

GLOSSARY

Attitude-tendency to respond positively or negatively to an idea, object, or person; influences ability to succeed in science; attitude towards science is influenced by how science is experienced

Classifying-the sorting or ordering of objects according to their properties or similarities and differences; based on observational relationships that exist between objects or events

Cognitive science-the study of how learning takes place

Communicating-the transmission of observable data; examples include spoken or written words, graphs, drawings, diagrams, maps, mathematical equations; skills such as asking questions, discussing, explaining, reporting, and outlining can aid in the development of communication skills

Conceptual understanding-includes the body of scientific knowledge that students draw upon when conducting a scientific investigation or engaging in scientific reasoning; involves a variety of information, including events from science instruction and experiences with the natural environment; scientific concepts, principles, laws, and theories that scientists use to explain and predict observations about the world

Controlling variables-managing the conditions or factors in an experiment necessary for the results of experimentation to be reliable

Curriculum-what students should understand and/or be able to do

Defining operationally-stating definitions in working terms

Evolving-change over time; may refer to biological changes, geological changes; and/or technological changes

Experimenting-testing a hypothesis under controlled conditions; basic to the total scientific process; uses all process skills

Hypothesis-forming a generalization / question based on observations; involves asking questions, making inferences and predictions; must be testable/tested to establish credibility

Inferring-using logic to draw conclusions from observations; suggests explanations, reasons, and/or causes for events; based on judgments; and may not always be valid

Inquiry-a set of interrelated processes by which students and scientists pose questions about the natural world and investigate phenomena; a critical component of a science program at all grade levels and in every domain of science; allows students to learn science in a way that reflects how science actually works (NSES, p. 214)

Instruction-methods used to structure learning opportunities to teach concepts

Interpreting data-integrated process skill; involves making predictions, inferences, and hypotheses from a set of data; revision of interpretations may be necessary when additional data are obtained

Investigate-Conducting a search or examination of evidence so as to understand a concept; inquire into systematically

Measuring-ordering of things by magnitude, such as area, length, volume, mass; processes to quantify observations; involves the use of instruments and the skills needed to use them effectively

Models-useful way of describing and explaining interrelationships of ideas; can be mental, physical, and/or verbal representation of an idea; represent what we know about an idea or concept; under constant change as new data are obtained

Nature of science-incorporates the historical development of science, habits of mind that characterize science, and methods of inquiry and problem solving

Nature of technology-encompasses the issues of design, application of science to real-world problems, and trade-offs or compromises that need to be considered for technological solutions

Observing-using one or more of the senses in perceiving properties or similarities and differences in objects and events; can be made directly with the senses or indirectly through the use of simple or complex instruments; influenced by the previous experience of the observer

Practical reasoning-probing students' ability to use and apply science understanding in new, real world applications

Predicting-suggesting what will occur in the future; based on observations, measurements, and inferences about relationships between or among observed variables; speculation of what will happen based on past experiences; accuracy of a prediction is affected by the accuracy of the observation; conjecture about how a particular system will behave, followed by observations to determine if the system did behave as expected within a specified range of situations

Scientific investigation-probes students' ability to use the tools of science, including both cognitive and laboratory tools; students acquire new information, plan appropriate tests, use a variety of scientific tools, and communicate the results of the investigations

Standards-criteria used to judge quality

Systems-complete, predictable cycles, structures, or processes occurring in natural phenomena; may also be an artificial construction created to represent or explain a natural occurrence; system boundaries and interrelationships of subsystems exist; input to and outputs from.

Technological design-abilities that include identifying appropriate problems, designing a solution or product, implementing a proposed design, evaluating completed solutions or products, communicating the process of design.

Themes-big ideas of science that transcend various scientific disciplines

Theory-an always tentative explanation of phenomena that we observe; never proven; representative of the most logical explanation based on currently available evidence; becomes stronger as more supporting evidence is gathered; provides a context for predictions.

Using numbers-quantifying variables, measurements, and/or comparisons; needed to manipulate measurements and to order and classify objects.

Using space/time relations-describing the spatial relationships of objects and their change with time; examples are motion, direction, spatial arrangement, symmetry, and shape.