



Colorado's Standards

Purpose of this document: These assessment frameworks function as an assessment development document. They guide the development of the Colorado Student Assessment Program (CSAP), and thus reflect only those student skills and knowledge that can be assessed on a large scale, paper pencil assessment. The entire body of knowledge of any content area is beyond the scope of a summative assessment. The CSAP simply provides a once yearly snapshot of student progress relative to the Colorado Model Content Standards.

NOTE: CSAP Assessment Frameworks are not in lieu of a curriculum.

Who created this document?

As a result of activities from the Year of Science in 2006, the standards and benchmarks were reviewed and revised by stakeholders representing the state of Colorado and the science community. This group included science educators, science curriculum experts, scientists, and higher education faculty. At various stages through the development and writing, these documents were made available for public comment. The Colorado Model Content Standards for Science were approved by the State Board of Education in February 2007.

As the key document which guides development of the CSAP, the assessment frameworks were then reviewed and revised with the input of a standing Science Assessment Committee, along with the input of additional qualified stakeholders.

ASSESSMENT FRAMEWORK– *defines what can be assessed on the State’s large-scale, paper and pencil, standardized assessment (CSAP). This document is organized as follows:*

Standard		<i>Indicates the broad knowledge and skills that all students should be acquiring in Colorado schools at grade level. Each standard is assessed every year.</i>	
Topic	Benchmark	<i>Tactical descriptions of the knowledge and skills students should acquire by each grade level assessed by CSAP (5,8,10) or by district assessments at all grade levels.</i>	
	Assessment Objectives	a	<i>Specific knowledge and skills selected to be measured by CSAP for each grade level. Assessment Objectives are assessed on a cyclical basis.</i>

Grade 5 Science Assessment Frameworks

Standard 1		Students apply the processes of scientific investigation and design, conduct, communicate about, and evaluate such investigations. Students know and are able to:	
Processes of Scientific Investigation	Benchmark 1.1	Design, plan and conduct a variety of simple investigations (for example: formulate a testable question, state a hypothesis, make systematic observations, develop and communicate logical conclusions based on evidence)	
	Assessment Objectives	1.1.a	Identify that changing (manipulating) a different variable in a previously given simple experiment will give a new result (response).
		1.1.b	Identify that only one variable can be changed (manipulated) in an experiment.
		1.1.c	Identify and develop a testable question, and state a hypothesis.
		1.1.d	Relate observations and data to a testable question.
		1.1.e	Develop and communicate logical conclusions and make predictions based on evidence from an experiment.
	Benchmark 1.2	Select and use appropriate tools and technology to gather and display (for example: graphs, charts, diagrams) quantitative and qualitative data related to an investigation. (for example: length, volume, and mass measuring instruments, thermometers, watches, magnifiers, microscopes, calculators, and computers)	
	Assessment Objectives	1.2.a	Identify the appropriate scientific tools that are used to gather data for an investigation.
		1.2.b	Identify the appropriate metric units for length, temperature, mass and volume.
		1.2.c	Represent data and evidence from an experiment in visual form (e.g., data tables, graphs, diagrams).

Grade 5 Science Assessment Frameworks

Standard 2		Physical Science: Students know and understand common properties, forms, and changes in matter and energy. <i>(Focus: Physics and Chemistry)</i> Students know and can demonstrate understanding that:	
Physical Properties	Benchmark 2.1	Objects have physical properties that can be measured (for example: length, mass, volume and temperature)	
	Assessment Objectives	2.1.a	Use appropriate tools to measure physical properties of objects.
		2.1.b	Use measurements to make qualitative and quantitative comparisons between physical properties of objects.
	Benchmark 2.2	Measurable physical properties can be compared before and after effecting a change to verify a change has occurred and used to predict the outcome in similar circumstances.	
	Assessment Objectives	2.2.a	Use measurements before and after an event to determine whether a change has occurred in a physical property of an object.
		2.2.b	Using given data, predict how a similar event will affect a physical property of a similar object.
	Benchmark 2.3	Matter is made up of parts that are too small to be seen	
	Assessment Objectives	2.3.a	Explain that all matter takes up space and has mass.
		2.3.b	Recognize that all matter is made of parts called atoms, which are too small to be seen.
	Benchmark 2.4	Matter exists in physical states (solid, liquid, gas) and can change from one state to another	
Assessment Objectives	2.4.a	Identify the physical states of matter and describe the physical properties of each <i>(for example, a liquid has a definite volume but takes the shape of its container)</i> .	
	2.4.b	Identify the physical state of a given material, and recognize that changes in the physical state of matter do not change the composition of the substance.	
	2.4.c	Describe how the processes of melting, freezing, evaporation, and condensation change matter from one physical state to another.	

Grade 5 Science Assessment Frameworks

Standard 2		Physical Science: Students know and understand common properties, forms, and changes in matter and energy. (Focus: Physics and Chemistry) Students know and can demonstrate understanding that:	
Transfer of Energy	Benchmark 2.5	There are different types and sources of energy (for example: light, heat, motion)	
	Assessment Objective	2.5.a	Identify various types of energy and common sources of these types of energy.
	Benchmark 2.6	Electricity in circuits can produce light, heat, sound and magnetic effects	
	Assessment Objectives	2.6.a	Recognize that an electrical circuit must be complete to function.
2.6.b		Give examples of devices that use electrical energy to produce light, heat, sound, and magnetic effects.	
Forces and Motion	Benchmark 2.7	There are different types of forces (for example: gravity and magnetism)	
	Assessment Objectives	2.7.a	Describe that a force is a push or a pull on an object, and identify that gravity, magnetism, and friction are examples of forces.
		2.7.b	Recognize that the effects of forces on objects can be seen (but the force itself cannot be directly seen).
	Benchmark 2.8	Changes in speed or direction of motion are caused by forces	
	Assessment Objectives	2.8.a	Explain that more than one force may be acting on an object at the same time.
2.8.b		Evaluate the changes in speed or direction of motion caused by unbalanced forces acting on an object.	

Grade 5 Science Assessment Frameworks

Standard 3		Life Science: Students know and understand the characteristics and structure of living things, the processes of life, and how living things interact with each other and their environment. <i>(Focus: Biology-- Anatomy, Physiology, Botany, Zoology, Ecology)</i> Students know and can demonstrate understanding that:	
Structure and Function in Living Systems	Benchmark 3.1	Each plant or animal has different structures and behaviors that serve different functions in growth, survival, and reproduction.	
	Assessment Objectives	3.1.a.	Identify and describe different plant structures that serve different functions in growth, survival and reproduction.
		3.1.b.	Identify and describe different animal structures and behaviors that serve different functions in growth, survival and reproduction.
	Benchmark 3.2	Green plants need energy from sunlight and various raw materials to live, and animals consume plants and other organisms to live.	
	Assessment Objectives	3.2.a.	Identify the basic needs of plants.
		3.2.b.	Describe how animals use food (focus on growth and energy).
	Benchmark 3.3	Human body systems have basic structures, functions and needs (for example: digestive, respiratory, circulatory, skeletal, muscular).	
	Assessment Objectives	3.3.a.	Identify organ systems and the major organs.
		3.3.b.	Describe the function of various human body systems.
Life Cycles of Organisms	Benchmark 3.4	There is interaction and interdependence between and among nonliving and living components of ecosystems (for example: food webs, symbiotic and parasitic relationships, dependence on rainfall, pollination).	
	Assessment Objectives	3.4.a.	Identify and describe the influence of nonliving components on living components of an ecosystem.
		3.4.b.	Identify and describe the interaction of organisms in an ecosystem.
	Benchmark 3.5	Life cycles vary from organism to organism (for example: frog, chicken, butterfly, radish, bean plant).	
	Assessment Objectives	3.5.a.	Identify organisms that go through similar life stages.
3.5.b.		Sequence the stages of growth of plants and animals.	

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Diversity and Adaptations of Organisms	Benchmark 3.6	Fossils can be compared to one another and to living organisms according to their similarities and differences	
	Assessment Objective	3.6.a.	Describe evidence that shows life has changed over time.
	Benchmark 3.7	There are similarities and differences in appearance among individuals of the same population (for example: size, color, shape)	
	Assessment Objective	3.7.a.	Describe ways that plants or animals of the same population and life stage look different.
	Benchmark 3.8	There are similarities and differences between organisms (for example: plants vs. animals, vertebrate vs. invertebrate)	
	Assessment Objective	3.8.a.	Classify organisms based on characteristics.

Grade 5 Science Assessment Frameworks

Standard 4		Earth and Space Science: Students know and understand the processes and interactions of Earth's systems and the structure and dynamics of Earth and other objects in space. <i>(Focus: Geology, Meteorology, Astronomy, Oceanography)</i> Students know and can demonstrate understanding that:	
Earth's Composition, Processes and History	Benchmark 4.1	Fossils are evidence of past life	
	Assessment Objectives	4.1.a	Describe how fossil evidence reveals environmental characteristics and changes over time.
		4.1.b	Predict or infer how fossils are formed from previously living organisms.
	Benchmark 4.2	Natural processes change Earth's surface (for example: weathering, erosion, mountain building, volcanic activity, earthquakes and floods)	
	Assessment Objectives	4.2.a	Identify and describe the concepts of weathering, erosion, and deposition and the resulting physical features (canyons, mountains, etc).
		4.2.b	Explain the contribution of volcanic and earthquake activity to the changes in Earth's surface.
Benchmark 4.3	Many of Earth's resources can be conserved, recycled and depleted		
Assessment Objective	4.3.a	Explain the depletion of resources and the benefit for conserving, recycling (landfills, water).	
Weather and Water	Benchmark 4.4	Weather is different from climate	
	Assessment Objective	4.4.a	Compare and contrast weather and climate.
	Benchmark 4.5	Most of Earth's surface is covered by water, most of the water is saltwater in the oceans, and that freshwater is found in rivers, lakes, underground sources and glaciers	
	Assessment Objective	4.5.a	Recognize that the majority of Earth's surface is covered by water (salt and fresh water).
	Benchmark 4.6	Water exists on Earth in different states (solid, liquid, gas) and changes from one state to another (for example: evaporation, condensation and precipitation).	
	Assessment Objectives	4.6.a	Describe the physical states of water in nature and how it can change from one form to another.
4.6.b		Identify the different parts of the water cycle.	

Standard 4		Earth and Space Science: Students know and understand the processes and interactions of Earth's systems and the structure and dynamics of Earth and other objects in space. <i>(Focus: Geology, Meteorology, Astronomy, Oceanography)</i> Students know and can demonstrate understanding that:	
Solar System	Benchmark 4.7	There are basic components of the Solar System (for example: Sun, planets, moons)	
	Assessment Objective	4.7.a	Compare and contrast the Solar System's components (the Sun, planets, moons).
	Benchmark 4.8	The Earth and Sun provide a diversity of resources (for example: soils, fuels, minerals, medicines and food)	
	Assessment Objectives	4.8.a.	Describe types of natural energy resources (renewable, nonrenewable) and their uses on Earth.
		4.8.b.	Identify Earth's different natural resources and their uses.
	Benchmark 4.9	The rotation of Earth on its axis, in relation to the Sun, produces the day-and-night cycle and the orbit of Earth around the Sun completes one year	
Assessment Objective	4.9.a	Describe the events that occur as a result of the motions of the earth (day/night, year, revolution vs. rotation, orbit).	

Grade 5 Science Assessment Frameworks

Standard 5	Students understand that the nature of science involves a particular way of building knowledge and making meaning of the natural world. Students know and can demonstrate understanding that:	
Benchmark 5.1	When a science experiment is repeated with the same conditions, the experiment generally works the same way	
Assessment Objectives	5.1.a.	Predict the results of experiments when they are repeated.
	5.1.b.	Recognize that the results of an experiment should be verified through repetition.
Benchmark 5.2	Models are used to represent events and objects (for example: comparing a map of the school to the actual school; a model of the Earth to Earth itself)	
Assessment Objective	5.2.a.	Identify that basic models are used to understand scientific processes and/or objects that may be difficult to study.