I. Teacher Preparation

A. Elementary School Licensure Requirements

1. Licensure Grade Levels[1]

a. Does the state offer an Early Elementary Education credential (Preschool/Kindergarten to Grade 2/3)?	Yes	Early Childhood (Ages 3 - 8)
b. Does the state offer an Elementary Education credential (Kindergarten/Grade 1 to Grade 5/6)?	Yes	Elementary (ages 7-12)

2. Early Elementary[2]

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 Education[2]

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[3]

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	There are no requirements. The courses may be taken as a part of pre-service preparation or as a part of a Master program.
	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?	No

b. If yes, which of the following does the state provide?	1. Science frameworks		
	2. Curriculum maps		
	3. Learning progressions		
	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[4]

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

b. If the state is an adoption state, do adopted materials in science include those that address topics specific to the geosciences?	N/A	American Legacy Publishing: Science Studies Weekly (k-5) Capstone: Oklahoma K-5 Science Bundles Carolina Biological Supply Company: STC series. Topic-related titles, including those related to the geosciences, e.g. Weather, Land and Water, Sun Earth Moon Systems. Cengage Learning, Inc.: EX SCI: K-5 series. Titles are subdivided by Life Science, Physical Science, and Earth Science Delta Education, LLC: FOSS series. Topic-related titles, including those related to the geosciences, e.g. Air and Weather, Pebbles, Sand and Silt, Water and Climate, Landforms. Discovery Education Inc.: Discovery Education Science Techbooks, Grades K-5 Houghton Mifflin Harcourt: Science and Engineering Leveled Readers, K-5 (various titles) Reading in Science (various titles) McGraw-Hill School Education, LLC: Wonders Science, Content Reader Packages, PKG-6 Pearson, Scott Foresman: Pearson Interactive Science, K-5 Student Editions Sangari Active Science, SASC, LLC.: Kits and TE with various titles, include geoscience related, e.g. Weather, Earth Systems, Soil

3. Support for New Standards[3]

a. Does that state provide resources to school systems to effectively implement the standards as they change?	Yes	X	Resources are being developed that support the standards. The resources will include content support and lesson models around the domains. In addition, examples of differentiated lessons and assessment supports will also be developed. Professional development will focus on standards orientation and best practices. Workshops will be in person at various locations around the state and virtual.
	No		
	Local issue		
	Unknown		

4. Professional Development[3]

a. Does the SEA provide professional development that is, at least in part, specific to the geosciences?	Yes, provided by SEA		Teachers do participate in WET and WILD. The state office does not keep statistics on the number of participants. Universities offer geosciences courses that would prepare pre-service teachers.
	Yes, but independent of SEA	X	
	No		
	Local issue		
	Unknown		

II. Curriculum

A. Elementary School State Science Standards

1. Organization[5]

a. What is the name of the state's elementary school science standards?	Oklahoma Academic Standards for Science

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?	Disciplinary Core Ideas
	Sub-standard statements that provide more detail to the overarching standards (level two)	X		Performance Expectations

2. Content[5]

a. Are the science standards subdivided according to scientific discipline (Physical Science, Life Science, and Earth and Space Science)?	Yes	The standards are organized according to three Domains: Physical Science Life Science Earth and Space Science
b. Are the Earth and Space Science standards identified by core ideas in the geosciences?	Yes	The Earth and Space Science Domain is sub-divided by the following topics: Earth's Place in the Universe Earth's Systems Earth and Human Activity Topics are further subdivided by Disciplinary Core Idea. These include: <u>Earth's Place in the Universe</u> The Universe and its Stars Earth and the Solar System The History of Planet Earth <u>Earth's Systems</u> Weather and Climate Biology Human Impacts on Earth Systems Earth Materials and Systems Plate Tectonics and Large-Scale System Interactions The Roles of Water in Earth's Surface Processes <u>Earth and Human Activity</u> Natural Resources

		Natural Hazards Human Impacts on Earth Systems
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	Kindergarten – Students look at the use of natural resources by humans. They also consider local forms of severe weather and safety precautions associated with that severe weather. 1st Grade – Students consider the impact of humans on land, water, air resources and the local environment. 3rd Grade – Students look at weather-related hazards, their impacts, and ways humans can reduce those impacts. 4th Grade – Students examine renewable and nonrenewable energy resources. Students also examine natural hazards (earthquakes, tsunamis, volcanic eruptions) and ways humans can reduce the impacts of those hazards. 5th Grade – Students identify ways humans can protect and conserve natural resources and the environment.
d. Do the state's standards include career exploration in the geosciences?	Yes	Kindergarten – Students look at role or weather scientists in forecasting severe weather so that communities can prepare for and respond to these events. There is no emphasis on career options/exploration in the other grade levels.

3. Development[5]

a. When were the standards adopted or last revised?	Within the last two years (2014-2015)	X	
	Between 3-6 years ago (2010-2013)		
	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		The Oklahoma Academic Standards for Science were adopted in 2014. They are replacing the Priority Academic Student Skills (PASS) for Science, which were adopted in 2011.
	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. Content[5]

a. What is the name of the state's middle school science standards?	Oklahoma Academic Standards for 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. Content[5]

a. What is the name of the state's high school science standards?	Oklahoma Academic Standards for 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 Graduation[6]

a. What is the total number of credits required for graduation?	23
b. What is the number of science credits required for graduation?	3

2. Course Content[6]

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?	Yes
f. Does Earth Science have to be lab-based?	Yes

III. Instruction

A. Elementary School Approaches to Instruction

1. State Science Standards[5]

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?	Science and Engineering Practices

c. Do the state's science standards provide a rationale for this approach?	Yes

d. If so, what is the rationale?	The Science and Engineering Practices describe the major practices that scientists employ as they investigate and build models and theories about the world and a key set of engineering practices that engineers use as they design and build systems. The term "practice" is used instead of the term "process" to emphasize that scientists and engineers use skill and knowledge simultaneously, not in isolation.

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[3]

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 from district to district. Some schools have 1 to 1 technology. Schools use a variety of computers, IPads, and digital lab equipment to teach science.

IV. Learning Contexts

A. Elementary School Classrooms

1. Class Size[3]

a. What is the average number of students in an elementary classroom?	Class sizes vary from district to district. Some rural schools only have 62 students.
b. What is the maximum allowable number of students in an elementary classroom?	Unknown

2. Instructional Time[3]

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

B. Elementary School Support Services

1. Specialized Support[3]

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		Universal Design for Learning is used to help all the students particularly the special education and ESL students.
	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[3]

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

b. If so, what are they?	Oklahoma has informal science partners that provide science programs after school. The programs are provided by parks and recreation, museums, and state parks. The Oklahoma Association of Environmental Education provides science initiatives.

2. Remedial Education[3]

a. What remedial supports are in place for geosciences topics with which students are struggling?	Local level decision	X	Remediation varies by school.
	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?	Oklahoma State Testing Program (OSTP), Oklahoma Core Curriculum Tests (OCCT), Science Grade 5[7]
b. At what grade(s) is the assessment implemented?	5[7]
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[7]

e. Are there any plans for revising or changing the current elementary level science assessment?	No plans for revision		Currently, the Oklahoma Core Curriculum Tests (OCCT), Science Grade 5 assesses standards and objectives found in the Priority Academic Student Skills (PASS) for Science, which were adopted in 2011. The State adopted the Oklahoma Academic Standards for Science in June of 2014. The OCCT, Science Grade 5 will assess the standards and objectives found in the new standards beginning in the 2016-2017 school year.[3]
	Revision is planned, but timeline is unknown		
	Revision is planned with implementation date set	X	
	Unknown		

2. Results[9]

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

3. District Level Reporting[10]

a. At the district level, are the percentages of students performing at each PLD reported to the public?	Yes	Summary Reports are produced at the district level for all subjects tested. These reports communicate summary results of all students tested. Summary Reports for Science Tests Grade 5 are disaggregated by Standards and Objectives tested from the Priority Academic Student Skills (PASS) for Science, which were adopted in 2011. These include: 1) Properties of Matter and Energy
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	

		2) Organisms and Environments 3) Structures of the Earth and the Solar System

4. State Level Reporting[11]

a. At the state level, are the percentages of students performing at each PLD reported to the public?	Yes	The SEA publishes a "State Results Summary" report to the public with scores on the Oklahoma Core Curriculum Tests (OCCT) Grade 5 Science. The report provides aggregated scores as well as median percent correct by standards and objectives from the State's science standards.
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. TIMSS[12]

a. Has the state participated in the Trends in International Mathematics and Science Study (TIMSS)?	No

b. If yes, in which years did the state participate?	1995	
	2003	
	2007	
	2011	

C. Middle School Statewide Science Assessment

1. Structure and Content[13]

a. What is the name of the statewide standardized test in science at the middle school level?	Oklahoma School Testing Program (OSTP), Grade 8 Science
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 Content[13]

a. What is the name of the state's standardized science assessment(s)?	Oklahoma School Testing Program (OSTP), End-of-Instruction (EOI) Biology I
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?	No
e. Does the assessment address Earth Science concepts?	No

VII. Accountability

A. School Level

1. Individual Student[14]

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 Student Report to parents/guardians. The Student Report describes an individual student's performance in terms of scale score, achievement level, and according to the State's academic standards for each subject. The Student Report for a grade 5 student includes the student's performance on the science assessment. The Student Report for science provides sub-scores which indicate an individual student's performance on each of the Standards and Objectives tested according to the Priority Academic Student Skills (PASS) for Science, which were adopted in 2011 (the State's science standards). These include: 1) Properties of Matter and Energy 2) Organisms and Environments 3) Structures of the Earth and the Solar System The Student Report is shared with teachers. In addition, a Class Summary Report is generated for teachers that allows a teacher to examine both the distribution of the class performance across performance levels and the pattern of the class performance across the standards and objectives assessed.
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 Appraisal[15]

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

B. District Level

1. District Accreditation[4]

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

C. State Level

1. Statewide Monitoring[4]

a. Are student outcomes in statewide science assessments at the elementary level used in monitoring the adequacy of state educational systems?	Yes	Science scores are reported to the public and used to improve instruction.

2. Trends in Student Outcomes[16]

a. Does the SEA report to the public performance results on the state science assessment over time?	Yes	

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)		
	8 to 10 years (2004-2005 to 2013-2014)	X	9 years of data (2003-2013)
	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

[1] Office of Educational Quality, National Board Certification, Certification Areas, Teacher Certification: https://www.ok.gov/oeqa/National_Board_Certification/Certification_Areas/index.html
[2] Certification Examinations for Oklahoma Educators, CEOE Study Guides, PDFs: http://www.ceoe.nesinc.com/CE_studyguide_opener.asp
[3] Oklahoma State Department of Education (personal communication).
[4] Oklahoma State Textbook Committee, School District Information, 2015 Approved Materials, MSExcel: http://oktextbooks.ok.gov/
[5] Oklahoma State Department of Education, Science, Oklahoma Academic Standards for Science: http://ok.gov/sde/science#Resources
[6] High School Curricular Requirements for Admission to Oklahoma Colleges and Oklahoma's Promise – (Oklahoma Higher Learning Access Program) http://ok.gov/sde/sites/ok.gov.sde/files/High%20School%20Course%20Approval%20for%20College%20Admission%20and%20OHLAP_Version8202014.pdf
[7] Oklahoma State Department of Education, Office of Assessments, Assessment Materials, Grade 5 Science Item Specs, OKLAHOMA SCHOOL TESTING PROGRAM,
OKLAHOMA CORE CURRICULUM TESTS, TEST and ITEM SPECIFICATIONS, Science, Grade 5, PDF: http://ok.gov/sde/documents/2013-09-05/blue-prints-plds-item-specs
[8] Oklahoma State Department of Education, Science, Oklahoma Academic Standards for Science, PDF: http://ok.gov/sde/science#Resources
[9] Oklahoma State Department of Education, Office of Assessments, Assessment Materials, Grade 5, PLDs, Grade 5 Science Performance Level Descriptors, PDF: http://ok.gov/sde/documents/2013-09-05/blue-prints-plds-item-specs
[10] Oklahoma State Department of Education, Office of Assessments, State Testing Resources, Downloads, Oklahoma School Testing Program, 2013-2014 Test Interpretation Manual, PDF http://ok.gov/sde/assessment-administrator-resources-administrators
[11] Oklahoma State Department of Education, Office of Assessments, State Testing Resources, State Summary Reports, Science, Oklahoma Core Curriculum Tests (OCCT) Grade 5 Science – Spring 2014 Administration, State Results Summary, PDF: http://ok.gov/sde/assessment-administrator-resources-administrators
[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] Oklahoma State Department of Education, Assessment Materials: http://ok.gov/sde/documents/2013-09-05/blue-prints-plds-item-specs
[14] Oklahoma State Department of Education, Office of Assessments, State Testing Resources, Downloads, Oklahoma School Testing Program, 2013-2014 Test Interpretation Manual, PDF: http://ok.gov/sde/assessment-administrator-resources-administrators
[15] Oklahoma State Department of Education, TLE Quantitative Components, VAM Training PAK (Presentation Assistance Kit) for TLE, Quick Facts Brochure: http://www.ok.gov/sde/documents/2014-05-02/vam-training-pak-presentation-assistance-kit-tle
[16] Office of Educational Quality and Accountability, School and District Profiles Reports, Profiles State Reports, 2013 State Report, PDF: https://www.ok.gov/oeqa/School_&_District_Profiles_Reports/State_Reports.html