



**Achievement Level Descriptors**  
**for**  
**Grade 8 Science**

Georgia Department of Education  
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## Achievement Levels and Achievement Level Descriptors

With the implementation of the Georgia Milestones Assessment System, Georgia educators have developed four achievement levels to describe student mastery and command of the knowledge and skills outlined in Georgia's content standards. Most students have at least some knowledge of the content described in the content standards; however, achievement levels succinctly describe how much mastery a student has. Achievement levels give meaning and context to scale scores by describing the knowledge and skills students must demonstrate to achieve each level.

The four achievement levels on Georgia Milestones are *Beginning Learner*, *Developing Learner*, *Proficient Learner*, and *Distinguished Learner*. The general meaning of each of the four levels is provided below:

**Beginning Learners do not yet demonstrate proficiency** in the knowledge and skills necessary at this grade level/course of learning, as specified in Georgia's content standards. The students **need substantial academic support** to be prepared for the next grade level or course and to be on track for college and career readiness.

**Developing Learners demonstrate partial proficiency** in the knowledge and skills necessary at this grade level/course of learning, as specified in Georgia's content standards. The students **need additional academic support** to ensure success in the next grade level or course and to be on track for college and career readiness.

**Proficient Learners demonstrate proficiency** in the knowledge and skills necessary at this grade level/course of learning, as specified in Georgia's content standards. The students **are prepared** for the next grade level or course and are on track for college and career readiness.

**Distinguished Learners demonstrate advanced proficiency** in the knowledge and skills necessary at this grade level/course of learning, as specified in Georgia's content standards. The students **are well prepared** for the next grade level or course and are well prepared for college and career readiness.

More detailed and content-specific concepts and skills are provided for each grade, content area, and course in the **Achievement Level Descriptors (ALDs)**. ALDs are narrative descriptions of the knowledge and skills expected at each of the four achievement levels and were developed for each grade level, content area, and course by committees of Georgia educators in March 2015 and July 2015. The ALDs are based on the state-adopted content standards.

**ALDs show a progression of knowledge and skills** for which students must demonstrate competency across the achievement levels. It is important to understand that a student should demonstrate mastery of the knowledge and skills within his/her achievement level *as well as all content and skills in any achievement levels that precede his/her own, if any*. For example, a Proficient Learner should also possess the knowledge and skills of a Developing Learner *and* a Beginning Learner.

POLICY ALDs			
Beginning Learner	Developing Learner	Proficient Learner	Distinguished Learner
<p><b>Beginning Learners do not yet demonstrate proficiency in the knowledge and skills</b> necessary at this grade level/course of learning, as specified in Georgia’s content standards. The students need substantial academic support to be prepared for the next grade level or course and to be on track for <i>college and career readiness</i>.</p>	<p><b>Developing Learners demonstrate partial proficiency in the knowledge and skills</b> necessary at this grade level/course of learning, as specified in Georgia’s content standards. The students need additional academic support to ensure success in the next grade level or course and to be on track for <i>college and career readiness</i>.</p>	<p><b>Proficient Learners demonstrate proficiency in the knowledge and skills</b> necessary at this grade level/course of learning, as specified in Georgia’s content standards. The students are prepared for the next grade level or course and are on track for <i>college and career readiness</i>.</p>	<p><b>Distinguished Learners demonstrate advanced proficiency in the knowledge and skills</b> necessary at this grade level/course of learning, as specified in Georgia’s content standards. The students are well prepared for the next grade level or course and are well prepared for <i>college and career readiness</i>.</p>
RANGE ALDs			
Beginning Learner	Developing Learner	Proficient Learner	Distinguished Learner
<p>A student who achieves at the <b>Beginning Learner</b> level demonstrates minimal command of the grade-level standards. The pattern exhibited by student responses indicates that students are most likely able to</p> <ul style="list-style-type: none"> <li>• identify solids, liquids, and gases;</li> <li>• recognize that elements on the Periodic Table of Elements have different properties from one another;</li> <li>• recognize that an object is the sum of its parts;</li> <li>• identify that there are different forms of energy;</li> <li>• identify that a wave has different parts;</li> <li>• understand that an object’s temperature can change;</li> </ul>	<p>A student who achieves at the <b>Developing Learner</b> level demonstrates partial command of the grade-level standards. The pattern exhibited by student responses indicates that students are most likely able to</p> <ul style="list-style-type: none"> <li>• identify an atom and a molecule;</li> <li>• identify particle arrangements for each phase of matter;</li> <li>• explain what a physical property is;</li> <li>• explain what a chemical property is;</li> <li>• recognize that elements within the same group or family on the Periodic Table of Elements have similar properties;</li> <li>• identify the Law of Conservation of Matter;</li> </ul>	<p>A student who achieves at the <b>Proficient Learner</b> level demonstrates proficiency of the grade-level standards. The pattern exhibited by student responses indicates that students are most likely able to</p> <ul style="list-style-type: none"> <li>• distinguish between atoms and molecules;</li> <li>• identify the characteristics of a pure substance and of a mixture;</li> <li>• describe the movement of particles in solids, liquids, gases, and plasmas states;</li> <li>• distinguish between physical and chemical properties of matter as physical (density, melting point, boiling point) or chemical (reactivity, combustibility);</li> <li>• explain the relationship</li> </ul>	<p>A student who achieves at the <b>Distinguished Learner</b> level demonstrates advanced proficiency of the grade-level standards. The pattern exhibited by student responses indicates that students are most likely able to</p> <ul style="list-style-type: none"> <li>• describe the difference between pure substances (elements, compounds) and mixtures;</li> <li>• explain energy transformation in terms of the Law of Conservation of Energy;</li> <li>• explain the relationship between potential and kinetic energy and categorize given examples of energy as potential or kinetic;</li> <li>• correlate real-world applications of the three types</li> </ul>

<ul style="list-style-type: none"> <li>determine necessary components to complete an electric circuit;</li> <li>identify when objects are speeding up or slowing down;</li> <li>identify the effects of gravity on objects on Earth;</li> <li>recognize that there are different types of simple machines;</li> <li>recognize that magnets exert force on each other and on other objects;</li> <li>use the metric system in scientific investigations;</li> <li>recognize safety precautions used during scientific investigations;</li> <li>recognize that parts in a system are related to one another;</li> <li>use data to create a simple graph, chart, table, or diagram;</li> <li>recognize that scientific information can be organized into tables, charts, graphs, and diagrams; and</li> <li>identify safety issues in a laboratory investigation.</li> </ul>	<ul style="list-style-type: none"> <li>identify the characteristics of different forms of energy (heat, light, electricity, mechanical motion, sound);</li> <li>explain that colors are seen as a reflection of light;</li> <li>identify the properties of sound;</li> <li>diagram the parts of a wave;</li> <li>identify the structural differences of series and parallel circuits;</li> <li>recognize that simple machines are part of complex machines;</li> <li>identify the three types of heat energy transfer (radiation, conduction, convection);</li> <li>identify the four types of wave behavior in relation to light (reflection, refraction, diffraction, absorption);</li> <li>describe velocity as consisting of speed and direction;</li> <li>describe the ways objects can accelerate;</li> <li>identify force as being balanced or unbalanced;</li> <li>identify the six types of simple machines (lever, inclined plane, pulley, wedge, screw, wheel and axle);</li> <li>describe what an electric field is;</li> <li>convert metric measurements to other metric units;</li> <li>identify the appropriate tools for specific laboratory</li> </ul>	<ul style="list-style-type: none"> <li>between heat energy and phase changes</li> <li>distinguish between changes in matter as physical (shape, phase, texture, size) or chemical (development of a gas, formation of precipitate, change in color);</li> <li>use the Periodic Table of Elements to predict the properties of elements;</li> <li>demonstrate the Law of Conservation of Matter;</li> <li>identify the characteristics of electromagnetic and mechanical waves;</li> <li>identify the law of conservation of energy;</li> <li>identify energy transformations within a real-world setting;</li> <li>identify the characteristics of potential and kinetic energy;</li> <li>compare and contrast the different forms of energy (heat, light, electricity, mechanical motion, sound);</li> <li>explain that colors are distinguished by difference in wavelength/frequencies;</li> <li>explain why wavelengths outside the visible spectrum are not detected by the human eye;</li> <li>describe how the behavior of waves is affected by medium (gas, liquid, solid);</li> <li>relate the properties of sound</li> </ul>	<ul style="list-style-type: none"> <li>of heat energy transfer;</li> <li>describe how the behavior of light waves is manipulated causing reflection, refraction, diffraction, and absorption;</li> <li>demonstrate the effect of simple machines (lever, inclined plane, pulley, wedge, screw, wheel and axle) on work and calculate mechanical advantage;</li> <li>use mathematical relationships to demonstrate scientific information;</li> <li>present scientific information in the form of graphs, diagrams, and concise text;</li> <li>evaluate claims based on scientific information;</li> <li>construct alternate explanations for scientific observations;</li> <li>construct an operational series and parallel circuit and explain the advantages or disadvantages of each;</li> <li>calculate metric conversion using dimensional analysis;</li> <li>demonstrate and explain lab safety procedures and protocol; and</li> <li>design an authentic investigation/experiment using a scientific method.</li> </ul>
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	<p>investigations; and</p> <ul style="list-style-type: none"><li>• identify the scientific information presented by graphs and diagrams.</li></ul>	<p>to everyday experiences;</p> <ul style="list-style-type: none"><li>• explain how the parts of a wave are affected by changes in amplitude and pitch;</li><li>• demonstrate the advantages and disadvantages of series and parallel circuits;</li><li>• predict and interpret how energy will flow in series and parallel circuits;</li><li>• describe the three types of heat energy transfer (radiation, conduction, convection);</li><li>• explain the four types of wave behavior in relation to light (reflection, refraction, diffraction, absorption);</li><li>• recognize that every object exerts gravitational force on every other object;</li><li>• recognize that the forces exerted by objects depend on how much mass the objects have and how far apart they are;</li><li>• investigate and explain that electric currents and magnets can exert force on each other;</li><li>• determine the relationship between velocity and acceleration in that acceleration is a rate of change in velocity;</li><li>• demonstrate the effect of balanced and unbalanced forces on an object in terms of gravity, inertia, and friction;</li></ul>	
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		<ul style="list-style-type: none"><li>• explain how simple machines make work easier;</li><li>• analyze scientific data using computational and estimation skills;</li><li>• determine the appropriate technology to be used in a scientific investigation;</li><li>• use models to represent scientific concepts;</li><li>• determine the appropriate materials and procedure in a scientific investigation; and</li><li>• analyze the information used to evaluate a scientific claim.</li></ul>	
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