

Alaska State Educational Standards

Moon Mars and Beyond

Lessons 1 – 13, and e-mission

Note:

There is no mention of planet science in the general state standards. As such, the number science standards met through this unit is deceptively low. A review of grade based standards will show that several science standards will be met in the 4th through 6th grade level.

Lesson 01:

Science: E(1)

English/LA: A(1, 2), B(1), C(2, 3)

Lesson 02:

Science: E(1, 3), G(1, 3)

English/LA: A(1, 2, 4, 5, 8), B(1), C(1, 2, 4)

Technology: E(5, 8)

History: A(7)

Lesson 03:

Math: A(1 – 5), B(1, 2, 5 – 8), C(2, 4), D(1 – 3, 5), E(3)

English/LA: A(1, 2, 4 – 6, 8), B(1, 3), C(1 – 5)

Lesson 04:

English/LA: B(1), C(1 – 5)

Lesson 05:

English/LA: B(1), C(1 – 5)

Lesson 06:

Math: A(1 – 4), B(4, 6 – 8), C(2, 4), D(1, 2), E(3)

English/LA: C(1 – 5)

Geography: A(1, 2, 5)

Lesson 07:

Math: A(1 – 4), B(4, 6 – 8), C(2, 4), D(1, 2), E(3)

English/LA: C(1 – 5)

Geography: A(1, 2)

Lesson 08:

English/LA: B(1, 2), E(1)

Technology: E(5, 6)

History: A(1, 6 – 8)

Lesson 09:

English/LA: B(1), C(2, 5)

Lesson 10:

Math: A(1, 3, 6), B(1, 2, 5, 6, 8), C(2, 4), D(1 – 3)

English/LA: B(1), C(1 – 5)

Lesson 11:

Math: A(1, 2), C(2, 4), E(3)

Science: B(3, 4)

English/LA: A(2), B(1), C(2 – 5)

Technology: A(1, 3), B(1 – 3)

Geography: A(1), B(1)

Lesson 12:

Math: A(1, 2), C(2, 4), E(3)

Science: B(1, 3, 4)

English/LA: A(2), B(1), C(2 – 5)

Geography: A(1), B(1)

Lesson 13:

Math: A(1, 2), C(2, 4), E(3)

Science: B(1, 3, 4)

English/LA: A(2), B(1), C(2 – 5)

Geography: A(1), B(1)

e-mission:

Math: A(1 – 4, 6), B(1, 2, 4 – 8), C(1, 2, 4), D(1 – 4), E(3)

Science: A(2), E(2)

English/LA: A(3, 4, 7), B(1, 2), C(1 – 5), D(1, 4)

Geography: A(1, 2, 5), B(1)

Technology: A(1 – 3), B(1), C(2), D(1 – 3)

Mathematics Standards

A A student should understand mathematical facts, concepts, principles, and theories.

A1 Understand and use numeration, including

- a. numbers, number systems, counting numbers, whole numbers, integers, fractions, decimals, and percents
- b. irrationals and complex numbers.

A2 Select and use appropriate systems, units, and tools of measurement, including estimation.

A3 Perform basic arithmetic functions, make reasoned estimates, and select and use appropriate methods or tools for computation or estimation including mental arithmetic, paper and pencil, a calculator, and a computer.

A4 Represent, analyze, and use mathematical patterns, relations, and functions using methods such as tables, equations, and graphs.

A5 Construct, draw, measure, transform, compare, visualize, classify, and analyze the relationships among geometric figures.

A6 Collect, organize, analyze, interpret, represent, and formulate questions about data and make reasonable predictions about the certainty, uncertainty, or impossibility of an event.

B A student should understand and be able to select and use a variety of problem-solving strategies.

B1 Use computational methods and appropriate technology as problem-solving tools.

B2 Use problem solving to investigate and understand mathematical content.

B4 Develop and apply strategies to solve a variety of problems.

B5 Check results against mathematical rules.

B6 Use common sense to help interpret results.

B7 Apply what was learned to new situations.

B8 Use mathematics with confidence.

C A student should understand and be able to form and use appropriate methods to define and explain mathematical relationships.

C1 Express and represent mathematical ideas using oral and written presentations, physical materials, pictures, graphs, charts, and algebraic expressions.

C2 Relate mathematical terms to everyday language.

C4 Clarify mathematical ideas through discussions with others.

D A student should be able to use logic and reason to solve mathematical problems.

D1 Analyze situations.

D2 Draw logical conclusions.

D3 Use models, know facts, and relationships to explain the students reasoning.

D4 Use deductive reasoning to verify conclusions, judge the validity of arguments, and construct valid arguments.

D5 Use inductive reasoning to recognize patterns and form mathematical propositions.

E A student should be able to apply mathematical concepts and processes to situations within and out side of school.

E1 Explore problems and describe results using graphical, numerical, physical, algebraic, and verbal mathematical models or representations.

E2 Use mathematics in daily life.

E3 Use mathematics in other curriculum areas.

Science Standards

A **Science as Inquiry and Process**: A student should understand and be able to apply the processes and applications of scientific inquiry.

A2 Develop an understanding that the processes of science require integrity, logical reasoning, skepticism, openness, communication, and peer review.

B Concepts of Physical Science: A student should understand and be able to apply the concepts, models, theories, universal principles, and facts that explain the physical world.

B1 Develop an understanding of the characteristic properties of matter and the relationship of these properties to their structure and behavior.

B2 Develop an understanding that energy appears in different forms, can be transformed from one form to another, can be transferred or moved from one place or system to another, may be unavailable for use, and is ultimately conserved.

B3 Develop an understanding of the interactions between matter and energy, including physical, chemical, and nuclear changes, and the effects of these interactions on physical systems.

B4 Develop an understanding of motions, forces, their characteristics and relationships, and natural forces and their effects.

E Science and Technology: A student should understand the relationships among science, technology, and society.

E1 Develop an understanding of how scientific knowledge and technology are used in making decisions about issues, innovations, and responses to problems and everyday events.

E2 Develop an understanding that solving problems involves different ways of thinking, perspectives, and curiosity that lead to the exploration of multiple paths that are analyzed using scientific, technological, and social merits.

E3 Develop an understanding of how scientific discoveries and technological innovations affect and are affected by our lives and cultures.

G History and Nature of Science: A student should understand the history and nature of science.

G1 Develop an understanding that historical perspectives of scientific explanations demonstrate that scientific knowledge changes over time, building on prior knowledge.

G3 Develop an understanding that scientific knowledge is ongoing and subject to change as new evidence becomes available through experimental and/or observational confirmation(s).

English/Language Arts Standards

A A student should be able to speak and write well for a variety of purposes and audiences.

A1 Apply elements of effective writing and speaking; these elements include ideas, organization, vocabulary, sentence structure, and personal style.

A2 In writing, demonstrate skills in sentence and paragraph structure, including grammar, spelling, capitalization, and punctuation.

A3 In speaking, demonstrate skills in volume, intonation, and clarity.

A4 Write and speak well to inform, to describe, to entertain, to persuade, and clarify thinking in a variety of formats, including technical communication.

A7 Communicate ideas using varied tools of electronic technology.

B A Student should be a competent and thoughtful reader, listener, and viewer of literature, technical materials, and a variety of other information.

B1 Comprehend meaning from written text and oral and visual information by applying a variety of reading, listening, and viewing strategies; these strategies include phonic, context, and vocabulary cues in reading, critical viewing, and active listening.

B2 Reflect on, analyze, and evaluate a variety of oral, written, and visual information and experiences, including discussions, lectures, art, movies, television, technical materials, and literature.

C A student should be able to identify and select from multiple strategies in order to complete projects independently and cooperatively.

C1 Make choices about a project after examining a range of possibilities.

C2 Organize a project by

- a. understanding directions.
- b. making and keeping deadlines.
- c. seeking, selecting, and using relevant resources.

C3 Select and use appropriate decision-making processes.

C4 Set high standards for a project quality.

C5 When working on a collaborative project,

- a. take responsibility for individual contributions to the project.
- b. share ideas and workloads.

- c. incorporate individual talents and perspectives.
- d. work effectively with others as an active participant and as a responsive audience.
- e. evaluate the processes and work on self and others.

D A student should be able to think logically and reflectively in order to present and explain positions based on relevant and reliable information.

D1 Develop a position by

- a. reflecting on personal experiences, prior knowledge, and new information.
- b. formulating and refining questions.
- c. identifying a variety of pertinent sources of information.
- d. analyzing and synthesizing information.
- e. determining an author's purposes.

D4 Explain and defend a position orally, in writing, and with visual aids as appropriate.

Technology

A A student should be able to operate technology-based tools.

A1 Use a computer to enter and retrieve information.

A2 Use technological tools for learning, communications, and productivity.

A3 Use local and worldwide networks.

B A student should be able to use technology to locate, select and manage information.

B1 Identify and locate information sources using technology.

B2 Choose sources of information from a variety of media.

B3 Select relevant information by applying accepted research methods.

C A student should be able to use technology to explore ideas, solve problems, and derive meaning.

C2 Solve problems both individually and with others.

D A student should be able to use technology to express ideas and exchange information.

D1 Convey ideas to a variety of audiences using publishing, multi-media, and communications tools.

D2 Use communications technology to exchange ideas and information.

D3 Use technology to explore new and innovative methods for interaction with others.

E A student should be able to use technology responsibly and understand its impact on individuals and society.

E5 Examine the role of technology in the workplace and explore careers that require the use of technology.

E6 Evaluate ways that technology impacts culture and the environment.

E8 Recognize the implications of emerging technologies.

History

A A student should understand that history is a record of human experiences that links the past to the present and the future.

A1 Understand chronological frameworks for organizing historical thought and place significant ideas, institutions, people, and events within time sequences.

A6 Know that cultural elements, including language, literature, the arts, customs, and belief systems, reflect the ideas and attitudes of a specific time and know how the cultural elements influence the human interaction.

A7 Understand that history is dynamic and composed of key turning points.

A8 Know that history is a bridge to understanding groups of people and an individual's relationship to society.

Geography

A A student should be able to make and use maps, globes, and graphs to gather, analyze, and report spatial (geographic) information.

A1 Use maps and globes to locate places and regions.

A2 Make maps, globes, and graphs.

A5 Evaluate the importance of the locations of human and physical features in interpreting geographic patterns.

B A student should be able to utilize, analyze, and explain information about the human and physical features of places and regions.

B1 Know that places have distinctive geographic characteristics.