Science Content Advisor Consensus Recommendations

Science Content Advisors:

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Topic	Concepts/Areas	Recommendations	Rationale
Framework	Current K-12 framework	Keep the current structure (strands) while considering the following recommendations in this section for the framework.	Current framework is comprehensive and manageable.
	Introduction	Address all introductions by making the wording more concise so that the introduction has a purpose, which is to include general descriptions and boundaries of the course/grade level for teacher use	Current introduction is redundant with the KS statements.
	Engineering design	Incorporate engineering design and application into the process skills. For example, see KS (3) for K–12.	Education research shows that students learn by doing. Students need practice with application of science and engineering processes to explore concepts.
	Relevance	Refine or add language in KS (3) for K–12 to encourage using real-world issues to make the content relevant to students' lives.	Content advisors are not suggesting adding specific, real-world examples, but encourage adding opportunities for teachers to connect science to the real world.

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Vertical Alignment	Vertical alignment	**K–5:** demonstrates clear vertical alignment **6–8:** Balance the science concepts (matter and energy; force, motion and energy; earth and space; organisms and environment) in each grade level similar to the K–5 TEKS to ensure clear and logical development of concepts across K–8. Consider reducing earth and space content in grades 6 through 8 and adding content for the other three science concepts (as listed above). **High School:** Ensure that K–8 TEKS support the high school TEKS and that the high school TEKS build from the K–8 TEKS.	To reinforce and spiral concepts so that students can better master, retain, and reinforce knowledge Currently, grades 6–8 concepts are not vertically aligned but are more subject specific (e.g., grade 7 is limited to life science). Adding the concepts will prepare middle school students for the required high school courses. The integration of concepts is similar to Cross-Cutting Concepts in NGSS.
	Conceptual gaps	Address conceptual gaps to include foundational concepts such solutions, bonding, pH, electricity, and structures of biomolecules. Where possible, identify and address these concepts in already existing SEs. For example, there is a large gap from grade 5 to high school when the TEKS cover electricity.	Students are showing up in grade 9 with conceptual gaps in knowledge needed to be successful in high school courses and prepared for college and career.
	Percentage of lab time	Keep current percentages of investigations at K–5 and lab time at grade 6–high school. • Add “such as” definitions of different kinds of investigations (wet lab, dry lab, field investigation). • Ensure that verbs in SEs support the recommendations and requirements of lab time. • Align verbs to cognitive level of students.	To give teachers clarification for the different kinds of definitions The verb in the SE should reflect the student action.

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Vertical Alignment (cont'd)	Additional high school science courses	Align language used in streamlined Biology, Chemistry, and Physics TEKS. See SE (3)(A) analyze, evaluate, and critique scientific explanations by using empirical evidence, logical reasoning, and experimental and observational testing, ~~including examining all sides of scientific evidence of those scientific explanations so as to encourage critical thinking by the student,~~ Eliminate "In all fields of science" in the KS statement.	Language was already removed from the courses during 2017 streamlining. Evidence does not have sides.
Science Concepts	K–5 Grade-specific science concept changes	Consider grade level changes in content suggested by content advisors, including rearrangements, additions, and deletions. For example, in grade 2 add gases and in grade 3 add volume to physical properties.	Adding concepts will ensure alignment.
	High school core courses	In high school, consider eliminating content so that teachers have the time to thoroughly teach the content necessary for postsecondary success.	"Mile wide/inch deep:" Sometimes teachers are forced to gloss over information because there are so many concepts.
	Earth and human activity	Clarify and expand human impact on ecosystems, including human use of resources and climate data. For example (but not limited to): SEs K.1.B, 4.7.C, 8.11.C	Existing framework requires human impact on the environment (positive and negative), environmental conscious decision making, conservation, and preservation. Use NGSS earth and space science (Earth and Human Activity Strand) as a guide to incorporate the topics listed above into the current standards. Content advisors recognize that climate change is a controversial topic, and it is important to identify unbiased sources of information.

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Process Skills	Scientific literacy	Consider adding that students should learn the difference between causation and correlation within KS (2) in high school. Address the reliability of sources of information within SE (3)(B) at high school and vertically align all grade levels as developmentally appropriate.	These skills promote scientific literacy and the identification and use of reliable sources.
	Math integration with science	Ensure that math is integrated into the standards. Integrate computational or quantitative concepts in science courses that are developmentally and age appropriate. Consider horizontal alignment with math.	These are essential and necessary skills for college and career readiness.
Wording and Language	Make technical edits to the language	Remove redundant and unnecessary language. For example, beginning at grades 6–high school SE (3)(A) analyze, evaluate, and critique scientific explanations by using empirical evidence, logical reasoning, and experimental and observational testing, ~~so as to encourage critical thinking by the student~~	The language regarding "critical thinking" has already been stated in the KS statement.
	Clean up scientific language	Consider the suggested edits from individual content advisors' initial reviews. Reduce ambiguous or simplistic language that can cause confusion. Reduce ambiguous or simplistic language that can cause confusion. For example, use "genes" instead of "traits" where appropriate or "density" instead of "sink or float".	Poor wording can lead to incorrect concepts.