



BROOKFIELD PUBLIC SCHOOLS

APPLIED EDUCATION FRAMEWORK

JANUARY 2008



Applied Education Philosophy

The philosophy of the Applied Education Departmental is to help students meet their fullest potential as productive citizens by providing an environment that is safe, supports risk-taking, and invites a sharing of ideas. Applied Education reinforces and complements other curricula and develops conceptual understandings through experiential learning. The role of the teacher is to guide, provide access to information, and allow the student to search for answers and the opportunity to discover for themselves using real life situations.

Student progress must be monitored on a regular basis using a variety of assessment methods. Assessment is most effective when it is part of the instructional process and also when it is employed at the end of the learning cycle. Performance based assessments complement traditional paper-pencil tests to provide formative and summative information about a student's progress. Students need to demonstrate their understanding of concepts and their ability to apply them.

Business Education

Business Education is an integral part of the academic structure and provides a significant contribution to the education of all students in a business orientated society. Emphasis is placed on enabling students to become productive and contributing members of society, capable of economic self sufficiency, life-long learning and adapting to change.

Students will understand fundamental business/marketing concepts that affect daily business decision making. Students will also develop skills, knowledge, understanding, and attitudes necessary for successful participation in postsecondary education and/or employment opportunities in their business endeavors as responsible and contributing citizens of local, national and global economies.

Family and Consumer Sciences Education

Family and Consumer Sciences Education provides knowledge and skills needed for home and family life, as well as, those needed to succeed in related careers. We believe that instruction in Family and Consumer Sciences Education must actively engage students in the learning process. Students learn best through experience in order to develop conceptual understandings and connect these understandings to everyday life.

Students will develop an understanding of concepts and develop competencies in the following areas: Community and Consumer Awareness, Interpersonal Relationships, Child Development and Parenting Education, Nutrition and Wellness, Food Science, Textiles and Design and Interior Design.

Technology Education

Technology Education develops technological literacy; the ability to use, manage, assess, and understand technology. The creation of technology is uniquely a human endeavor and a distinguishing characteristic of our developed civilization. Technology is the application of organized knowledge and problem solving techniques. It consists of inventions, innovations and other creative developments for producing physical objects and performing technical services. Technology involves the resources, tools, machines, processes and systems that are needed for satisfying the material needs and desires of people. It includes the processes of design, engineering, invention, research, experimentation, development, production and quality control.

Technology education provides a vital link in the math/science/technology triangle to assist with understanding, living and working in our advanced technology/information era. Its interdisciplinary nature also helps students to comprehend and apply the natural sciences, social sciences and humanities.

Students will be actively involved in classroom/laboratory activities that develop knowledge, skills and attitudes regarding industry and technology. Emphasis is given to leadership, communication, social interaction, problem solving, decision making and manipulative skills. The technological method of problem solving is experienced through identifying a problem, collecting and analyzing data, generating alternatives, synthesizing a design or plan, developing a proposed product or service, and evaluating the process and results.

- Understand and apply economic and finance concepts;
- Understand and apply business technology in the workplace.

Applied Education Goals

Students will:

- Demonstrate a mastery of basic skills in communication, computation, critical thinking and decision-making;
- Transfer and adapt skills learned to different work and life situations;
- Utilize traits associated with a positive work ethic;
- Develop an appreciation for lifelong learning and further education;
- Explore career opportunities.

Business Education

Students will:

- Develop an appreciation for the role of business in a global society;
- Understand the legal and ethical aspects of business;
- Understand the responsibility of workers in the field of business;
- Understand and apply economic and finance concepts;
- Understand and apply business technology in the workplace.

Family and Consumer Sciences Education

Students will:

- Demonstrate management of human, technological, economic and environmental resources;
- Demonstrate respectful and caring relationships in the family, workplace, and community;
- Explain how families are influenced by various social and cultural factors;
- Demonstrate nutrition and wellness practices that enhance individual, family and community well-being;
- Evaluate the impact of parenting and educator roles and responsibilities on meeting the developmental needs and interests of children;
- Apply the principles of design to make informed decisions regarding textiles, apparel, housing, interiors, and furniture;
- Explain how skills and knowledge in Family and Consumer Sciences Education are transferable to other careers in education, food service, food science, textiles and design.

Technology Education

Students will:

- Recognize the scope of technology and evaluate the impact and influence technology has on society, culture and the environment;
- Develop cognitive and psychomotor problem-solving skills through applied research, design, production, operation and analysis of technological systems (informational, physical and biological);

- Use resources, processes, concepts and tools of technology safely and effectively;
- Create devices for solving problems using creativity and concepts of design and technology;
- Understand the influences of technology on consumer and career choices.

Applied Education

Hallmarks of Best Instructional Practice

Hallmarks of Best Instructional Practice are the observable, in-class characteristics and actions that denote a high quality program. The hallmarks are noted in instructional research and represent the best pedagogy to build student independence through the gradual release of responsibility from the teacher to the student.

- **Teacher modeling** the expected performance through explicit instruction identifying effective strategies by use of quality examples in text, student work, demonstrations, and technology. For example: scale drawings using a CAD program, food preparation, accounting software application, stock market analysis, safe and proper use of tools and machinery.
- **Guided practice** through activities that build on one another with increasing levels of complexity and decreasing levels of support. For example: using food preparation skills to follow a recipe, layout diagrams to working drawings, from creating to analyzing an income statement, from analyzing a corporation's financial condition to creating an investment portfolio:

Multiple structures that meet the individual needs of students. For example using differentiated instruction through a mix of whole class, small group and individual activities; i.e., remodel a specific measuring skill.

Teacher as coach/facilitator providing feedback during activities; for example, remodel a specific measuring skill.

Active learning—exploring/learning by doing and discussions with peers, presentations and critiques.

Conferencing engages students to reflect on their learning processes; for example individual feedback sessions.

Student use of rubrics to guide their work. For example, self assessments on shared rubrics to model exemplars compared to anchor sets.

- **Independent practice** through activities that prompt students to apply new learning. For example, homework, extended learning assignments and projects.
- **Application opportunities** through activities or performance expectations that require students to apply skills and strategies, and new concepts in real world, authentic tasks including the use of technology. For example, spreadsheet applications, scaled drawings and computer aided drawings.
- **High levels of thinking** are expected through the creation of reflective journals, guided discussion, critiquing, conceptualizing, debating and creating original products. For example, peer critique on presentations and self-assessments.
- **Assessment** practice focuses on diagnostic assessment before instruction to guide the instructional learning process; formative assessment during instruction to provide specific and frequent feedback to students/teachers and to make adjustments to refocus instruction; and summative assessments at the end of an instructional unit to determine the level of attainment of the learning goals within that unit. For example, administer quizzes, tests and projects.

Applied Education Essential Understandings

Business Education

1. *Accounting/Management:* Business and entrepreneurial concepts are used to affect financial decision making.
2. *Economic Decision Making:* Economic principles as well as how people function within them must be applied to a global society.
3. *Open Ended Decision Making:* Choices people make are based in part on limited resources.
4. *Investments:* Understanding different types of investment instruments including common stocks, bonds, mutual funds, real estate, and tax shelters are fundamental.
5. *Career Investigation:* Concepts and strategies are necessary for career exploration, development and growth.

Family and Consumer Sciences Education

1. *Consumer Science and Family Resource Management:* Management practices impact the proper and efficient use of human, technological, economic and environmental resources.
2. *Interpersonal Relationships:* Demonstrating respectful and caring relationships in the family, workplace, and community enables students to grow and develop into productive citizens.
3. *Individual and Family Development:* Individuals and families are influenced by various social and cultural factors.
4. *Nutrition and Wellness:* Knowledge of nutrition and wellness practices enhances the well-being of individuals, families and communities.

5. *Child Development and Parenting Education:* Parents and educators have a responsibility to meet the developmental needs and interests of their children.
6. *Textiles and Design:* The principles of design can be used by consumers to make informed decisions regarding textiles, apparel, housing, interiors and furniture.
7. *Careers in Family and Consumer Sciences Education:* Skills and knowledge in Family and Consumer Sciences Education are transferable to other careers in education, food service, food science, textiles and design.

Technology Education

1. *Nature of Technology:* The characteristics and scope of technology. The relationships among technologies and the connections between technology and other fields.
2. *Technology and Society:* The cultural, social economic and political effects of technology. The effects of technology on the environment. The role of society in the development and use of technology. The influence of technology on history.
3. *Design:* The attributes of design. Engineering design. The role of troubleshooting, research and development, invention and innovation, and experimentation in problem solving.
4. *Abilities for a Technological World:* Apply the design process. Use and maintain technological products and systems. Assess the impact of products and systems.
5. *The Designed World:* Select and use: energy and power technologies, information and communication technologies, transportation technologies, manufacturing technologies and construction technologies.

Applied Education Essential Questions

Business Education

1. How do students make sound financial business decisions?
2. How do students make appropriate business decisions in the global marketplace?
3. How do students make decisions based upon limited resources?
4. How do students utilize computer technology?
5. How do students prepare for college and/or the workplace?

Family and Consumer Sciences Education

1. How do we effectively utilize human, technological, economic, and environmental resources in our daily lives?
2. What traits contribute to positive and caring relationships?
3. How does society impact the well being of individuals?
4. How does nutrition and wellness influence the quality of life?
5. What factors impact and enhance the developmental needs and interests of children?
6. How do consumers utilize the principles of design to make informed textile decisions?
7. What skills and knowledge are transferable to careers in education, food service, food science, textiles and design?

Technology Education

1. What is technology and its relationships with other fields?
2. How does technology impact and influence the world we live in?
3. What is design and its role in the technological world?
4. How is the design process applied to real world problems?
5. How do we select, use, maintain and evaluate technological products and systems?

Content Standards and Expected Performances

Content Standard 2:
Management/Marketing

Business Education

Expected Performance Grades 9-12 students will:

Business Education

Content Standard 1: Accounting		Business Education	
		Expected Performance Grades 9-12 students will:	
<i>Knowledge of a company's financial resources is the basis for understanding its worth on the open market and its potential for investment.</i>	1.1	Understand profit and loss;	
	1.2	Understand personal credit and debt;	
	1.3	Prepare a budget for personal/household expenses;	
	1.4	Understand personal income tax;	
	1.5	Complete the accounting cycle and be able to prepare basic financial statements according to generally accepted accounting principles for various forms of business organizations;	
	1.6	Prepare, interpret and analyze basic financial statements as used by stockholders, creditors and other users of financial information;	
	1.7	Apply appropriate accounting principles and procedures to selected topics such as income taxes and payroll preparations;	
	1.8	Understand time value of money;	
	1.9	Understand the importance of financial markets and instruments in the wealth creation process;	
	1.10	Evaluated different types of financial instruments.	

Content Standard 2: Management/Marketing		Business Education	
		Expected Performance Grades 9-12 students will:	
<i>Person and business financial decisions in the global marketplace as affected by economic theories, the law and the utilization of human resources.</i>	2.1	Explain the importance of leadership in business organizations;	
	2.2	Explain the basic concepts of business law;	
	2.3	Identify the basic features of various economic systems, including that of the United States and the importance of their inter-relationships;	
	2.4	Identify personal traits that are typical characteristics of a successful entrepreneur;	
	2.5	Discuss the role involvement of the United States in international trade;	
	2.6	Identify the steps in the decision-making process to a situation involving an economic decision;	
	2.7	Understand basic economic principles of supply and demand;	
	2.8	Analyze management functions and theories including their implementation and integration within the global business environment.	
	2.9	Analyze the ethical and legal rules as they relate to the conduct of business within the socioeconomic arena of the national and international marketplace;	
	2.10	Analyze the degree to which one possesses the characteristics of an entrepreneur and apply economic concepts and legal considerations when making entrepreneurial decisions;	
	2.11	Analyze the role of international business and how it impacts business activities on the local, state and international levels;	
	2.12	Apply the decision-making process for personal financial planning as it applies to their roles as citizens, workers, and consumers.	

**Content Standard 3:
Technology**

Business Education

Expected Performance Grades 9-12 students will:

Appropriate technology must be analyzed, synthesized, evaluated and applied to solve problems and complete tasks efficiently and effectively.

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| 3.1 | Identify commonly used basic hardware and software components; |
| 3.2 | Use basic input technologies appropriately to enter and manipulate text; graphics and numerical values; |
| 3.3 | Use touch keyboarding skills at acceptable speed and accuracy levels to enter and manipulate text and data; |
| 3.4 | Gather, evaluate, use and correctly cite data from information technology sources; |
| 3.5 | Cite sources of all types of data; |
| 3.6 | Create, maintain, query and design reports using various software. |
| 3.7 | Use advance input technologies appropriately to enter and manipulate text, graphics, and numerical values; |
| 3.8 | Adhere to legal and ethical issues that apply to safety and security, including laws pertaining to computer crime and abuse. |

**Content Standard 4:
Career Development**

Business Education

Expected Performance Grades 9-12 students will:

The workplace has ever evolving requirements that are related to life long learning and to careers.

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| 4.1 | Identify and correlate individual talents and interests; |
| 4.2 | Use a variety of research tools to identify and describe career opportunities in the global economy; |
| 4.3 | Demonstrate appropriate skills, behaviors, and ethics for the workplace; |
| 4.4 | Research career cluster through a variety of resources; |
| 4.5 | Assess and analyze personal skills, abilities, aptitudes, strength and weaknesses as they relate to career exploration and development; |
| 4.6 | Utilize career resources to develop a career information portfolio that includes international career opportunities; |
| 4.7 | Apply the concepts of work ethics, workplace relationships, diversity and communication skills to career development; |
| 4.8 | Develop strategies to make an effective transition from school to career. |

Family and Consumer Sciences Education

Content Standard 1: Consumer Science and Family Resource Management

Family & Consumer Sciences Education Expected Performance Grades 5-12 students will:

Management

practices impact the proper and efficient use of human, technological, economic and environmental resources.

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| 1.1 | Develop a plan for spending and saving money; |
| 1.2 | Describe steps to become a responsible consumer; |
| 1.3 | Explain policies that support consumer rights and responsibilities; |
| 1.4 | Utilize technology for individual and family resources; |
| 1.5 | Demonstrate an understanding of management processes of individual and family resources including food, clothing and shelter. |

Content Standard 2: Interpersonal Relationships

Family & Consumer Sciences Education Expected Performance Grades 5-12 students will:

Demonstrating

respectful and caring relationships in the family, workplace and community enables students to grow and develop into productive citizens.

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| 2.1 | Describe consequences of appropriate and inappropriate behavior; |
| 2.2 | Identify feelings, both positive and negative; |
| 2.3 | Demonstrate teamwork; |
| 2.4 | Describe their roles within the family, school, and community; |
| 2.5 | Identify positive coping skills to deal with difficult situations. |
| 2.6 | Describe the traits of a productive citizen. |

Content Standard 3:
Individual and Family Development

**Content Standard 3:
Individual and Family
Development**

**Family & Consumer Sciences Education
Expected Performance Grades 5-12 students will:**

Individuals and families are influenced by various social and cultural factors.

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| 3.1 | Describe similarities and differences between families where one parent is working outside the home versus two parents working outside the home; |
| 3.2 | Describe how culture influences individual and family food choices, food preparation and celebrations involving food; |
| 3.3 | Identify the stages of individual development; |
| 3.4 | Explain how social forces such as media and technology influence individuals and their families. |

**Content Standard 4:
Nutrition and
Wellness**

**Family & Consumer Sciences Education
Expected Performance Grades 5-12 students will:**

Knowledge of nutrition and wellness practices enhances the well-being of individuals, families and communities.

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| 4.1 | Identify safety, sanitary and environmental concerns that effect food preparation; |
| 4.2 | Practice correct safety and sanitary methods used to prepare foods; |
| 4.3 | Select and use equipment correctly in food preparation; |
| 4.4 | Explain how the United States dietary guidelines influence nutrition and wellness; |
| 4.5 | Examine factors that influence nutrition and wellness practices for adolescents; |
| 4.6 | Evaluate factors that influence nutritionally linked diseases and disorders; |
| 4.7 | Plan menus to meet individual and family nutritional needs; |
| 4.8 | Prepare a variety of food products that meet the needs of individual lifestyles and cultures; |
| 4.9 | Evaluate the impact of science and technology on food composition and safety. |

**Content Standard 5:
Child Development
and Parenting
Education**

**Family & Consumer Sciences Education
Expected Performance Grades 5-12 students will:**

Parents and educators have a responsibility to meet the developmental needs and interest of their children.

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| 5.1 | Analyze principles of human growth and development during childhood; |
| 5.2 | Assess conditions that influence human growth and development during childhood; |
| 5.3 | Investigate the roles and responsibilities of parents and caregivers; |
| 5.4 | Evaluate parenting practices that promote human growth and development; |
| 5.5 | Identify external support systems that provide services for parents and caregivers; |
| 5.6 | Analyze developmentally appropriate practices to plan for early childcare education. |

**Content Standard 6:
Textiles and Design**

**Family & Consumer Sciences Education
Expected Performance Grades 5-12 students will:**

The principles of design can be used by consumers to make informed decisions regarding textiles, apparel, housing, interiors and furniture.

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| 6.1 | Identify colors, lines, shapes, forms and textures; |
| 6.2 | Develop fine motor skills necessary for manipulating and creating design projects; |
| 6.3 | Evaluate fiber and textile materials; |
| 6.4 | Demonstrate skills needed to produce or repair textile products and apparel; |
| 6.5 | Evaluate design decisions in relation to available resources and options; |
| 6.6 | Describe the needs, goals and resources of the family in order to create an interior design plan; |
| 6.7 | Identify room modifications for individuals requiring specific design needs; |
| 6.8 | Demonstrate an ability to draw and design a basic floor plan; |
| 6.9 | Explain changes in furniture and architecture over time; |
| 6.10 | Demonstrate design ideas through visual presentation; |
| 6.11 | Use computer-aided design programs to facilitate the design process. |

**Content Standard 7:
Careers in Family &
Consumer Sciences
Education**

**Family & Consumer Sciences Education
Expected Performance Grades 5-12 students will:**

***Skills and
knowledge in Family
and Consumer
Sciences Education
are transferable to
other careers in
education, food
service, food science,
textiles and design.***

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| 7.1 | Identify employment opportunities in food related careers; |
| 7.2 | Identify employment opportunities in textile and design related careers; |
| 7.3 | Analyze career paths within the field of education; |
| 7.4 | Describe how the skills and knowledge developed in Family and Consumer Sciences Education apply to employment opportunities in the fields of education, food service, food science, textiles and design. |

Technology Education

Content Standard 1: Economics		Technology Education Expected Performance Grades 5-12 students will:	
<i>The link between technology and the economy is the force behind societal emergence and evolution.</i>	1.1	Use tools and machines to experience enterprise;	
	1.2	Develop skills in making wise consumer decisions;	
	1.3	Construct a solution to a given problem using a limited amount of time, personnel, material and financial resources.	

Content Standard 2: Technological Impacts		Technology Education Expected Performance Grades 5-12 students will:	
<i>Technology has a social, cultural and environmental impact on people's lives.</i>	2.1	Define technology;	
	2.2	Trace the historical development of at least one technology, identifying its effects and hypothesizing about its future;	
	2.3	Explain how technology and technological activity has expected and unexpected effects;	
	2.4	Describe how personal actions can effect the environment.	
	2.5	Identify positive and negative impacts of technology;	
	2.6	Describe how mathematics, science, language arts, social studies and the arts are related to technology;	
	2.7	Document how a technological activity you are involved in during class had expected and unexpected effects;	
	2.8	Identify and apply the systems model to evaluate the impact of a given technological development;	
	2.9	Explore positive and negative impacts of a variety of technologies.	

Content Standard 3: Career Awareness		Technology Education	
		Expected Performance Grades 5-12 students will:	
<i>The diversity, expectations, trends and requirements of the world of work impact its function on society.</i>	3.1	Understand the importance of individuals in an organization.	
	3.2	Develop personal responsibility and accountability in the work place/classroom lab;	
	3.3	Define and discuss the concept of "work ethic";	
	3.4	Identify high school and post-secondary training selections necessary to prepare for a particular career choice;	
	3.5	Prepare a list of skills necessary to perform well in a particular career;	
	3.6	Demonstrate an ability to take responsibility for their actions.	

Content Standard 4: Problem Solving/Research and Development		Technology Education	
		Expected Performance Grades 5-12 students will:	
<i>Technology is the result of a creative act and when applied to problem-solving strategies enhance invention and innovation.</i>	4.1	Describe methods of problem solving;	
	4.2	Develop a written action plan to solve a problem;	
	4.3	Use a variety of (technology) methods to communicate a solution to a problem.	
	4.4	Evaluate a solution to a problem;	
	4.5	Work cooperatively in a small group to solve a technical problem;	
	4.6	Identify a problem and use a problem-solving method to develop a solution;	
	4.7	Develop a solution for a real-life problem;	
	4.8	Gather, record and organize data, based on observations;	
	4.9	Evaluate and modify a solution to a problem;	
	4.10	Differentiate between human problems and needs;	
	4.11	Understand the role of creativity in problem solving;	
	4.12	Define decision-making research and innovation;	

Content Standard 4: Problem Solving/Research and Development (continued)

4.13	Discuss how technological systems have been used to solve human problems;
4.14	Apply cooperative techniques while engaging in group problem solving activities;
4.15	Engage in an activity that requires creativity;
4.16	Apply appropriate and effective questioning techniques;
4.17	Describe and apply the processes used to make decisions;
4.18	Test a design idea through experimentation;
4.19	Develop a solution for a real life problem;
4.20	Select and apply a general problem solving model in a laboratory setting;
4.21	Identify research methods, materials and techniques;
4.22	Conduct an applied research project;
4.23	Develop, test and modify a design through experimentation;
4.24	Differentiate between invention and innovation;
4.25	Apply technological systems to solve a posed problem;
4.26	Apply a general problem solving model to improve upon an existing product;
4.27	Apply a general problem solving model including research techniques to invent a product;
4.28	Use research techniques to support design development;
4.29	Develop several alternative design solutions to the same problem;
4.30	Use a communication technology to visualize a design idea;
4.31	Prepare and document a design brief;
4.32	Select appropriate technical processes and fabricate a prototype;
4.33	Evaluate design ideas to determine the most appropriate;
4.34	Be familiar with the laws related to copyrights, trademarks and patents;
4.35	Present an idea using multimedia technology;
4.36	Design and conduct a technical experiment.

**Content Standard 5:
Leadership**

**Technology Education
Expected Performance Grades 5-12 students will:**

***Leadership
attributes are both
evidenced in and
applied to
collaboration teams.***

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| 5.1 | Define team; |
| 5.2 | Identify the role of various team members; |
| 5.3 | Describe a team within the school setting; |
| 5.4 | Evaluate the effectiveness of a team; |
| 5.5 | Explore different roles within a team; |
| 5.6 | Organize a team to solve a teacher-given problem; |
| 5.7 | Define the responsibility of each member of a work team; |
| 5.8 | Engage in presentation activities; |
| 5.9 | Develop organizational skills through practical experiences; |
| 5.10 | Demonstrate strategies for effectively managing time over several class periods; |
| 5.11 | Consider personal strengths in determining team assignments; |
| 5.12 | Engage in presentation activity using visual aids and/or handout material; |
| 5.13 | Apply organizational skills to classroom and lab activities; |
| 5.14 | Present information in an appropriate manner; |
| 5.15 | Present information in a clear, concise and appropriate manner to a variety of audiences. |

**Content Standard 6:
Materials and
Processes**

Technology Education

Expected Performance Grades 5-12 students will:

The origins, properties and processing techniques associated with the material building blocks of technology are necessary to understand the world in which we live.

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| 6.1 | Safely select and use a tool or resource; |
| 6.2 | Identify technological resources as materials, people, time, money, information, tools, etc.; |
| 6.3 | Demonstrate the appropriate selection, use and safe operation of basic hand and power tools; |
| 6.4 | Use manual measuring devices accurately; |
| 6.5 | Produce simple products from a variety of materials using manual devices; |
| 6.6 | Explore methods used to convert raw and recycled materials into usable products; |
| 6.7 | Demonstrate a working knowledge of the layout, shaping, smoothing, assembly, and finish techniques used to produce a product; |
| 6.8 | Participate in a manufacturing activity; |
| 6.9 | Experiment with the alteration of material characteristics; |
| 6.10 | Describe the physical structures and properties of materials. |

**Content Standard 7:
Communication
Systems**

**Technology Education
Expected Performance Grades 5-12 students will:**

The ability to effectively apply physical, graphic and electronic communications techniques in processing, transmitting, receiving and organizing information is essential to function in a technological world.

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| 7.1 | Define a communication system; |
| 7.2 | Identify the parts of a communication system; |
| 7.3 | Describe the universal input, process, output and feedback (IPOF) system model; |
| 7.4 | Acquire technology-based information and apply it in classroom and laboratory situations; |
| 7.5 | Apply techniques of interpersonal communication in activities; |
| 7.6 | Evaluate and select appropriate methods of communication for a given problem or situation; |
| 7.7 | Send and access information through a network; |
| 7.8 | Use communications technology to acquire images and information; |
| 7.9 | Express a design idea using a graphical system; |
| 7.10 | Use CAD software to create a 2D or 3D image; |
| 7.11 | Use CAD software to create an original design. |

Content Standard 9:
Transportation

**Content Standard 8:
Production Systems**

Technology Education
Expected Performance Grades 5-12 students will:

There are various methods involved in turning raw materials into useable products.

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| 8.1 | Describe the input, process, output, and feedback (IPOF) system model in a productive system; |
| 8.2 | Safely use a variety of tools and machines to produce a product; |
| 8.3 | Define basic manufacturing terminology; |
| 8.4 | Design, construct and test models of shelters and other structures; |
| 8.5 | Identify the characteristics of sub- and super- structures; |
| 8.6 | Produce a product using simple production sequence: layout, shaping, smoothing, assembly and finishing techniques; |
| 8.7 | Apply the method of line production in the "manufacture" of a simple product; |
| 8.8 | Differentiate between manufacturing and construction systems; |
| 8.9 | Demonstrate the safe and accurate use of tools and machines in a production system to create a finished product; |
| 8.10 | Apply a variety of manufacturing techniques and processes to create a usable product. |

Content Standard 10:
Transportation
Systems

Technology Education
Expected Performance Grades 5-12 students will:

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| 10.1 | Create a mock business within the classroom or school; |
| 10.2 | Define the terms, single ownership, corporation and partnership; |
| 10.3 | Design a product based on available materials, tools, and equipment; |
| 10.4 | Discuss Intellectual Property and identify several examples; |
| 10.5 | Use basic business practices such as purchase orders, invoices, and balance sheets in a technological endeavor. |

**Content Standard 9:
Transportation
Systems**

**Technology Education
Expected Performance Grades 5-12 students will:**

Transportation systems are used to move goods and people through various environments. These systems are comprised of common technical subsystems.

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| 9.1 | Define a transportation system; |
| 9.2 | Identify the parts of a transportation system; |
| 9.3 | Describe the function of various parts of a transportation system; |
| 9.4 | Differentiate between vehicular and stationary transportation systems; |
| 9.5 | Differentiate between fixed and random-route land transportation systems; |
| 9.6 | Describe and be able to identify the transportation subsystems of body/frame, propulsion, suspension, control, guidance and support in a variety of transportation devices; |
| 9.7 | Identify and experiment with devices used to protect product and personnel in transportation systems; |
| 9.8 | Apply the concept of transportation subsystems while solving transportation problems; |
| 9.9 | Explore, build, fabricate, test and evaluate model marine, space, land and air transportation systems and report on results; |
| 9.10 | Apply pneumatic, hydraulic, mechanical, and electrical energy to design problems involving transportation. |

**Content Standard 10:
Transportation
Systems**

**Technology Education
Expected Performance Grades 5-12 students will:**

The techniques of enterprise are related to product and service production, economics, human and material resources and technology.

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| 10.1 | Create a mock business within the classroom or school; |
| 10.2 | Define the terms, single ownership, corporation and partnership; |
| 10.3 | Design a product based on available materials, tools, and equipment. |
| 10.4 | Discuss Intellectual Property and identify several examples; |
| 10.5 | Use basic business practices such as purchase orders, invoices, and balance sheets in a technological endeavor. |

**Content Standard 11:
Engineering Design**

**Technology Education
Expected Performance Grades 5-12 students will:**

The engineering design processes is applied to achieve desired outcomes across all technology content areas.

11.1	Define design;
11.2	Identify the elements of engineering the design process;
11.3	Explain the role of creativity in the engineering design process;
11.4	Design and construct a solution to a real world engineering problem;
11.5	Identify the elements of design;
11.6	Explore a variety of creativity-enhancing techniques;
11.7	Discuss the differences between problem solving- and engineering design strategies;
11.8	Develop conceptual designs for transportation, communications, production and bio-related problems;
11.9	Use a variety of creativity-enhancing techniques in conceptual design situations;
11.10	Explore techniques used to refine conceptual design sketches;
11.11	Develop preliminary product layouts.