

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 (PreK - Grade 3)
b. Does the state offer an Elementary Education credential (Kindergarten/Grade 1 to Grade 5/6)?	Yes	Elementary Education (K-6)

2. Early Elementary²

a. Is an educational practice examination required for licensure?	Yes
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?	Yes
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 Renewal³

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		
	No		
	Local issue		
	Unknown	X	

B. Elementary School Curriculum Support

1. Guidelines for Curriculum Development⁴

a. Does the SEA provide guidelines for curriculum development, beyond the state's science standards?	Yes
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b. If yes, which of the following does the state provide?	1. Science frameworks		
	2. Curriculum maps		
	3. Learning progressions		
	4. Benchmark maps	X	Grade/Course Level Expectations
	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	X	Checks for Understanding

2. Instructional Materials

a. At what level does adoption of instructional materials occur?	State level	X ⁵
	Local level	

b. If the state is an adoption state, do adopted materials in science include those that address topics specific to the geosciences?	Yes	<p><u>American Legacy</u> Science Studies Weekly <u>Delta Education</u> FOSS Science (Air and Weather; Pebbles, Sand and Silt; Earth Materials; Landforms) <u>Delta Education</u> DSM Science (Finding the Moon; Sunshine and Shadows; Soil Science; Solar System; Earth, Moon and Sun) <u>HMH School (Houghton Mifflin Harcourt)</u> Tennessee Science (K, 1, 2, 3, 4, 5) <u>Macmillan/McGraw-Hill</u> Science: A Closer Look, Tennessee Edition, (1, 2, 3, 4, 5) <u>Carolina Biological Supply Company</u> STC Program (Weather; Soils; Rocks and Minerals; Land and Water; <u>Carolina Biological Supply Company</u> Building Blocks of Science <u>Carolina Biological Supply Company</u> GEMS (Ocean Currents; Space Sciences Sequence)⁶</p>
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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	
	No	
	Local issue	
	Unknown	X

4. Professional Development

a. Does the SEA provide professional development	Yes, provided by SEA	
	Yes, but independent of SEA	

that is, at least in part, specific to the geosciences?	No		
	Local issue		
	Unknown	X	

II. Curriculum

A. Elementary School State Science Standards

1. Organization⁷

a. What is the name of the state's elementary school science standards?		2009 Tennessee Science Curriculum Framework		
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?	Conceptual Strands and Guiding Questions
	Sub-standard statements that provide more detail to the overarching standards (level two)	X		Grade Level Expectations

2. Content⁷

a. Are the science standards subdivided according to scientific discipline (Physical Science, Life Science, and Earth and Space Science)?	Yes	At each grade level, standards are organized by content area: 1) Embedded Inquiry 2) Embedded Technology and Engineering 3) Life Science 4) Earth and Space Science 5) Physical Science
b. Are the Earth and Space Science standards identified by core ideas in the geosciences?	Yes	Earth and Space Science standards are subdivided by the following content area topics (core ideas): Standard 6 – The Universe Standard 7 – The Earth Standard 8 – The Atmosphere
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	In grade 2, students differentiate between renewable and non-renewable resources. In grade 3, students consider methods for conserving natural resources. In grade 4, students evaluate the impact of humans on non-renewable resources.
d. Do the state's standards include career exploration in the geosciences?	No	

3. Development

a. When were the standards adopted or last revised?	Within the last two years (2014-2015)		2009 ⁷
	Between 3-6 years ago (2010-2013)		
	Between 7-10 years ago (2006-2009)	X	
	More than 10 years ago (before 2006)		

b. Does the state have plans to review/revise its science standards?	Currently under review		
	Within the next 5 years (2015-2020)		
	Between 5 and 10 years from now (2020-2025)		
	No plan or timeline exists		
	Unknown	X	

B. Middle School State Science Standards

1. Content⁷

a. What is the name of the state's middle school science standards?	2009 Tennessee Science Curriculum Framework
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. Content⁷

a. What is the name of the state's high school science standards?	2009 Tennessee Science Curriculum Framework
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 Graduation⁸

a. What is the total number of credits required for graduation?	22
b. What is the number of science credits required for graduation?	3

2. Course Content⁸

a. Is Life Science required?	Yes
b. Is Physical Science required?	Yes
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?	Yes

III. Instruction

A. Elementary School Approaches to Instruction

1. State Science Standards⁷

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
c. Do the state's science standards provide a rationale for this approach?	Yes
d. If so, what is the rationale?	See the standards.

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. Technology

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

IV. Learning Contexts

A. Elementary School Classrooms

1. Class Size

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

2. Instructional Time

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		
	Local decision		
	Teachers must spend a certain amount of time teaching science.		
	Unknown	X	

B. Elementary School Support Services

1. Specialized Support

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		
	Depends on the specifications of a student's IEP or ILP		
	Teachers must follow specific practices regarding science		
	Unknown	X	

V. Extra-Curricular Programs

A. Elementary School Geosciences Enrichment Opportunities

1. After-School and Informal Education

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?	Unknown
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b. If so, what are they?	Unknown
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2. Remedial Education

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

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?	Tennessee Comprehensive Assessment Program (TCAP) Achievement Test ⁹		
b. At what grade(s) is the assessment implemented?	3, 4, and 5 ⁹		
c. Does the statewide science assessment measure achievement of the state's standards, i.e. is the assessment aligned with state standards?	Yes ⁹		
d. Is the content of the statewide science assessment sub-divided by discipline, namely Physical Science, Life Science, Earth and Space Science?	Yes ¹⁰		
e. Are there any plans for revising or changing the current elementary level science assessment?	No plans for revision	<input type="checkbox"/>	
	Revision is planned, but timeline is unknown	<input type="checkbox"/>	
	Revision is planned with implementation date set	<input type="checkbox"/>	
	Unknown	<input checked="" type="checkbox"/>	

2. Results⁹

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

3. District Level Reporting⁹

a. At the district level, are the percentages of students performing at each PLD reported to the public?	Yes	The SEA provides TCAP results at the district level. The TCAP statewide science assessment is administered at elementary grades 3, 4, and 5. District results provided to the public through the SEA website are averaged for all three grades.
b. At the district level, is student achievement reported according to scientific discipline (Life Sciences, Physical Sciences, Earth and Space Sciences)?	Yes	TCAP Achievement reports are available to educators via PearsonAccess, a secure website. School Achievement Level Summary Reports and School Reporting Category Performance Reports provide district (system) averages at each grade level (3, 4, and 5). School Reporting Category Performance Reports provide school level results on the TCAP statewide science assessments. The results are subdivided by reporting categories, which for science are: Life Science 1: Cells, Flow of Matter and Energy, Heredity Life Science 2: Interdependence, Biodiversity and Change Earth Science: The Universe, The Earth, The Atmosphere Physical Science 1: Matter and Energy Physical Science 2: Motion, Forces in Nature
c. If yes, is this data available to the public?	No	

		<p>District averages are provided for each category for comparison.</p> <p>These reports are not available to the public and can be accessed via PearsonAccess, a secure website.</p>
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4. State Level Reporting⁹

a. At the state level, are the percentages of students performing at each PLD reported to the public?	Yes	TCAP achievement test results in science, provided to the public by the SEA through its website, are not subdivided by discipline.
b. At the state level, is student achievement reported according to scientific discipline (Life Sciences, Physical Sciences, Earth and Space Sciences)?	Yes	However, TCAP Achievement reports are available to educators via PearsonAccess, a secure website. School Reporting Category Performance Reports provide school level results on the TCAP statewide science assessments. The results are subdivided by reporting categories, which for science are:
c. If yes, is this data available to the public?	No	<p>Life Science 1: Cells, Flow of Matter and Energy, Heredity ; Life Science 2: Interdependence, Biodiversity and Change; Earth Science: The Universe, The Earth, The Atmosphere; Physical Science 1: Matter and Energy ; Physical Science 2: Motion, Forces in Nature</p> <p>For comparison, these reports provide state level averages for each reporting category.</p>

B. Elementary School International Assessments in Science

1. TIMSS¹¹

a. Has the state participated in the Trends in International Mathematics and Science Study (TIMSS)?	No
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b. If yes, in which years did the state participate?	1995	
	2003	
	2007	
	2011	

C. Middle School Statewide Science Assessment

1. Structure and Content¹²

a. What is the name of the statewide standardized test in science at the middle school level?	Tennessee Comprehensive Assessment Program (TCAP) Achievement Test
b. At what grade(s) is the assessment implemented?	6, 7, and 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 Content¹³

a. What is the name of the state's standardized science assessment(s)?	Tennessee Comprehensive Assessment Program (TCAP) End of Course exams in Biology and Chemistry
b. At what grade level is the assessment implemented?	End-of-Course
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?	No

VII. Accountability

A. School Level

1. Individual Student⁹

a. Does the state produce an Individual Student Report (ISR) that describes a student's performance on the state's science assessment?	Yes	Schools provide an Individual Profile Report (IPR) to parents/guardians. The IPR describes an individual student's overall performance in terms of scale score and achievement level. In addition, the IPR provides the student's performance on Reporting Categories. The reporting categories for science are aligned with the 2009 Tennessee Science Curriculum Framework and include: Life Science 1: Cells, Flow of Matter and Energy, Heredity Life Science 2: Interdependence, Biodiversity and Change Earth Science: The Universe, The Earth, The Atmosphere Physical Science 1: Matter and Energy Physical Science 2: Motion, Forces in Nature
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	
		Teachers are provided a Class Report which provides a comprehensive analysis of student performance on the TCAP Achievement Test. The report lists the names of the students in the class and displays the number correct for each student for each reporting category.

2. Teacher Appraisal¹⁴

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 Accreditation

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

C. State Level

1. Statewide Monitoring

a. Are student outcomes in statewide science assessments at the elementary level used in monitoring the adequacy of state educational systems?	Unknown	
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2. Trends in Student Outcomes¹⁵

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	4 years of data (2010-2013)
	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 Tennessee Department of Education, Teaching, Licensing, Add Endorsement, Find Endorsement Codes, Academic Endorsements: http://www.tn.gov/education/licensing/endorsement_codes.shtml

² Educational Testing Service, Tennessee Test Requirements, Test Required for All Licensure Areas: <http://www.ets.org/praxis/tn/requirements/>

³ Tennessee Department of Education, Teaching, Licensing, Renew, Renewal Activities and Renewal Points http://www.tn.gov/education/licensing/renewal_activities.shtml

⁴ Tennessee Department of Education, Instruction, Standards, Science: <http://www.tn.gov/education/standards/science.shtml>

⁵ Tennessee Department of Education, Instruction, Textbook Services: <http://www.tn.gov/education/textbooks/index.shtml>

⁶ Tennessee Book Company, Official List of Textbook, Section III – Science, Health, Agriculture, Family and Consumer Sciences and Physical Education – 2009: http://www.tennesseebook.com/new_web_12/catalogs/catalogs.asp

⁷ Tennessee Department of Education, Instruction, Standards, Science: <http://www.tn.gov/education/standards/science.shtml>

⁸ Tennessee Department of Education, Instruction, Graduation Requirements: <http://www.tn.gov/education/instruction/graduation.shtml>

⁹ Tennessee Department of Education, Assessment, Grades 3-8 TCAP Achievement Test, For Educators, Guides, Directions and Manuals, 2013 Educator’s Guide to Test Report Interpretation, PDF: http://www.tn.gov/education/assessment/grades_3-8.shtml

¹⁰ Tennessee Department of Education, Assessment, Grades 3-8 TCAP Achievement Test, For Educators, 2-14-2015 Test Design, Achievement Frameworks, Science, Grades 3, 4, and 5, PDFs: http://www.tn.gov/education/assessment/grades_3-8.shtml

¹¹ 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>

¹² Tennessee Department of Education, Assessment, Grades 3-8 TCAP Achievement Test: http://www.tn.gov/education/assessment/grades_3-8.shtml

¹³ Tennessee Department of Education, Assessment, High School End of Course Exams: http://www.tn.gov/education/assessment/high_school.shtml

¹⁴ Tennessee Educator Acceleration Model, Statute and Policy, Tennessee State Board of Education, Teacher and Principal Evaluation Policy, 5.201, PDF: <http://team-tn.org/evaluation/statute-and-policy/>

¹⁵ Tennessee Department of Education, Data, Data Available for Download, TCAP, 2012-2013, Results compared to the previous three years, PDF: http://www.tn.gov/education/data/download_data.shtml