The Scientific and Engineering Practices Work Group is in agreement with the recommendation from Work Group A and the content advisors to integrate scientific and engineering practices into the process skills in the current TEKS. Additionally, the work group is in agreement with the recommendation to rename the strand as "Scientific and engineering practices." Using language from the current TEKS and the K-12 Framework for Science Education, the work group reorganized the structure of the knowledge and skills statements and student expectations in the current Scientific Processes strand to reflect key domains of the scientific and engineering process: investigating, evaluating, and developing explanations and solutions. The work group maintained student expectations specific to issues related to science and society to give a context to science and engineering.

To support vertical alignment the work group developed student expectations for each grade band using common vocabulary, phrases, and numbering. For certain grade level or course specific student expectations, the work group elected to standardize the language while allowing future work groups to add appropriate content, e.g., lists of tools. The work group maintained the requirement for percentage of instructional time for investigations for grades 6-12 (40%) within the knowledge and skills statements. The work group recommends moving (2)(A), (B), and (C) from Biology, Chemistry, and Physics into the introduction for all high school courses. These student expectations are definitions which are more appropriately presented in the introduction. The student expectation (2)(D) in Biology and Chemistry is an applicable, measurable practice; therefore, the work group recommends its inclusion in the student expectations for grades 6-12.

1. Scientific and engineering practices. The student, for at least 40% of instructional time [6-12], asks questions, identifies problems, and plans and safely conducts classroom, laboratory, and field investigations to seek answers or design solutions using appropriate tools and models.

Kindergarten-Grade 2	**Grades 3-5**	**Grades 6-8**	**High school**
A. ask questions and define problems based on observations or information from text, phenomena, models, or investigations	A. ask questions and define problems based on observations or information from text, phenomena, models, or investigations	A. ask questions and define problems based on observations or information from text, phenomena, models, or investigations	A. ask questions and define problems based on observations or information from text, phenomena, models, or investigations
B. use scientific practices to plan and conduct descriptive investigations and use engineering practices to develop solutions to design problems	B. use scientific practices to plan and conduct descriptive investigations and use engineering practices to develop solutions to design problems (Grades 3-4) B. use scientific practices to plan and conduct descriptive and simple experimental investigations and use engineering practices to develop solutions to design problems (Grade 5)	B. use scientific practices to plan and conduct descriptive, comparative, and experimental investigations and use engineering practices to develop solutions to design problems	B. apply scientific practices to plan and conduct descriptive, comparative, and experimental investigations and use engineering practices to develop solutions to design problems

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1. Scientific and engineering practices. The student, for at least 40% of instructional time [6-12], asks questions, identifies problems, and plans and safely conducts classroom, laboratory, and field investigations to seek answers or design solutions using appropriate tools and models.			
Kindergarten-Grade 2	**Grades 3-5**	**Grades 6-8**	**High school**
C. identify, describe, and demonstrate safe practices during classroom and field investigations as outlined in Texas Education Agency-approved safety standards	C. demonstrate safe practices and the use of safety equipment during classroom and field investigations as outlined in Texas Education Agency-approved safety standards	C. use appropriate safety equipment and practices during laboratory, classroom, and field investigations as outlined in Texas Education Agency approved safety standards	C. use appropriate safety equipment and practices during laboratory, classroom, and field investigations as outlined in Texas Education Agency approved safety standards
D. use tools to measure, test, and compare to make observations and design solutions to problems, including (grade level work group will list tools based on standards)	D. use tools to measure, test, and analyze information to make observations and design solutions to problems, including (grade level work group will list tools based on standards)	D. use appropriate tools, including (list should be grade level specific)	D. use appropriate tools such as (content should be specific to the course)
E. collect observations and measurements as evidence to answer questions, explain phenomena, or test design solutions	E. collect observations and measurements as evidence to answer questions, explain phenomena, or test design solutions	E. collect quantitative data using the International System of Units (SI) and qualitative data as evidence to answer questions, explain phenomena, or test design solutions	E. collect quantitative data using the International System of Units (SI) and qualitative data as evidence to answer questions, explain phenomena, or test design solutions
F. record and organize data using pictures, numbers, words, and simple graphs (insert grade-level appropriate graphs)	F. construct appropriate simple tables, graphs, maps, and charts to organize data (insert grade-level appropriate graphs)	F. construct appropriate tables, graphs, maps, and charts using repeated trials and means, to organize data (insert grade-level appropriate graphs)	F. organize qualitative and quantitative data using (insert course appropriate graphical representations)
G. develop and use a model to conceptually represent phenomena, objects, and tools or a prototype for a solution to a problem	G. develop a model for tools, objects, and things that cannot be experienced or a prototype for a solution to a problem	G. develop and use models to represent phenomena, systems, or processes in order to answer questions or to refine designs	G. develop and use models to represent phenomena, systems, or processes in order to answer questions or to refine designs

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1. Scientific and engineering practices. The student, for at least 40% of instructional time [6-12], asks questions, identifies problems, and plans and safely conducts classroom, laboratory, and field investigations to seek answers or design solutions using appropriate tools and models.			
Kindergarten-Grade 2	**Grades 3-5**	**Grades 6-8**	**High school**
			NOTE: Work group recommends moving to introduction. 2.A. know the definition of science and understand that it has limitations, as specified in subsection (b)(2) of this section
			NOTE: Work group recommends moving to introduction. 2.B. know that hypotheses are tentative and testable statements that must be capable of being supported or not supported by observational evidence. Hypotheses of durable explanatory power that have been tested over a wide variety of conditions are incorporated into theories
			NOTE: Work group recommends moving to introduction. 2.C. know scientific theories are based on natural and physical phenomena and are capable of being tested by multiple independent researchers. Unlike hypotheses, scientific theories are well established and highly reliable explanations, but they may be subject to change as new areas of science and new technologies are developed
		H. distinguish between scientific hypotheses, theories, and laws	H. (2.D.) distinguish between scientific hypotheses, theories, and laws

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2. Scientific and engineering practices. The student analyzes and interprets data to derive meaning, identify features and patterns, and discover relationships or correlations to develop evidence-based arguments or evaluate designs. The student is expected to:			
Grade 2	**Grade 5**	**Grade 8**	**High school**
A. identify advantages and limitations of models such as their size, scale, properties, and materials	A. identify advantages and limitations of models such as their size, scale, properties, and materials	A. identify advantages and limitations of models such as their size, scale, properties, and materials	A. identify advantages and limitations of models such as their size, scale, properties, and materials
B. analyze data by identifying significant features and patterns	B. analyze data by identifying significant features and patterns and take into account sources of error or limitations	B. analyze data by identifying significant features and patterns, apply statistics and probability, and take into account sources of error or limitations	B. analyze data by identifying significant features and patterns, apply statistics and probability, and take into account sources of error or limitations
C. explain and compare numerical representations of data and patterns to explore scientific questions and engineering problems	C. explain and compare numerical representations of data and patterns to explore scientific questions and engineering problems	C. use mathematical concepts and processes to assess patterns or correlations while investigating scientific questions and engineering problems.	C. use mathematical concepts and processes to assess patterns or correlations and apply quantitative relationships while investigating scientific questions and engineering problems
D. evaluate a design or object using criteria to determine if it works as intended	D. evaluate a design or object using criteria to refine a problem statement or solution (Grades 3-4) D. evaluate experimental and engineering designs (Grade 5)	E. evaluate experimental and engineering designs	D. evaluate experimental and engineering designs

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3. Scientific and engineering practices. The student develops evidence-based explanations and communicates findings, conclusions, and proposed solutions.			
Grade 2	**Grade 5**	**Grade 8**	**High school**
A. develop explanations and propose solutions supported by data and models	A. develop explanations and propose solutions supported by data and models	A. develop explanations and propose solutions supported by data and models consistent with scientific ideas, principles, and theories	A. develop explanations and propose solutions supported by data and models consistent with scientific ideas, principles, and theories
B. communicate explanations and solutions individually and collaboratively in a variety of settings and formats	B. communicate explanations and solutions individually and collaboratively in a variety of settings and formats	B. communicate explanations and solutions individually and collaboratively in a variety of settings and formats	B. communicate explanations and solutions individually and collaboratively in a variety of settings and formats
C. listen actively to others' explanations to identify relevant evidence and engage respectfully in scientific argumentation	C. listen actively to others' explanations to identify relevant evidence and engage respectfully in scientific argumentation	C. engage respectfully in scientific argumentation using applied scientific explanations and empirical evidence	C. engage respectfully in scientific argumentation using applied scientific explanations and empirical evidence

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4. Scientific and engineering practices. The students knows the contributions of scientists and recognizes the importance of scientific research and innovation on society.			
Grade 2	**Grade 5**	**Grade 8**	**High School**
A. explain how science or an innovation can help others	A. explain how scientific discoveries and innovative solutions to problems impact science and society	A. relate the impact of past and current research on scientific thought and society, including the process of science and contributions of diverse scientists as related to the content	A. relate the impact of past and current research on scientific thought and society, including research methodology, ethics, and contributions of diverse scientists as related to the content
A. make informed decisions when reviewing promotional materials for products and services	B. make informed decisions when reviewing informational resources and promotional materials for products and services	B. make informed decisions by evaluating evidence from multiple appropriate sources to assess the credibility, accuracy, and methods used	B. make informed decisions by evaluating evidence from multiple appropriate sources to assess the credibility, accuracy, and methods used
C. identify what a scientist or engineer is and explore what different scientists and engineers do	C. research and explore connections between grade-level appropriate science concepts and STEM careers	C. research and explore connections between grade-level appropriate science concepts and STEM careers	C. research and explore connections between grade-level appropriate science concepts and STEM careers
			D. analyze, evaluate, and critique scientific explanations and solutions by using empirical evidence, logical reasoning, and experimental and observational testing

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