Science Instructional Materials Review Criteria

Program Name: _____

CATEGORY 1: STANDARDS ALIGNMENT

Washington State adopted the Next Generation Science Standards in October 2013 as the Washington State Science Learning Standards. The NGSS Innovations are the five most significant ways the NGSS advance science teaching and learning, when compared to previous standards and typical instructional and curricular practice in American schools.

- Innovation 1: Making Sense of Phenomena and Designing Solutions to Problems (Category 1)
- Innovation 2: Three-Dimensional Learning (Category 1) and Assessment (Category 2)
- Innovation 3: Building K–12 Progressions (Category 1)
- Innovation 4: Alignment with English Language Arts and Mathematics (Category 1)
- Innovation 5: All Standards, All Students (Category 3)

4: Superior Evidence 3: Strong Evidence 2: Moderate Evidence 1: Minimal Evidence 0: No Evidence

	Aligned to Standards	Scientifically Accurate	Grade-level Appropriate	Average Score
1. The instructional materials present the SEPs (Science and Engineering Practices) in a way that is:				
2. The instructional materials present the DCIs (Disciplinary Core Ideas) in a way that is:				
3. The instructional materials present the CCCs (Crosscutting Concepts) in a way that is:				

4. Individual learning activities include at least two of the three dimensions: Science and Engineering Practices (SEPs), Disciplinary Core Ideas (DCIs), and Crosscutting Concepts (CCCs).	
5. The instructional program provides phenomena-based science units.	
6. The instructional program engages students in the engineering design process by solving relevant and appropriately sophisticated engineering problems.	
7. Units are organized as a storyline, anchored by a phenomenon or engineering problem that allows for students to build knowledge to explain the phenomenon or solve the engineering problem.	
8. Phenomena and/or engineering problems are presented to students as directly (first hand) as possible.	
9. The instructional program provides opportunities for students to collect evidence using computer-based simulations, hands-on investigations, informational texts, and other media.	
10. Instructional materials draw upon students' prior knowledge and experiences related to the targeted learning of SEPs, DCIs, and CCCs.	
11. Instructional materials provide students with opportunities to consider the ethical implications of science.	
12. The instructional program lists grade-appropriate connection(s) to the Common Core State Standards in Math and English Language Arts.	
13. The instructional program requires students to use and build their knowledge of the Disciplinary Core Ideas within the following domains throughout the course:	
Life Science	Rating:
Earth and Space Science	Rating:
Physical Science	Rating:
Engineering, Technology, and Application of Science	Rating:
Average Rating for Component 13:	

14. The instructional program requires students to use and build their knowledge of the Science and Engineering Practices throughout the course:	
SEP 1: Asking Questions (science) and Defining Problems (engineering)	Rating:
SEP 2: Developing and Using Models	Rating:
SEP 3: Planning and Carrying Out Investigations	Rating:
SEP 4: Analyzing and Interpreting Data	Rating:
SEP 5: Using Mathematics and Computational Thinking	Rating:
SEP 6: Constructing Explanations (science) and Designing Solutions (engineering)	Rating:
SEP 7: Engaging in Argument from Evidence	Rating:
SEP 8: Obtaining, Evaluating, and Communicating Information	Rating:
Average Rating for Component 14:	

15. The instructional program requires students to use and build their knowledge of the Crosscutting Concepts throughout the course:	
CCC 1: Patterns	Rating:
CCC 2: Cause and Effect	Rating:
CCC 3: Scale, Proportion, and Quantity	Rating:
CCC 4: Systems and System Models	Rating:
CCC 5: Energy and Matter	Rating:
CCC 6: Structure and Function	Rating:
CCC 7: Stability and Change	Rating:
Average Rating for Component 15:	

Total Score:	/	Pts Possible: 60	=	% Score:

CATEGORY 2: ASSESSMENTS

Assessments, like standards-based instruction, need to interweave the disciplinary core ideas, science and engineering practices and cross-cutting concepts. "Effective assessment of three-dimensional science learning requires more than a one-to-one mapping between the NGSS performance expectations and assessment tasks. It is important to note that more than one assessment task may be required to adequately assess students' mastery of some three-dimensional targets, and any given assessment task may assess aspects of more than one performance expectation." (*NGSS Innovations and Instructional Materials*, 2017)

4: Superior Evidence	3: Strong Evidence	2: Moderate Evidence	1: Minimal Evidence	0: No Evidence

1. Assessments engage students in at least two of the three dimensions of teaching and learning: The Science and Engineering Practices (SEPs), Disciplinary Core Ideas (DCIs), and Crosscutting Concepts (CCCs).
2. Assessments are accessible to all learners regardless of gender identification, language, learning exceptionality, cultural, or socioeconomic status.
3. Assessments are designed to yield information teachers may use in planning and modifying instruction.
4. Assessment tools include multiple measures of student progress within a unit.
5. Pre-assessments for each unit are provided to elicit students' prior knowledge and preconceptions.
6. Formative assessments are embedded consistently within the unit of instruction and are designed to elicit understanding to provide evidence of students' progress toward mastering the three-dimensional learning.
7. Summative assessments, at the end of a chapter or a unit, require students to provide a complete scientific explanation for the unit phenomenon, supported by evidence.
8. Summative assessments involve a variety of modalities, including, but not limited to: hands-on or simulation-based performance tasks, open-ended constructed response problems, and scoring of portfolios of student work collected over the course of instruction.
9. Tools are provided for scoring assessment items (e.g., sample student responses, rubrics, scoring guidelines).
10. Guidance is provided for interpreting the assessments (e.g., determining what high and low scores mean for students) that allow for interpretation of levels of student understanding.
11. Instructional materials provide opportunities and guidance for oral and/or written self-assessment and teacher feedback allowing students to monitor their own learning.
12. Instructional materials include opportunities to use digital technology to assess three-dimensional learning.

Total Score:	/	Pts Possible: 48	=	% Score:

CATEGORY 3: INCLUSIVE EDUCATIONAL PRACTICES

Instructional materials designed for the NGSS provide opportunities for all learners, and guidance to teachers for supporting diverse student groups, including students from economically disadvantaged backgrounds, students with special needs (e.g., visually impaired students, hearing impaired students), English learners, students from diverse racial and ethnic backgrounds, students with alternative education needs, and talented and gifted students. They do so using a variety of approaches, but also ensure the features of NGSS design are intentionally leveraged to support diverse learners as they develop proficiency, agency, and identity in science. (*NGSS Innovations and Instructional Materials*, 2017)

4: Superior Evidence	3: Strong Evidence	2: Moderate Evidence	1: Minimal Evidence	0: No Evidence

1.	Instructional materials leverage students' knowledge and experiences by eliciting and revisiting ideas throughout the unit.
2.	Instructional materials are designed to leverage diverse cultural and socioeconomic backgrounds of students, including honoring the ways they come to know science.
3.	Instructional materials include options for how to connect instruction to students' home, neighborhood, community, and/or culture, with a lens on social justice and on sustainability.
4.	Instructional materials provide an intentional balance of a wide variety of activities within a unit (e.g., simulations, hands-on activities, readings, discourse, kinesthetic activities, etc.) to support students' engagement in content.
5.	Instructional materials emphasize the importance of science education to all members of society in a way that is culturally and socially authentic.
6.	Teacher resources supply differentiated paths for learners. In particular, resources provide instructional guidance to support students at various skill levels in science.
7.	Students express their understanding of the phenomena using multiple modalities, including, but not limited to, discussing, writing, and drawing.
8.	Instructional materials provide appropriate accommodations and modifications to support active participation in the learning of science and engineering by all students.
9.	Instructional materials are made accessible to students by providing appropriate supports for different reading levels.
10.	Instructional materials are available in multiple languages.
11.	Instructional materials provide opportunities for students to explore science and engineering careers connected to their lives through relevance and authenticity.

12. Instructional materials integrate technology-based, value-added tools that address issues of equitable access and support the growth of digital literacy skills and engagement for all students.
13. Instructional materials approach the content from multiple cultural and socioeconomic perspectives.
14. Instructional materials include work and innovations in the fields of science and technology done by people from different global societies.
15. Instructional materials include how different global communities experience, and are impacted by, science and engineering.
16. Instructional materials include examples of science innovations that have exploited groups in history to prevent the perpetuation of present and future exploitation.
17. Instructional materials emphasize the importance of using science and engineering to benefit all.

Total Score:	/	Pts Possible: 68	=	% Score:

CATEGORY 4: EVALUATION OF BIAS CONTENT

"As schools work to increase success for all students, it is important to recognize the impact of bias in classrooms, instructional materials, and teaching strategies. Evaluating for bias requires us to learn about others and to respect and appreciate the differences and similarities."

– WA OSPI Equity & Civil Rights Task Force

4: Superior Evidence 3: Strong Evidence 2: Moderate Evidence 1: Minimal Evidence 0: No Evidence

Instructions The column categories are umbrella terms meant to encompass all examples to consider while reviewing the instructional materials. For categories represented, evaluate the level of evidence for each of the numbered components.	Gender	Sexual Orientation	Ethnicity	Culture	Physical Disability	Physical Characteristics	Age	Family Structure	Socioeconomic Status	Geographic Setting	Average Score
1. Reflect qualities such as collaboration, compassion, intelligence, imagination, and courage.											
2. Represented as central characters in narratives and illustrations.											
3. Shown in active decision-making and leadership roles.											
4. Shown performing similar work in related fields.											
5. Referred to by their names and roles, not their characteristics.											

6. Materials include historical and current contributions to science and engineering by members of non-dominant cultures.
7. Groups are identified in gender-neutral language (example: 'firefighter' instead of 'fireman').
8. People of all genders are depicted in non-traditional as well as traditional roles in the family, at work, in leisure activities, and in attitude.
9. Persons with disabilities are shown working and playing as equals with those around them.
10. Where appropriate, instructional materials acknowledge when the dominant culture took credit for discoveries and work done by non-dominant cultures.

Total Score:	/	Pts Possible: 40	=	% Score:

CATEGORY 5: INSTRUCTIONAL PLANNING AND SUPPORT

"Educators must possess a repertoire of evidence-based instructional strategies in delivering the curriculum to develop talent, enhance learning, and provide students with the knowledge and skills to become independent, self-aware learners, and to give students the tools to contribute to a multicultural, diverse society. The curriculum, instructional strategies, and materials and resources must engage a variety of learners using culturally responsive practices." *–National Association for Gifted Children website*

4: Superior Evidence	3: Strong Evidence	2: Moderate Evidence	1: Minimal Evidence	0: No Evidence

1.	Teacher support materials provide storylines that show how units are intentionally sequenced
2.	The instructional program includes features that help teachers understand how the Science and Engineering Practices (SEPs), Disciplinary Core Ideas (DCIs), and Crosscutting Concepts (CCCs) are integrated throughout the materials.
3.	Instructional materials contain teacher guidance on the lesson level that explains how the targeted SEPs, DCIs, and CCCs work together to support students in making sense of phenomena or designing solutions to problems.
4.	The instructional program provides guidance to teachers on how to engage students in a variety of discourse strategies to support their three-dimensional learning.
5.	Teachers are provided with a wide variety of engaging, student-centered learning activities that help students make sense of phenomena and in designing solutions to related problems.
6.	The instructional program contains teacher guidance, with annotations and suggestions, for how to successfully implement their units and daily lesson plans.
7.	Instructional materials contain explanations of the instructional approaches of the program and identification of the research-based strategies.
8.	Teacher support materials provide background knowledge related to the scientific content in each lesson.
9.	Where appropriate, teacher background knowledge materials include a global and local perspective.
10.	Teacher support materials identify common student preconceptions and suggestions for how to provide feedback and engage students in meaning-making that addresses these preconceptions.
11.	Teacher support materials provide guidance with opportunities for checking for understanding and adjusting lessons, if necessary, to ensure three-dimensional learning.
12.	Instructional materials document how each lesson and unit align to English/Language Arts and Math Common Core State Standards.

13. Instructional materials include a comprehensive list of supplies needed, as well as a detailed list of preparation tasks, for each lesson.
14. Instructional materials embed clear science safety guidelines for teachers and students across all lessons that are consistent with science safety rules and regulations, when appropriate, lab safety sheets are provided, and digital safety concerns and guidelines are addressed.
15. Instructional materials designated for each grade level are appropriate for one school year, and teacher support materials contain suggested pacing for the school year.
16. Instructional materials contain strategies for informing students, parents, and caregivers about the science program and suggestions for how they can help support student progress and achievement.
17. Instructional materials encourage the meaningful use of technologies (such as video clips or computer simulations) to investigate phenomena that cannot be directly experienced in the classroom, as well as tools used to record, display, and analyze data.
18. Instructional materials provide guidance to teachers on how the use of embedded technology and how science instruction may be improved by the effective use of technology and multimedia literacy skills.
19. Instructional materials include or reference digital technology that provides opportunities for teachers and/or students to collaborate with each other (e.g., websites, discussion groups, webinars, etc.).

20. Electronic learning resources support instruction by:	Rating
a) indicating which lessons require technology.	
b) having a well-designed user interface.	
c) providing technical support.	
d) including suggestions for appropriate use.	
e) including back up analog-based plans.	
Average Rating for Component 20:	

Total Score:	/	Pts Possible: 80	=	% Score:

SUMMARY

	% Score		Points		Weighting		Score
Category 1		* 100 =		*		=	
Category 2		* 100 =		*		=	
Category 3		* 100 =		*		=	
Category 4		* 100 =		*		=	
Category 5		* 100 =		*		=	
						TOTAL	