

I. Teacher Preparation

A. Elementary School Licensure Requirements

1. Licensure Grade Levels¹

a. Does the state offer an Early Elementary Education credential (Preschool/Kindergarten to Grade 2/3)?	Yes	Early Childhood Education (Ages 0-8)
b. Does the state offer an Elementary Education credential (Kindergarten/Grade 1 to Grade 5/6)?	Yes	Elementary Education (Grades K-6)

2. Early Elementary²

a. Is an educational practice examination required for licensure?	No
b. Is an examination in reading and writing or language arts required for licensure?	Yes
c. Is a mathematics examination required for licensure?	Yes
d. Is a science examination required for licensure?	Yes

3. Elementary Education²

a. Is an educational practice examination required for licensure?	No
b. Is an examination in reading and writing or language arts required for licensure?	Yes
c. Is a mathematics examination required for licensure?	Yes
d. Is a science examination required for licensure?	Yes

4. Licensure Renewal¹

a. What is the period of validity for an educator's license?	Less than 5 years		
	5 years	X	
	Greater than 5 years		
b. Can in-service teachers receive certification credit for professional development courses/programs in Earth and Space Sciences?	Yes	X	Teachers can use Continuing Education hours from professional development, in any area they teach that would support their growth, toward recertification. ³
	No		
	Local issue		
	Unknown		

B. Elementary School Curriculum Support

1. Guidelines for Curriculum Development

a. Does the SEA provide guidelines for curriculum development, beyond the state's science standards?	Yes		
b. If yes, which of the following	1. Science frameworks	X	Standards Graphic Organizers ⁴
	2. Curriculum maps	X	Content Connection Samples ⁵
	3. Learning progressions	X	Vertical Progression in Science ⁶

does the state provide?	4. Benchmark maps		
	5. Templates for unit design		
	6. Curriculum development guides		
	7. Model units		
	8. Lesson plan templates/guides		
	9. Web-based lesson plan portals		
	10. Model lesson plans		
	11. Assessment guidelines		

2. Instructional Materials

a. At what level does adoption of instructional materials occur?	State level	
	Local level	X ⁷

b. If the state is an adoption state, do adopted materials in science include those that address topics specific to the geosciences?	N/A
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3. Support for New Standards

a. Does that state provide resources to school systems to effectively implement the standards as they change?	Yes		Currently, state is not offering/implementing any support mechanisms. ³
	No	X	
	Local issue		
	Unknown		

4. Professional Development

a. Does the SEA provide professional development that is, at least in part, specific to the geosciences?	Yes, provided by SEA		The SEA does not provide specific PD. This is the prevue of the LEA. The SEA provides PD on standards implementation. ³
	Yes, but independent of SEA		
	No		
	Local issue	X	
	Unknown		

II. Curriculum

A. Elementary School State Science Standards

1. Organization⁸

a. What is the name of the state's elementary school science standards?	Colorado Academic Standards (CAS) in Science
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b. What is the grade-level arrangement of the standards?	Grade specific	X
	Grade-level bands	
	Benchmark grade levels	

c. How are the standards outlined?	Overarching standard statements (level one)	X	d. What terms are used to identify each level?	Grade Level Expectations
	Sub-standard statements that provide more detail to the overarching standards (level two)	X		Evidence Outcomes

2. Content⁸

a. Are the science standards subdivided according to scientific discipline (Physical Science, Life Science, and Earth and Space Science)?	Yes	
b. Are the Earth and Space Science standards identified by core ideas in the geosciences?	No	
c. Do the state's standards include current issues in the geosciences? Current issues in the geosciences can be described as Earth science processes altered by human activities or Earth science processes that affect human well-being.	Yes	Students in grade 5 look at renewable and nonrenewable resources, including wind and solar energy. They look at resource distribution systems and communities built around sources of resources, e.g. mining. In grade 2 and 5 students also examine natural hazards, such as earthquakes, flooding, and tornadoes and ways to mitigate their impacts on humans.
d. Do the state's standards include career exploration in the geosciences?	No	Standards make no mention of career options/exploration in the geosciences.

3. Development

a. When were the standards adopted or last revised?	Within the last two years (2014-2015)		Adopted December 10, 2009 ⁸
	Between 3-6 years ago (2010-2014)	X	
	Between 7-10 years ago (2006-2009)		
	More than 10 years ago (before 2006)		

b. Does the state have plans to review/revise its science standards?	Currently under review		Currently, the SEA does not have a plan to revise the CAS and any changes would require action by the CO State Board of Education. ³
	Within the next 5 years (2015-2020)		
	Between 5 and 10 years from now (2020-2025)		
	No plan or timeline exists	X	
	Unknown		

B. Middle School State Science Standards

1. Content⁸

a. What is the name of the state's middle school science standards?	Colorado Academic Standards (CAS) in Science
b. Are Earth and Space Science topics included in the standards?	Yes
c. Is Life Science and Physical Science content included in the standards?	Yes

C. High School State Science Standards

1. Content⁸

a. What is the name of the state's high school science standards?	Colorado Academic Standards (CAS) in Science
b. Are Earth and Space Science topics included in the standards?	Yes
c. Is Life Science and Physical Science content included in the standards?	Yes

D. High School Course Requirements

1. Credits Required for Graduation⁹

a. What is the total number of credits required for graduation?	0
b. What is the number of science credits required for graduation?	0

2. Course Content⁹

a. Is Life Science required?	No
b. Is Physical Science required?	No
c. Is Earth Science required?	No
d. Is Environmental Science required?	No
e. Is Earth Science accepted?	Not stated
f. Does Earth Science have to be lab-based?	Not stated

III. Instruction

A. Elementary School Approaches to Instruction

1. State Science Standards⁸

a. Do the state's science standards provide guidelines regarding any specific approach to be used for science teaching?	Yes
b. If so, what is the term used to identify this approach?	Scientific Inquiry and Science Process Skills

c. Do the state's science standards provide a rationale for this approach?	Yes
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d. If so, what is the rationale?	As a 21st century skill and readiness competency.
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2. Guidelines for Curriculum Planning

a. If the state offers guidelines for curriculum planning, do these advocate more specific strategies for science instruction?	No
b. If so, what are the strategies?	N/A

3. Technology³

a. Are decisions regarding the use of technology in elementary science classrooms made at the state level or local level?	Local level
b. What kinds of technology are being used by elementary school science teachers in the state?	Technology is a local decision.

IV. Learning Contexts

A. Elementary School Classrooms

1. Class Size³

a. What is the average number of students in an elementary classroom?	Unknown (local data)
b. What is the maximum allowable number of students in an elementary classroom?	Unknown (local data)

2. Instructional Time³

a. At the elementary level, are teachers recommended or required to dedicate a certain amount of instructional time to science?	There is no time requirement		There is no requirement from the SEA for this. This is a local decision.
	Local decision	X	
	Teachers must spend a certain amount of time teaching science.		

B. Elementary School Support Services

1. Specialized Support³

a. Are there specific policies in place regarding English as a Second Language (ESL) and Special Education services that could impact science instruction (e.g. pull-out or push-in models)?	Local level decision	X	
	Depends on the specifications of a student's IEP or ILP		
	Teachers must follow specific practices regarding science		
	Unknown		

V. Extra-Curricular Programs

A. Elementary School Geosciences Enrichment Opportunities

1. After-School and Informal Education³

a. Are opportunities to engage in geoscience-related topics outside of school (e.g. after-school programs and informal education programs) being offered to students in the state?	Local decision
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b. If so, what are they?	Unknown
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2. Remedial Education³

a. What remedial supports are in place for geosciences topics with which students are struggling?	Local level decision	X	
	Remediation services are being provided to students in science		
	No remediation support in science		
	Unknown		

VI. Monitoring Systems

A. Elementary School Statewide Science Assessment

1. Structure and Content

a. What is the name of the statewide standardized test in science at the elementary level?	Colorado Measures of Academic Success (CMAS) ¹⁰		
b. At what grade(s) is the assessment implemented?	5 ¹⁰		
c. Does the statewide science assessment measure achievement of the state's standards, i.e. is the assessment aligned with state standards?	Yes ¹¹		
d. Is the content of the statewide science assessment sub-divided by discipline, namely Physical Science, Life Science, Earth and Space Science?	Yes ¹²		
e. Are there any plans for revising or changing the current elementary level science assessment?	No plans for revision	X	No changes planned. New assessment was implemented in 2014. ³
	Revision is planned, but timeline is unknown		
	Revision is planned with implementation date set		
	Unknown		

2. Results¹³

a. Is student achievement measured by Performance Level Descriptors?	Yes
b. If yes, how many performance levels are there?	4

3. District Level Reporting¹⁴

a. At the district level, are the percentages of students performing at each PLD reported to the public?	Yes	
b. At the district level, is student achievement reported according to scientific discipline (Life Sciences, Physical Sciences, Earth and Space Sciences)?	Yes	
c. If yes, is this data available to the public?	Yes	

4. State Level Reporting¹⁵

a. At the state level, are the percentages of students performing at each PLD reported to the public?	Yes	Science discipline results will be able to be compared on the new CMAS state science assessment. The transitional assessment currently in place (TCAP) does not report according to science discipline.
b. At the state level, is student achievement reported according to scientific discipline (Life Sciences, Physical Sciences, Earth and Space Sciences)?	Yes	
c. If yes, is this data available to the public?	Yes	

B. Elementary School International Assessments in Science

1. TIMSS¹⁶

a. Has the state participated in the Trends in International Mathematics and Science Study (TIMSS)?	Yes
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b. If yes, in which years did the state participate?	1995	X
	2003	
	2007	
	2011	X

C. Middle School Statewide Science Assessment

1. Structure and Content¹⁷

a. What is the name of the statewide standardized test in science at the middle school level?	Colorado Measures of Academic Success (CMAS)
b. At what grade(s) is the assessment implemented?	8
c. Does the assessment address Life Science concepts?	Yes
d. Does the assessment address Life Science concepts?	Yes
e. Does the assessment address Earth Science concepts?	Yes

C. High School Statewide Science Assessment(s)

1. Structure and Content¹⁷

a. What is the name of the state's standardized science assessment(s)?	Colorado Measures of Academic Success: High School Science
b. At what grade level is the assessment implemented?	12
c. Does the assessment address Life Science concepts?	Yes
d. Does the assessment address Physical Science concepts?	Yes
e. Does the assessment address Earth Science concepts?	Yes

VII. Accountability

A. School Level

1. Individual Student¹⁸

a. Does the state produce an Individual Student Report (ISR) that describes a student's performance on the state's science assessment?	Yes	<p>Schools provide a Student Performance Report to parents/guardians. This report describes an individual student's performance on statewide assessments in terms of scale score and proficiency level.</p> <p>Grade 5 reports include student performance on the science assessment in terms of scale score and proficiency level. In addition, results are subdivided according to Reporting Category.</p> <p>The Reporting Categories for science are: Physical Science Life Science Earth Systems Science Scientific Investigation and Nature of Science</p> <p>Schools receive a CMAS Content Standards Roster Report. This report provides the overall performance level, reporting category, and PGC/GLE data for each student at the grade and school level. Results are subdivided according to Reporting Category.</p>
b. Is the ISR made available to a student's parents or guardians?	Yes	
c. Is the ISR made available to a student's teacher?	Yes	
d. Does the ISR report student's performance in terms of scale score and achievement level?	Yes	
e. Does the ISR subdivide results by science discipline (Physical Science, Life Science, Earth and Space Science)?	Yes	

2. Teacher Appraisal¹⁹

a. Are students' results on the statewide science assessment a component of teacher evaluation?	Can be
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B. District Level

1. District Accreditation³

a. Are student outcomes in statewide science assessments at the elementary level part of accreditation of public schools at the district level?	Yes	X	
	No		
	At a future point		
	Local decision		
	Unknown		

C. State Level

1. Statewide Monitoring³

a. Are student outcomes in statewide science assessments at the elementary level used in monitoring the adequacy of state educational systems?	Yes	
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2. Trends in Student Outcomes²⁰

a. Does the SEA report to the public performance results on the state science assessment over time?	Yes
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b. If yes, how many years of achievement data are available?	3 years (2011-2012 to 2013-2014)		
	4-7 years (2007-2008 to 2013-2014)	X	6 years (2008-1014)
	8 to 10 years (2004-2005 to 2013-2014)		
	11 or more years (before 2004-2005)		

c. Are the results also subdivided by science discipline (Life Sciences, Physical Sciences, Earth and Space Sciences)?	No
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¹ Colorado Department of Education, Educator Licensing, Requirements for a Colorado Initial Teacher License: http://www.cde.state.co.us/cdeprof/Licensure_tch_req.asp

² Pearson Education, Program Licensing Assessments for Colorado Educators, PLACE Study Guides, Elementary Education (01), PDF: http://www.place.nesinc.com/CO_viewSG_opener.asp

³ Colorado Department of Education (personal communication).

⁴ Colorado Department of Education, Standards and Instruction, Colorado Academic Standards Graphic Organizers: <http://www.cde.state.co.us/standardsandinstruction/casgraphicorganizers>

⁵ Colorado Department of Education, Content Areas, Content Connection Samples (Kindergarten through 5th Grade): <http://www.cde.state.co.us/ContentAreas/ContentConnections/index>

⁶ Colorado Department of Education, Content Areas, Vertical Progression Tools, Science, PDF: <http://www.cde.state.co.us/ContentAreas/VerticalProgressions/index>

⁷ Colorado Department of Education, Standards and Instruction, Colorado Academic Standards Fact Sheets and FAQs: <http://www.cde.state.co.us/standardsandinstruction/factsheetsandfaqs#standardsfaqs>

⁸ Colorado Department of Education, Science – State Standards, Science Standards, Preschool – High School PDF Version: <http://www.cde.state.co.us/coscience/statestandards>

⁹ Colorado Department of Education, Developing Colorado’s High School Graduation Requirements: <http://www.cde.state.co.us/postsecondary/graduationrequirements>

¹⁰ Colorado Department of Education, New Assessments, Colorado Measure of Academic Success: Science and Social Studies: <http://www.cde.state.co.us/assessment/newassess-sum>

¹¹ Colorado Department of Education, New Assessments, Colorado Measure of Academic Success: Science and Social Studies, Data and Results, Spring 2014 CMAS Standards, PGCs, and GLEs: Science Grades 5 and 8, PDF: <http://www.cde.state.co.us/assessment/newassess-sum>

¹² Colorado Department of Education, New Assessments, Colorado Measure of Academic Success: Science and Social Studies, Frameworks, Science: Grade 5, PDF: <http://www.cde.state.co.us/assessment/newassess-sum>

¹³ Colorado Department of Education, New Assessments, Colorado Measure of Academic Success: Science and Social Studies, CMAS Performance Levels, PDF: <http://www.cde.state.co.us/assessment/newassess-sum>

¹⁴ Colorado Department of Education, New Assessments, Colorado Measure of Academic Success: Science and Social Studies, Data and Results, Score Interpretation Training, PPT: <http://www.cde.state.co.us/assessment/newassess-sum>

¹⁵ Colorado Department of Education, New Assessments, Colorado Measure of Academic Success: Science and Social Studies, Data and Results, Score Interpretation Training, PPT: <http://www.cde.state.co.us/assessment/newassess-sum>

¹⁶ U.S. Dept. of Education, Institute of Education Sciences, National Center for Education Statistics, Trends in International Mathematics and Science Study (TIMSS), State and District Participation in TIMSS: <https://nces.ed.gov/TIMSS/benchmark.asp>

¹⁷ Colorado Department of Education, New Assessments, Colorado Measure of Academic Success: Science and Social Studies: <http://www.cde.state.co.us/assessment/newassess-sum>

¹⁸ Colorado Department of Education, CMAS – Science and Social Studies Assessments, Spring 2014, Spring 2014 Interpretive Guide, PDF: <http://www.cde.state.co.us/assessment/newassess-sum>

¹⁹ Colorado Department of Education, State Model Evaluation System for Teachers, Teacher Quality Standards: <http://www.cde.state.co.us/educatoreffectiveness/smes-teacher#studentlearning>

²⁰ Colorado Department of Education, CSAP/TCAP – Data and Results, CSAP/TCAP Summary Data: <http://www.cde.state.co.us/assessment/coassess-dataandresults#summarydata>