Technology & Engineering Curriculum Framework

TECHNOLOGY AND ENGINEERING LONG TERM TRANSFER GOALS
Transfer goals highlight the effective uses of understanding, knowledge, and skill that we seek in the long run; i.e., what we want students to be able to do when they confront new challenges – both in and outside of school.

Students will be able to engage as technological and engineering literate members of a global society, using their learning to:

1. Analyze a problem in its entirety while recognizing the subcomponents interacting with human-made and natural environments.
2. Apply investigation, imagination, innovative thinking, and physical skills to accomplish goals.
3. Employ hands-on problem solving, i.e., designing, making/building, producing, and evaluating outcomes.
4. Acquire, analyze, and evaluate information to reach an informed conclusion, using logic and reasoning skills.
5. Investigate better solutions through a belief that opportunities can be found in every challenge.
6. Collaborate as part of a team, valuing the contributions of all members.
7. Exchange and explain ideas by sharing information with a larger community.
8. Demonstrate integrity and conscientiousness, considering ethical issues involved.

BIG IDEAS	ESSENTIAL QUESTIONS
Declarative statements describe concepts that transcend grade levels. Big Ideas are essential to provide focus on specific content for all students.	*Questions are specifically linked to the Big Ideas. They should frame student inquiry, promote critical thinking, and assist in learning transfer.*
Big Idea 1: The study of technology and engineering requires knowledge of the natural world and the human-made world.	*Why is it important to have an understanding of the natural and human-made worlds?*
Big Idea 2: The study of technology and engineering involves the ability to understand, use, assess, and create technological products, systems, and ways of thinking.	*Why is it important to understand, use, assess, and create technological products, systems, and ways of thinking?*
Big Idea 3: The study of technology and engineering as a human activity is interdisciplinary.	*How does the interdisciplinary nature of technology and engineering influence human activity?*

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Big Idea 4: Technology and engineering activities require resources.	*How are various resources used in technology and engineering activities?*
Big Idea 5: A system is a group of interrelated components designed collectively to achieve a desired goal.	*How do system components work together to achieve a desired goal?*
Big Idea 6: Historically, technological knowledge has accelerated along with other fields.	*Why does technological knowledge often accelerate alongside other fields?*
Big Idea 7: Historical eras are often defined by technological advancements.	*How do technological advancements define different historical eras?*
Big Idea 8: Historically, technology has both created and solved problems.	*How has technology both created and solved problems?*
Big Idea 9: Technologically literate people are well-equipped to learn about and use technological products and systems.	*Why is it important for people to be technologically literate?*
Big Idea 10: Maintenance and repair of a technological product, system, or process is crucial to keeping it in proper working order.	*How can a product, system, or process be kept in proper working order?*
Big Idea 11: People should gather, synthesize, and analyze information before drawing conclusions when assessing a technological product, system, or process.	*How can information be used to evaluate technological products, systems, and processes?*

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Big Idea 12: Technology and engineering have both positive and negative impacts on society and the environment.	*How can one assess the impact of technology and engineering on society?*
Big Idea 13: Decisions made about technology and engineering involve consideration of costs, benefits, and tradeoffs.	*How do costs, benefits, and tradeoffs factor into decisions made about technology and engineering?*
Big Idea 14: Responsible creation and use of technology requires the sustainable use of renewable and nonrenewable resources and handling of waste.	*Why is it important to sustainably manage technological resources?*
Big Idea 15: Use of technology can lead to fundamental changes in individuals, human cultures, and the environment.	*How does changing technology impact the individual, culture, and environment?*
Big Idea 16: The needs and wants of society often shape technology and engineering developments.	*How do technology and engineering address the needs and wants of society?*
Big Idea 17: The values and beliefs of societies shape attitudes toward technology.	*How do the values and beliefs of societies shape attitudes toward technology?*
Big Idea 18: Technology and engineering are interdisciplinary, relating to more than one content area.	*How do technology and engineering relate to other content areas?*
Big Idea 19: Technological knowledge and practices advance – and are advanced by – other fields.	*How do advancements from one field impact another?*

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Big Idea 20: Design is a fundamental human activity.	*Why is design important to human activity?*
Big Idea 21: There is no single, best solution as designs can always be improved and refined.	*Why is there no single correct solution in design?*
Big Idea 22: Design in technology and engineering is iterative.	*What is the value of iteration within the design process?*
Big Idea 23: There are requisite skills used in technology and engineering design.	*How are requisite skills applied in technology and engineering design?*
Big Idea 24: There are universal principles and elements of design.	*How are designs influenced by universal principles and elements of design?*
Big Idea 25: Making is an inherent part of technology and engineering design.	*Why is making a necessary component of design?*
Big Idea 26: Design optimization is driven by criteria and constraints.	*How do criteria and constraints drive design?*