Science	**T**echnology	**E**ngineering	**A**rt	**M**ath
The study of the world around us through observation and experiment	*A set of tools, both modern and traditional, that help us achieve our goals*	*Creating things that work, or making them work better, to solve problems in the real world*	*Expressing imagination and skill through creative design*	*The practice of using patterns and abstract symbols to form logical arguments and predictions*
Science is the study of the natural world, including the laws of nature associated with physics, chemistry, and biology and the treatment or application of facts, principles, concepts, and conventions associated with these disciplines. Science is both a body of knowledge that has been accumulated over time and a process—scientific inquiry—that generates new knowledge. Knowledge from science informs the engineering design process. Scientifically literate students use scientific knowledge not only in physics, chemistry, biological sciences, and earth/space sciences to understand the natural world, but they also understand the scientific need for existing and new technologies, how new advances in scientific understanding can be engineered, and how mathematics is used to articulate and solve problems.	Technology, while not a discipline in the strictest sense, comprises the entire system of people and organizations, knowledge, processes, and devices that go into creating and operating technological artifacts, as well as the artifacts themselves. Throughout history, humans have created technology to satisfy their wants and needs. Much of modern technology is a product of science and engineering, and technological tools are used in both fields. Technologically literate students understand that technology is the innovation with or manipulation of our natural resources to help create and satisfy human needs and also to learn how to obtain, utilize, and manage technological tools to solve science, mathematics, and engineering problems.	Engineering is both a body of knowledge—about the design and creation of human-made products—and a process for solving problems. This process is design under constraint. One constraint in engineering design is the laws of nature, or science. Other constraints include time, money, available materials, ergonomics, environmental regulations, manufacturability, and reparability. Engineering utilizes concepts from science and mathematics as well as technological tools. Students who are literate in engineering understand how past, present, and future technologies are developed through the engineering design process to solve problems. They also see how science and mathematics are used in the creation of these technologies.	Art is a discipline that can be mastered—for example, one can become a specialist in digital media. Art is also a method that connects science, technology, engineering, and math through the open communication of history and social understanding. Projects that incorporate artistic elements will appeal to a more diverse audience, adding meaning and relevancy to its design, implementation, and review. Artistic components of design allows for the free expression of imagination and functional skill in a given craft. Students who are literate in the arts have an appreciation of technological contexts, as well as the ability to reframe the application of scientific principles to engineering realities.	Mathematics is the study of patterns and relationships among quantities, numbers, and space. Unlike in science, where empirical evidence is sought to warrant or overthrow claims, claims in mathematics are warranted through logical arguments based on foundational assumptions. The logical arguments themselves are part of mathematics along with the claims. As in science, knowledge in mathematics continues to grow, but unlike in science, knowledge in mathematics is not overturned, unless the foundational assumptions are transformed. Specific conceptual categories of K-12 mathematics include numbers and arithmetic, algebra, functions, geometry, and statistics and probability. Mathematics is used in science, engineering and technology. Mathematically literate students not only know how to analyze, reason, and communicate ideas effectively; they can also mathematically pose, model, formulate, solve, and interpret questions and solutions in science, technology, and engineering.

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