

**EXPLORE  
SCIENCE  
TEST**

**Table 7: The College Readiness Standards**

The Standards describe what students who score in the specified score ranges are *likely* to know and to be able to do. The ideas for progress help teachers identify ways of enhancing students' learning based on the scores students receive. The score range at the Benchmark level of achievement is highlighted.

		<i>Interpretation of Data</i>	<i>Scientific Investigation</i>	<i>Evaluation of Models, Inferences, and Experimental Results</i>
<b>1–12</b>	<b>Standards</b>	<ul style="list-style-type: none"> <li>Students who score in the 1–12 range are most likely beginning to develop the knowledge and skills assessed in the other score ranges.</li> </ul>		
	<b>ideas for progress</b>	<ul style="list-style-type: none"> <li>locate data in simple tables and graphs</li> <li>become familiar with different types of graphs (e.g., line graphs, pie charts, bar graphs)</li> <li>become familiar with units of measurement commonly used in science</li> </ul>	<ul style="list-style-type: none"> <li>observe experiments being performed and discuss what was done and why</li> </ul>	<ul style="list-style-type: none"> <li>discuss what hypotheses and conclusions are and how they are different from each other</li> </ul>
<b>13–15</b>	<b>Standards</b>	<ul style="list-style-type: none"> <li>Select a single piece of data (numerical or nonnumerical) from a single data presentation (e.g., a table or graph with two or three variables; a food web diagram)</li> <li>Identify basic features of a table, graph, or diagram (e.g., headings, units of measurement, axis labels)</li> </ul>		
	<b>ideas for progress</b>	<ul style="list-style-type: none"> <li>locate several data points in a simple table or graph and make comparisons between them</li> <li>become familiar with common terms used in science (e.g., <i>star</i>, <i>force</i>, <i>mineral</i>)</li> <li>create basic tables and graphs from sets of scientific data</li> <li>read newspaper and magazine articles pertaining to science and technology and discuss main points with peers</li> <li>describe trends and relationships in data displayed in simple tables and graphs</li> </ul>	<ul style="list-style-type: none"> <li>determine an appropriate method for performing a simple experiment</li> <li>perform simple laboratory activities designed to teach familiarity with a number of commonly used tools (e.g., thermometers, balances, glassware)</li> </ul>	<ul style="list-style-type: none"> <li>read science articles of an appropriate level from newspapers and science newsmagazines and identify any hypotheses or conclusions made by the author(s)</li> </ul>

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		<i>Interpretation of Data</i>	<i>Scientific Investigation</i>	<i>Evaluation of Models, Inferences, and Experimental Results</i>
<b>16–19</b>	<b>Standards</b>	<ul style="list-style-type: none"> <li>■ Select two or more pieces of data from a simple data presentation</li> <li>■ Understand basic scientific terminology</li> <li>■ Find basic information in a brief body of text</li> <li>■ Determine how the value of one variable changes as the value of another variable changes in a simple data presentation</li> </ul>	<ul style="list-style-type: none"> <li>■ Understand the methods and tools used in a simple experiment</li> </ul>	
	<b>ideas for progress</b>	<ul style="list-style-type: none"> <li>■ display data gathered in laboratory exercises in a variety of formats (e.g., line graphs, pie charts, bar graphs)</li> </ul>	<ul style="list-style-type: none"> <li>■ perform experiments that require more than one step</li> <li>■ conduct a simple experiment that makes use of a control group</li> </ul>	<ul style="list-style-type: none"> <li>■ read descriptions of actual experiments (e.g., completed science fair research, simple experiments from science education journals) and discuss whether the conclusions that were made support or contradict the hypotheses</li> <li>■ formulate hypotheses, predictions, or conclusions based on the results of an experiment</li> </ul>
<b>20–23</b>	<b>Standards</b>	<ul style="list-style-type: none"> <li>■ Select data from a complex data presentation (e.g., a table or graph with more than three variables; a phase diagram)</li> <li>■ Compare or combine data from a simple data presentation (e.g., order or sum data from a table)</li> <li>■ Translate information into a table, graph, or diagram</li> </ul>	<ul style="list-style-type: none"> <li>■ Understand the methods and tools used in a moderately complex experiment</li> <li>■ Understand a simple experimental design</li> <li>■ Identify a control in an experiment</li> <li>■ Identify similarities and differences between experiments</li> </ul>	<ul style="list-style-type: none"> <li>■ Select a simple hypothesis, prediction, or conclusion that is supported by a data presentation or a model</li> <li>■ Identify key issues or assumptions in a model</li> </ul>
	<b>ideas for progress</b>	<ul style="list-style-type: none"> <li>■ examine line graphs to determine if they show a direct or inverse relationship between variables</li> <li>■ become familiar with scatterplots</li> <li>■ determine a simple mathematical relationship between two variables</li> <li>■ integrate scientific information from popular sources (e.g., newspapers, magazines, the Internet) with that found in textbooks</li> </ul>	<ul style="list-style-type: none"> <li>■ perform several repetitions of an experiment to determine the reliability of results</li> </ul>	<ul style="list-style-type: none"> <li>■ evaluate whether the data produced by an experiment adequately support a given conclusion</li> <li>■ compare and contrast two different models about a scientific phenomenon</li> </ul>

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The Standards describe what students who score in the specified score ranges are *likely* to know and to be able to do. The ideas for progress help teachers identify ways of enhancing students' learning based on the scores students receive. The score range at the Benchmark level of achievement is highlighted.

		<i>Interpretation of Data</i>	<i>Scientific Investigation</i>	<i>Evaluation of Models, Inferences, and Experimental Results</i>
<b>24–25</b>	<b>Standards</b>	<ul style="list-style-type: none"> <li>■ Compare or combine data from two or more simple data presentations (e.g., categorize data from a table using a scale from another table)</li> <li>■ Compare or combine data from a complex data presentation</li> <li>■ Interpolate between data points in a table or graph</li> <li>■ Determine how the value of one variable changes as the value of another variable changes in a complex data presentation</li> <li>■ Identify and/or use a simple (e.g., linear) mathematical relationship between data</li> <li>■ Analyze given information when presented with new, simple information</li> </ul>	<ul style="list-style-type: none"> <li>■ Understand the methods and tools used in a complex experiment</li> <li>■ Understand a complex experimental design</li> <li>■ Predict the results of an additional trial or measurement in an experiment</li> <li>■ Determine the experimental conditions that would produce specified results</li> </ul>	<ul style="list-style-type: none"> <li>■ Select a simple hypothesis, prediction, or conclusion that is supported by two or more data presentations or models</li> <li>■ Determine whether given information supports or contradicts a simple hypothesis or conclusion, and why</li> <li>■ Identify strengths and weaknesses in one or more models</li> <li>■ Identify similarities and differences between models</li> <li>■ Determine which model(s) is(are) supported or weakened by new information</li> <li>■ Select a data presentation or a model that supports or contradicts a hypothesis, prediction, or conclusion</li> </ul>
	<b>ideas for progress</b>	<ul style="list-style-type: none"> <li>■ relate scientific information contained in written text to numerical data</li> <li>■ manipulate algebraic equations that represent data</li> </ul>	<ul style="list-style-type: none"> <li>■ determine the hypothesis behind an experiment that requires more than one step</li> <li>■ determine alternate methods of testing a hypothesis</li> </ul>	<ul style="list-style-type: none"> <li>■ communicate findings of an experiment and compare conclusions with those of peers</li> </ul>

**Science College Readiness Standards are measured in the context of science topics students encounter in science courses. These topics may include:**

Life Science/Biology	Physical Science/Chemistry, Physics	Earth & Space Science
<ul style="list-style-type: none"> <li>■ Animal behavior</li> <li>■ Animal development and growth</li> <li>■ Body systems</li> <li>■ Cell structure and processes</li> <li>■ Ecology</li> <li>■ Evolution</li> <li>■ Genetics</li> <li>■ Homeostasis</li> <li>■ Life cycles</li> <li>■ Molecular basis of heredity</li> <li>■ Origin of life</li> <li>■ Photosynthesis</li> <li>■ Plant development, growth, structure</li> <li>■ Populations</li> <li>■ Taxonomy</li> </ul>	<ul style="list-style-type: none"> <li>■ Atomic structure</li> <li>■ Chemical bonding, equations, nomenclature, reactions</li> <li>■ Electrical circuits</li> <li>■ Elements, compounds, mixtures</li> <li>■ Force and motions</li> <li>■ Gravitation</li> <li>■ Heat and work</li> <li>■ Kinetic and potential energy</li> <li>■ Magnetism</li> <li>■ Momentum</li> <li>■ The Periodic Table</li> <li>■ Properties of solutions</li> <li>■ Sound and light</li> <li>■ States, classes, and properties of matter</li> <li>■ Waves</li> </ul>	<ul style="list-style-type: none"> <li>■ Earthquakes and volcanoes</li> <li>■ Earth's atmosphere</li> <li>■ Earth's resources</li> <li>■ Fossils and geological time</li> <li>■ Geochemical cycles</li> <li>■ Groundwater</li> <li>■ Lakes, rivers, oceans</li> <li>■ Mass movements</li> <li>■ Plate tectonics</li> <li>■ Rocks, minerals</li> <li>■ Solar system</li> <li>■ Stars, galaxies, and the universe</li> <li>■ Water cycle</li> <li>■ Weather and climate</li> <li>■ Weathering and erosion</li> </ul>