

Reporting Category	Colorado Academic Standards Summative Assessment Framework - FINAL Science Grade 8	% of Score Points of Total Test	Points		
			For Concept/ Skill	For Concept/ Skill and SI/NS*	Total
1	Physical Science	36%	22	7	29
	<p>1. Identify and calculate the direction and magnitude of forces that act on an object, and explain the results in the object's change of motion</p> <p>a. Predict and evaluate the movement of an object by examining the forces applied to it (DOK 1-2)</p> <p>b. Use mathematical expressions to describe the movement of an object (DOK 1-2)</p> <p>c. Develop and design a scientific investigation to collect and analyze speed and acceleration data to determine the net forces acting on a moving object (DOK 2-3)</p>				
	<p>2. There are different forms of energy, and those forms of energy can be changed from one form to another – but total energy is conserved</p> <p>a. Gather, analyze, and interpret data to describe the different forms of energy and energy transfer (DOK 1-2)</p> <p>b. Develop a research-based analysis of different forms of energy and energy transfer (DOK 1-3)</p> <p>c. Use research-based models to describe energy transfer mechanisms, and predict amounts of energy transferred (DOK 1-2)</p>				
	<p>3. Distinguish between physical and chemical changes, noting that mass is conserved during any change</p> <p>a. Identify the distinguishing characteristics between a chemical and a physical change (DOK 1)</p> <p>b. Gather, analyze, and interpret data on physical and chemical changes (DOK 1-2)</p> <p>c. Gather, analyze, and interpret data that show mass is conserved in a given chemical or physical change (DOK 1-2)</p> <p>d. Identify evidence that suggests that matter is always conserved in physical and chemical changes (DOK 1)</p> <p>e. Examine, evaluate, question, and ethically use information from a variety of sources and media to investigate physical and chemical changes (DOK 1-2)</p>				
	<p>4. Recognize that waves such as electromagnetic, sound, seismic, and water have common characteristics and unique properties</p> <p>a. Compare and contrast different types of waves (DOK 1-2)</p> <p>b. Describe for various waves the amplitude, frequency, wavelength, and speed (DOK 1)</p> <p>c. Describe the relationship between pitch and frequency in sound (DOK 1)</p> <p>d. Develop and design a scientific investigation regarding absorption, reflection, and refraction of light (DOK 2-3)</p>				

* Scientific Investigations and the Nature of Science (SI/NS).

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2	Life Science	30%	18	6	24
	<p>1. Human activities can deliberately or inadvertently alter ecosystems and their resiliency</p> <p>a. Develop, communicate, and justify an evidence-based scientific example of how humans can alter ecosystems (DOK 1-3)</p> <p>b. Analyze and interpret data about human impact on local ecosystems (DOK 1-3)</p> <p>c. Recognize and infer bias in print and digital resources while researching an environmental issue (DOK 1-3)</p> <p>d. Use technology resources such as online encyclopedias, online databases, and credible websites to locate, organize, analyze, evaluate, and synthesize information about human impact on local ecosystems (DOK 1-2)</p> <p>e. Examine, evaluate, question, and ethically use information from a variety of sources and media to investigate an environmental issue (DOK 1-2)</p> <p>2. Organisms reproduce and transmit genetic information (genes) to offspring, which influences individuals' traits in the next generation</p> <p>a. Develop, communicate, and justify an evidence-based scientific explanation for how genetic information is passed to the next generation (DOK 1-3)</p> <p>b. Use direct and indirect observations, evidence, and data to support claims about genetic reproduction and traits of individuals (DOK 1-3)</p> <p>c. Gather, analyze, and interpret data on transmitting genetic information (DOK 1-2)</p> <p>d. Use models and diagrams to predict the phenotype and genotype of offspring based on the genotype of the parents (DOK 1-2)</p> <p>e. Use computer simulations to model and predict phenotype and genotype of offspring based on the genotype of the parents (DOK 1-2)</p>				

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3	Earth Systems Science	34%	20	7	27
	<p>1. Weather is a result of complex interactions of Earth's atmosphere, land and water, that are driven by energy from the sun, and can be predicted and described through complex models</p> <p>a. Differentiate between basic and severe weather conditions, and develop an appropriate action plan for personal safety and the safety of others (DOK 1-3)</p> <p>b. Observe and gather data for various weather conditions and compare to historical data for that date and location (DOK 1-2)</p> <p>c. Use models to develop and communicate a weather prediction (DOK 1-2)</p>				
	<p>2. Earth has a variety of climates defined by average temperature, precipitation, humidity, air pressure, and wind that have changed over time in a particular location</p> <p>a. Develop, communicate and justify an evidence-based scientific explanation to account for Earth's different climates (DOK 1-3)</p> <p>b. Research and evaluate direct and indirect evidence to explain how climates vary from one location to another on Earth (DOK 2-3)</p> <p>c. Examine, evaluate, and question information from a variety of sources and media to investigate how climates vary from one location to another on Earth (DOK 2-3)</p>				
	<p>3. The solar system is comprised of various objects that orbit the Sun and are classified based on their characteristics</p> <p>a. Construct a scale model of the solar system, and use it to explain the motion of objects in the system such as planets, Sun, Moons, asteroids, comets, and dwarf planets (DOK 2-3)</p> <p>b. Describe methods and equipment used to explore the solar system and beyond (DOK 1)</p> <p>c. Design an investigation that involves direct observation of objects in the sky, and analyze and explain results (DOK 2-3)</p> <p>d. Research, critique, and communicate scientific theories that explain how the solar system was formed (DOK 1-3)</p> <p>e. Use computer data sets and simulations to explore objects in the solar system (DOK 1-2)</p> <p>f. Recognize that mathematical models are used to predict orbital paths and events (DOK 1)</p>				
	<p>4. The relative positions and motions of Earth, Moon, and Sun can be used to explain observable effects such as seasons, eclipses, and Moon phases</p> <p>a. Develop, communicate, and justify an evidence-based explanation using relative positions of Earth, Moon, and Sun to explain the following natural phenomenon: 1. Tides 2. Eclipses of the Sun and Moon 3. Different shapes of the Moon as viewed from Earth (DOK 1-3)</p>				

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	b. Analyze and interpret data to explain why we have seasons (DOK 1-2) c. Use models to explain the relative motions of Earth, Moon, and Sun over time (DOK 1-2)				
4	Scientific Investigations and the Nature of Science (SI/NS)	25%	The 20 points for SI will be distributed among the 3 standards.		
	Asking testable questions, make a falsifiable hypothesis, design an inquiry based method of finding the answer				
SC09-GR.8-S.3-GLE.2-N.1	Ask testable questions and make a falsifiable hypothesis about earth's climate and use an inquiry based approach to find an answer. (DOK 1-3)				
	Share results of experiments with others and respectfully discuss results				
SC09-GR.8-S.1-GLE.2-N.1	Share experimental data, and respectfully discuss conflicting results. (DOK 2-3)				
SC09-GR.8-S.1-GLE.3-N.2	Share experimental data, and respectfully discuss conflicting results emulating the practice of scientists. (DOK 2-3)				
	Use and understand historical context to refine current understanding				
SC09-GR.8-S.1-GLE.1-N.1	Recognize that our current understanding of forces has developed over centuries of studies by many scientists, and that we will continue to refine our understanding of forces through continued scientific investigations and <u>advances in data collection</u> . (DOK 1)				
SC09-GR.8-S.2-GLE.2-N.2	Recognize that current understanding of genetics has developed over time and become more sophisticated as <u>new technologies have lead to new evidence</u> . (DOK 1)				
SC09-GR.8-S.3-GLE.1-N.2	Use the historical context and impact of early weather research and consider the potential implications for <u>current weather studies on science and our society</u> . (DOK 1-3)				
SC09-GR.8-S.3-GLE.3-N.2	Recognize that our current understanding of the solar system has developed over centuries of studies by many scientists, and that through continued scientific investigations and advances in data collection, we will continue to refine our understanding of the solar system. (DOK 1)				
	Critically evaluate scientific models				
SC09-GR.8-S.1-GLE.4-N.1	Evaluate models used to explain and predict wave phenomena that cannot be directly measured. (DOK 2-3)				
SC09-GR.8-S.2-GLE.2-N.3	Critically evaluate models used to represent deoxyribonucleic acid (DNA) and genes; identify strengths and <u>weaknesses of these models for representing complex natural phenomena</u> . (DOK 2-3)				
	Critically evaluate scientific claims generated by the media and by peers				
SC09-GR.8-S.2-GLE.1-N.1	Critically evaluate scientific claims in popular media and peer generated explanations regarding interactions in ecosystems, and determine if the evidence presented is appropriate and sufficient to support the claims. (DOK 2-3)				

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SC09-GR.8-S.3-GLE.4-N.2	Evaluate visual and print media for scientific evidence, bias, and conjecture related to the historical ideas about relative positions of the Earth, Moon and Sun. (DOK 1-3)				
	Evaluate the reproducibility of an experiment and critically examine experimental results				
SC09-GR.8-S.1-GLE.3-N.1	Evaluate the reproducibility of an experiment, and critically examine conflicts in experimental results. (DOK 2-3)				
SC09-GR.8-S.3-GLE.2-N.2	Describe various techniques that scientists use to study climate, and suggest ways that each technique can be used to better understand various climates and changes in climate. (DOK 1-2)				
	Recognize and describe the ethical traditions of science				
SC09-GR.8-S.1-GLE.2-N.2	Recognize and describe the ethical traditions of science: value peer review; truthful reporting of methods and outcomes; making work public; and sharing a lens of professional skepticism when reviewing the work of others. (DOK 1)				
	Understand that scientists work from the assumption that the universe is a single system in which the basic rules are the same everywhere				
SC09-GR.8-S.1-GLE.4-N.2	Understand that scientists work from the assumption that the universe is a single system in which the basic rules are the same everywhere. For example, the speed of light in a vacuum is constant across space and time. (DOK 1)				
SC09-GR.8-S.3-GLE.3-N.1	Understand that scientists work from the assumption that the universe is a single system in which the basic rules are the same everywhere - that planets follow the same rules about forces as other objects. (DOK 1)				
	Select and use appropriate tools				
SC09-GR.8-S.1-GLE.2-N.3	Use tools to gather, view, analyze, and report results for scientific investigations designed to answer questions about energy transformations. (DOK 1-2)				
SC09-GR.8-S.3-GLE.1-N.1	Evaluate of the accuracy of various tools used in forecasting weather. (DOK 2-3)				
SC09-GR.8-S.1-GLE.4-N.3	Select and use technology tools to gather, view, analyze, and report results for scientific investigations about the characteristics and properties of waves. (DOK 1-2)				
	Find, evaluate, and select appropriate information from a variety of media sources to answer scientific questions				
SC09-GR.8-S.1-GLE.1-N.2	Find, evaluate, and select appropriate information from reference books, journals, magazines, online references, and databases to answer scientific questions about motion and acceleration. (DOK 1-2)				
	Understand and explore the interrelationships of science				
SC09-GR.8-S.2-GLE.2-N.1	Understand the interconnected nature of math and science by utilizing math in the prediction of future generations. (DOK 2)				
SC09-GR.8-S.3-GLE.4-N.1	Explore the global consequences of the interrelationships among science, technology and human activity. (DOK 1-3)				
	TOTAL	100%	60	20	80

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