

Colorado Alternate Assessment



Based on the 2020 Colorado Academic Standards

Science Assessment Framework

(starting in 2023)

Grade 5

DRAFT

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January 2022

CoAlt Science Assessment Frameworks

Concepts and skills explicitly identified in the Extended Evidence Outcomes (EEOs) of the Colorado Academic Standards (CAS) are the basis for the Colorado Alternate Assessment (CoAlt). CoAlt Science Frameworks specify the Prepared Graduate Statements, Grade Level Expectations, and Evidence Outcomes that are included on the state assessments. The frameworks also list the target percentage representation and number of score points for each reporting category (e.g., Physical Science, Physical/Life Science and Earth Systems) based on standards areas that appear on the state summative assessments. The relative weight across reporting categories is based on the number and depth of the Evidence Outcomes within the reporting category. Each Prepared Graduate Statement addressed within the CAS grade-level or grade span is expected to be represented on the assessment each year.

Colorado's 2020 Science Standards support a [three-dimensional model](#) of science teaching and learning. Items on the Colorado Alternate Assessment may be one, two or three dimensional.

The Three Dimensions of Science Teaching and Learning – Grade 5 2020 Colorado Academic Standards with Extended Evidence Outcomes

Teaching to the [Extended Evidence Outcomes of the Colorado Academic Standards](#) with fidelity is the best preparation for the CoAlt assessments. The CAS, adopted by the State Board of Education, were developed through an extensive process involving educators and with public input.

Disciplinary Core Ideas

The Disciplinary Core Ideas (DCIs) form the basis for the content that students are expected to know by the end of the grade level and are present in every item.

Not all DCIs are included in the Grade 5 standards. Those which are included in Grade 5 are listed below, with their numerical association as listed in the [2020 Colorado Extended Evidence Outcomes Document](#).

Physical Science: Students know and understand common properties, forms, and changes in matter and energy.

PS1: Matter and Its Interactions

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PS2: Motion and Stability: Forces and Interactions

PS3: Energy

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.

LS1: From Molecules to Organisms: Structures and Processes

LS2: Ecosystems: Interactions, Energy, and Dynamics

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.

ESS1: Earth's Place in the Universe

ESS2: Earth's Systems

ESS3: Earth and Human Activity

Science and Engineering Practices

The Science and Engineering Practices (SEPs) in the CAS are interwoven within certain items, and all SEPs found in the grade 5 standards are tested according to the [SEP progressions](#).

Not all SEPs are included in the Grade 5 standards. Those which are included in Grade 5 are listed below, with their numerical association as listed in the [2020 Colorado Extended Evidence Outcomes Document](#).

2. Developing and using models
3. Planning and carrying out investigations
4. Analyzing and interpreting data
5. Using mathematics and computational thinking

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7. Engaging in argument from evidence
8. Obtaining, evaluating, and communicating information

Cross Cutting Concepts

Crosscutting concepts (CCCs) have applications across all domains of science. As such, they are a way of linking the different domains of science. The CCCs in the CAS are interwoven within certain items. Each CCC found in the grade 5 standards is assessed according to the [CCC progressions](#).

Not all CCCs are included in the Grade 5 standards. Those which are included in Grade 5 are listed below, with their numerical association as listed in the [2020 Colorado Extended Evidence Outcomes Document](#).

1. Patterns. Observed patterns of forms and events guide organization and classification, and they prompt questions about relationships and the factors that influence them.
2. Cause and effect: Mechanism and explanation. Events have causes, sometimes simple, sometimes multifaceted. A major activity of science is investigating and explaining causal relationships and the mechanisms by which they are mediated. Such mechanisms can then be tested across given contexts and used to predict and explain events in new contexts.
3. Scale, proportion, and quantity. In considering phenomena, it is critical to recognize what is relevant at different measures of size, time, and energy and to recognize how changes in scale, proportion, or quantity affect a system's structure or performance.
4. Systems and system models. Defining the system under study—specifying its boundaries and making explicit a model of that system—provides tools for understanding and testing ideas that are applicable throughout science and engineering.
5. Energy and matter: Flows, cycles, and conservation. Tracking fluxes of energy and matter into, out of, and within systems helps one understand the systems' possibilities and limitations.

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Scenarios for Items

Items are driven by high-quality scenarios that are grounded in phenomena or problems. All scenarios are puzzling and intriguing and are explainable using grade appropriate integration of the three-dimensions of the 2020 CAS Extended Evidence Outcomes. Scenarios are presented in two different ways: clusters and standalone items.

Clusters: Students are presented with background information and still images and asked to make sense of the phenomenon described using their knowledge of the 2020 CAS Extended Evidence Outcomes. The first item in the cluster will have three answer options and be one-dimensional testing the DCI only. The second item in the cluster will typically have three answer options and be two-dimensional. The third item in the cluster will have four answer options and be three-dimensional.

Standalone Items: Students are presented with a unique phenomenon and asked to make sense of that phenomenon based on the information in the stimulus and answer the three-dimensional question using their knowledge of the 2020 CAS Extended Evidence Outcomes.

Cluster scenarios comprise the majority of the assessment, as students are asked to make sense of a larger phenomenon and answer more questions associated with those scenarios. Standalone items are included to target a small number of 2020 CAS Extended Evidence Outcomes not represented in cluster scenarios, and these Extended Evidence Outcomes rotate on an annual basis.

Item Types

Items associated with grounding phenomena are presented in two different ways.

Selected Response (3SR): For multiple choice items, students utilize information from the stimulus to make sense of the phenomenon and select a correct answer out of 3 or 4 provided choices.

Supported Performance Tasks (SPT): require students to complete a chart or graphic. Students use option cards to respond to three related prompts for each item. Students may manipulate the option cards independently or indicate the desired placement to the Test Administrators through their preferred mode of expressive communication, such as verbal direction or eye gaze. This item type allows students to demonstrate their knowledge and skills to create a product, revealing a different level of understanding of specific concepts and skills than that which are demonstrated through Selected Response items alone.

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		Selected Response Target	Supported Performance Task Target
Physical Science	33 – 36	12 - 13	3
Prepared Graduate 1. Students can use the full range of science and engineering practices to make sense of natural phenomena and solve problems that require understanding structure, properties and interactions of matter.			
<p>Grade Level Expectation: 5.1.1 Matter exists as particles that are too small to be seen; measurements of a variety of observable properties can be used to identify particular materials.</p> <p>Extended Evidence Outcomes:</p> <p>a. Use a model to demonstrate that matter is made of particles too small to be seen (e.g., inflating a balloon, blowing up a ball).</p> <p>b. Classify materials based on their properties (e.g., color, hardness, solubility, thermal conductivity)</p> <p>Grade Level Expectation: 5.1.2 Chemical Reactions that occur when substances are mixed can be identified by the emergence of substances with different properties; the total mass remains the same.</p> <p>Extended Evidence Outcomes:</p> <p>a. Use qualitative and/or quantitative observations, show evidence of how heating, cooling, or mixing substances, the total weight is conserved.</p> <p>b. Identify and compare the properties of two substances before and after mixing.</p>			
<p>Grade Level Expectation: 5.1.3 The gravitational force of Earth acting on an object near Earth's surface pulls that object toward the planet's center.</p> <p>Extended Evidence Outcomes:</p> <p>a. Provide evidence by demonstration that the force of gravity pulls any object down toward the earth.</p>			

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		Selected Response Target	Supported Performance Task Target
Physical/Life Science*	27	9	3
Prepared Graduate 1. Students can use the full range of science and engineering practices to make sense of natural phenomena and solve problems that require understanding structure, properties and interactions of matter.			
Prepared Graduate 6. Students can use the full range of science and engineering practices to make sense of natural phenomena and solve problems that require understanding how living systems interact with the biotic and abiotic environment.			
Grade Level Expectation: 5.1.4 The energy released from food was once energy from the sun. Extended Evidence Outcomes: a. Using a model, describes that energy in animals' food was once energy from the sun. Grade level Expectation: 5.2.2 Matter cycles between air and soil and among plants, animals and microbes as these organisms live and die. Extended Evidence Outcomes: a. Develop a model to show the movement of matter among plants, animals, and the environment.			
Prepared Graduate 6. Students can use the full range of science and engineering practices to make sense of natural phenomena and solve problems that require understanding how living systems interact with the biotic and abiotic environment.			
Grade Level Expectation: 5.2.1 Plants acquire their material from growth chiefly from air and water. Extended Evidence Outcomes: a. Use evidence to show that plants get the materials they need to grow chiefly from air and water, but not soil (e.g., plant grown in water without soil and demonstrates growth).			
Earth and Space Science	38-40	14 - 15	3
Prepared Graduate 9. Students can use the full range of science and engineering practices to make sense of natural phenomena and solve problems that require understanding the universe and Earth's place in it.			

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		Selected Response Target	Supported Performance Task Target
<p>Grade Level Expectation: 5.3.1 Stars range greatly in size and distance from Earth, and this can explain their relative brightness.</p> <p>Extended Evidence Outcomes:</p> <p>a. Identifies that the sun is a star that is brighter than their stars because of its relation to its distance from the Earth.</p>			
<p>Grade Level Expectation: 5.3.2 Earth's orbit and rotation and the orbit of the moon around earth cause observable patterns.</p> <p>Extended Evidence Outcomes:</p> <p>a. Observe and graph patterns of daily changes in the amount of daylight across seasons. i. Measures length of shadows across time and at different times of the day.</p>			
<p>Prepared Graduate 10. Students can use the full range of science and engineering practices to make sense of natural phenomena and solve problems that require understanding how and why Earth is constantly changing.</p>			
<p>Grade Level Expectation: 5.3.3 Earth's major systems interact in multiple ways to affect Earth's surface materials and processes.</p> <p>Extended Evidence Outcomes:</p> <p>a. Describe the interaction between any of the Earth's systems (e.g., the influence of the atmosphere on landforms through weather and climate; the influence of the ocean on ecosystems and the melting glaciers and rising sea-level).</p> <p>Grade Level Expectation: 5.3.4 Most of Earth's water is in the ocean and much of Earth's freshwater in glaciers or underground.</p> <p>Extended Evidence Outcomes:</p> <p>a. Using a graph, compare the amounts of saltwater and freshwater on Earth found in oceans, lakes, rivers, glaciers, ground water, and polar ice caps.</p>			
<p>Grade Level Expectation: 5.3.5 Societal activities have had major effects on land, ocean, atmosphere and even outer space.</p> <p>Extended Evidence Outcomes:</p> <p>a. Use text and media to identify ways to protect the Earth's resources and environment (e.g., solar energy and wind energy).</p>			

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		Selected Response Target	Supported Performance Task Target
	100	36	9
Item Types	% of Total Test Score Points	Targeted Points	
Selected Response (three per cluster)	80	36	
Supported Performance Task (three questions per task)	20	9	
	100	45	

**The Physical/Life Science Category Encompasses Physical Science EO 5.1.4.a as it is inextricably connected to the two Life Science EOs at this grade level.

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