in daily life (e.g., heat-resistant plastic handles on pans, rust-resistant paints on highway bridges).	325 fireworks displays and electron excitation 339 plastics	134 using a spectrometer 135 observing different light sources with a spectrometer
gr8.II.1.a grade 8 Integrated Science	Students will understand that energy from sunlight is changed to chemical energy in plants, transfers between living organisms, and that changing the environment may alter the amount of energy provided to living organisms.	Compare ways that plants and animals obtain and use energy.	Recognize the importance of photosynthesis in using light energy as part of the chemical process that builds plant materials.	90 photosynthesis and energy 400 photosynthesis explained 420 photosynthesis and dissolved oxygen	

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gr8.II.1.b grade 8 Integrated Science	Students will understand that energy from sunlight is changed to chemical energy in plants, transfers between living organisms, and that changing the environment may alter the amount of energy provided to living organisms.	Compare ways that plants and animals obtain and use energy.	Explain how respiration in animals is a process that converts food energy into mechanical and heat energy.	89	energy conservation and earth systems	37	investigating conservation of energy with rollercoaster
				89	efficiency and energy transfer in natural systems	38	conservation of energy and energy transformations
				90	energy conservation and efficiency in biological systems	162	carbon reactions and the environment
				90	biological systems and energy flow	162	importance of fossil fuels
				92	potential and kinetic energy explained	162	structure of fossil fuels
				94	conservation of energy explained		
				96	energy transformations and conservation		
				97	different forms of energy described		
				100	energy conservation and swimming		
				102	prove that energy is conserved		
				360	chemical reactions and digestion		
				370	carbon chains		
				400	photosynthesis and carbon reactions		
				401	fossil fuels and carbon reactions		

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gr8.II.1.c grade 8 Integrated Science	Students will understand that energy from sunlight is changed to chemical energy in plants, transfers between living organisms, and that changing the environment may alter the amount of energy provided to living organisms.	Compare ways that plants and animals obtain and use energy.	Trace the path of energy from the sun to mechanical energy in an organism.	89	energy conservation and earth systems	37 investigating conservation of energy with rollercoaster 38 conservation of energy and energy transformations 39 make an energy flow chart
				89	efficiency and energy transfer in natural systems	
				90	energy conservation and efficiency in biological systems	
				92	potential and kinetic energy explained	
				94	conservation of energy explained	
				95	following an energy transformation	
				96	energy transformations and conservation	
				97	different forms of energy described	
				100	energy conservation and swimming	
				102	prove that energy is conserved	
				491	Earth's internal energy	
				629	energy from the sun	
				632	harnessing the sun's energy	

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gr8.II.2.a grade 8 Integrated Science	Students will understand that energy from sunlight is changed to chemical energy in plants, transfers between living organisms, and that changing the environment may alter the amount of energy provided to living organisms.	Generalize the dependent relationships between organisms.	Categorize the relationships between organisms (i.e., producer/consumer/decomposer, predator/prey, mutualism/parasitism) and provide examples of each.	450	pollutants and food chain	
				450	producers, herbivores, carnivores	

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gr8.II.2.b grade 8 Integrated Science	Students will understand that energy from sunlight is changed to chemical energy in plants, transfers between living organisms, and that changing the environment may alter the amount of energy provided to living organisms.	Generalize the dependent relationships between organisms.	Use models to trace the flow of energy in food chains and food webs.	451	ocean food chain	
				451	food chain and energy	

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gr8.II.2.c grade 8 Integrated Science	Students will understand that energy from sunlight is changed to chemical energy in plants, transfers between living organisms, and that changing the environment may alter the amount of energy provided to living organisms.	Generalize the dependent relationships between organisms.	Formulate and test a hypothesis on the effects of air, temperature, water, or light on plants (e.g., seed germination, growth rates, seasonal adaptations).	19	experimenting with plants (question 8)	
				90	photosynthesis and energy	
				400	photosynthesis explained	
				420	photosynthesis and dissolved oxygen	

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gr8.II.2.d grade 8 Integrated Science	Students will understand that energy from sunlight is changed to chemical energy in plants, transfers between living organisms, and that changing the environment may alter the amount of energy provided to living organisms.	Generalize the dependent relationships between organisms.	Research multiple ways that different scientists have investigated the same ecosystem.	515	descriptions and distribution of desert biomes	
				517	descriptions and distribution of tropical rainforest biomes	

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gr8.II.3.a grade 8 Integrated Science	Students will understand that energy from sunlight is changed to chemical energy in plants, transfers between living organisms, and that changing the environment may alter the amount of energy provided to living organisms.	Analyze human influence on the capacity of an environment to sustain living things.	Describe specific examples of how humans have changed the capacity of an environment to support specific life forms.	515 descriptions and distribution of desert biomes 517 descriptions and distribution of tropical rainforest biomes	

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gr8.II.3.b grade 8 Integrated Science	Students will understand that energy from sunlight is changed to chemical energy in plants, transfers between living organisms, and that changing the environment may alter the amount of energy provided to living organisms.	Analyze human influence on the capacity of an environment to sustain living things.	Distinguish between inference and evidence in a newspaper or magazine article relating to the effect of humans on the environment.	116	study appliance labels and instructions	76	analyze watch manufacturer's claims
				148	create pamphlet on utility's energy saver programs	162	inferences from promotional materials for vehicles
				385	hydrogen-powered cars and the environment	163	too much CO ₂
				385	research environmental impact of fuel cells	163	research how trees offset accumulation of CO ₂
				385	research fuel cells	163	research how trees offset accumulation of CO ₂
				401	fossil fuels		
				406	problems caused by airborne pollutants	178	predict the quality of surface water to be tested and justify your answer
				420	electrical generation facilities and ecosystems		
				420	effect of electrical generating facilities on dissolved oxygen in water	181	study water filtration device claims
				442	effect of excess nitrates on environment	182	investigate effect of acid rain on microorganisms
				443	acid rain explained	201	research the causes of ozone in the lower atmosphere
				449	impact of increased CO ₂ in oceans		
				454	study claims made by bottled water companies		
				454	research the issue of acid rain		
				485	effects of CFC's on the ozone layer		

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				488	effects of burning fossil fuels	
				521	permafrost	
gr8.II.3.c grade 8 Integrated Science	Students will understand that energy from sunlight is changed to chemical energy in plants, transfers between living organisms, and that changing the environment may alter the amount of energy provided to living organisms.	Analyze human influence on the capacity of an environment to sustain living things.	Infer the potential effects of humans on a specific food web.	450	pollutants and food chain	215 thermohaline currents and the ocean food chain
				450	producers, herbivores, carnivores	
				451	ocean food chain	
				451	food chain and energy	

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gr8.II.3.d grade 8 Integrated Science	Students will understand that energy from sunlight is changed to chemical energy in plants, transfers between living organisms, and that changing the environment may alter the amount of energy provided to living organisms.	Analyze human influence on the capacity of an environment to sustain living things.	Evaluate and present arguments for and against allowing a specific species of plant or animal to become extinct, and relate the argument to the of flow energy in an ecosystem.	90 biological systems and energy flow	

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gr8.III.1.a grade 8 Integrated Science	Students will understand the processes of rock and fossil formation.	Compare rocks and minerals and describe how they are related.	Recognize that most rocks are composed of minerals.	579	formation of igneous and sedimentary and metamorphic rocks	242	understanding how igneous rocks are formed and growing crystals to investigate their formation
				581	identifying igneous and sedimentary and metamorphic rocks	244	understanding how sedimentary rocks are formed and creating sedimentary deposits to investigate them
						246	understanding and investigating how metamorphic rocks are formed
						247	interpreting how different rock formations were formed

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gr8.III.1.b grade 8 Integrated Science	Students will understand the processes of rock and fossil formation.	Compare rocks and minerals and describe how they are related.	Observe and describe the minerals found in rocks (e.g., shape, color, luster, texture, hardness).	576	properties of minerals	242	understanding how igneous rocks are formed and growing crystals to investigate their formation
				577	common minerals		
				578	Mohs hardness scale		
				579	formation of igneous and sedimentary and metamorphic rocks	243	examine samples of granite, gabbro, rhyolite, and basalt
				581	identifying igneous and sedimentary and metamorphic rocks	244	understanding how sedimentary rocks are formed and creating sedimentary deposits to investigate them
						245	examine samples of conglomerate and shale
				246	understanding and investigating how metamorphic rocks are formed		
						247	interpreting how different rock formations were formed

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gr8.III.1.c grade 8 Integrated Science	Students will understand the processes of rock and fossil formation.	Compare rocks and minerals and describe how they are related.	Categorize rock samples as sedimentary, metamorphic, or igneous.	579	formation of igneous and sedimentary and metamorphic rocks	242	understanding how igneous rocks are formed and growing crystals to investigate their formation
				581	identifying igneous and sedimentary and metamorphic rocks	244	understanding how sedimentary rocks are formed and creating sedimentary deposits to investigate them
						246	understanding and investigating how metamorphic rocks are formed
						247	interpreting how different rock formations were formed
gr8.III.2.a grade 8 Integrated Science	Students will understand the processes of rock and fossil formation.	Describe the nature of the changes that rocks undergo over long periods of time.	Diagram and explain the rock cycle.	539	activity of Earth's crust at plate boundaries		
				540	balance of creating and consuming Earth's crust		
				568	constructive and destructive processes		
				568	constructive and destructive processes		
				571	formation of soil		
	582	the rock cycle					

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gr8.III.2.b grade 8 Integrated Science	Students will understand the processes of rock and fossil formation.	Describe the nature of the changes that rocks undergo over long periods of time.	Describe the role of energy in the processes that change rock materials over time.	539 activity of Earth's crust at plate boundaries 540 balance of creating and consuming Earth's crust 568 constructive and destructive processes 568 constructive and destructive processes 571 formation of soil 582 the rock cycle	

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gr8.III.2.c grade 8 Integrated Science	Students will understand the processes of rock and fossil formation.	Describe the nature of the changes that rocks undergo over long periods of time.	Use a model to demonstrate how erosion changes the surface of Earth.	534	predicting what Earth might look like in 50 million years	230	predicting plate movement over 50 million years and the resultant land features
				540	land features resulting from divergent plate boundaries	240	estimating the effects of meteor impacts on Earth
				541	resulting land features from subduction	241	identifying which geologic features on Earth were caused by meteors
				542	land features resulting from transform plate boundaries		
				553	predict separation of North America and Europe in 75 million years		
				554	predict effects of divergent plate boundaries on Great Rift Valley		
				561	formation of Hawaiian Islands due to volcanic activity		
				564	volcanoes shape the Earth		
				569	mountain-building		
				569	constructive process of mountain building		
				570	changes in land features due to erosion		
				570	the destructive process of erosion		

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				571 572	wind erosion effect of glaciers on land
gr8.III.2.d grade 8 Integrated Science	Students will understand the processes of rock and fossil formation.	Describe the nature of the changes that rocks undergo over long periods of time.	Relate gravity to changes in Earth's surface.	561 564 569 570 571	formation of Hawaiian Islands due to volcanic activity volcanoes shape the Earth constructive process of mountain building the destructive process of erosion wind erosion
gr8.III.2.e grade 8 Integrated Science	Students will understand the processes of rock and fossil formation.	Describe the nature of the changes that rocks undergo over long periods of time.	Identify the role of weathering of rocks in soil formation.	568 571 582	constructive and destructive processes formation of soil the rock cycle
gr8.III.2.f grade 8 Integrated Science	Students will understand the processes of rock and fossil formation.	Describe the nature of the changes that rocks undergo over long periods of time.	Describe and model the processes of fossil formation.	527 528 529 575	origin of fossils relative dating interpreting rock formations studying moon rocks on Earth
				240 241	estimating the effects of meteor impacts on Earth identifying which geologic features on Earth were caused by meteors
				225 226	determining the relative ages of rock formations sequencing events in a geologic cross-section

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gr8.III.3.a grade 8 Integrated Science	Students will understand the processes of rock and fossil formation.	Describe how rock and fossil evidence is used to infer Earth's history.	Describe how the deposition of rock materials produces layering of sedimentary rocks over time.	568	constructive and destructive processes	242	understanding how igneous rocks are formed and growing crystals to investigate their formation
				571	formation of soil	244	understanding how sedimentary rocks are formed and creating sedimentary deposits to investigate them
				579	formation of igneous and sedimentary and metamorphic rocks	246	understanding and investigating how metamorphic rocks are formed
				581	identifying igneous and sedimentary and metamorphic rocks	247	interpreting how different rock formations were formed
				582	the rock cycle		
gr8.III.3.b grade 8 Integrated Science	Students will understand the processes of rock and fossil formation.	Describe how rock and fossil evidence is used to infer Earth's history.	Identify the assumptions scientists make to determine relative ages of rock layers.	528	relative dating	225	determining the relative ages of rock formations
				529	interpreting rock formations	226	sequencing events in a geologic cross-section
				575	studying moon rocks on Earth		

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gr8.III.3.c grade 8 Integrated Science	Students will understand the processes of rock and fossil formation.	Describe how rock and fossil evidence is used to infer Earth's history.	Explain why some sedimentary rock layers may not always appear with youngest rock on top and older rocks below (i.e., folding, faulting).	579 formation of igneous and sedimentary and metamorphic rocks 581 identifying igneous and sedimentary and metamorphic rocks	242 understanding how igneous rocks are formed and growing crystals to investigate their formation 244 understanding how sedimentary rocks are formed and creating sedimentary deposits to investigate them 246 understanding and investigating how metamorphic rocks are formed 247 interpreting how different rock formations were formed

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Standard #: Curriculum	Standard	Objective	Indicator	Volume 1 Student Text page		Volume 2 Investigation Manual page	
gr8.III.3.d grade 8 Integrated Science	Students will understand the processes of rock and fossil formation.	Describe how rock and fossil evidence is used to infer Earth's history.	Research how fossils show evidence of the changing surface of the Earth.	516	using maps to identify mountain ranges	225	determining the relative ages of rock formations
				528	relative dating	226	sequencing events in a geologic cross-section
				529	interpreting rock formations	229	using a globe to identify mountain ranges
				559	using a map to identify volcanoes	240	estimating the effects of meteor impacts on Earth
				561	formation of Hawaiian Islands due to volcanic activity	241	identifying which geologic features on Earth were caused by meteors
				564	volcanoes shape the Earth		
				569	constructive process of mountain building		
				570	the destructive process of erosion		
				571	wind erosion		
575	studying moon rocks on Earth						
gr8.III.3.e grade 8 Integrated Science	Students will understand the processes of rock and fossil formation.	Describe how rock and fossil evidence is used to infer Earth's history.	Propose why more recently deposited rock layers are more likely to contain fossils resembling existing species than older rock layers.	528	relative dating	225	determining the relative ages of rock formations
				529	interpreting rock formations	226	sequencing events in a geologic cross-section
				575	studying moon rocks on Earth		

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Standard #: Curriculum	Standard	Objective	Indicator	Volume 1 Student Text page	Volume 2 Investigation Manual page	
gr8.III.4.a grade 8 Integrated Science	Students will understand the processes of rock and fossil formation.	Compare rapid and gradual changes to Earth's surface.	Describe how energy from the Earth's interior causes changes to Earth's surface (i.e., earthquakes, volcanoes).	531	formation of Earth's layers	240 estimating the effects of meteor impacts on Earth 241 identifying which geologic features on Earth were caused by meteors
				532	description of Earth's layers	
				557	structure of a volcano	
				558	formation of magma in Earth's mantle	
				560	figure showing structure of different types of volcanoes	
				561	formation of Hawaiian Islands due to volcanic activity	
				564	volcanoes shape the Earth	
				569	constructive process of mountain building	
				570	the destructive process of erosion	
571	wind erosion					

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Standard #: Curriculum	Standard	Objective	Indicator	Volume 1 Student Text page	Volume 2 Investigation Manual page		
gr8.III.4.b grade 8 Integrated Science	Students will understand the processes of rock and fossil formation.	Compare rapid and gradual changes to Earth's surface.	Describe how earthquakes and volcanoes transfer energy from Earth's interior to the surface (e.g., seismic waves transfer mechanical energy, flowing magma transfers heat and mechanical energy).	534	predicting what Earth might look like in 50 million years	230	predicting plate movement over 50 million years and the resultant land features
				540	land features resulting from divergent plate boundaries	236	understanding the Volcanic Explosivity Index
				541	resulting land features from subduction		
				542	land features resulting from transform plate boundaries		
				543	conversion of energy in rocks causes seismic waves		
				543	causes and descriptions of earthquakes		
				544	seismic waves		
				545	earthquakes rating scales		
				553	predict separation of North America and Europe in 75 million years		
				554	predict effects of divergent plate boundaries on Great Rift Valley		
				557	structure of a volcano		
				560	types and shapes of volcanoes		

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Standard #: Curriculum	Standard	Objective	Indicator	Volume 1 Student Text page	Volume 2 Investigation Manual page
				560 figure showing structure of different types of volcanoes	
				561 shield volcanoes	
				562 stratovolcanoes	
				569 mountain-building	
				570 changes in land features due to erosion	
				572 effect of glaciers on land	

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Standard #: Curriculum	Standard	Objective	Indicator	Volume 1 Student Text page	Volume 2 Investigation Manual page		
gr8.III.4.c grade 8 Integrated Science	Students will understand the processes of rock and fossil formation.	Compare rapid and gradual changes to Earth's surface.	Model the process of energy buildup and release in earthquakes.	543	conversion of energy in rocks causes seismic waves	228	reading a bathymetric map
				543	earthquakes and plate tectonics	229	using a geologic hazard map of frequent earthquakes
				543	causes and descriptions of earthquakes		
				544	seismic waves		
				545	earthquakes rating scales		
				546	where earthquakes occur		
				547	earthquake hazard map		
				558	geologic basis for volcanic eruptions		
				558	formation of magma in Earth's mantle		
				559	where volcanic activity occurs		
				561	geologic basis for shield volcanoes		
				562	geologic basis for stratovolcanoes		
				563	geologic bases for cinder cone volcanoes		
				573	geologic hazard maps		
586	using a geologic hazard map						

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gr8.III.4.d grade 8 Integrated Science	Students will understand the processes of rock and fossil formation.	Compare rapid and gradual changes to Earth's surface.	Investigate and report possible reasons why the best engineering or ecological practices are not always followed in making decisions about building roads, dams, and other structures.	75	relationship between science and technology	52	the cost of using electrical appliances
				397	impact of nuclear energy	70	using engineering design cycle
				406	reducing pollution	182	investigate effect of acid rain on microorganisms
				422	the science of scuba diving		
				443	acid rain explained		
				454	research the issue of acid rain		
				536	using echo sounders to map the sea floor		
				603	using satellite technology		
605	space shuttle						

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Standard #: Curriculum	Standard	Objective	Indicator	Volume 1 Student Text page	Volume 2 Investigation Manual page		
gr8.III.4.e grade 8 Integrated Science	Students will understand the processes of rock and fossil formation.	Compare rapid and gradual changes to Earth's surface.	Model how small changes over time add up to major changes to Earth's surface.	534	predicting what Earth might look like in 50 million years	230	predicting plate movement over 50 million years and the resultant land features
				534	definition of plate tectonics		
				538	theory of plate tectonics		
				540	land features resulting from divergent plate boundaries		
				541	resulting land features from subduction		
				542	land features resulting from transform plate boundaries		
				553	predict separation of North America and Europe in 75 million years		
				554	predict effects of divergent plate boundaries on Great Rift Valley		
				569	mountain-building		
				570	changes in land features due to erosion		
572	effect of glaciers on land						

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Standard #: Curriculum	Standard	Objective	Indicator	Volume 1 Student Text page	Volume 2 Investigation Manual page
gr8.IV.1.a grade 8 Integrated Science	Students will understand the relationships among energy, force, and motion.	Investigate the transfer of energy through various materials.	Relate the energy of a wave to wavelength.	227 importance of wavelength of sound waves 248 color and frequency of light waves	83 find speed of a wave 86 adjust frequency of a standing wave 105 explore relationship between color and wavelength 265 an element's spectral lines correspond to specific wavelengths of light
gr8.IV.1.b grade 8 Integrated Science	Students will understand the relationships among energy, force, and motion.	Investigate the transfer of energy through various materials.	Compare the transfer of energy (i.e., sound, light, earthquake waves, heat) through various mediums.	201 waves transmit energy 203 transverse and longitudinal waves 211 standing waves on a string 486 energy and radiation relationships 632 the sun's energy reaches Earth in the form of electromagnetic waves	82 study wave pulses on elastic cord 84 make different types of waves in a ripple tank
gr8.IV.1.c grade 8 Integrated Science	Students will understand the relationships among energy, force, and motion.	Investigate the transfer of energy through various materials.	Describe the spread of energy away from an energy-producing source.	201 waves transmit energy 486 energy and radiation relationships 632 the sun's energy reaches Earth in the form of electromagnetic waves	

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gr8.IV.1.d grade 8 Integrated Science	Students will understand the relationships among energy, force, and motion.	Investigate the transfer of energy through various materials.	Compare the transfer of heat by conduction, convection, and radiation and provide examples of each.	468	heat transfer through air	192	investigate convection in liquids
				468	densely packed solids are good conductors of heat		
				469	convection currents and weather		
				469	warming hands over candle		
				470	convection currents in water		
				471	solid road surface emits radiation		
				471	transfer of heat by radiation		
				488	global warming and heat transfer by radiation		
499	apply knowledge of heat transfer to different situations						
gr8.IV.1.e grade 8 Integrated Science	Students will understand the relationships among energy, force, and motion.	Investigate the transfer of energy through various materials.	Demonstrate how white light can be separated into the visible color spectrum.	248	visible light wavelenths and color	101	observing white light through diffraction grating
				269	using a prism to show different colors in white light		

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Standard #: Curriculum	Standard	Objective	Indicator	Volume 1 Student Text page		Volume 2 Investigation Manual page	
gr8.IV.2.a grade 8 Integrated Science	Students will understand the relationships among energy, force, and motion.	Examine the force exerted on objects by gravity.	Distinguish between mass and weight.	47 53	weight vs. mass how to calculate weight	20	weight vs. mass
gr8.IV.2.b grade 8 Integrated Science	Students will understand the relationships among energy, force, and motion.	Examine the force exerted on objects by gravity.	Cite examples of how Earth's gravitational force on an object depends upon the mass of the object.	52 52 54 55 612	gravity depends on mass the effect of gravity Newton's law of universal gravitation calculating gravitational force between objects Newton's law of universal gravitation	20 257	investigate effect of gravity on motion relating the relationship between orbital speed and distance to the equation of universal gravitation
gr8.IV.2.c grade 8 Integrated Science	Students will understand the relationships among energy, force, and motion.	Examine the force exerted on objects by gravity.	Describe how Earth's gravitational force on an object depends upon the distance of the object from Earth.	52 54 55 612	gravity depends on mass Newton's law of universal gravitation calculating gravitational force between objects Newton's law of universal gravitation	257	relating the relationship between orbital speed and distance to the equation of universal gravitation

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Standard #: Curriculum	Standard	Objective	Indicator	Volume 1 Student Text page		Volume 2 Investigation Manual page	
gr8.IV.2.d grade 8 Integrated Science	Students will understand the relationships among energy, force, and motion.	Examine the force exerted on objects by gravity.	Design and build structures to support a load.	69	how to calculate mechanical advantage	25	discover mechanical advantage of ropes and pulleys
				71	pliers as an example of a lever	27	changing force and distance on a lever
				71	how a lever works	27	set up a lever that has mechanical advantage
				73	three classes of levers	30	exploring force and distance with ropes and pulleys
				80	design a toothbrush		
				80	set up a lever with MA greater than 1		
				81	analyze block and tackle		
				81	analyze pulleys with different numbers of supporting strings		
				81	calculate mechanical advantage		
				82	analyze wheelbarrow		

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Standard #: Curriculum	Standard	Objective	Indicator	Volume 1 Student Text page	Volume 2 Investigation Manual page
gr8.IV.2.e grade 8 Integrated Science	Students will understand the relationships among energy, force, and motion.	Examine the force exerted on objects by gravity.	Engineer (design and build) a machine that uses gravity to accomplish a task.	52 the effect of gravity 69 how to calculate mechanical advantage 71 pliers as an example of a lever 71 how a lever works 73 three classes of levers 80 design a toothbrush 80 set up a lever with MA greater than 1 81 analyze block and tackle 81 analyze pulleys with different numbers of supporting strings 81 calculate mechanical advantage 82 analyze wheelbarrow	20 investigate effect of gravity on motion 25 discover mechanical advantage of ropes and pulleys 27 changing force and distance on a lever 27 set up a lever that has mechanical advantage 30 exploring force and distance with ropes and pulleys
gr8.IV.3.a grade 8 Integrated Science	Students will understand the relationships among energy, force, and motion.	Investigate the application of forces that act on objects, and the resulting motion.	Calculate the mechanical advantage created by a lever.	67 how simple machines manipulate forces 70 mechanical advantage of block and tackle 71 parts of a lever 72 mechanical advantage of a lever 77 how gears work	

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Standard #: Curriculum	Standard	Objective	Indicator	Volume 1 Student Text page	Volume 2 Investigation Manual page	
gr8.IV.3.b grade 8 Integrated Science	Students will understand the relationships among energy, force, and motion.	Investigate the application of forces that act on objects, and the resulting motion.	Engineer a device that uses levers or inclined planes to create a mechanical advantage.	67	how simple machines manipulate forces	25 discover mechanical advantage of ropes and pulleys 27 changing force and distance on a lever 27 set up a lever that has mechanical advantage 30 exploring force and distance with ropes and pulleys
				69	how to calculate mechanical advantage	
				70	mechanical advantage of block and tackle	
				71	parts of a lever	
				71	pliers as an example of a lever	
				71	how a lever works	
				72	mechanical advantage of a lever	
				73	three classes of levers	
				77	how gears work	
				80	design a toothbrush	
				80	set up a lever with MA greater than 1	
				81	analyze block and tackle	
				81	analyze pulleys with different numbers of supporting strings	
				81	calculate mechanical advantage	
				82	analyze wheelbarrow	

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Standard #: Curriculum	Standard	Objective	Indicator	Volume 1 Student Text page		Volume 2 Investigation Manual page	
gr8.IV.3.c grade 8 Integrated Science	Students will understand the relationships among energy, force, and motion.	Investigate the application of forces that act on objects, and the resulting motion.	Engineer a device that uses friction to control the motion of an object.	56	friction explained	21	effect of friction on the car
				64	research effect of friction on human joints		

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gr8.IV.3.d grade 8 Integrated Science	Students will understand the relationships among energy, force, and motion.	Investigate the application of forces that act on objects, and the resulting motion.	Design and build a complex machine capable of doing a specified task.	67	how simple machines manipulate forces	25	discover mechanical advantage of ropes and pulleys
				69	how to calculate mechanical advantage	25	discover mechanical advantage of ropes and pulleys
				69	how to calculate mechanical advantage	27	set up a lever that has mechanical advantage
				70	mechanical advantage of block and tackle	27	set up a lever that has mechanical advantage
				71	how a lever works	70	designing and testing different electric motors
				71	parts of a lever	194	design and construct an aneroid barometer
				71	how a lever works		
				72	mechanical advantage of a lever		
				73	three classes of levers		
				73	three classes of levers		
				76	sample engineering problem		
				77	how gears work		
				80	set up a lever with MA greater than 1		
				80	set up a lever with MA greater than 1		
				81	calculate mechanical advantage		
				81	calculate mechanical advantage		

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Standard #: Curriculum	Standard	Objective	Indicator	Volume 1 Student Text page	Volume 2 Investigation Manual page		
gr8.IV.3.e grade 8 Integrated Science	Students will understand the relationships among energy, force, and motion.	Investigate the application of forces that act on objects, and the resulting motion.	Investigate the principles used to engineer changes in forces and motion.	14	how to calculate speed	9	collect data and calculate speed of car
				20	find speed of bumblebee	10	calculate speed of the car
				20	calculate speed of car	12	find speed of car at different positions
				24	accurate speed measurements	14	calculate speed of car at two places on the ramp
				32	average speed vs. instantaneous	16	unbalanced forces and acceleration of car
				42	calculate speed from distance/time graph	16	thinking about force
				45	Newton's third law summarized	17	calculate speed of car
				45	Newton's first law summarized	23	using 3rd law to explain common phenomena
				45	Newton's second law summarized	25	discover mechanical advantage of ropes and pulleys
				48	Newton's first law in detail	27	set up a lever that has mechanical advantage
				49	Newton's second law in detail	36	find speed of marble
				51	balanced and unbalanced forces		
				59	Newton's third law in detail		
				69	how to calculate mechanical advantage		
				71	how a lever works		
				73	three classes of levers		
				80	set up a lever with MA greater than 1		

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Standard #: Curriculum	Standard	Objective	Indicator	Volume 1 Student Text page	Volume 2 Investigation Manual page
				81 82	
gr8.IV.4.a grade 8 Integrated Science	Students will understand the relationships among energy, force, and motion.	Analyze various forms of energy and how living organisms sense and respond to energy.	Analyze the cyclic nature of potential and kinetic energy (e.g., a bouncing ball, a pendulum).	81 calculate mechanical advantage 82 analyze the human jaw as a simple machine 89 energy conservation and earth systems 89 efficiency and energy transfer in natural systems 90 energy conservation and efficiency in biological systems 92 potential and kinetic energy explained 94 conservation of energy explained 96 energy transformations and conservation 97 different forms of energy described 100 energy conservation and swimming 102 prove that energy is conserved	36 energy conservation and the roller coaster 37 investigating conservation of energy with rollercoaster 38 conservation of energy and energy transformations

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Standard #: Curriculum	Standard	Objective	Indicator	Volume 1 Student Text page		Volume 2 Investigation Manual page	
gr8.IV.4.b grade 8 Integrated Science	Students will understand the relationships among energy, force, and motion.	Analyze various forms of energy and how living organisms sense and respond to energy.	Trace the conversion of energy from one form of energy to another (e.g., light to chemical to mechanical).	95	following an energy transformation	39	make an energy flow chart
				95	understand basic forms of energy	39	identify type of energy involved
				629	energy from the sun		
				632	harnessing the sun's energy		
gr8.IV.4.c grade 8 Integrated Science	Students will understand the relationships among energy, force, and motion.	Analyze various forms of energy and how living organisms sense and respond to energy.	Cite examples of how organisms sense various types of energy.	219	how the ear works	90	investigate human perception of sound
				223	loudness and decibels	186	develop a way to convert between Fahrenheit and Celsius temperature scales
				270	human eye as an optical instrument		
				459	comparing temperature in Fahrenheit and Celsius scales		
gr8.IV.4.d grade 8 Integrated Science	Students will understand the relationships among energy, force, and motion.	Analyze various forms of energy and how living organisms sense and respond to energy.	Investigate and report the response of various organisms to changes in energy (e.g., plant response to light, human response to motion, sound, light, insects' response to changes in light intensity).	90	transformations of matter and energy in photosynthesis	90	investigate human perception of sound
				219	how the ear works	90	investigate human perception of sound
				223	loudness and decibels	98	investigate sound and music
				226	voice recognition programs	104	investigate RGB model of color
				226	white noise		
				226	sonograms		
				232	musical instruments		
				249	RGB model of color		

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Standard #: Curriculum	Standard	Objective	Indicator	Volume 1 Student Text page		Volume 2 Investigation Manual page	
gr8.IV.4.e grade 8 Integrated Science	Students will understand the relationships among energy, force, and motion.	Analyze various forms of energy and how living organisms sense and respond to energy.	Investigate and describe how engineers have developed devices to help us sense various types of energy (e.g., seismographs, eyeglasses, telescopes, hearing aids).	75	relationship between science and technology	70	using engineering design cycle
				122	batteries, energy, and voltage		
				125	circuit breakers		
				126	ground fault circuit interrupter		
				131	how a light bulb works		
				171	how does an electric doorbell work?		
				247	how an LCD display works		
				252	how color printers work		
				254	how a color TV works		
				273	fiber optics		
				422	the science of scuba diving		
				439	the clean water act		
				445	catalytic converters and scrubbing reduce acid rain		
				489	hydrogen powered cars		
				536	using echo sounders to map the sea floor		
				544	what we can learn from seismographs		
				550	understanding earthquakes allows engineers to design safer buildings		

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				603 using satellite technology	
				605 space shuttle	