

I³ - EbD Curriculum – Invention-Innovation-Inquiry

This project funded by the National Science Foundation is so named because invention and innovation are the hallmarks of technological thinking and action.

Students learn how inventions, innovations, and systems are created and how technology becomes part of people's lives



Units for Technological Literacy

A structure for the study and implementation of technology education within elementary classrooms



- Invention
- Innovation
- Inquiry
- Communication
- Construction
- Design
- Manufacturing
- Power & Energy
- Technological Systems
- Transportation
- Contact
- Order

Welcome to I³ Invention-Innovation-Inquiry: Units for Technological Literacy, Grades 5-6



This project is supported in part, by the [National Science Foundation](#) and implemented by the [International Technology Education Association](#) and [California University of Pennsylvania](#).
The I³ Project, Invention-Innovation and Inquiry was created to provide professional support for teachers interested in technological literacy in education, in particular, elementary curriculum.

Acknowledgment and Disclaimer
"This material is based upon work supported by the National Science Foundation under Grant No. 0095922."
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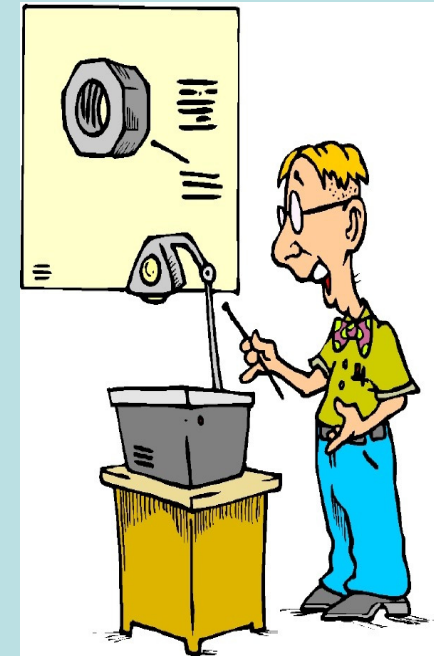
Each unit is designed to integrate mathematics and science with technology and take 8 to 10 days.

- standards-based content
- suggested teaching approaches
- detailed learning activities
- teacher background information
- handouts
- transparency masters
- testing

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What students learned from I3 units... (according to teachers):

- Inquiry skills
- Problem-solving skills
- The engineering design process
- Research skills via Internet/printed sources
- Writing skills
- Thinking “outside the box”
- Enhanced creativity
- That even a good design may fail
- How to follow specific directions
- To communicate a message to a specific audience
- To identify alternatives in decision-making situations



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Unit Titles and Descriptions:

1. **Invention: The Invention Crusade**

- Students develop an idea for an invention by designing and constructing a working model or prototype of a gadget that helps a small child to do a household task.

2. **Innovation: Inches, Feet, & Hands**

- Students use the engineering design process to design and develop an improved product that is used by the human hand.

3. **Communication: Communicating School Spirit**

- Students examine communication processes and mediums by designing, developing, and implementing different types of commercial projects promoting school spirit.

4. **Manufacturing: The Fudgeville Crisis**

- Students explore food preservation and packaging as their companies mass-produce and package “fudge” for a Fudge Festival.

5. **Transportation: Across the United States**

- Students investigate the systems of transportation and how transportation has impacted the United States and then apply their learning by designing a transportation vehicle.

6. **Construction: Beaming Support**

- Students act as structural engineers and design and construct at least two laminated paper beams—testing, evaluating, and redesigning their beams for maximum strength.

7. **Power and Energy: The Whispers of Willing Wind**

- Students gain an understanding of wind energy and power as they construct a device that captures wind energy and converts it to electricity.

8. **Design: Toying with Technology**

- Students explore two-dimensional (2-D) and three-dimensional (3-D) visualization processes and mediums by designing, developing, and building toys that solve a given problem.

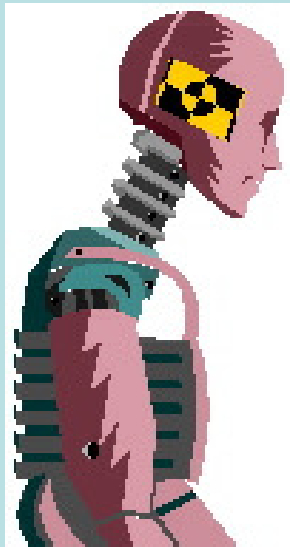
9. **Inquiry: The Ultimate School Bag**

- Students use inquiry skills to redesign a school bag and construct a model of the “Ultimate School Bag.”

10. **Technological Systems: Creating Mechanical Toys**

- Students investigate two mechanical devices, pneumatics and linkage mechanisms, and design a toy that uses both to create movement.

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INNOVATION—INVENTION—INQUIRY
Technological Literacy Units for Grades 5-6

I³

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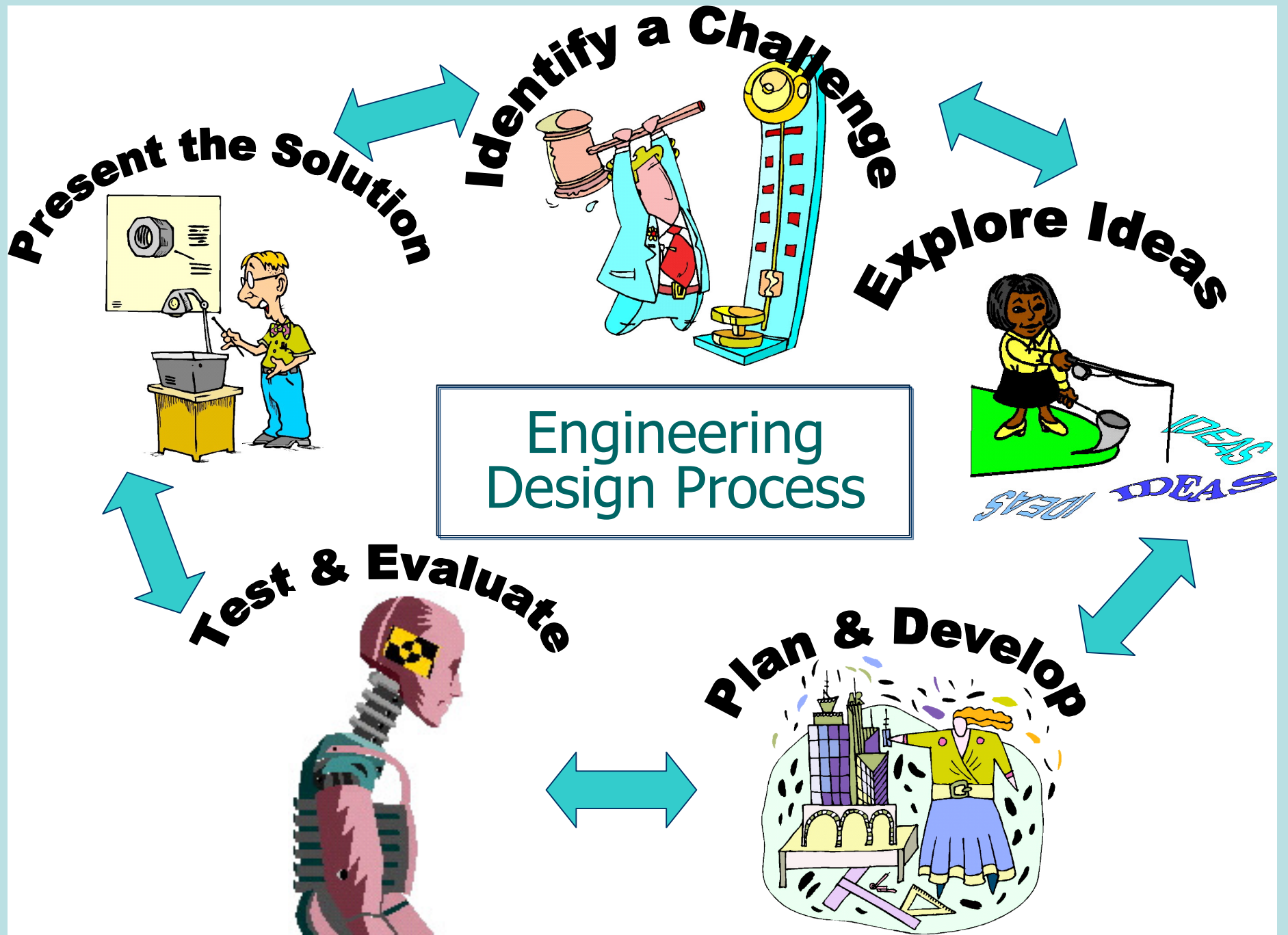


Example I³ Unit: Whispers of the Willing Wind



During this unit you are going to:

- Research and compare the most common resources used to produce electricity to gain an understanding of how those systems work.
- Examine the ways energy is used for technological devices in their home.
- Construct a device that will capture wind energy and convert it into mechanical energy.
- Design and build a structure to support the wind energy device.





Intermediate Unit 1
CENTER FOR STEM EDUCATION



More information on the I³ Curriculum

<http://www.iteea.org/i3/index.htm>