

7th Grade Science

Goal	ISAT%	Objective Description (with content limits)
		Standard 1: Nature of Science
1.1: Understand Systems, Order, and Organization		<p>7.S.1.1.1 Define small systems as a part of a whole system. (633.01.a)</p> <p>CL: E Content Limit: Items should address content that the student has experience with such as fire drills, the organization of sports teams, an orchestra, or a band. Items can also address topics like organelles in protozoa or the role various plant cell types play in the survival of the plant. The idea is to draw learning together for students.</p>
1.1: Understand Systems, Order, and Organization		<p>7.S.1.1.2 Determine how small systems contribute to the function of the whole. (633.01.a)</p> <p>CL: E Content Limit: Material should emphasize major body systems and their component parts including the circulatory, digestive, respiratory, and skeletal systems.</p>
1.1: Understand Systems, Order, and Organization		<p>7.S.1.1.3 Identify the different structural levels of an organism (cells, tissues, organs, and organ systems). (633.01.b)</p> <p>CL: E Content Limit: Material should emphasize major body systems and their component parts including the circulatory, digestive, respiratory, and skeletal systems.</p>
1.2: Understand Concepts and Processes of Evidence, Models, and Explanations		<p>7.S.1.2.1 Describe how observations and data are evidence on which to base scientific explanations and predictions. (633.02.a)</p> <p>CL: E Content Limit: Items should offer choices that have a direct link between the observation offered for consideration and the correct answer.</p>
1.2: Understand Concepts and Processes of Evidence, Models, and Explanations		<p>7.S.1.2.2 Use observations to make defensible inferences. (633.02.b)</p> <p>CL: Content Limit: Graphics or examples should be limited to natural history topics or observable reactions in living systems.</p>
1.2: Understand Concepts and Processes of Evidence, Models, and Explanations		<p>7.S.1.2.3 Use models to explain or demonstrate a concept. (633.02.c)</p> <p>CL: Content Limit: Material should emphasize major body systems and their component parts including the circulatory, digestive, respiratory, and skeletal systems. Cell models, the component parts of an eye, and the atomic positioning in solids, liquids, and gases are also suitable topics.</p>

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1.3: Understand Constancy, Change, and Measurement		7.S.1.3.1 Identify concepts of science that have been stable over time. (633.03.a) CL: E Content Limit: Address concepts including the cell theory, germ theory of disease, molecular theory of matter, and similar topics.
1.3: Understand Constancy, Change, and Measurement		7.S.1.3.2 Recognize changes that occur within systems. (633.03.b) CL: E Content Limit: Address topics such as the impact of exercise on breathing and heart rate and the impact of light from a window on the direction of plant growth, etc.
1.3: Understand Constancy, Change, and Measurement		7.S.1.3.3 Make metric measurements using appropriate tools. (633.03.c) CL: C Content Limit: Use linear metric measures, volume measures of milliliter and liter, and mass measure of grams.
1.6: Understand Scientific Inquiry and Develop Critical Thinking Skills		7.S.1.6.1 Identify controls and variables used in scientific investigations. (634.01.b) CL: E Content Limit: Items should stress the students' ability to distinguish between a control and a variable.
1.6: Understand Scientific Inquiry and Develop Critical Thinking Skills		7.S.1.6.2 Use appropriate tools and techniques to gather and display data. (634.01.c) CL: C Content Limit: Line graphs, bar graphs, pie charts, and tables are all suitable for use and interpretation.
1.6: Understand Scientific Inquiry and Develop Critical Thinking Skills		7.S.1.6.3 Evaluate data in order to form conclusions. (634.01.d) CL: E Content Limit: Data offered for consideration should be linear or tied to a focused topic.
1.6: Understand Scientific Inquiry and Develop Critical Thinking Skills		7.S.1.6.4 Use evidence and critical thinking to accept or reject a hypothesis. (634.01.e) CL: E Content Limit: Material offered for consideration should be single-faceted and include topics like the impact of over-watering potted plants or growing plants in light or darkness.
1.6: Understand Scientific Inquiry and Develop Critical Thinking Skills		7.S.1.6.5 Evaluate alternative explanations or predictions. (634.01.f) CL: E Content Limit: Students should be able to identify two explanations and/or predictions that are reasonable for a topic.

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1.6: Understand Scientific Inquiry and Develop Critical Thinking Skills	39-43%	7.S.1.6.6 Communicate and defend scientific procedures and explanations. (634.01.g) CL: E Content Limit: Items should address pieces of data or evidence that will support or refute an explanation.
1.8: Understand Technical Communication		7.S.1.8.1 Read and evaluate technical instructions. (643.02.a) CL: E Content Limit: Items indicate that students can read and follow the instructions for lab procedures and textbook activities.
Standard 2: Physical Science		
2.1: Understand the Structure and Function of Matter and Molecules and Their Interactions		6.S.2.1.1* Compare and contrast the differences among elements compounds and mixtures. (620.01.a) CL: D Content Limit: Items can address that there are more than 100 unique elements. Elements bond to make compounds and can be physically combined to make mixtures. The properties of elements change when compounds are formed. Elements can be physically separated from mixtures.
2.1: Understand the Structure and Function of Matter and Molecules and Their Interactions		6.S.2.1.2* Define the properties of matter. (620.01.b) CL: B Content Limit: Items can address ideas like a solid has definite volume and shape, a liquid has a definite volume and an indefinite shape, and a gas has no definite shape or volume.
2.1: Understand the Structure and Function of Matter and Molecules and Their Interactions		6.S.2.1.3* Compare densities of equal volumes of a solid, a liquid, or a gas. (619.01.c) CL: D Content Limit: Items must address atomic or molecular spacing in each state of matter.
2.1: Understand the Structure and Function of Matter and Molecules and Their Interactions		6.S.2.1.4* Describe the effect of temperature on density. (620.01.c) CL: D Content Limit: Items should address the impact that temperature has on the density of a material.
2.1: Understand the Structure and Function of Matter and Molecules and Their Interactions		6.S.2.1.5* Explain the nature of physical change and how it relates to physical properties (the distance between molecules as water changes from ice to liquid water and to water vapor). (620.01.d) CL: D Content Limit: Items address the effect of temperature on the spacing and movement of atoms or molecules.
2.1: Understand the Structure and Function of Matter and Molecules and Their Interactions		

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2.2 Understand Concepts of Motion and Forces	13-17%	<p>6.S.2.2.1* Describe the effects of different forces (gravity and friction) on the movement, speed, and direction of an object. (620.03.d)</p> <p>CL: D Content Limit: Items will address friction's effect on motion and that gravity is an attractive force between objects.</p>
Standard 3: Biology		
3.1: Understand the Theory of Biological Evolution		<p>7.S.3.1.1 Describe how natural selection explains species change over time. (637.01.a)</p> <p>CL: D Content Limit: Items should address environments in flux (new volcanic islands, lakes being impacted by pollution, the margins of a hot spring), and give insights into how life forms would respond to environmental pressure over time.</p>
3.2: Understand the Relationship between Matter and Energy in Living Systems		<p>7.S.3.2.1 Describe how energy stored in food is primarily derived from the Sun through photosynthesis. (638.01.a)</p> <p>CL: D Content Limit: Items should probe the basic photosynthetic reaction and the role of producers in the food web.</p>
3.2: Understand the Relationship between Matter and Energy in Living Systems		<p>7.S.3.2.2 Describe how the availability of resources (matter and energy) limits the distribution and abundance of organisms. (638.01.b)</p> <p>CL: E Content Limit: Use the food web and interaction of trophic levels to probe this content.</p>
3.2: Understand the Relationship between Matter and Energy in Living Systems		<p>7.S.3.2.4 Identify how energy flows through ecosystems in one direction, from photosynthetic organisms to herbivores, carnivore, and decomposers. (638.01.d)</p> <p>CL: D Content Limit: Use the food web as the basis for items.</p>
3.3: Understand the Cell is the Basis of Form and Function for All Living Things		<p>7.S.3.3.1 Explain the relationships among specialized cells, tissues, organs, organ systems, and organisms. (636.01.a)</p> <p>CL: E Content Limit: Items should address the components of an individual system, such as the digestive system.</p>
3.3: Understand the Cell is the Basis of Form and Function for All Living Things		<p>7.S.3.3.2 Identify the parts of specialized plant and animal cells. (636.01.b)</p> <p>CL: B Content Limit: Include neurons, skeletal muscle, smooth muscle, cardiac muscle, stomata, and root hairs.</p>

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3.3: Understand the Cell is the Basis of Form and Function for All Living Things	13-17%	7.S.3.3.3 Identify the functions of cell structures. (636.01.b) CL: D Content Limit: Organelles that are visible with a light microscope, like vacuoles, chloroplasts, and the nucleus are suitable. Organelles that require an electron microscope for observation (endoplasmic reticulum, ribosomes, etc.) should not be addressed.
3.3: Understand the Cell is the Basis of Form and Function for All Living Things		7.S.3.3.4 Describe cell functions that involve chemical reactions. (630.01.c) CL: D Content Limit: Include organelles that are visible with a light microscope: nucleus, vacuoles, chloroplasts, and the cell membrane.
3.3: Understand the Cell is the Basis of Form and Function for All Living Things		7.S.3.3.5 Describe how dominant and recessive traits are inherited. (636.01.e) CL: D Content Limit: Include traits easily observed: hair color, eye color, and skin color.
Standard 4: Earth & Space Systems		
4.1: Understand Scientific Theories of Origin and Subsequent Changes in the Universe and Earth Systems	13-17%	6.S.4.1.1* Explain the interactions among the solid earth, oceans, atmosphere, and organisms. (624.01.a) CL: D Content Limit: Items will address layers of Earth, the effect of weathering on rocks, and the impact bodies of water have on weather.
4.1: Understand Scientific Theories of Origin and Subsequent Changes in the Universe and Earth		6.S.4.1.2* Explain the water cycle and its relationship to weather and climate. (624.01.b) CL: D Content Limit: Items should address the water cycle and its impact on the movement of water in the system (precipitation).
4.1: Understand Scientific Theories of Origin and Subsequent Changes in the Universe and Earth		6.S.4.1.3* Identify cumulus, cirrus, and stratus clouds and how they relate to weather changes. (624.01.c) CL: D Content Limit: Items should address cloud types and the weather patterns associated with each.
Standard 5: Personal & Social Perspectives; Technology		
5.2: Understand the Relationship between Science and Technology		7.S.5.2.1 Explain how science and technology are interrelated. (640.01.a) CL: ? Content Limit: ?
5.2: Understand the Relationship between Science and Technology		7.S.5.2.2 Explain how science advances technology. (640.01.b) CL: ? Content Limit: ?

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7.S. Understand the Importance of Natural Resources and the Need to Manage and Conserve Them	13-17%	7.S.5.3.1 Identify alternative sources of energy. (641.03.a) CL: D Content Limit: Content may include solar and wind power and hybrid vehicles.

*Depends upon when content is taught.

Cognitive level codes:
B: Memorize
C: Perform procedures
D: Demonstrate understanding
E: Conjecture, generalize, prove
F: Solve non-routine problems, make connections