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 Education (PreK - K) Early Childhood Education (K – 4)
b.	Does the state offer an Elementary Education credential (Kindergarten/Grade 1 to Grade 5/6)?	Yes	Elementary Education (K - 6)

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?	No

3. Elementary Education[2]

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 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	Elementary teachers do not, at this time, receive certification credit for professional development courses/programs in Earth and Space Sciences. However, elementary educators can participate in recertification and licensure renewal with various classes associated with earth and space sciences provided by recognized accredited institutions of higher learning.[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

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	X	Teach 21 Web Site[5]
		6. Curriculum development guides		
		7. Model units		
		8. Lesson plan templates/guides		
		9. Web-based lesson plan portals	X	Teach 21 Web Site[5]
		10. Model lesson plans		
		11. Assessment guidelines		

2. Instructional Materials[6]

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?	Yes	Delta Education FOSS K, 1, 2, 3, 4, 5 (geoscience titles include Pebbles, Sand and Silt; Air and Weather; Earth Materials; Ladforms; Solar Energy; Water) Harcourt School Publishers Harcourt Science, K-6 MacMillan McGraw Hill MacMillan/McGraw-Hill Science K, 1, 2, 3, 4, 5 Pearson Scott Foresman Scott Foresman Science, K, 1, 2, 3, 4, 5 Houghton Mifflin Company Houghton Mifflin Science, K-6

3. Support for New Standards[4]

a.	Does that state provide resources to school systems to effectively implement the standards as they change?	Yes		Local school systems are provided financial resources to purchase curricula and materials for instruction in science. The state will fund local school systems with instructional material funds so they can purchase resources and effectively implement the standards as they change.
		No		
		Local issue	X	
		Unknown		

4. Professional Development[4]

a. Does the SEA provide professional development that is, at least in part, specific to the geosciences?	Yes, provided by SEA		The state provides professional development of project WET and project WILD through the Department of Natural Resources. Institutions of Higher Education in West Virginia are charged with teacher preparedness for teaching geosciences through classes taught at the undergraduate level, and also a more in-depth study of geosciences through post-graduate level courses.
	Yes, but independent of SEA	X	
	No		
	Local issue		
	Unknown		

II. Curriculum

A. Elementary School State Science Standards

1. Organization[7]

a. What is the name of the state's elementary school science standards?	21st Century Science K-8 Content Standards and Objectives for West Virginia Schools

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 Descriptors
	Sub-standard statements that provide more detail to the overarching standards (level two)			

2. Content[7]

a. Are the science standards subdivided according to scientific discipline (Physical Science, Life Science, and Earth and Space Science)?	No	21st Century Science K-8 Content Standards and Objectives for West Virginia Schools Standards are organized according to the following: Standard 1: Nature of Science Standard 2: Content of Science Standard 3: Application of Science Standard 2 states "Students will demonstrate an understanding of the interrelationships among physics, chemistry, biology and the earth and space sciences."
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-	Yes	21st Century Science K-8 Content Standards and Objectives for West Virginia Schools An objective in Grade 5 states, "Students will identify resources as being renewable or non-renewable."

being.		
d. Do the state's standards include career exploration in the geosciences?	Yes	21st Century Science K-8 Content Standards and Objectives for West Virginia Schools Standard 1: Nature of Science, at the K, 1, 2, 3, and 4 levels, states that, "Students will demonstrate an understanding of the history and nature of science as a human endeavor encompassing the contributions of diverse cultures, scientists, and careers." An objective in grade 2, "Students will identify and discuss science careers in the community." An objective in grade 3, "Students will explore science careers in the community." An objective in grade 4, "Students will explore science careers in West Virginia." An objective in grade 5, "Students will examine the careers and contributions of men and women of diverse cultures to the development of science."

3. Development

a. When were the standards adopted or last revised?	Within the last two years (2014-2015)		21st Century Science K-8 Content Standards and Objectives for West Virginia Schools Adopted September 14, 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		The current state science standards are the 21st Century Science K-8 Content Standards and Objectives for West Virginia Schools. On December 11, 2014, the Next Generation Content Standards and Objectives for Science in West Virginia Schools were accepted as the new state science standards. These will go into effect on July 1, 2016.[7]
	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[8]

a. What is the name of the state's middle school science standards?	Next Generation Content Standards and Objectives for Science in West Virginia Schools (Next Generation Science Standards)

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[9]

a. What is the name of the state's high school science standards?	Next Generation Content Standards and Objectives for Science in West Virginia Schools (Next Generation Science Standards)
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[10]

a. What is the total number of credits required for graduation?	24
b. What is the number of science credits required for graduation?	3

2. Course Content[10]

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 Standards[7]

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?	Inquiry

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

d. If so, what is the rationale?	The study of science as a human endeavor provides for the acquisition of ideas leading toward the current knowledge base that represents science content. The nature of science encompasses the basic values and beliefs that make up the scientific world view, how scientists go about their work and the general culture of scientific enterprise. Studying historical and current discoveries of scientists and scientific milestones provides students with information about how discoveries have influenced current scientific thought and advancements. Students should understand that the continuous development of scientific knowledge shapes history. The study of the history and nature of science clarifies scientific inquiry and the role of science in the development of world cultures. Students will engage in active inquiry through investigations and hands-on activities a minimum of 50% of the instructional time. Developing scientific literacy requires a learning environment in which students actively participate in meaningful hands-on activities while developing current technology skills. These investigations explore the natural world, require critical thinking and develop process skills. Learning activities are sequenced to shape, modify and develop students' knowledge in order for them to become independent inquirers.

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[4]

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 local school systems. Many schools engage in distance learning, computer enhanced learning, and a variety of other technology based learning systems. Most schools have interactive white boards to assist in the delivery of curriculum; however, this too is a local control decision.

IV. Learning Contexts

A. Elementary School Classrooms

1. Class Size[4]

a. What is the average number of students in an elementary classroom?	Average classroom size, beyond what is in code, is determined at the local level.
b. What is the maximum allowable number of students in an elementary classroom?	Per state code, elementary classrooms in West Virginia cannot exceed over 25 students.

2. Instructional Time[4]

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		In Policy 2510, time devoted to individual subjects is determined by the educator. Learning Programs serving students in grades Pre-K-5 address the holistic needs of all students. A comprehensive approach to early learning is inclusive of a balanced focus on knowledge and skill-building, the development of positive dispositions to learning, provides the potential to improve child outcomes and closes achievement gaps.
	Local decision	X	
	Teachers must spend a certain amount of time teaching science.		
	Unknown		

B. Elementary School Support Services

1. Specialized Support[4]

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		Support for Personalized Learning (SPL) is a framework of multiple supports for all students and includes the process referred to as response to intervention (RTI). SPL includes: 1) Providing high-quality instruction matched to student needs; 2) screening all students for academic and behavior concerns; 3) continuous monitoring of student performance; and 4) using learning rate over time and level of performance to make important educational decisions. It is a systematic multi-level approach for supporting the diverse needs of students in both academic and behavioral domains through the use of universal design for learning (UDL), differentiated instruction and targeted and intensive interventions based on ongoing assessments of student performance. This process is characterized by procedures aligned with the steps of problem solving and documents a student's response or non-response to general education instruction and the student's academic performance in comparison to grade-level standards.
	Depends on the specifications of a student's IEP or ILP	X	
	Teachers must follow specific practices regarding science		
	Unknown		

V. Extra-Curricular Programs

A. Elementary School Geosciences Enrichment Opportunities

1. After-School and Informal Education[4]

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?	There are no requirements in the state for after school clubs in the elementary setting. Local Educational Agencies may provide interest or developmentally appropriate clubs for students after school hours. West Virginia Department of Education partners with many institutions of higher learning to conduct science education initiatives. The West Virginia Math Science Partnerships pairs private industry, higher education, and Local Education Agencies with educators to improve or enhance professional learning and student achievement. Our Youth Science Camp partners with industry, higher education, state agencies, and local educational agencies to improve science application and knowledge.

2. Remedial Education[4]

a. What remedial supports are in place for geosciences topics with which students are struggling?	Local level decision		Through Support for Personalized Learning initiatives students with difficulty in all subject areas are addressed.
	Remediation services are being provided to students in science	X	
	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?	West Virginia Educational Standards Test 2 (WESTEST2)[11]
b. At what grade(s) is the assessment implemented?	3, 4, and 5[11]
c. Does the statewide science assessment measure achievement of the state's standards, i.e. is the assessment aligned with state standards?	Yes[12]
d. Is the content of the statewide science assessment sub-divided by discipline, namely Physical Science, Life Science, Earth and Space Science?	No[13]

e. Are there any plans for revising or changing the current elementary level science assessment?	No plans for revision		The West Virginia Department of Education is in the process of changing the science test to reflect content and processes of the new standards, however, students in grades 3-11 are tested on current standards every year through our WESTEST 2.[4]
	Revision is planned, but timeline is unknown	X	
	Revision is planned with implementation date set		
	Unknown		

2. Results[14]

a. Is student achievement measured by Performance Level Descriptors?	Yes
b. If yes, how many performance levels are there?	5

3. District Level Reporting[15,16]

a. At the district level, are the percentages of students performing at each PLD reported to the public?	Yes	The SEA has created the WVDE Public Reporting website. Here, the public can obtain information about performance on the statewide assessments, including science, at the school and county levels. Scores are reported as percentage of students proficient in science. However, the SEA produces two reports at the State and County levels that report performance according to content standards or clusters: Confidential Summary Report (CSR) Confidential Item Analysis Summary (CIAS) These reports are not available to the public.
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?	No	

4. State Level Reporting[16,17]

a. At the state level, are the percentages of	Yes	At a State level, scores reported are aggregated

students performing at each PLD reported to the public?		and 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, the SEA produces two reports at the State and County levels that report performance according to content standards or clusters: Confidential Summary Report (CSR) Confidential Item Analysis Summary (CIAS)
c. If yes, is this data available to the public?	No	These reports are not available to the public.

B. Elementary School International Assessments in Science

1. TIMSS[18]

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[19]

a. What is the name of the statewide standardized test in science at the middle school level?	West Virginia General Summative Assessment
b. At what grade(s) is the assessment implemented?	6
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[19]

a. What is the name of the state's standardized science assessment(s)?	West Virginia General Summative Assessment
b. At what grade level is the assessment implemented?	10
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 Student[20]

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 Student Report to parents/guardians. This report describes an individual student's performance on statewide assessments in terms of scale score and performance level. The SEA also produces an Individual Right Response Record that provides responses according to content standard and objective number. Grades 3, 4 and grade 5 reports include student performance on the science assessment. The Individual Student Report and Individual Right Response Record are provided to schools to direct instruction.
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[4]

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

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	

2. Trends in Student Outcomes[16, 17]

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)	X	6 years of data (2007-2013)
	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

[1] West Virginia Department of Education, TeachWV, Educator Preparation: http://wvde.state.wv.us/teachwv/teachprep.html
[2] Educational Testing Service, Praxis, West Virginia, Test Requirements, West Virginia Test Requirements: http://www.ets.org/praxis
[3] West Virginia Department of Education, State Board Policies, Policy 5202 Licensure of Professional/Paraprofessional Personnel: http://wvde.state.wv.us/policies/index.html#p5202
[4] West Virginia Department of Education (personal communication).
[5] West Virginia Department of Education, Teach21: http://wvde.state.wv.us/teach21/
[6] West Virginia Department of Education, Materials, Past Official Multiple Lists for English Language Arts and Health, 2006-2012 Multiple Listing (Science/Health part 2): http://wvde.state.wv.us/materials/GroupIIandIII.html
[7] West Virginia Department of Education, Policies, CSOs – Content Standards and Objectives Policies, Policy 2520.3 and Policy 2520.3C: http://wvde.state.wv.us/policies/csos.html
[8] West Virginia Department of Education, Content Standards and Objectives Policies, Policy 2520.3: http://wvde.state.wv.us/policies/csos.html
[9] West Virginia Department of Education, Content Standards and Objectives Policies, Policy 2520.3C: http://wvde.state.wv.us/policies/csos.html
[10] West Virginia Department of Education, WV Graduation Requirements: http://wvde.state.wv.us/counselors/students/graduation-requirements.html
[11] West Virginia Department of Education, WESTEST 2: http://wvde.state.wv.us/oaa/westest_index.html
[12] West Virginia Department of Education, WESTEST 2, Tech Data, Alignment Analysis, Science, Alignment Analysis of Science Standards and Post-Field Test WESTEST 2 Assessments, PDF: http://wvde.state.wv.us/oaa/westest_index.html
[13] West Virginia Department of Education, OAA File Cabinet, WESTEST 2, Technical Reports (2008 – Present), 2012 WESTEST 2 Technical Report.PDF, WVDE WESTEST 2 Technical Report Spring 2012 WESTEST 2 Reading/Language Arts, Mathematics, Science, and Social Studies Assessments: https://sites.google.com/a/wvde.k12.wv.us/oaar-file-cabinet/westest-2
[14] West Virginia Department of Education, WESTEST 2, Scale Score Ranges and Academic Achievement Descriptors: http://wvde.state.wv.us/oaa/westest2_cut_score_ranges.html#G5S

[15] West Virginia Department of Education, School and District Information, Academic Performance, WESTEST2 by County: http://wveis.k12.wv.us/nclb/pub/
[16] West Virginia Department of Education, Sample State Reports: http://wvde.state.wv.us/oaa/westest2_reports_state.html
[17] West Virginia Department of Education, Report Card 2012/2013 http://wveis.k12.wv.us/nclb/pub/rpt1213/pickreportcard.cfm
[18] 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
[19] West Virginia Department of Education, Assessment and Accountability: http://wvde.state.wv.us/oaa/
[20] West Virginia Department of Education, Assessment and Accountability, Parent Interpretative Guide to Student Reports for West Virginia Educational Standards Test 2 (WESTEST 2): http://wvde.state.wv.us/oaa/parent.html