

Science and Engineering Overarching Statements and Standards

Developing and using models.

Descriptor: Students will be able to develop, use and revise models to describe, test and predict through the integration of scientific engineering practices and cross-cutting concepts.

Childhood (K-5)	Early Adolescence (6-8)	Adolescence (9-diploma)
K-ESS3 2-LS2 2-ESS2 K-2-ETS1 3-LS1 4-PS4 4-LS1 5-PS1 5-LS2 5-ESS2 5-PS3	MS-PS1 MS-PS3 MS-PS4 MS-PS4 MS-LS1 MS-LS2 MS-LS3 MS-ESS1 MS-ESS2 MS-ETS1	HS-PS1 HS-PS3 HS-LS1 HS-LS2 HS-ESS1

Planning and carrying out scientific investigations.

Descriptor: Students will utilize tools/technology to undertake scientific investigations involving data collection, hypothesis testing description of phenomena and communicate conclusions effectively.

Childhood (K-5)	Early Adolescence (6-8)	Adolescence (9-diploma)
K-PS2 K-PS3 1-PS4 1-ESS1 2-PS1 2-LS2 2-LS4 3-PS2 4-PS3 4-ESS2 5-PS1 3-5-ETS1	MS-PS2 MS-PS3 MS-LS1 MS-ESS2	HS-PS1 HS-PS2 HS-PS3 HS-LS1 HS-ESS2

Analyzing and interpreting scientific data.

Descriptor: Students will understand and analyze matter, reactions and physical systems as demonstrated through the integration of scientific and engineering practices and cross-cutting concepts.

Childhood (K-5)	Early Adolescence (6-8)	Adolescence (9-diploma)
K-LS1 3-ESS2 5-PS1 5-ESS2	MS-PS4	HS-PS1 HS-PS2 HS-PS3 HS-PS4 HS-LS2 HS-ESS1 HS-ESS3 HS-ETS1

Science and Engineering Overarching Statements and Standards

Using Mathematics and computational thinking.

Descriptor: Students will use mathematical and/or computational representations to support a claim.

Childhood (K-5)	Early Adolescence (6-8)	Adolescence (9-diploma)
5-PS1 5-ESS2	MS-PS4 MS-LS4	HS-PS1 HS-PS2 HS-PS3 HS-PS4 HS-LS2 HS-ESS1 HS-ESS3 HS-ETS1

Constructing explanations and designing solutions.

Descriptor: Students will use the valid and reliable evidence to develop and evaluate claims and/or solutions that are consistent with scientific ideas, principles and theories.

Childhood (K-5)	Early Adolescence (6-8)	Adolescence (9-diploma)
K-PS3 1-PS4 1-LS1 1-LS3 2-PS1 2-ESS1 2-ESS2 3-LS3 3-LS4 4-PS3 4-PS4 4-ESS1 4-ESS3 3-5-ETS1	MS-PS1 MS-PS2 MS-PS3 MS-LS1 MS-LS2 MS-LS4 MS-ESS1 MS-ESS2 MS-ESS3	HS-PS1 HS-PS2 HS-LS1 HS-LS2 HS-LS4 HS-ESS1 HS-ESS3 HS-ETS1

Engaging in argument from evidence.

Descriptor: Students will compare and evaluate competing scientific ideas to engage in informed argumentation.

Childhood (K-5)	Early Adolescence (6-8)	Adolescence (9-diploma)
K-ESS2 2-PS1 3-LS2 3-LS4 3-ESS3 4-LS1 5-PS2 5-LS1 5-ESS1	MS-PS2 MS-PS3 MS-LS1 MS-LS2 MS-ESS3 MS-ETS1	HS-PS4 HS-LS2 HS-LS3 HS-LS4 HS-ESS1 HS-ESS2 HS-ESS3

Science and Engineering Overarching Statements and Standards

Obtaining, evaluating, and communicating information.

Descriptor: Students will interpret information obtained through diverse media, assess scientific validity and effectively express their findings.

Childhood (K-5)	Early Adolescence (6-8)	Adolescence (9-diploma)
K-ESS3 1-LS1 2-ESS2 4-ESS3 5-ESS3	MS-PS1 MS-PS4 MS-LS4	HS-PS2 HS-PS4 HS-LS4 HS-ESS1

Asking questions and defining scientific problems.

Descriptor: Students will ask questions of each other about the texts they read, the features of the phenomena they observe, and the conclusions they draw from their models or scientific investigations. For engineering, they should ask questions to define the problem to be solved and to elicit ideas that lead to the constraints and specifications for its solution.

Childhood (K-5)	Early Adolescence (6-8)	Adolescence (9-diploma)
K-ESS3 K-2-ETS1 3-PS2 4-PS3 3-5-ETS1	MS-PS2 MS-ESS3 MS-ETS1	HS-PS4 HS-LS3 HS-ETS1

Science and Engineering Overarching Statements and Standards

THE GUIDING PRINCIPLES

- A. A clear and effective communicator who:
 - 1. Demonstrates organized and purposeful communication in English and at least one other language;
 - 2. Uses evidence and logic appropriately in communication;
 - 3. Adjusts communication based on the audience; and
 - 4. Uses a variety of modes of expression (spoken, written, and visual and performing including the use of technology to create and share the expressions);

- B. A self-directed and lifelong learner who:
 - 1. Recognizes the need for information and locates and evaluates resources;
 - 2. Applies knowledge to set goals and make informed decisions;
 - 3. Applies knowledge in new contexts;
 - 4. Demonstrates initiative and independence;
 - 5. Demonstrates flexibility including the ability to learn, unlearn, and relearn;
 - 6. Demonstrates reliability and concern for quality; and
 - 7. Uses interpersonal skills to learn and work with individuals from diverse backgrounds;

- C. A creative and practical problem solver who: [1995, c. 649, §1 (new).]
 - 1. Observes and evaluates situations to define problems;
 - 2. Frames questions, makes predictions, and designs data/information collection and analysis strategies;
 - 3. Identifies patterns, trends, and relationships that apply to solutions;
 - 4. Generates a variety of solutions, builds a case for a best response and critically evaluates the effectiveness of the response;
 - 5. Sees opportunities, finds resources, and seeks results;
 - 6. Uses information and technology to solve problems; and
 - 7. Perseveres in challenging situations;

- D. A responsible and involved citizen who:
 - 1. Participates positively in the community and designs creative solutions to meet human needs and wants;
 - 2. Accepts responsibility for personal decisions and actions;
 - 3. Demonstrates ethical behavior and the moral courage to sustain it;
 - 4. Understands and respects diversity;
 - 5. Displays global awareness and economic and civic literacy; and
 - 6. Demonstrates awareness of personal and community health and wellness;

- E. An integrative and informed thinker who:
 - 1. Gains and applies knowledge across disciplines and learning contexts and to real life situations with and without technology;
 - 2. Evaluates and synthesizes information from multiple sources;
 - 3. Applies ideas across disciplines; and
 - 4. Applies systems thinking to understand the interaction and influence of related parts on each other and on outcomes.