

## Core Idea ETS2

### **Links Among Engineering, Technology, Science, and Society**

*How are engineering, technology, science, and society interconnected?*

- insight
- science
- catalyze
- technology
- application
- engineering design
- scientific investigation
- system

### ETS2.A: INTERDEPENDENCE OF SCIENCE, ENGINEERING, AND TECHNOLOGY

*What are the relationships among science, engineering, and technology?*

- team(s)
- scale (larger or smaller)
- data
  - to record data
  - manage data
  - analyze data
- model
- complex systems
- precision

*Grade Band Endpoints for ETS2.A*

***By the end of grade 2.***

- questions
- natural world
- tools
- engineering
- science
- observation
- measurement
- design

***By the end of grade 5.***

- tools and instruments (e.g., rulers, balances, thermometers, graduated cylinders, telescopes, microscopes)
- scientific exploration
- data
- natural world
- engineering design
- scientific discovery
- knowledge
- scientific concepts
- research findings

***By the end of grade 8.***

- engineering
- scientific discovery
- industry
- engineered systems
- technology
- new science
- materials research
- measurement
- exploration
- modeling
- computational capacity
- scientific investigation

***By the end of grade 12.***

- science
- engineering
- research and development (R&D)

**ETS2.B: INFLUENCE OF ENGINEERING, TECHNOLOGY, AND SCIENCE ON SOCIETY AND THE NATURAL WORLD**

*How do science, engineering, and the technologies that result from them affect the ways in which people live? How do they affect the natural world?*

- agriculture
- technology
- natural resources
- short-consequences

- long-term consequences
- +/- & consequences
- human health
- health of natural environment
- recent human history
- society
- human population
- natural environment
- science and engineering domains—agriculture, medicine, housing, transportation, energy production, water availability, and land use, among others.
- deep impact(s)
- balancing of costs, benefits, and risks
- mathematical modeling
- scale of place, time, or system complexity
- human judgment

Human populations and longevity have increased, as advances in science and engineering have influenced the ways in which people interact with one another and with their surrounding natural environment.

- market forces
- political processes
- influence (on the work of scientists and engineers)
- goals
- priorities
- limit(s)
- extraction of raw materials
- pollution (from mining, farming, and industry)

*Grade Band Endpoints for ETS2.B*

***By the end of grade 2.***

- technology
- human life
- human-made product(s)
- design
- natural world
- materials
- impact(s) (on the natural world)

***By the end of grade 5.***

- needs
- wants
- demands
- technology(ies)
- engineers
- benefit(s)
- risk(s)
- societal demands

***By the end of grade 8.***

- human activity
- natural resources
- short-term consequences
- long-term consequences
- +/- impact(s)
- health
- natural environment
- technology
- societal needs
- desires
- values
- scientific research
- climate
- natural resources
- economic conditions
- regulation
- mitigate impacts

***By the end of grade 12.***

- modern civilization
- technological systems (like agriculture, health, water, energy, transportation, manufacturing, construction, and communications)
- scientific knowledge
- engineering design practices
- benefits
- costs
- risks
- adoption
- technological innovation

- market forces
- societal demands
- government regulation
- deep impact
- environment
- mitigation
- analysis of costs
- environmental impacts
- expected benefit