

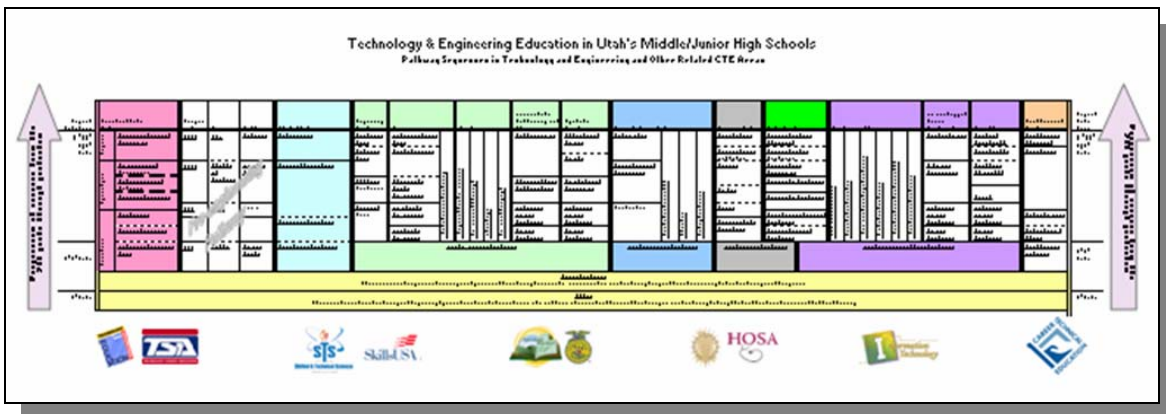
Career and Technical Education Introduction Overview

Technology and Engineering

This is the 2007 revision of the Technology and Engineering portion of the CTE Intro curriculum.

Through this activity-centered curriculum students are exposed to CTE related careers. These learning experiences must be kept exploratory in nature. Each cluster area listed below is allocated 4-5 days of exploration. Teachers need to carefully choose the videos, dvds, presentation, and activities that they use to maximize the learning experience of each student. **Remember this course should be an exciting and fun introduction the Career and Technical Education option available to students.**

Pathway exploration should be a part of every activity and lesson taught in the CTE Intro course. This year the state office printed up the following 6 foot long poster. Please use it to show the pathways that are available to your students. Remember not all pathways are available to your students. Some pathways may be available in magnet centers or UCAT programs. Please make sure student and parents understand which pathway options are available to them.



If you do not have a copy of this poster please contact Melvin Robinson at Melvin.robinson@schools.utah.gov or call at 801-538-7598

Technology Student Association (TSA) activities can be use in CTE Intro as long as they fit the exploratory nature of CTE Intro and meet the cluster area competencies.

Scope and Sequence of Technology and Engineering Education
 Below is a potential scope and sequence to a trimester rotation.

Trimester #3 (Tech & Eng Ed) Sample					
	M	T	W	TH	F
1	Tech Ed Overview	Career Development Lessons ≈ 3 days			Safety Training 2 days
2	Safety Training 2 days	Engineering ≈ 4 days, Engineering and the basics engineering design process			
3	Communications Technology ≈ 5 days, all the ways people have developed to send and receive messages				
4	Personal Economics ≈ 2 days – Choices have costs and benefits		Information Technology ≈ 2 days – information technology and digital media in today's technology world		Flex Day
5	Construction Technology ≈ 4 days, construction technology involves the technology used in designing and building structures				Flex Day
6	Manufacturing Technology ≈ 5 days, manufacturing technology in producing items people want and need				
7	Health Science and Technology ≈ 5 days – The relationship and impact of health care on technology				
8	Marketing ≈ 5 days –The 4 P's of Marketing				
9	Agriculture ≈ 5 days – The relationship and impact of agriculture and natural resources on technology and engineering				
10	Work Based Learning ≈ 2 days – nature of the workplace, the value of work to society		Career Development Lessons ≈ 3 days		
11	Energy & Power Technology ≈ 4 days, The relationship between energy, power, and the ability to do work				Flex Day
12	Transportation Technology ≈ 4 days, The different types of transportation systems				Wrap Up

Communication Technology– Cluster Objectives

1. Definition of Communication Technology: This includes all the ways people have developed to send and receive messages¹.
2. Communications Model
 - Sender
 - Message
 - Receiver
 - Feedback
3. Impacts on society and environment
 - ❖ Example Activities:
 - Audio Visual Commercial (This could be a Marketing activity)
 - Business card/Id bag with digital picture
 - Computer Aided Drafting (CAD)
 - Defining the internet activity
 - Digital photography
 - Geographic Information Systems (GIS)
 - Graphic arts
 - Java programming with robo code (This could be a IT activity)
 - Laser fiber optics demonstration/Activity
 - Laser Exploration
 - Measuring instruction and activity
 - Sketching
 - Etc.
 - ❖ Sample Careers
 - Drafter
 - Engineer and Engineering Technician
 - Photographer
 - Sound Technician
 - Technology and Engineering Teacher

¹ Brusic, Sharon A., James F. Fales, and Vincent F. Kuetemeyer. Technology Today and Tommorrow. 4th Ed. Peoria: Glencoe/McGraw-Hill, 1999, Page 22

Construction – Cluster Objectives

1. Definition of Construction Technology: All the technology used in designing and building structures².
2. Types of Construction
 - Civil
 - Commercial
 - Industrial
 - Residential
3. Impacts on society and environment
 - ❖ Example Activities:
 - Architectural design (sketch house plan, simple model)
 - Platform/Truss design and construction
 - Span-it software bridge
 - Etc.
 - ❖ Sample Careers
 - Architect
 - Carpenter
 - Engineer and Engineering Technician
 - Plumber
 - Space Construction
 - Technology and Engineering Teacher

² Brusica, Sharon A., James F. Fales, and Vincent F. Kuetemeyer. Technology Today and Tomorrow. 4th Ed. Peoria: Glencoe/McGraw-Hill, 1999, Page 23

Energy and Power – Cluster Objectives

1. Definition of Energy and Power. Energy: The ability to do work. Definition of Power: The amount of work done³.
2. Common energy sources
 - Solar
 - Fossil fuels
 - Hydro
 - Geo thermal
 - Wind
 - Etc.
3. Impacts on society and environment
 - ❖ Example Activities:
 - Corn Plastic
 - Heat Expansion
 - Laser Demonstration
 - Mechanical power (This could be used as a Transportation activity, e.g.: Capsela, Lego, K'NEX etc.)
 - Paper clip electric motor
 - Photo Voltaic
 - Rocket Power
 - Simple circuits
 - Solar Oven - Build and cook with a solar oven (This could also be a Manufacturing Activity)
 - Solar Power
 - Wind Generator
 - Etc.
 - ❖ Sample Careers
 - Electrician
 - Engineer and Engineering Technician
 - Mechanic
 - Power Plant Technician
 - Technology and Engineering Teacher

³ Thode, Brad, and Terry Thode. Technology In Action. 2nd Ed. Peoria: Glencoe/McGraw-Hill, 2002, Page 287

Manufacturing – Cluster Objectives

1. Definition of Manufacturing Technology: all the technologies people use to make the things they want and need⁴.
 2. Identify different types of production systems.
 - Custom
 - Intermittent
 - Continuous
 - Flexible
 3. Impacts on society and environment
- ❖ Example Activities:
- Candle stick holder
 - Mass production e.g.: peg games, string games, puzzle, Bolt assembly etc.
 - Materials testing
 - Message pad project
 - Plastic picture frame
 - Robotics activity
 - Solar oven - Build and cook with a solar oven (This could also be an energy & power activity)
 - Etc.
- ❖ Sample Careers
- Engineer and Engineering Technician
 - Machinist
 - Robotic Technician
 - Sheet Metal Technician
 - Technology and Engineering Teacher

⁴ Brusic, Sharon A., James F. Fales, and Vincent F. Kuetemeyer. Technology Today and Tomorrow. 4th Ed. Peoria: Glencoe/McGraw-Hill, 1999, Page 23

Transportation – Cluster Objectives

1. Definition of Transportation Technology: All the means we use to help us move through the air, [in space], in water, or over land⁵.
 2. Types of Transportation systems
 - Land
 - Air and Space
 - Marine
 - Pipeline and Conveyor
 3. Impacts on society and environment
- ❖ Example Activities:
- Aerodynamics, e.g.: egg carton/meat tray airplanes, etc.
 - Flight simulator
 - Foam gliders
 - Maglevitation
 - Marine activity
 - Mechanical power (This could be used as an Energy and Power activity, e.g.: Capsela, Lego, K'NEX etc.
 - Monorail
 - Pipeline or conveyor activity
 - Rocket trajectory, e.g.: Pitsco straw rockets, etc.
 - Etc.
- ❖ Sample Careers
- Auto Technician
 - Engineer and Engineering Technician
 - Equipment Operator
 - Hazmat (Hazardous Materials) Technician
 - Technology and Engineering Teacher

⁵ Brusic, Sharon A., James F. Fales, and Vincent F. Kuetemeyer. Technology Today and Tomorrow. 4th Ed. Peoria: Glencoe/McGraw-Hill, 1999, Page 24

Engineering – Cluster Objectives

1. Definition of engineering: Engineering is the application of math, science, and technical skills to design and create something of value.
 2. The basic Design Process
 1. Define the problem
 2. Gather pertinent information
 3. Generate multiple solutions
 4. Analyze and select a solution
 5. Test and implement the solution
 3. Impacts on society and environment
- ❖ Example Activities: (Note: all activities should have strong math and science applications)
- 3D Modeling
 - Architectural Modeling
 - Aviation – Aerospace
 - Biotechnology
 - Boat Hull (Hydroplane or Hydrofoil)
 - Bridge Design and Construction
 - Energy Conversion and Storage
 - Environmental – Water Purification
 - Materials Testing
 - Mouse Trap Cars
 - Power systems
 - Restraint systems (Crash)
 - Rocketry
 - Tower Design
 - Truss Design and Construction
 - Wind tunnel
 - ???
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- ❖ Sample Careers
- Aerospace and Aviation Engineering & Aerospace and Aviation Engineering Technologist
 - Chemical Engineering and & Chemical Engineering Technologist
 - Civil Engineering & Civil Engineering Technologist
 - Manufacturing Engineering & Manufacturing Technologist
 - Etc.
 - Technology and Engineering Teacher