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 post-secondary 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 post-secondary 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 post-secondary 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 post-secondary 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 July 2017 and March 2018. 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 the student's achievement level *as well as all content and skills in any achievement levels that precede the student's 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**
	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 *post-secondary 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 *post-secondary 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 *post-secondary 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 *post-secondary readiness.*
RANGE ALDs				
Standard	**Beginning Learner**	**Developing Learner**	**Proficient Learner**	**Distinguished Learner**
	A student who achieves at the **Beginning Learner** level demonstrates minimal command of the grade-level standards. The pattern exhibited by student responses indicates that students are most likely able to:	A student who achieves at the **Developing Learner** level demonstrates partial command of the grade-level standards. The pattern exhibited by student responses indicates that students are most likely able to:	A student who achieves at the **Proficient Learner** level demonstrates proficiency of the grade-level standards. The pattern exhibited by student responses indicates that students are most likely able to:	A student who achieves at the **Distinguished Learner** level demonstrates advanced proficiency of the grade-level standards. The pattern exhibited by student responses indicates that students are most likely able to:
Matter				
S8P1a S8P1b S8P1c S8P1d S8P1e S8P1f	• identify pure substances and mixtures; • recognize the movement of particles in solids, liquids, gases, and plasma states; • recognize a phase change when thermal energy is added or removed; • identify chemical and physical properties of matter; • recognize that when a change in a substance occurs, it can be classified as either chemical or physical;	• compare and contrast models of pure substances (elements, compounds) and mixtures; • use provided models to describe the movement of particles in solids, liquids, gases, and plasma states when thermal energy is added or removed; • compare and contrast chemical and physical properties of matter; • explain a given argument based on observational	• develop and use a model to compare and contrast pure substances (elements and compounds) and mixtures; • develop and use models to describe the movement of particles in solids, liquids, gases, and plasma states when thermal energy is added or removed; • plan and carry out investigations to compare and contrast chemical (i.e., reactivity, combustibility) and physical (i.e., density, melting	• justify models used to compare and contrast pure substances and mixtures; • compare models that illustrate the movement of particles in solids, liquids, gases, and plasma states when thermal energy is added or removed; • refine investigations that compare and contrast chemical and physical properties of matter; • evaluate arguments based on observational evidence to

	• identify patterns within the periodic table that illustrate the structure, composition, and characteristics of atoms and simple molecules; • recognize an example of the conservation of matter in a chemical reaction	evidence that when a change in a substance occurs, it can be classified as either chemical or physical; • use provided models to identify and analyze patterns within the periodic table that illustrate the structure, composition, and characteristics of atoms and simple molecules; • from provided evidence, construct a limited explanation that describes the concept of the conservation of matter in a chemical reaction	point, boiling point) properties of matter; • construct an argument based on observational evidence to support the claim that when a change in a substance occurs, it can be classified as either chemical or physical; • develop models (e.g., atomic-level models, including drawings, computer representations) by analyzing patterns within the periodic table that illustrate the structure, composition, and characteristics of atoms (protons, neutrons, and electrons) and simple molecules; • construct an explanation based on evidence to describe conservation of matter in a chemical reaction including the resulting differences between products and reactants	determine which best supports a claim that when a change in a substance occurs, it can be classified as either chemical or physical; • evaluate models that represent patterns of the periodic table that illustrate the structure, composition, and characteristics of atoms and simple molecules. • evaluate an explanation based on evidence to describe conservation of matter in a chemical reaction including the resulting differences between products and reactants
Energy				
S8P2a S8P2b S8P2c S8P2d	• recognize relationships of kinetic energy to mass and speed, and potential energy to mass and height of an object; • explain the transformation between kinetic and potential energy within a system; • identify energy transformations within a system;	• explain relationships of kinetic energy to mass and speed, and potential energy to mass and height of an object; • carry out a provided investigation to explain the transformation between kinetic and potential energy within a system; • construct a limited argument based on observational	• analyze and interpret data to create graphical displays that illustrate the relationships of kinetic energy to mass and speed, and potential energy to mass and height of an object; • plan and carry out an investigation to explain the transformation between kinetic and potential energy within a system (e.g., roller	• make inferences and/or predictions based on graphical displays and explain the relationships of kinetic energy to mass and speed, and potential energy to mass and height of an object; • refine investigations to explain the transformation between kinetic and potential energy within a system;

	• identify the effects of heat transfer on molecular motion as it relates to the collision of atoms (conduction), through space (radiation), or in currents in a liquid or a gas (convection)	evidence to make a claim about the type of energy transformations that occur within a system; • carry out a provided investigation to identify the effects of heat transfer on molecular motion as it relates to the collision of atoms (conduction), through space (radiation), or in currents in a liquid or gas (convection)	coasters, pendulums, rubber bands); • construct an argument to support a claim about the type of energy transformations within a system [e.g., lighting a match (light to heat), turning on a light (electrical to light)]; • plan and carry out investigations on the effects of heat transfer on molecular motion as it relates to the collision of atoms (conduction), through space (radiation), or in currents in a liquid or a gas (convection)	• evaluate arguments used to support a claim about the type of energy transformations within a system; • refine investigations exploring the effects of heat transfer on molecular motion as it relates to the collision of atoms (conduction), through space (radiation), or in currents in a liquid or a gas (convection)
Motion				
S8P3a S8P3b S8P3c	• recognize patterns in the relationships between speed and distance, and velocity and acceleration; • describe the effects of balanced and unbalanced forces as they relate to the motion of an object and Newton's Laws of Motion; • recognize that the amount of force needed to accelerate an object is proportional to its mass (inertia)	• use provided data to describe patterns in the relationships between speed and distance, and velocity and acceleration; • construct a simple explanation that predicts the effects of balanced and unbalanced forces as they relate to the motion of an object and Newton's Laws of Motion; • construct a limited argument based on observational evidence to support the claim that the amount of force needed to accelerate an object is proportional to its mass (inertia)	• analyze and interpret data to identify patterns in the relationships between speed and distance, and velocity and acceleration; • construct an explanation using Newton's Laws of Motion to describe the effects of balanced and unbalanced forces on the motion of an object; • construct an argument from evidence to support the claim that the amount of force needed to accelerate an object is proportional to its mass (inertia)	• construct arguments supported by evidence related to the patterns in the relationships between speed and distance, and velocity and acceleration; • compare and evaluate examples of Newton's Laws of Motion to describe the effects of balanced and unbalanced forces on the motion of an object; • evaluate graphical displays to provide evidence in support of the claim that the amount of force needed to accelerate an object is proportional to its mass (inertia)

Waves				
S8P4a S8P4b S8P4c S8P4d S8P4e S8P4f S8P4g	• recognize the similarities and differences between electromagnetic and mechanical waves; • use data to illustrate the relationship between the electromagnetic spectrum and energy; • recognize that the electromagnetic spectrum can be used to help make devices used in communication, the medical field, and technology; • recognize that light and sound waves are reflected, refracted, absorbed, diffracted or transmitted through various materials; • recognize that a relationship exists between density of media and wave behavior (i.e., speed); • identify some properties of waves; • recognize the effects that lenses have on light	• compare the similarities and differences between electromagnetic and mechanical waves; • construct a simple explanation using data to illustrate the relationship between the electromagnetic spectrum and energy; • explain how the electromagnetic spectrum is used in practical applications in devices; • use a provided model to describe how light and sound waves are reflected, refracted, absorbed, diffracted or transmitted through various materials; • use provided data to describe patterns in the relationship between density of media and wave behavior (i.e., speed); • use provided models describe the relationships between wave properties and energy; • use provided models to describe the effects that lenses have on light and their possible technological applications	• ask questions to develop explanations about the similarities and differences between electromagnetic and mechanical waves; • construct an explanation using data to illustrate the relationship between the electromagnetic spectrum and energy; • design a device to illustrate practical applications of the electromagnetic spectrum (e.g., communication, medical, military); • develop and use a model to compare and contrast how light and sound waves are reflected, refracted, absorbed, diffracted or transmitted through various materials; • analyze and interpret data to predict patterns in the relationship between density of media and wave behavior (i.e., speed); • develop and use a model (e.g., simulations, graphs, illustrations) to predict and describe the relationships between wave properties (e.g., frequency, amplitude, wavelength) and energy; • develop and use models to demonstrate the effects that lenses have on light (i.e., formation an image) and	• evaluate questions used to develop explanations about the similarities and differences between electromagnetic and mechanical waves; • evaluate graphical display or other model to illustrate the relationship between the electromagnetic spectrum and energy; • refine the design of a device used to illustrate practical applications of the electromagnetic spectrum; • refine models used to compare and contrast how light and sound waves are reflected, refracted, absorbed, diffracted or transmitted through various materials; • create graphical displays used to predict patterns in the relationship between density of media and wave behavior (i.e., speed); • critically analyze models used to predict and describe the relationships between wave properties and energy; • critically analyze models to demonstrate the effects that lenses have on light and their possible technological applications

			their possible technological applications	
Force				
S8P5a S8P5b S8P5c	• recognize that fields exist between objects exerting forces on each other even when the objects are not in contact; • identify how the distribution of charge is different for conductors and insulators; • identify the factors that affect the strength of electric and magnetic forces.	• construct a limited argument based on observational evidence to support the claim that fields exist between objects exerting forces on each other even when the objects are not in contact; • carry out a provided investigation to describe how the distribution of charge is different for conductors and insulators; • carry out a provided investigation to describe the factors that affect the strength of electric and magnetic forces.	• construct an argument using evidence to support the claim that fields (i.e., magnetic fields, gravitational fields, electric fields) exist between objects exerting forces on each other even when the objects are not in contact; • plan and carry out investigations to demonstrate the distribution of charge in conductors and insulators; • plan and carry out investigations to identify the factors (e.g., distance between objects, magnetic force produced by an electromagnet with varying number of wire turns, varying number or size of dry cells, varying size of iron core) that affect the strength of electric and magnetic forces.	• refine an argument made using evidence to support the claim that fields exist between objects exerting forces on each other even when the objects are not in contact; • refine investigations used to demonstrate the distribution of charge in conductors and insulators; • evaluate investigations used to identify the factors that affect the strength of electric and magnetic forces.

