

Science - Grade 5

Idaho Department of Education Content Standards	Objective	Sub Objectives	Task Analysis	Essential Vocabulary
Cognitive level codes: • B: Memorize • C: Perform procedures • D: Demonstrate understanding • E: Conjecture, generalize, prove • F: Solve non-routine problems, make connections	Bloom's Equivalent • B = Knowledge • C = Comprehension • D = Comprehension • E = Application and Analysis • F = Synthesis	Shaded objectives should be assessed in the classroom, but not included on the ISAT assessment.		
Standard 1: Nature of Science				
Goal 1.1: Understand Systems, Order, and Organization	5.S.1.1.1 Compare and contrast different systems. (603.01.a) CL: E Content Limit: Compare one item to another; do not make multiple-item comparisons. Systems tested should be familiar to students. Systems that could be used to develop items include classroom systems (stations, seating plans, built-in operation schemes), games (tag, kick ball), school systems (student: teacher: principal), the water cycle, and body systems (skeletal, digestive, respiratory).	<ul style="list-style-type: none"> Compare and contrast different systems 	<ul style="list-style-type: none"> Define system as a group of parts that work together as a whole Explain how school is a system Select one part of a system and defend the importance of it to the entire system (for example, heart in the circulatory system) Compare and contrast two systems (for example, school and a plant cell) 	system
Goal 1.2: Understand Concepts and Processes of Evidence, Models, and Explanations	5.S.1.2.1 Use observations and data as evidence on which to base scientific explanations and predictions. (603.02.a) CL: E Content Limit: Explanations and predictions are limited to directly described or illustrated information in the item.	<ul style="list-style-type: none"> Use observations and data as evidence on which to base scientific explanations and predictions 	<ul style="list-style-type: none"> Make observations (for example, birds' beaks) Record data Ask questions (for example, why are the beaks shaped differently) Predict and infer (for example, gathering food, protection, habitat) Explain reasoning 	observation • predict • data • infer
	5.S.1.2.2 Explain the difference between observation and inference. (603.02.b) CL: Content Limit:	<ul style="list-style-type: none"> Explain the difference between observation and inference 	<ul style="list-style-type: none"> Define observation as using senses to gather information about objects and events Define inference as using logical reasoning to come to a conclusion based on data and observations Discuss the difficulty of making inferences with the absence of the five senses Compare and contrast observation and inference 	observation • inference • five senses
	5.S.1.2.3 Use models to explain or demonstrate a concept. (603.02.c) CL: Content Limit:	<ul style="list-style-type: none"> Use models to explain or demonstrate a concept 	<ul style="list-style-type: none"> Recognize a model as a physical representation of a process or object Discuss the effectiveness of using a model Create a model (for example, atom, cell, water cycle, lung) Construct a model to scale 	model • scale

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Goal 1.3: Understand Constancy, Change, and Measurement	5.S.1.3.1 Analyze changes that occur in and among systems. (603.03.b) CL: E Content Limit: Analysis is limited to changes directly described or illustrated in the item.	<ul style="list-style-type: none"> Analyze changes that occur in and among systems 	<ul style="list-style-type: none"> Recognize that change occurs in systems Analyze positive and negative changes to systems (for example, ecosystems, food web, scientific discoveries) 	system • analyze
	5.S.1.3.2 Measure in both U.S. Customary and International System of Measurement (metric system) units with an emphasis on the metric system. (603.03.c) CL: C Content Limit: Measurement should be in millimeters, centimeters, grams.	<ul style="list-style-type: none"> Measure in both U.S. Customary and International System of Measurement (metric system) units with an emphasis on the metric system 	<ul style="list-style-type: none"> Recognize that the metric system is based on units of 10 Name the units of measurement in U.S. Customary and metric systems Use rulers to measure length in both metric and U.S. Customary units Compare mass of several objects by using a balance scale Measure the volume of liquids Choose the appropriate unit to measure items in U.S. Customary and metric systems 	metric system • U.S. Customary system • millimeter • centimeter • gram • volume
Goal 1.4: Understand the Theory that Evolution is a Process that Relates to the Gradual Changes in the Universe and of Equilibrium as a Physical State	No objectives at this grade level.			
Goal 1.5: Understand Concepts of Form and Function	5.S.1.5.1 Explain how the shape or form of an object or system is frequently related to its use or function. (603.05.a) CL: E Content Limit: Items are limited to very visual content, including the streamlining of a dolphin's body and the webbing on a duck's foot.	<ul style="list-style-type: none"> Explain how the shape or form of an object or system is frequently related to its use or function 	<ul style="list-style-type: none"> Explain how the size and shape of an object affects function Compare and contrast animal adaptations Infer the function of the adaptation 	shape • form • function • adaptation

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Goal 1.6: Understand Scientific Inquiry and Develop Critical Thinking Skills	5.S.1.6.1 Write and analyze questions that can be answered by conducting scientific experiments. (604.01.a) CL: C Content Limit: Content should be limited to questions including the amount of water required by bean seedlings grown in small containers for healthy growth, and the conditions necessary for painted lady butterfly larva to pupate.	<ul style="list-style-type: none"> Write and analyze questions that can be answered by conducting scientific experiments 	<ul style="list-style-type: none"> Examine a list of questions and determine if they are testable Discuss possible testable questions that are measurable Create questions of interest that are both measurable and testable 	analyze • hypothesis • measurable • testable
	5.S.1.6.2 Conduct scientific investigations using a control and a variable. (604.01.b) CL: C Content Limit: Assessed in the classroom, not on the ISAT.	<ul style="list-style-type: none"> Conduct scientific investigations using a control and a variable 	<ul style="list-style-type: none"> Define a variable as a factor that can affect the outcome of an experiment Recognize that only one variable can be changed at a time Design and conduct a scientific investigation using a control and a variable and measure results 	control • variable
	5.S.1.6.3 Select and use appropriate tools and techniques to gather and display data. (604.01.c) CL: C Content Limit: Content should be limited to metric rulers, bar graphs, and basic tables.	<ul style="list-style-type: none"> Select and use appropriate tools and techniques to gather and display data 	<ul style="list-style-type: none"> List available scientific tools (for example, eyedroppers, rulers, thermometers, magnifying glass, beakers, balance scales) Demonstrate the use of scientific tools Select the appropriate tools needed to conduct the investigation and measure results Discuss ways to display data (for example, chart, graph, poster) Create a display of data using a key 	tools • graph • bar graph • line graph • pie chart • table • key
	5.S.1.6.4 Use evidence to analyze descriptions, explanations, predictions, and models. (604.01.d) CL: E Content Limit: Students should be presented a set of evidence or series of observations and be asked to derive information or make predictions based on this evidence.	<ul style="list-style-type: none"> Use evidence to analyze descriptions, explanations, predictions, and models 	<ul style="list-style-type: none"> Discuss the observation and evidence that is presented (for example, erosion) Formulate possible explanations for changes that have occurred Make a prediction of what may happen in the future 	evidence • prediction • analyze • explanation • model

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	5.S.1.6.5 State a hypothesis based on observations. (604.01.e) CL: E Content Limit: When provided sequential graphics, students will be able to select the most logical hypothesis from a list of possible options.	<ul style="list-style-type: none"> • State a hypothesis based on observations 	<ul style="list-style-type: none"> • Define hypothesis as an explanation that can be tested in an experiment • View sequential graphics • Select the most logical hypothesis from a list of possible options 	hypothesis • sequential
	5.S.1.6.6 Compare alternative explanations and predictions. (604.01.f) CL: E Content Limit: When provided sequential graphics and a set of possible explanations, students will be able to select the most logical explanation from a list of possible options.	<ul style="list-style-type: none"> • Compare alternative explanations and predictions 	<ul style="list-style-type: none"> • Compare sequential graphics and predict what will follow • Identify possible explanations • Select the most logical explanation from a list of possible options 	sequential
	5.S.1.6.7 Communicate scientific procedures and explanations. (604.01.g) CL: Content Limit: Assessed in the classroom, not on the ISAT.	<ul style="list-style-type: none"> • Communicate scientific procedures and explanations 	<ul style="list-style-type: none"> • Summarize scientific procedures of an experiment • Assume leadership for a group experiment • Assess that scientific procedures were followed 	scientific procedure
Goal 1.7: Understand That Interpersonal Relationships Are Important in Scientific Endeavors	No objectives at this grade level.			
Goal 1.8: Understand Technical Communication	5.S.1.8.1 Communicate scientific procedures and explanations. (613.02.a) CL: C Content Limit: Assessed in the classroom, not on the ISAT.	<ul style="list-style-type: none"> • Communicate scientific procedures and explanations 	<ul style="list-style-type: none"> • Summarize scientific procedures of an experiment • Assume leadership for a group experiment • Assess that scientific procedures were followed (for example, rubric, checklist, peer conference) 	scientific procedure

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Standard 2: Physical Science				
Goal 2.1: Understand the Structure and Function of Matter and Molecules and Their Interactions	5.S.2.1.1 Describe the differences among elements, compounds, and mixtures. (605.01.a) CL: D Content Limit: Students should be able to identify the characteristics of an element, compound, and mixture.	<ul style="list-style-type: none"> Describe the differences among elements, compounds, and mixtures. 	<ul style="list-style-type: none"> Recognize that matter is made up of anything that takes up space and has mass Infer that all atoms are made of matter Explain that an element is made up of only one type of atom Recognize and decode the basic function of the periodic table Contrast the difference between atoms and molecules Compare and contrast elements and compounds Observe different types of mixtures and hypothesize if they can be easily separated. Design an experiment to test hypothesis. Draw a conclusion and communicate results. Distinguish the characteristics of an element, compound, and mixture 	mass • matter • atom • element • periodic table • molecule • compound • mixture
	5.S.2.1.2 Compare the physical differences among solids, liquids and gases. (605.01.c) CL: D Content Limit: Students should be able to recognize the differences in molecular distance between a solid, a liquid, and a gas, as well as differences in basic molecular motion.	<ul style="list-style-type: none"> Compare the physical differences among solids, liquids and gases 	<ul style="list-style-type: none"> Recognize that all matter is made of particles in motion Identify the characteristics of solids, liquids, and gases using the terms shape and volume Define and explain density Contrast the molecular motion of solids, liquids, and gases Label pictures showing the density of solids, liquids, and gases 	solid • liquid • gas • volume • shape • mass • density
	5.S.2.1.3 Explain the nature of physical change and how it relates to physical properties. (605.01.d) CL: D Content Limit: Students should be able to recognize the change(s) in physical properties that take place when physical changes occur including ice melting into water and water being heated into steam.	<ul style="list-style-type: none"> Explain the nature of physical change and how it relates to physical properties 	<ul style="list-style-type: none"> Recognize that matter can change states Summarize changes that can occur without changing the substance itself Diagram the physical changes of water from a solid to a liquid to a gas and back again Contrast the difference between evaporation and condensation 	physical properties • physical changes • states of matter • evaporation • condensation
Goal 2.2: Understand Concepts of Motion and Forces	No objectives at this grade level.			
Goal 2.3: Understand the Total Energy in the Universe is Constant	No objectives at this grade level.			
Goal 2.4: Understand the Structure of Atoms	No objectives at this grade level.			

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Goal 2.5: Understand Chemical Reactions	No objectives at this grade level.			
Standard 3: Biology				
Goal 3.1: Understand the Theory of Biological Evolution	No objectives at this grade level.			
Goal 3.2: Understand the Relationship between Matter and Energy in Living Systems	5.S.3.2.1 Communicate how plants convert energy from the Sun through photosynthesis. (608.01.a) CL: D Content Limit: Students will know that chlorophyll, carbon dioxide, and water are necessary for photosynthesis to occur. Additionally, students will know that the energy necessary to “power” the photosynthetic reaction is provided by the Sun.	<ul style="list-style-type: none"> Communicate how plants convert energy from the Sun through photosynthesis 	<ul style="list-style-type: none"> Recall that plant cells contain chlorophyll in chloroplasts Recognize that chlorophyll absorbs light energy List the components required for photosynthesis (carbon dioxide, light energy, chlorophyll, and water) Diagram the process of photosynthesis including oxygen and sugar Design an experiment to show the effect of light on plant growth using one plant as a control and another as a variable Measure the growth of the plant using metric units on a weekly basis. Gather data and graph the results. Conclude which plant was able to carry out photosynthesis 	energy • convert • chlorophyll • chloroplast • photosynthesis • carbon dioxide • oxygen • control • variable
Goal 3.3: Understand the Cell is the Basis of Form and Function for All Living Things	5.S.3.3.1 Compare and contrast the structural differences between plant and animal cells. (606.01.b) CL: E Content Limit: Address only the readily observable organelles: cell wall, cell membrane, and chloroplast.	<ul style="list-style-type: none"> Compare and contrast the structural differences between plant and animal cells 	<ul style="list-style-type: none"> Explain that all living things are made of cells Draw and label the organelles in both plant and animal cells Describe the function of the basic organelles in both plant and animal cells Distinguish the difference between plant and animal cells Hypothesize why plants have cell walls Compare and contrast plant and animal cells using scientific tools 	cell • animal cell • plant cell • organelles • cell wall • cell membrane • chloroplast • nucleus
	5.S.3.3.2 Explain the concept that traits are passed from parents to offspring. (606.01.c) CL: D Content Limit: Traits should be limited to clearly observable characteristics including eye color, hair color and texture, and widow’s peak.	<ul style="list-style-type: none"> Explain the concept that traits are passed from parents to offspring 	<ul style="list-style-type: none"> Recognize that inherited traits are passed down from both parents to offspring through genes Define a gene as being part of a chromosome that is located in the nucleus of a cell List personal and observable traits (dimples, tongue rolling, ear lobes, etc.) Chart and graph observable traits of classmates Using a Punnett square, predict the likelihood of a recessive trait occurring Classify your inherited traits as being dominant or recessive 	traits • offspring • characteristics • genes • inherited traits • dominant • recessive • chromosomes • Punnett square

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Standard 4: Earth and Space Systems				
Goal 4.1: Understand Scientific Theories of Origin and Subsequent Changes in the Universe and Earth Systems	5.S.4.1.1 Describe the interactions among the solid earth, oceans and atmosphere (erosion, climate, tectonics and continental drift). (609.01.a) CL: D Content Limit: The role wind and water play in erosion, different cloud types, and the formation of earthquakes and volcanoes can all be addressed.	<ul style="list-style-type: none"> • Describe how movements of the earth's crust change the surface • Explain the effect oceans have on the solid earth • Tell how the atmosphere creates wind, clouds, and erosion. 	<ul style="list-style-type: none"> • Model the layers of the earth • Describe how the movement of tectonic plates can cause volcanoes and earthquakes • Analyze how water acts as an agent in eroding earth's surface • Illustrate the water cycle • Explain how temperature differences in the atmosphere cause wind and erosion • Observe and chart different cloud types over a period of time • Use appropriate tools to record weather data • Compose a story that describes the journey of a water molecule through the earth, ocean, and atmosphere 	erosion • climate • plate • plate tectonics • continental drift • volcano • lava • magma • earthquake • atmosphere • crust • core • mantle • lithosphere • precipitation • evaporation • condensation • cumulus • stratus • cirrus
Goal 4.2: Understand Geo-chemical Cycles and Energy in the Earth System	5.S.4.2.1 Explain the rock cycle and identify the three classifications of rocks. (609.02.a) CL: D Content Limit: How sedimentary, igneous, and metamorphic rocks are formed.	<ul style="list-style-type: none"> • Explain the rock cycle and identify the three classifications of rocks 	<ul style="list-style-type: none"> • Recognize that rocks are made of minerals • Classify the three types of rocks • Describe how wind and water create sedimentary rocks • Relate volcanic activity to the formation of igneous rocks • Tell where metamorphic rocks are likely to be found • Diagram and label the rock cycle • Dramatize the events that cause rocks to change from one form to another • Compare the mass of two different rocks using a balance scale • Using hand lenses, observe and classify samples of rocks and share findings 	erosion • weathering • rock cycle • sedimentary • igneous • metamorphic • minerals
Standard 5: Personal and Social Perspectives; Technology				

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Goal 5.1: Understand Common Environmental Quality Issues, Both Natural and Human Induced	5.S.5.1.1 Identify issues for environmental studies. (611.01.a) CL: E Content Limit: Content should be limited to events in the local school or community environment including food waste from the hot lunch program, storm runoff entering a local stream, and the impact on grass color due to uneven watering of the school yard.	<ul style="list-style-type: none"> • Identify issues for environmental studies 	<ul style="list-style-type: none"> • List ways that people's actions affect the environment (for example, air, water, soil) • Identify how students' behavior affects school environment • Select a local environmental problem and brainstorm possible solutions • Design and carry out a plan to improve the environmental problem 	environment • pollution • conservation • human impact • community • recycle
Goal 5.2: Understand the Relationship between Science and Technology	5.S.5.2.1 Describe how science and technology are part of a student's life. (610.01.a) CL: Content Limit:	<ul style="list-style-type: none"> • Describe how science and technology are part of a student's life 	<ul style="list-style-type: none"> • Recognize that science and technology can make tasks easier, faster, or more efficient • Describe how science and technology impacts our lives (for example, school, home, entertainment) • Debate the positive and negative aspects of science and technology in students' lives (for example, cell phones, computers, nuclear power) 	technology
	5.S.5.2.2 List examples of science and technology. (610.01.b) CL: Content Limit:	<ul style="list-style-type: none"> • List examples of science and technology 	<ul style="list-style-type: none"> • List examples of science and technology (for example, internet, transportation, space exploration, communication, medicine) • Predict ways technology and science could affect the future (for example, invent a new technological device that would improve living conditions) 	technology
Goal 5.3: Understand the Importance of Natural Resources and the Need to Manage and Conserve Them	5.S.5.3.1 Identify the differences between renewable and nonrenewable resources. (611.03.a) CL: E Content Limit: Content should be limited to issues within a school or local community including recycling programs for paper and aluminum and landfill issues.	<ul style="list-style-type: none"> • Identify the differences between renewable and nonrenewable resources 	<ul style="list-style-type: none"> • Define renewable and nonrenewable resources • Identify the differences between natural resources and resources used to produce energy (for example, wind, water, solar, geothermal, fossil fuels) in local communities • Categorize resources used at school as renewable and nonrenewable • Design and carry out a project to conserve resources at school or in the community 	resources • natural resources • renewable • nonrenewable • recycle • landfill