

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 Certificate (PreK - Grade 2)
b. Does the state offer an Elementary Education credential (Kindergarten/Grade 1 to Grade 5/6)?	Yes	Elementary Education Certificate (1-6)

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 Renewal

a. What is the period of validity for an educator's license?	Less than 5 years	
	5 years	X ³
	Greater than 5 years	

b. Can in-service teachers receive certification credit for professional development courses/programs in Earth and Space Sciences?	Yes	X ⁴	
	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
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b. If yes, which of the following does the state provide?	1. Science frameworks		
	2. Curriculum maps	X	http://www.ride.ri.gov/Portals/0/Uploads/Documents/Instruction-and-Assessment-World-Class-Standards/Science/NGSS/Building_a_Strong_Foundation_Access.pdf
	3. Learning progressions		
	4. Benchmark maps		
	5. Templates for unit design		
	6. Curriculum development guides		
	7. Model units	X	http://www.ride.ri.gov/Portals/0/Uploads/Documents/Instruction-and-Assessment-World-Class-Standards/Science/NGSS/Building_a_Strong_Foundation_Access.pdf
	8. Lesson plan templates/guides		
	9. Web-based lesson plan portals		
	10. Model lesson plans		
	11. Assessment guidelines		

2. Instructional Materials⁵

a. At what level does adoption of instructional materials occur?	State level	
	Local level	X
b. If the state is an adoption state, do adopted materials in science include those that address topics specific to the geosciences?	N/A	

3. Support for New Standards⁴

a. Does that state provide resources to school systems to effectively implement the standards as they change?	Yes	X	<p>A major goal of the SEA's Next Generation Science Standards Implementation Plan is to foster awareness and understanding of the new state science standards to all educators and stakeholders within the state. To help support this goal RIDE and the Rhode Island Strategic Leadership Team for the NGSS (RISLT) are building a cadre of volunteer educators to strengthen NGSS communication to all faculty and administration in RI schools.</p> <p>The NGSS Liaisons serve as a conduit between the RISLT and their colleagues in their schools. This networking of communication is a two-way process. NGSS-specific information, tools, and resources are shared with NGSS Liaisons through the RISLT and questions and concerns at the school level can then be communicated directly to the RISLT through the NGSS Liaisons. The objective of the NGSS Liaisons is to ensure that all educators and administrators in RI schools have access to information as</p>
	No		
	Local issue		
	Unknown		

			well as a process to pose questions and share ideas about NGSS.
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4. Professional Development⁴

a. Does the SEA provide professional development that is, at least in part, specific to the geosciences?	Yes, provided by SEA		<p>There is not a certification for earth and space science. K-12 is in the process of changing the certification for teachers. Teachers are prepared to teach geosciences through course they have elected to take as a part of their undergraduate program or during their license renewal process.</p> <p>Opportunities are made available to teachers via a newsletter for GLOBE, WET, and WILD. The state does not keep information on how many teachers participate in these programs.</p>
	Yes, but independent of SEA	X	
	No		
	Local issue		
	Unknown		

II. Curriculum

A. Elementary School State Science Standards

1. Organization⁶

a. What is the name of the state's elementary school science standards?	The Next Generation Science Standards (NGSS)
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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?	Performance Expectations
	Sub-standard statements that provide more detail to the overarching standards (level two)			

2. Content⁶

a. Are the science standards subdivided according to scientific discipline (Physical Science, Life Science, and Earth and Space Science)?	Yes	The standards are grouped into four major domains: 1) Physical Sciences 2) Life Sciences 3) Earth and Space Sciences 4) Engineering, Technology, and Applications of Science
b. Are the Earth and Space Science standards identified by core ideas in the geosciences?	Yes	The standards can be organized according to Disciplinary Core Idea (DCI). The DCIs for Earth and Space Sciences are: <u>ESS1 Earth's Place in the Universe</u> -ESS1A: The Universe and its Stars -ESS1B: Earth and the Solar System -ESS1C: The History of Planet Earth <u>ESS2 Earth's Systems</u> -ESS2A: Earth Materials and Systems -ESS2B: Plate Tectonics and Large-Scale Systems -ESS2C: The Role of Water in Earth's Surface Processes -ESS2D: Weather and Climate -ESS2E: Biogeology <u>ESS3 Earth and Human Activity</u> -ESS3A: Natural Resources -ESS3B: Natural Hazards -ESS3C: Human Impacts on Earth Systems -ESS3D: Global Climate Change
c. Do the state's standards include current issues in the	Yes	K: Students look the impact of humans on the local environment and consider ways to reduce that impact. 1: Students look at design solutions that reduce the impacts of

<p>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.</p>		<p>weather-related hazards. 4: Students examine renewable and non-renewable energy resources and how their uses affect the environment 5: Students consider the impact of human activities on the environment and ways that these impacts can be reduced and resources and the environment can be protected.</p>
<p>d. Do the state's standards include career exploration in the geosciences?</p>	<p>No</p>	

3. Development

<p>a. When were the standards adopted or last revised?</p>	<p>Within the last two years (2014-2015)</p>		<p>May 23, 2013⁶</p>
	<p>Between 3-6 years ago (2010-2013)</p>	<p>X</p>	
	<p>Between 7-10 years ago (2006-2009)</p>		
	<p>More than 10 years ago (before 2006)</p>		

<p>b. Does the state have plans to review/revise its science standards?</p>	<p>Currently under review</p>		<p>RI adopted NGSS in 2013. RI is on a 4-year implementation plan. The standards would likely be reviewed again in 2022; five years after the current standards are fully implemented.⁴</p>
	<p>Within the next 5 years (2015-2020)</p>		
	<p>Between 5 and 10 years from now (2020-2025)</p>	<p>X</p>	
	<p>No plan or timeline exists</p>		
	<p>Unknown</p>		

B. Middle School State Science Standards

1. Content⁶

<p>a. What is the name of the state's middle school science standards?</p>	<p>Next Generation Science Standards (NGSS)</p>
<p>b. Are Earth and Space Science topics included in the standards?</p>	<p>Yes</p>
<p>c. Is Life Science and Physical Science content included in the standards?</p>	<p>Yes</p>

C. High School State Science Standards

1. Content⁶

a. What is the name of the state's high school science standards?	Next Generation Science Standards (NGSS)
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 Graduation⁷

a. What is the total number of credits required for graduation?	20
b. What is the number of science credits required for graduation?	3

2. Course Content⁷

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 Standards⁶

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?	NGSS Science and Engineering Practices

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?	“Engaging in the practices of science helps students understand how scientific knowledge develops; such direct involvement gives them an appreciation of the wide range of approaches that are used to investigate, model, and explain the world. Engaging in the practices of engineering likewise helps students understand the work of engineers, as well as the links between engineering and science. Participation in these practices also helps students form an understanding of the crosscutting concepts and disciplinary ideas of science and engineering; moreover, it makes students’ knowledge more meaningful and embeds it more deeply into their worldview.”
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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. Technology⁴

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 varies by district. RI is moving towards 1 to 1 technology. PARCC has helped with the advancement of technology.

IV. Learning Contexts

A. Elementary School Classrooms

1. Class Size⁴

a. What is the average number of students in an elementary classroom?	Approximately 20. Class size varies by district. The teacher student ratio is 11 to 1.
b. What is the maximum allowable number of students in an elementary classroom?	Unknown

2. Instructional Time⁴

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		This is a district decision and varies by school. There is an overall minute mandate for instructional time, but schools decide how to use the minutes.
	Local decision	X	
	Teachers must spend a certain amount of time teaching science.		
	Unknown		

B. Elementary School Support Services

1. Specialized Support⁴

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	Modifications are a district level decision. NGSS has case studies in Appendix D - "All Standards, All Students": Making the Next Generation Science Standards Accessible to All Students
	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 Education⁴

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?	Yes
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b. If so, what are they?	<p>After school programs vary by district. Some schools have robotics, environmental, and rocketry clubs. Also schools work with the following partners:</p> <ul style="list-style-type: none"> • Brown University Science Programs • Natural Museum of History • Inner Space Center (oceanography exploration via internet) • NOAA Ship of Exploration <p>These are additional partners that work with students and teachers not listed in the question above. Some of these organizations have programs that are brought to the schools.</p> <ul style="list-style-type: none"> • Save the Bay • New England Sailing Association • RI Geological Association • Rodger Williams Park Zoo
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2. Remedial Education⁴

a. What remedial supports are in place for geosciences topics with which students are struggling?	Local level decision	X	Depends on the school and the teacher for science remediation.
	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?	New England Common Assessment Program (NECAP) Science Assessment ⁸		
b. At what grade(s) is the assessment implemented?	4 ⁸		
c. Does the statewide science assessment measure achievement of the state's standards, i.e. is the assessment aligned with state standards?	Yes ⁸		
d. Is the content of the statewide science assessment sub-divided by discipline, namely Physical Science, Life Science, Earth and Space Science?	Yes ⁹		
e. Are there any plans for revising or changing the current elementary level science assessment?	No plans for revision	The new assessment will be implemented in 2017 that will align with NGSS. ⁴	
	Revision is planned, but timeline is unknown		
	Revision is planned with implementation date set		X
	Unknown		

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 Reporting¹⁰

a. At the district level, are the percentages of students performing at each PLD reported to the public?	Yes	A NECAP District Summary Report is generated for each district in the state that details student performance on the Grade 4 NECAP Science assessment. The NECAP District Summary Report provides Grade 4 District results as scaled scores and achievement levels. Results are further divided by the following Science Domains: Physical Science Earth Space Science Life Science Inquiry
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 Reporting¹¹

a. At the state level, are the percentages of students performing at each PLD reported to the public?	Yes	A NECAP State Summary Report is generated that provides Grade 4 State-level results as scaled scores and achievement levels. Results are further divided by the following Science Domains: Physical Science; Earth Space Science; Life Science; Inquiry
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	The NECAP State Summary Report is available through the SEA website.

B. Elementary School International Assessments in Science

1. TIMSS¹²

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 Content¹³

a. What is the name of the statewide standardized test in science at the middle school level?	New England Common Assessment Program, Science Assessment (NECAP Science Assessment)
b. At what grade(s) is the assessment implemented?	8
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

C. High School Statewide Science Assessment(s)

1. Structure and Content¹³

a. What is the name of the state's standardized science assessment(s)?	New England Common Assessment Program, Science Assessment (NECAP Science Assessment)
b. At what grade level is the assessment implemented?	11
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 Student¹⁴

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 a NECAP Science Student Report to parents/guardians. This report describes an individual student's performance on the NECAP statewide science assessment in terms of scaled score and achievement level.
b. Is the ISR made available to a student's parents or guardians?	Yes	The Grade 4 NECAP Science Student Report subdivides a student's performance according to the following Science Domains: Physical Science
c. Is the ISR made available to a student's teacher?	Yes	Earth Space Science Life Science
d. Does the ISR report student's performance in terms of scale score and achievement level?	Yes	Inquiry the NECAP Science Student Report is available to authorized school personnel.
e. Does the ISR subdivide results by science discipline (Physical Science, Life Science, Earth and Space Science)?	Yes	In addition, a NECAP Item Analysis Report is generated for schools. This report provides scaled score and achievement level for each student in the school in science. The report also provides raw data for students and lists the Science Domain for each item. A Grade Level Summary Report is also generated for schools. This report provides school-wide Grade 4 results on the NECAP Science assessment. Mean results are reported as scaled scores and achievement levels. Results are further divided by Science Domains.

2. Teacher Appraisal⁴

a. Are students' results on the statewide science assessment a component of teacher evaluation?	No
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B. District Level

1. District Accreditation⁴

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

C. State Level

1. Statewide Monitoring⁴

a. Are student outcomes in statewide science assessments at the elementary level used in monitoring the adequacy of state educational systems?	No	
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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)		6 years of data (2008-2014)
	4-7 years (2007-2008 to 2013-2014)	X	
	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)?	Yes
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¹ Rhode Island Department of Education, Teachers and Administrators, Educator Certification, Certification – Current and Future Educators, Requirements, Teachers:

<http://www.ride.ri.gov/TeachersAdministrators/EducatorCertification.aspx#requirements>

² Educational Testing Service, Praxis, Rhode Island, Test Requirements, Rhode Island Test Requirements:

<http://www.ets.org/praxis/ri/requirements/>

³ Rhode Island Department of Education, Teachers and Administrators, Educator Certification:

<http://www.ride.ri.gov/Portals/0/Uploads/Documents/Teachers-and-Administrators-Excellent-Educators/Educator-Certification/Cert-main-page/CertificationRedesign-IssuanceRenewalReinstatement.pdf>

⁴ Rhode Island Department of Education (personal communication).

⁵ Education Commission of the States, State Textbook Adoption: <https://www.ecs.org/clearinghouse/57/75/5775.htm>

⁶ Rhode Island Department of Education, Instruction and Assessment, Science, Next Generation Science Standards:

<http://www.ride.ri.gov/InstructionAssessment/Science/NextGenerationScienceStandards.aspx>

⁷ Rhode Island Department of State, Regulations of the Board of Regents for Elementary and Secondary Education, Title L – Secondary Design: <http://sos.ri.gov/documents/archives/regdocs/released/pdf/DESE/6433.pdf>

⁸ Rhode Island Department of Education, Instruction and Assessment, Assessment, NECAP Science Assessment: <http://www.ride.ri.gov/InstructionAssessment/Assessment/NECAPScienceAssessment.aspx>

⁹ Rhode Island Department of Education, Instruction and Assessment, Assessment, NECAP Science Assessment, Technical Reports, Science, 2011-12 NECAP Science Technical Report with Appendices, PDF:
<http://www.ride.ri.gov/InstructionAssessment/Assessment/NECAPScienceAssessment.aspx#17113-technical-reports>

¹⁰ New England Common Assessment Program, NECAP Reporting, Reporting:
<http://reporting.measuredprogress.org/NECAPPublicRI/select.aspx>

¹¹ Rhode Island Department of Education, Instruction and Assessment, Assessment, NECAP Science Assessment, NECAP Results, State-Level Results, Grade 4, PDF:
<http://www.ride.ri.gov/InstructionAssessment/Assessment/NECAPScienceAssessment/NECAPResults.aspx#1552746-2014>

¹² 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>

¹³ Rhode Island Department of Education, Instruction and Assessment, Science, NECAP:
<http://www.ride.ri.gov/InstructionAssessment/Science.aspx#17772-necap>

¹⁴ Rhode Island Department of Education, Instruction and Assessment, Assessment, NECAP Science Assessment, NECAP Results, Guide to Using the 2014 NECAP Science Results, PDF:
<http://www.ride.ri.gov/InstructionAssessment/Assessment/NECAPScienceAssessment/NECAPResults.aspx#1552746-2014>

¹⁵ Rhode Island Department of Education, Instruction and Assessment, Assessment, NECAP Science Assessment, NECAP Results, NECAP Science Results:
<http://www.ride.ri.gov/InstructionAssessment/Assessment/NECAPScienceAssessment/NECAPResults.aspx#1552746-2014>