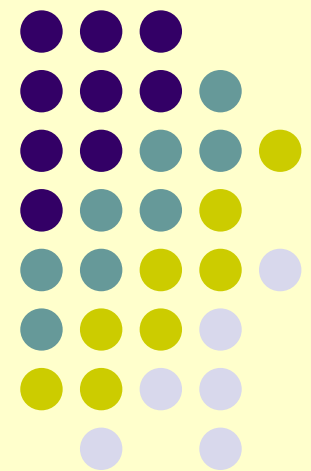
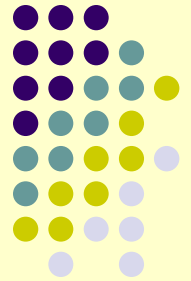


Technology Education Praxis II 0050

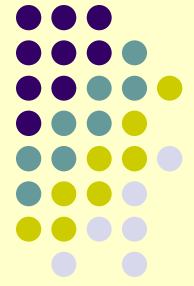
TEAM Fall Conference
Christopher Putnam
Laurie Kleier



Overview



- The Technology Education test is designed for prospective teachers at the secondary level.
- Aligned with the Standards for Technological Literacy (ITEA – STL)
- Questions focus on the prospective teacher's understanding and application of principles utilized in teaching technology education.

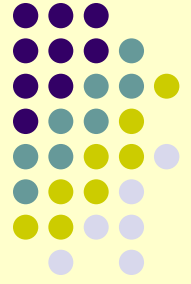


Test at a Glance

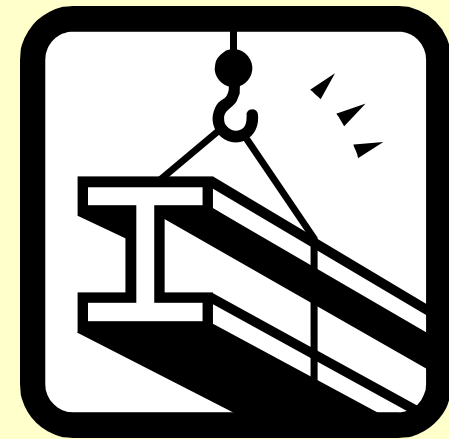
- **Test Name:** Technology Education
- **Test Code:** 0050
- **Time:** 2 hours or approximately 1 minute per question
- **Number of Questions:** 120
- **Format:** Selected Response

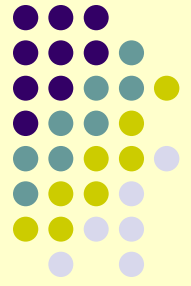


Content Categories



- Test is broken into five categories.
 - Pedagogy and Professional Studies
 - 36 Questions, 30% of exam
 - Info/Communication
 - 24 Questions, 20% of the exam
 - Construction
 - 14 Questions, 12% of the exam
 - Manufacturing
 - 22 questions, 18% of the exam
 - Energy/Power/Transportation
 - 24 questions, 20% of the exam





Overview of Preparation

- Approach the exam by looking at each of the 4 categories
- Use a general TechEd text to work from, HS or MS
- Practice exams!!!
- TechEd video series
- Study topics on ITEA website

Resources for Study

- Books:

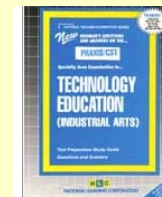
- FOT *Engineering by Design* Manual



- *Technology*, by R. Thomas Wright – Goodheart-Willcox Publisher – ISBN: 878-1-59070-719-7

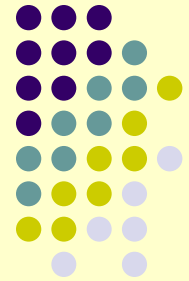


- *NTE Technology Education Test Prep Study Guide* – ISBN: 0-8373-8415-x

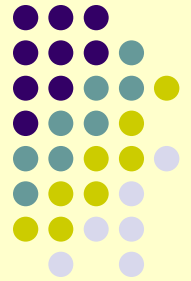


- Online Documents:

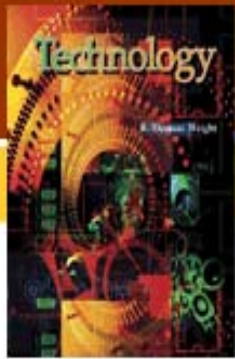
- BMI Core Technologies as described in online document: <http://www.thebmi.org/files/coretech.pdf>



Resources for Study – cont'd



- Online Practice Tests:
 - G-WLearning.com – Technology Education Student companion website. Chapters & online tests sorted by topic.
 - TEAM Praxis website - various sample tests with selection buttons.
http://www.techedmd.org/2820_praxis.htm



Technology

STUDENT COMPANION
WEB SITE



Home > Student Site > [Section 1: Technology](#)

Section Activities

Chapter Activities

Resource Center

Dynamic Glossary 

Section 1: Technology

Section Activities Include:

- Animated Activity
- Career Exploration
- Cross-Curricular Activity

Chapter 1: Technology: A Dynamic, Human System

- Crossword Puzzle
- Matching
- E-Flash Cards
- Interactive Quiz

Chapter 2: Technology As a System

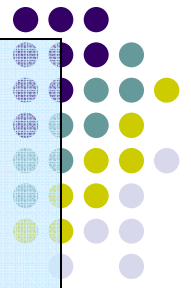
- Crossword Puzzle
- Matching
- E-Flash Cards
- Interactive Quiz

Chapter 3: Types of Technological Systems

- Crossword Puzzle
- Matching
- E-Flash Cards
- Interactive Quiz



G-wlearning.com



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- ▶ Budget
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- ▶ Join TEAM
- ▶ TEAM E-mail
- ▶ Search

MCCTES Praxis 2 preparation course

Go to:
<http://www.thebmi.org/index.cfm/cID/1272>

2008 Praxis

Praxis Workshop
9:30--1:30pm, BMI

- ▶ Session 1
- ▶ Session 2

PRAXIS

Session 1

Production-point Overview
 Exam process
 Calculators prohibited) 2 hours \$85, \$50 fee
[Intro link](#)

[Background movie](#)

PRACTICE EXAMS

Get results for the practice exams below,
 take the test and then email me at cputnam@bcps.org.
 I will send your exam results back to you.

What is Tech

[Problem Solving and Design](#)

[Systems and Resources](#)

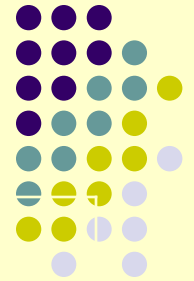
[Information and Communication](#)

[Energy, Power and Transportation](#)

[Construction and Manufacturing](#)

TEAM Praxis
 website

Specific Topics

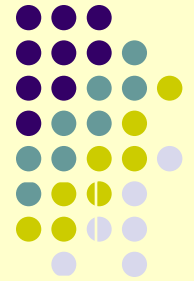


- Problem Solving & Constraints, p. 36, 83, 179, 184
- Management Process, p. 38
- Materials, pg. 69 –72
- Sources of Energy, -p. 74
- Corporation, p. 75, 647
- Conditioning Process, p. 95
- Elements of Machine Tools, p. 128
- Steam Engine, p. 140
- Internal Combustion, 4-stroke & External Combustion Engines, p. 142-3, 480-1, 549-550
- Computers, p. 150, 443-446
- Measurement & Quality Control, p. 170
- Steps in Solving Technological Problems, p. 182
- Brainstorming, p. 194
- Oblique, Isometric, Perspective Sketches, p. 198-202
- Modeling, Prototypes & Simulations, p. 207-212
- Radar, p. 216

Source – *Technology*, R. Thomas Wright, ISBN: 878-1-59070-719-7



Specific Topics – cont'd

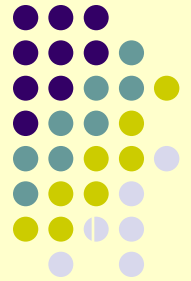


- Engineering & Detailed Drawings, p. 226
- Systems Drawings (symbols), p. 232
- Minerals, p. 258
- Thermal Conditioning Process, p. 305
- Parts of the Plumbing System, p. 330
- Types of Bridges (Beam, Truss, Arch, Cantilever), p. 336-7
- Communication Model, p. 364
- 4 Colors used in photograph, p. 383
- Lines used in Drawings, p. 230
- Fossil fuels, p. 256
- Process to Produce Glass, p. 281
- Types of Building Foundations, p. 324
- Road Elevation Grades, p. 335
- Types of Dams, p. 338
- 6 Major Printing Processes, p. 375-377
- Types of Film, p. 406

Source – *Technology*, R. Thomas Wright, ISBN: 878-1-59070-719-7



Specific Topics – cont'd

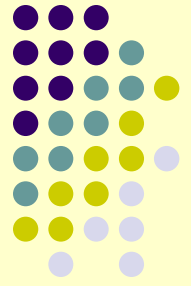


- Radio Broadcasting, AM/FM, p. 424-5
- Propulsion Systems (simple to complex), p. 477-8, 486, 493
- DOT programs: FAA, FHA, NTSB, p. 517
- Sources of Energy, Exhaustible, Inexhaustible, Renewable Energy, p. 531-533
- Types of “Work” Motion, p. 556
- Entrepreneurship, p. 641
- Marketing/Advertising, p. 664
- Energy Uses, p. 695
- GPS, Triangulation, not in book
- Transportation Pathways, p. 470
- Control Systems (degrees of freedom), p. 478
- Types of Energy, p. 527
- Passive/Active Solar Energy Collectors, p. 543-544
- Hydraulic Systems, p. 569
- Quality Control & JIT, p. 662-3, 702
- OSHA, p. 667
- Industrial Revolution & Centralized Manu., p. 708-9

Source – *Technology*, R. Thomas Wright, ISBN: 878-1-59070-719-7

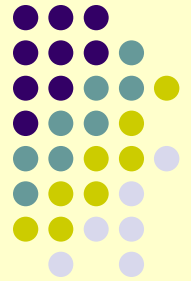


Test Strategies



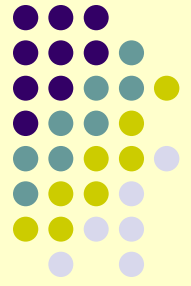
- Start studying about 4-weeks prior to exam
- Break study sessions into 1-hr. blocks
- Take online tests to assess your prior knowledge and then make a list of problem topics.
- Concentrate on problem topics, read topics in books, take online tests over if necessary.
- Make flash cards of vocabulary. Sort out topics you know from those you don't.

Test Strategies – cont'd



- Preview textbooks and flag sections to reread. Highlight in books as needed.
- Take Praxis Workshops.
- Watch TechEd videos for clarification.
- Time yourself on practice tests. Make sure you can answer questions in less than 1-min.
- Review question strategies from college. Process of elimination, etc.

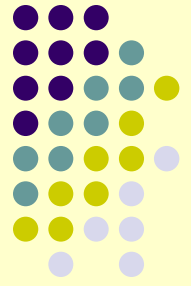




Test Strategies – cont'd

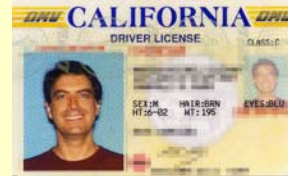
- Make sure to confirm your test time and location. Print out map & directions of test site. **MAPQUEST.**
- Set two alarm clocks the night prior to test, just in case.
- Get to bed early and get plenty of sleep.
- Take bottled water and pencils to test. Take an additional eraser if necessary.

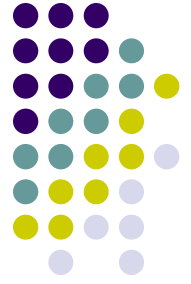




Test Strategies – cont'd

- Arrive at test location at least $\frac{1}{2}$ - 1 hr. prior to test.
- Do not carry books with you, or better yet, leave them in the car!
- Take a picture ID.
- Finally, **don't worry.**



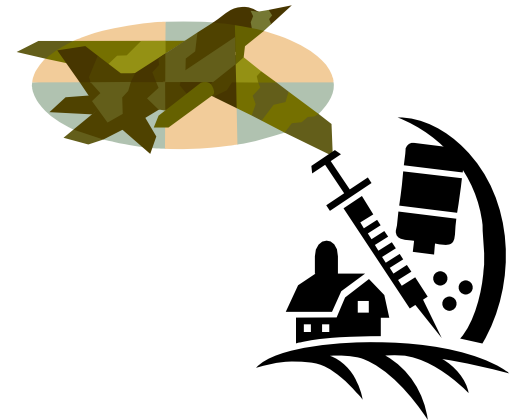
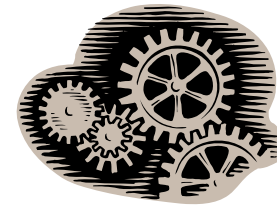
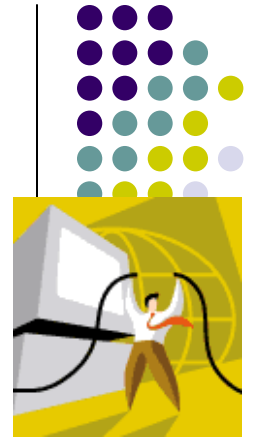


Technology Education

- “Technology Education is an integrated, experience-based instructional program designed to prepare students to be knowledgeable about technology - its evolution, systems, technologies, utilization, and social and cultural significance. “
- (Reference: <http://www.techedlab.com/define.html>)

Technology Education

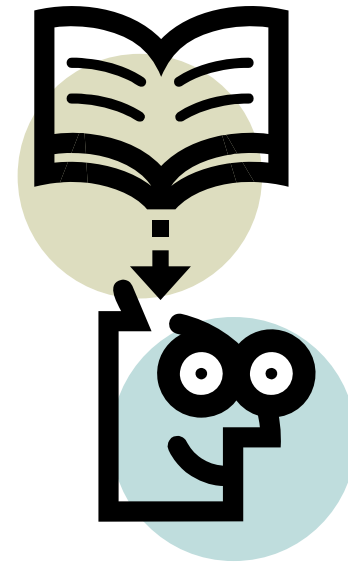
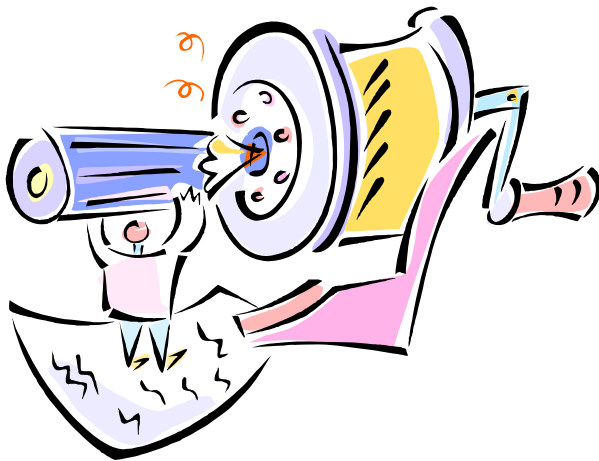
- “It results in the application of **mathematics** and **science** concepts to technological systems in areas such as, but not limited to: construction, manufacturing, communications, transportation, biotechnology, and power and energy.”
- (Reference: <http://www.techedlab.com/define.html>)



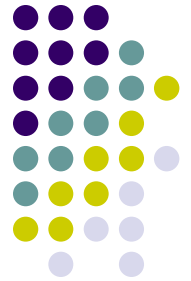
What Will Students Know or Be Able to Do?



- “Students are challenged to discover, create, solve problems, and construct solutions by using a variety of tools, machines, computer systems, materials, processes and technological systems.”
- (Reference: <http://www.techedlab.com/define.html>)



What is the Difference Between Technology Education and Educational Technology?



- Technology Education
- (Technological Studies)
- Teaches **about** technology in the content area
- Concerned with the broad spectrum of technology (How humans have designed and innovated the natural world)
- Primary Goal: **Technology Literacy** for everyone

- Educational Technology
- (Information Technology)
- Teaches **with** technology
- Primarily concerned with the narrow spectrum of information and communication technologies
- Primary Goal: to enhance the teaching and learning process

Science, Engineering, and Technology



- **S**am **W**ill **E**at **H**is **T**una **M**errily.
- **S**cience: **W**hy something happens
- **E**ngineering: **H**ow to turn the science into something useful
- **T**echnology: **M**aking something useful

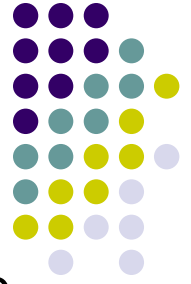


What is Technology?

- Technology is the application of knowledge skills and tools to solve problems and to extend human capabilities.

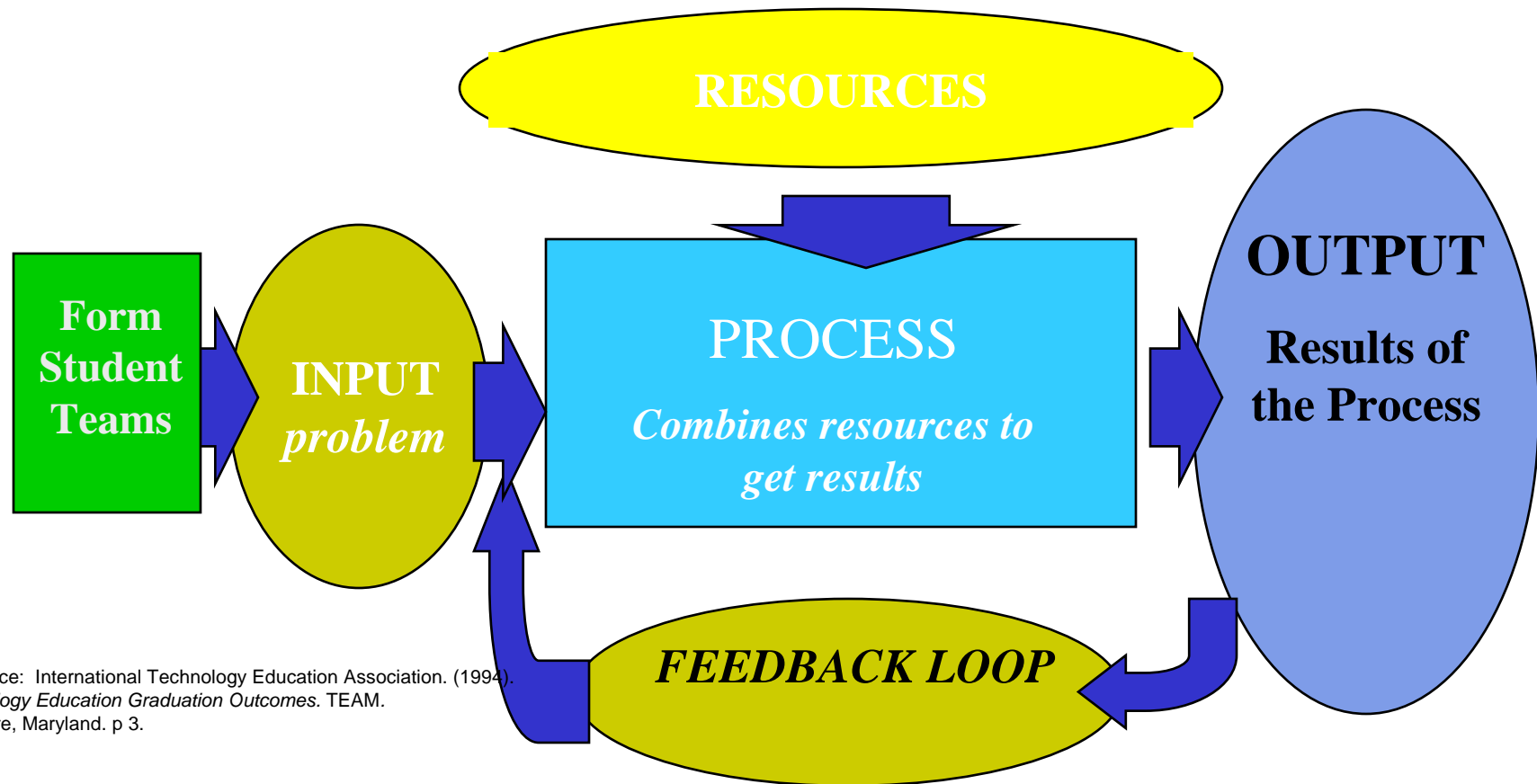


Reference: International Technology Education Association. (1994).
Technology Education Graduation Outcomes. TEAM.
Baltimore, Maryland. p 2.

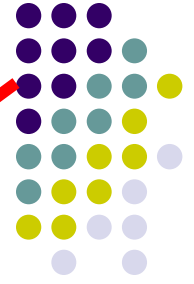


What is a System?

- A group of resources (people, info, tools, energy, capital, time and materials) working together for a purpose. Systems have goals, inputs, processes, outputs and feedback/control.

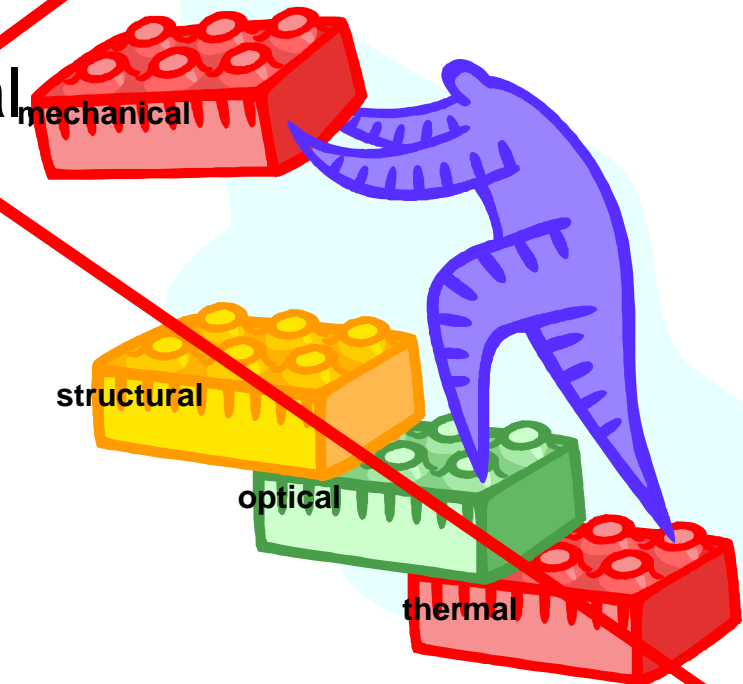


Reference: International Technology Education Association. (1994).
Technology Education Graduation Outcomes. TEAM.
Baltimore, Maryland. p 3.



What are the Core Technologies?

- They are the nine building blocks of technology systems.
- They include: mechanical, electronics, electrical, optical, fluid, thermal, structural, biotechnical, and materials technologies.



Reference: International Technology Education Association. (1994).
Technology Education Graduation Outcomes. TEAM.
Baltimore, Maryland. p 6.

The Maryland Core Technologies

The Core Technologies as defined in Maryland are the major content elements used to create technology devices and systems. They can be identified singularly or in combination in all technology devices. They are related to specific areas of scientific discovery and experimentation, and maybe uniquely defined by their application of specific scientific principles and concepts. They also provide experimental application and functional application of mathematic theorems and proofs as they operate.

Materials technology - the technology of producing, altering and combining materials.
Applications: producing paper from wood, producing aluminum from ore, drilling holes in wood, annealing to soften metal, casting ceramic, welding metal, laminating wood.

Mechanical technology - the technology of putting together mechanical parts to produce, control and transmit motion. Applications: gear systems in a car transmission, brakes on a bicycle, agitator in a washing machine.

Electrical technology - the technology of producing, storing, controlling, transmitting and getting work from electrical energy. Applications: power plant generator, flashlight battery, light switch, electric motor in a can opener, door bell, electric heater, blow dryer.

Electronic technology - the technology of using small amounts of electricity for controlling; detecting; and information collecting, storing, retrieving, and communicating. Applications: thermostat for controlling temperature, a metal detector, video tape recorder, computer, pocket calculator, telephone, radio, television.

Structural technology - the technology of putting parts and materials together to create supports, containers, shelters, connectors and functional shapes. Applications: legs on a chair or table, city water tower, swimming pool, buildings, roadways, bridges, storm sewer, airplane wing, satellite antenna dish.

Fluid technology - the technology of using fluid, either gaseous (pneumatics) or liquid (hydraulics) to apply force or to transport. Applications: pneumatics: air brakes on a truck, tires on a car, airfoils on an airplane. warm air heating ducts and fan in a building hydraulics: brakes on a car, plumbing in school.

Optical technology - the technology of producing light; controlling light; using light for information collection, processing, storage, retrieval and communication; and using light to do work. Applications: light bulb, LED (Light Emitting Diode), lenses to magnify and reduce, laser speed detector, laser compact disk, fiber optic telephone communication, laser cutting tools, laser surgery instruments furnace.

Thermal technology - the technology of producing, storing, controlling, transmitting and getting work from heat. Applications: furnace, hot water heater, toaster, insulation, heat exchanger (radiator, condenser), refrigerator, jet engine, hot air balloon.

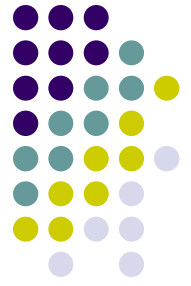
Bio technology - the technology of using, adapting and altering organisms and biological processes for a desired outcome. Applications: stain "eating" enzymes in detergent, bacteria "leaching" of metals from ore, altering plant genes to produce better crops.



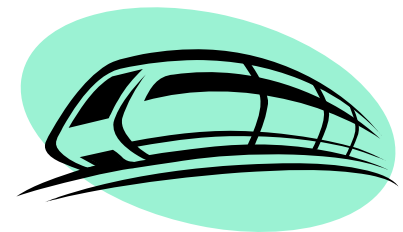
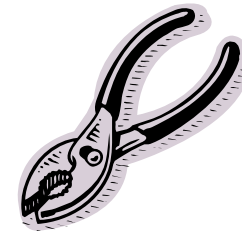
BMI
document
Core
Technologies

more
definitions

What is a Technology System?



- A group of resources working together to solve problems and extend human capabilities. These systems are built upon the nine core technologies. They can be small, medium or large.
 - Simple/Small examples:
 - Pliers and paper stapler
 - Complicated/Large examples:
 - aircraft carrier and AMTRAK



Reference: International Technology Education Association. (1994). *Technology Education Graduation Outcomes*. TEAM. Baltimore, Maryland. p. 8-9.

Some Various Applications of Technology Systems



- **Information and Communication** – collect and store and process info.
- **Health and Information** – provide health and medical services
- **Agriculture** – provide agricultural products and services
- **Finance** – provide banking and investment services
- **Manufacturing** – produce goods and materials
- **Construction** – produce structures
- **Transportation** – transport people and goods

Reference: International Technology Education Association. (1994).
Technology Education Graduation Outcomes. TEAM.
Baltimore, Maryland. p 9.

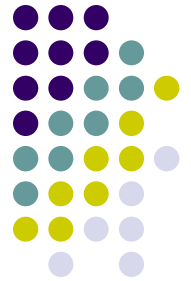


Overview of Tech Ed

- Focuses on technological systems and their impacts on culture and society
- Enables students to become technologically literate through the application, interpretation, and evaluation of information about technology.
- Promotes problem solving, group participation, creative and critical thinking
- Encourages both divergent and convergent thinking
- Emphasizes the “**why**” behind the “**how**” while utilizing an activity-centered approach.

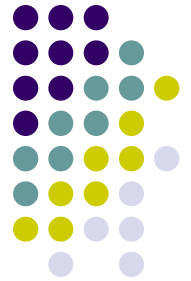
Reference: Wright, T. (2004). *Technology: Teachers Resource Binder*. Goodheart-Wilcox Publishing. p. 8.

Pedagogy and Professional Studies



- Important Facts:
- International Technology Education Association (ITEA) is our professional organization
 - <http://www.iteaconnect.org>
 - Publish Professional Journals
 - *The Technology Teacher*
 - *Technology and Children*
 - *Journal for Technology Education*

Pedagogy and Professional Studies

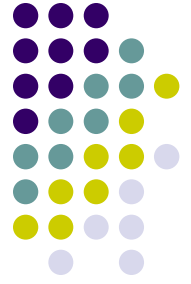


- ITEA is also involved in Professional and Curriculum Development
- Curriculum Development
 - *CATTS*
 - *Model Course Guides for Grade 6-12*
- *Professional Development*
 - *Standards for Technological Literacy (STL)*
 - *Advancing Excellence in Technological Literacy (AETL)*
 - *Funded via NSF and NASA as part of the Technology for All Americans Project*
 - <http://www.iteaconnect.org/TAA/TAA.html>



20 National Standards

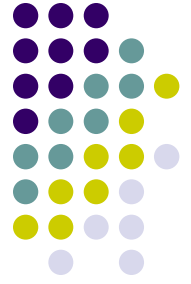
- **The Nature of Technology**
 - Students will develop an understanding of the characteristics and scope of technology.
 - Students will develop an understanding of the core concepts of technology.
 - Students will develop an understanding of the relationships among technologies and the connections between technology and other fields of study.
- **Technology and Society**
 - Students will develop an understanding of the cultural, social, economic, and political effects of technology.
 - Students will develop an understanding of the effects of technology on the environment.
 - Students will develop an understanding of the role of society in the development and use of technology.
 - Students will develop an understanding of the influence of technology on history.
- **Design**
 - Students will develop an understanding of the attributes of design.
 - Students will develop an understanding of engineering design.
 - Students will develop an understanding of the role of troubleshooting, research and development, invention and innovation, and experimentation in problem solving.
- **Abilities for a Technological World**
 - Students will develop abilities to apply the design process.
 - Students will develop abilities to use and maintain technological products and systems.
 - Students will develop abilities to assess the impact of products and systems.
- **The Designed World**
 - Students will develop an understanding of and be able to select and use medical technologies.
 - Students will develop an understanding of and be able to select and use agricultural and related biotechnologies.
 - Students will develop an understanding of and be able to select and use energy and power technologies.
 - Students will develop an understanding of and be able to select and use information and communication technologies.
 - Students will develop an understanding of and be able to select and use transportation technologies.
 - Students will develop an understanding of and be able to select and use manufacturing technologies.
 - Students will develop an understanding of and be able to select and use construction technologies.



Objectives

- **Cognitive:** mental skills (*Knowledge*)
- **Affective:** growth in feelings or emotional areas (*Attitude*)
- **Psychomotor:** manual or physical skills (*Skills*)
- Domains can be thought of as categories. Trainers often refer to these three domains as KSA (Knowledge, Skills, and Attitude). This taxonomy of learning behaviors can be thought of as "the goals of the training process." That is, after the training session, the learner should have acquired new skills, knowledge, and/or attitudes.
- Reference: <http://www.nwlink.com/~donclark/hrd/bloom.html>

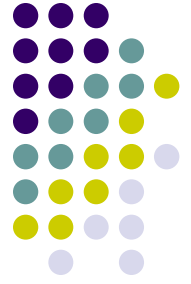
Teaching and Learning Strategies



- Maley Monograph I and II
 - Ingenuity Challenge
 - Topical Investigation
 - Modular Activity Package
 - Product Generation
 - Research and Experimentation
 - Engineering Design and Development



Facilities Guidelines

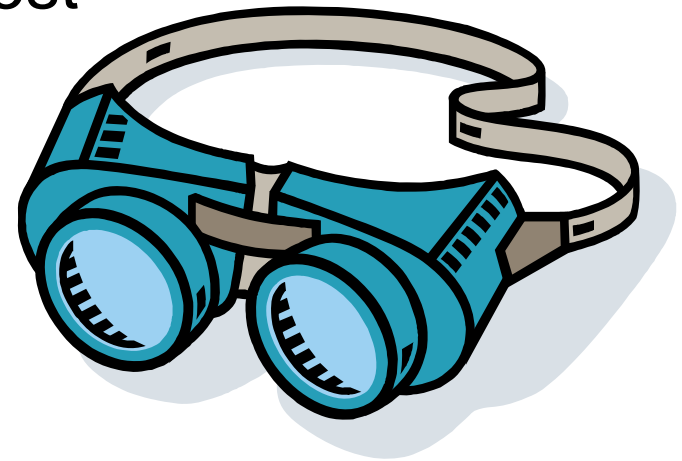


- Reference Materials
 - Technology Education Facility Guidelines (MSDE, 1994)
 - Technology Education Facility Planning – FAQ's (ITEA, 2000)

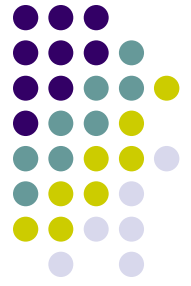
Safety



- Safety
 - Equipment, tools, materials and activities determine the dangers of a particular situation.
 - Recognizing hazards is the best way to avoid danger.
 - Common Sense:
 - General Safety Rules
 - Safe Use of Machines
 - Safe Use of Hand Tools



Information and Communication



- Design: Use technological principles to design effective products in the areas of Web, Video, Audio, and Multimedia
- Communication Systems
- Communications Processes
- Communication Outputs and Impacts



Resource Materials

- Stapled Handout - Information and Communication Section
 - Pages 3 -15
- Exploring Technology Education Video Series
 - Section B: Communication
 - Videos: B1, B2, B3, and B4
- Textbook: *Introduction to Technology*
 - *Chapters 3, 5,6,7,8, and 9*



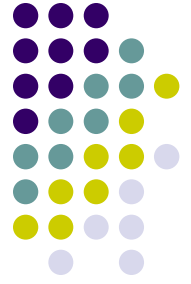
Construction

- Apply structural, architectural and aesthetic principles in the design of physical structures, models, prototypes
- Construction Systems
- Constructions resources and inputs
- Managerial processes; management functions – design, contract, market
- Construction and production processes
 - Prepare, build, install, enclose, finish
- Outputs – products, residential, commercial and civil



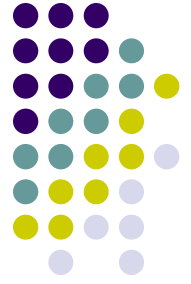
Resource Materials

- Stapled Handout: Construction Section
 - pages 15-20
- Exploring Technology Education Video Series
 - Section C: Construction
 - Videos: C1, C2, C3, and C4
- Textbook: *Introduction to Technology*
 - *Chapter 12*



Manufacturing

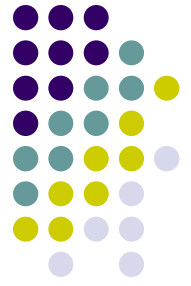
- Apply mechanical or human factors in the design of physical products or prototypes
- Manufacturing Systems: Definition of terms, manufacturing systems model; historical perspectives
- Manufacturing resources and inputs; human resources and knowledge
- Managerial processes: management functions; managed areas of activities; production systems
- Transformational Processes: Extracting raw materials; primary processing; secondary processing



Resource Materials

- Stapled Handout: Manufacturing Section
 - Pages 20-26
- Exploring Technology Education Video Series
 - Section D: Manufacturing
 - Videos: D1, D2, D3, D4, and D5
- Textbook: *Introduction to Technology*
 - *Chapter 10 and 11*

Power, Energy & Transportation



- Application of mechanical, structural, control, and aesthetic principles in the design of products, systems, and models
- Moving people and materials safely and effectively
- Control Systems: Electrical, Mechanical, hydraulic, pneumatic
- Transportation systems and subsystems,
 - Land, water, air, space

Power, Energy & Transportation



- Energy Sources: Conversions, measurements, storage
- Technical Systems: propulsion, suspension, control and guidance.
- Transportation outputs and impacts
 - Outputs – relocated goods; social cultural and environmental impacts



Resource Materials

- Stapled Handout: Energy, Power, Transportation
 - Pages 27-31
- Exploring Technology Education Video Series
 - Section E: Energy, Power, Transportation
 - Videos: E1, E2, E3, and E4
 - Textbook: *Introduction to Technology*
 - *Chapter 13 and 14*