



Disney Youth Education Series

Dynamics of Technology

National Standards

Mathematics

Uses a variety of strategies in the problem-solving process

Grades 6–8

- Understands how to break a complex problem into simpler parts or use a similar problem type to solve a problem
- Understands the role of written symbols in representing mathematical ideas and precise language in conjunction with special symbols of mathematics
- Uses a variety of reasoning processes to model and solve problems

Grades 9–12

- Uses a variety of strategies (e.g., identify a pattern, use equivalent representations) to understand new mathematical content and to develop more efficient solution methods or problem extensions.
- Uses formal mathematical language and notation to represent ideas, to demonstrate relationships within and among representations systems, and to formulate generalizations

Understands and applies basic and advanced properties of the concepts of numbers

Grades 6–8

- Understands the structure of numeration systems that are based on numbers other than 10

Grades 9–12

- Understands the properties and basic theorems of roots, exponents (e.g., $[b^m][b^n] = b^{m+n}$), and logarithms





Uses basic and advanced procedures while performing the process of computation

Grades 6–8

- Selects and uses appropriate computational methods
- Knows when an estimate is more appropriate than an exact answer for a variety of problem situations

Grades 9–12

- Understands various sources of discrepancy between an estimate and a calculated answer

Understands the general nature and uses of mathematics

Grades 6–8

- Understands that mathematics has been helpful in practical ways for many centuries

Grades 9–12

- Understands that mathematics often stimulates innovations in science and technology
- Understands that new mathematics continues to be invented today, along with the new connections between various components of mathematics

Science

Understands the composition and structure of the universe and the Earth's place in it

Grades 6–8

- Knows that the planet Earth and our Solar System appear to be somewhat unique, although similar systems might yet be discovered in the universe

Grades 9–12

- Knows ways in which technology has increased our understanding of the universe

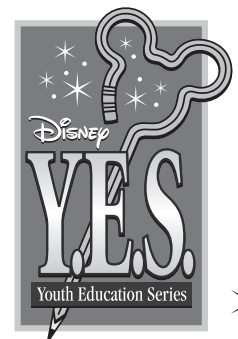
Understands forces and motion

Grades 6–8

- Knows that just as electric currents can produce magnetic forces, magnets can cause electric currents.

Grades 9–12

- Knows that magnetic forces are very closely related to electric forces and can be thought of as different aspects of a single electromagnetic force; the interplay of these forces is the basis for electric motors, generators, radio, television, and many other modern technologies





Understands the nature of scientific inquiry

Grades 9–12

- Uses technology and mathematics to perform accurate scientific investigations and communications
- Knows that conceptual principles and knowledge guide scientific inquiries; historical and current scientific knowledge influence the design and interpretation of investigations and the evaluation of proposed explanations made by other scientists
- Knows that investigations and public communication among scientists must meet certain criteria in order to result in new knowledge and methods

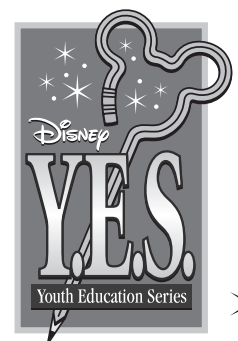
Understands the scientific enterprise

Grades 6–8

- Knows that people of all backgrounds and with diverse interests, talents, qualities, and motivations engage in fields of science and engineering; some of these people work in teams and others work alone, but all communicate extensively with others
- Knows that throughout history, many scientific innovators have had difficulty breaking through accepted ideas of their time to reach conclusions that are now considered to be common knowledge
- Knows ways in which science and society influence one another

Grades 9–12

- Knows that, throughout history, diverse cultures have developed scientific ideas and solved human problems through technology
- Understands that individuals and teams contribute to science and engineering at different levels of complexity
- Knows that science and technology are essential social enterprises, but alone they can only indicate what can happen, not what should happen
- Knows that creativity, imagination, and a good knowledge base are all required in the work of science and engineering





Technology

Understands the relationships among science, technology, society, and the individual

Grades 6–8

- Knows that scientific inquiry and technological design have similarities and differences
- Knows ways in which technology has influenced the course of history
- Knows that technology and science have a reciprocal relationship
- Knows ways in which technology and society influence one another

Grades 9–12

- Knows ways in which social and economic forces influence which technologies will be developed and used
- Knows that alternatives, risks, costs, and benefits, must be considered when deciding on proposals to introduce new technologies or to curtail existing ones
- Knows examples of advanced and emerging technologies and how they could impact society
- Knows that the rate of technological development and diffusion is increasing rapidly, even though individual technologies may be developed at a slow pace due to technical difficulties or consumer resistance
- Knows that technology can benefit the environment by providing scientific information, providing new solutions to older problems, and reducing the negative consequences of existing technology

Understands the nature and uses of different forms of technology

Grades 6–8

- Understands ways in which medical technology improves the quality of health care
- Knows the components of a communication system
- Knows that individual transportation vehicles contain several subsystems

