Pennsylvania
Science, Technology & Engineering and Environmental Literacy & Sustainability Standards (STEEL)

Grade 5

Adopted 2022

Life Science 3.1

Structure and Function

na1. Not applicable at this level. 3.1.5.NA1

Growth and Development of Organisms

na2. Not applicable at this level. 3.1.5.NA2

Organization for Matter and Energy Flow in Organisms

A. Support an argument that plants get the materials they need for growth chiefly from air and water. 3.1.5.A

Information Processing

na3. Not applicable at this level. 3.1.5.NA3

Interdependent Relationships in Ecosystems

B. Develop a model to describe the movement of matter among plants, animals, decomposers, and the environment. 3.1.5.B

Cycles of Matter and Energy Transfer in Ecosystems

na4. Not applicable at this level. 3.1.5.NA4

Ecosystem Dynamics, Functioning, and Resilience

na5. Not applicable at this level. 3.1.5.NA5

Social Interactions and Group Behavior

na6. Not applicable at this level. 3.1.5.NA6

Inheritance of Traits

na7. Not applicable at this level. 3.1.5.NA7

Variation of Traits

na8. Not applicable at this level. 3.1.5.NA8

Evidence of Common Ancestry and Diversity

na9. Not applicable at this level. 3.1.5.NA9

Natural Selection

na10. Not applicable at this level. 3.1.5.NA10

Adaptation

na11. Not applicable at this level. 3.1.5.NA11

Biodiversity and Humans

na12. Not applicable at this level. 3.1.5.NA12

Physical Science 3.2

Structure and Properties of Matter

A. Develop a model to describe that matter is made of particles too small to be seen. 3.2.5.A

B. Make and communicate observations and measurements to identify materials based on their properties. 3.2.5.B

C. Interpret and analyze data to make decisions about how to utilize materials based on their properties. 3.2.5.C

Chemical Reactions

D. Measure and graph quantities to provide evidence that regardless of the type of change that occurs when heating, cooling, or mixing substances, the total weight of matter is conserved. 3.2.5.D

E. Conduct an investigation to determine whether the mixing of two or more substances results in new substances. 3.2.5.E

Nuclear Processes

na1. Not applicable at this level. 3.2.5.NA1

Forces and Motion

na2. Not applicable at this level. 3.2.5.NA2

Types of Interactions

F. Support an argument that the gravitational force exerted by Earth on objects is directed down. 3.2.5.F

Definitions of Energy

na3. Not applicable at this level. 3.2.5.NA3

Conservation of Energy and Energy Transfer

na5. Not applicable at this level. 3.2.5.NA5

Relationship Between Energy and Forces

na6. Not applicable at this level. 3.2.5.NA6

Energy in Chemical Processes and Everyday Life

G. Use models to describe that energy in animals' food (used for body repair, growth, motion, and to maintain body warmth) was once energy from the sun. 3.2.5.G

Wave Properties

na7. Not applicable at this level. 3.2.5.NA7

Electromagnetic Radiation

na8. Not applicable at this level. 3.2.5.NA8

Information Technologies and Instrumentation

na9. Not applicable at this level. 3.2.5.NA9

Earth and Space Science 3.3

The Universe and Its Stars

A. Support an argument that differences in the apparent brightness of the sun compared to other stars is due to their relative distances from Earth. 3.3.5.A

Earth and the Solar System

B. Represent data in graphical displays to reveal patterns of daily changes in length and direction of shadows, day and night, and the seasonal appearance of some stars in the night sky. 3.3.5.B

The History of Planet Earth

na1. Not applicable at this level. 3.3.5.NA1

Earth Materials and Systems

C. Develop a model using an example to describe ways the geosphere, biosphere, hydrosphere, and/or atmosphere interact. 3.3.5.C

Plate Tectonics and Large-Scale System Interactions

na2. Not applicable at this level. 3.3.5.NA2

The Roles of Water in Earth's Surface Processes

D. Describe and graph the amounts of salt water and fresh water in various reservoirs to provide evidence about the distribution of water on Earth. 3.3.5.D

Weather and Climate

na3. Not applicable at this level. 3.3.5.NA3

Biogeology

na4. Not applicable at this level. 3.3.5.NA4

Natural Resources

na5. Not applicable at this level. 3.3.5.NA5

Natural Hazards

na6. Not applicable at this level. 3.3.5.NA6

Human Impact on Earth Systems

E. Obtain and combine information about ways individual communities use science ideas to protect the Earth's resources and environment. 3.3.5.E

F. Generate and design possible solutions to a current environmental issue, threat, or concern. 3.3.5.F

Environmental Literacy & Sustainability 3.4

Agricultural Systems

A. Analyze how living organisms, including humans, affect the environment in which they live, and how their environment affects them. 3.4.3-5.A

Environment and Society

B. Make a claim about the environmental and social impacts of design solutions and civic actions, including their own actions. 3.4.3-5.B

Watersheds and Wetlands

C. Examine ways you influence your local environment and community by collecting and displaying data. 3.4.3-5.C

Investigating Environmental Issues

D. Develop a model to demonstrate how local environmental issues are connected to larger local environment and human systems. 3.4.3-5.D

Environmental Experiences

na1. Refer to other standards in this document to build a learning progression. 3.4.3-5.NA1

Evaluating Solutions

E. Construct an argument to support whether action is needed on a selected environmental issue and propose possible solutions. 3.4.3-5.E

Environmental Sustainability

na2. Refer to other standards in this document to build a learning progression. 3.4.3-5.NA2

Environmental Stewardship

F. Critique ways that people depend on and change the environment. 3.4.3-5.F

Environmental Justice

G. Investigate how perspectives over the use of resources and the development of technology have changed over time and resulted in conflict over the development of societies and nations. 3.4.3-5.G

Technology & Engineering 3.5

Applying, Maintaining, and Assessing Technological Products and Systems

A. Use appropriate symbols, numbers, and words to communicate key ideas about technological products and systems. 3.5.3-5.A

B. Examine information to assess the trade-offs to using a product or system. 3.5.3-5.B

C. Follow directions to complete a technological task. 3.5.3-5.C

D. Predict how certain aspects of their daily lives would be different without given technologies. 3.5.3-5.D

E. Explain why responsible use of technology requires sustainable management of resources. 3.5.3-5.E

F. Classify resources used to create technologies as either renewable or nonrenewable. 3.5.3-5.F

G. Describe the helpful and harmful effects of technology. 3.5.3-5.G

H. Determine factors that influence changes in a society's technological systems or infrastructure. 3.5.3-5.H

I. Design solutions by safely using tools, materials, and skills. 3.5.3-5.I

J. Explain how technologies are developed or adapted when individual or societal needs and wants change. 3.5.3-5.J

K. Judge technologies to determine the best one to use to complete a given task or meet a need. 3.5.3-5.K

L. Demonstrate how tools and machines extend human capabilities, such as holding, lifting, carrying, fastening, separating, and computing. 3.5.3-5.L

Design and Design Thinking in Technology and Engineering Education

M. Demonstrate essential skills of the engineering design process. 3.5.3-5.M

N. Identify why a product or system is not working properly. 3.5.3-5.N

O. Describe requirements of designing or making a product or system. 3.5.3-5.O

P. Evaluate the strengths and weaknesses of existing design solutions, including their own solutions. 3.5.3-5.P

Q. Practice successful design skills. 3.5.3-5.Q

R. Apply tools, techniques, and materials in a safe manner as part of the design process. 3.5.3-5.R

S. Illustrate that there are multiple approaches to design. 3.5.3-5.S

T. Apply universal principles and elements of design. 3.5.3-5.T

U. Evaluate designs based on criteria, constraints, and standards. 3.5.3-5.U

V. Interpret how good design improves the human condition. 3.5.3-5.V

Integration of Knowledge, Technologies, and Practices

W. Describe the properties of different materials. 3.5.3-5.W

X. Explain how various relationships can exist between technology and engineering and other content areas. 3.5.3-5.X

Y. Identify the resources needed to get a technical job done, such as people, materials, capital, tools, machines, knowledge, energy, and time 3.5.3-5.Y

Z. Create a new product that improves someone's life. 3.5.3-5.Z

Nature and Characteristics of Technology and Engineering

AA. Create representations of the tools people made, how they cultivated to provide food, made clothing, and built shelters to protect themselves. 3.5.3-5.AA

BB. Illustrate how, when parts of a system are missing, it may not work as planned. 3.5.3-5.BB

CC. Describe how a subsystem is a system that operates as a part of another larger system. 3.5.3-5.CC

DD. Demonstrate how simple technologies are often combined to form more complex systems. 3.5.3-5.DD

EE. Explain how solutions to problems are shaped by economic, political, and cultural forces. 3.5.3-5.EE

FF. Compare how things found in nature differ from things that are human-made, noting differences and similarities in how they are produced and used. 3.5.3-5.FF

GG. Describe the unique relationship between science and technology, and how the natural world can contribute to the human-made world to foster innovation. 3.5.3-5.GG

HH. Differentiate between the role of scientists, engineers, technologists, and others in creating and maintaining technological systems. 3.5.3-5.HH