

## Chapter 2

# Industrial and Technology Education Model Curriculum Standards

Industrial and technology education model curriculum standards in California provide a model for district, school, and program curriculum development and improvement by defining (1) the essential collective knowledge of a specific subject area; and (2) what students will need to know and be able to do in a given career path. Standards can include:

- *Content standards*, which describe what a student should understand and be able to do
- *Student performance standards*, which define a student's level of achievement or competence
- *System performance standards*, which address a program's or school's success in achieving stated standards
- *School delivery standards*, which assess the school's capabilities for achieving stated standards

Central to the use of standards in California is their link to student assessment—the measure of student competency attained in relation to a standards-derived curriculum.

In California standards are intended to facilitate the continual refinement of instructional programs in accord with a variety of the state's societal and economic factors. The standards address the needs of individuals, the needs of business and industry, and the needs of the educational community and must be modified continually to meet those ever-changing needs. When technology changes in the workplace, industrial and technology education programs must make corresponding changes. Programs also must reflect the needs of the society as a whole, making appropriate changes in educational methods, strategies, articulation, and evaluation. Industrial and technology education must keep current and maintain flexibility in order to continue providing effective services to the diverse population it serves.

The standards provided in this document have been established by the industrial and technology education community in California and are the results of scholarly review and consensus among education, business, and industry participants. The organization and production of this standards document is directed by state statute.

Four elements—three types of standards and selected examples of activities to integrate the three types of standards—are included in this document:

- 1. Career–technical performance standards.** Career–technical performance standards are defined in this chapter in terms of organization and format. Complete career–technical performance standard listings are provided in Chapters 3 through 12.
- 2. Career performance standards.** Career performance standards are common across the industrial and technology education curriculum clusters listed in Chapters 3 through 12 and are discussed fully in this chapter.
- 3. Academic performance standards.** Academic performance standards include standards in science, mathematics, language arts, history–social science, visual arts, and health and nutrition. Academic performance standards are found in the activities integrated into the industrial and technology

education curriculum clusters listed in Chapters 3 through 12. These standards are discussed fully in this chapter.

- 4. Integrated performance activities.** Integrated performance activities, designed for the classroom or workplace, reflect two or more of the standards noted above. The activity examples presented in Chapters 3 through 12 will provide instructors, parents, curriculum planners, and other leaders in education with a means to promote student acquisition of selected standards.

## Career–Technical Performance Standards

The standards for industrial and technology education in California are written in the form of career–technical performance standards as delineated by the joint Career–Technical Assessment Program (C–TAP) of the California Department of Education and the Far West Laboratory for Educational Research and Development. Each performance standard is designed to contain two major elements: (1) a cognitive attainment or achievement element that describes what a student will know or understand; and (2) a psychomotor or skill element that describes what a student will be able to do. The career–technical performance standards are often written in a two-sentence format, making it easy to identify each of the two elements of a standard.

For example, Technology Core standard 14 is written in a two-sentence format as follows:

### **Standard 14: Systematic Problem Solving**

Students will understand the universal, systematic problem-solving model incorporating input, process, outcome, and feedback components. They will individually and cooperatively apply the systematic problem-solving model in a minimum of two selected communication, transportation, energy, production, or biotechnology activities, demonstrating their understanding in verbal or written forms.

The element in this standard describing what the student *will know* is in the first sentence: “understand the universal, systematic problem-solving model incorporating input, process, outcome, and feedback components.” The element describing what the student *will be able to do* is found in the second sentence: “individually and cooperatively apply the systematic problem-solving model in a minimum of two selected communication, transportation, energy, production, or biotechnology activities, demonstrating their understanding in verbal or written forms.”

Construction Technology standard 111 is another example written in a two-sentence format:

### **Standard 111: Mechanical Systems**

Students will understand the function and fabrication of mechanical systems (heating, cooling, security, and so forth). They will describe the various mechanical systems used in building construction and participate in related hands-on activities.

What the student *will know* is in the first sentence: “understand the function and fabrication of mechanical systems.” What the student *will be able to do* is found in the second sentence: “describe the various mechanical systems used in building construction and participate in related hands-on activities.”

Graphic Communications Technology standard 9 and Transportation and Energy Technology standard 5 are further examples of the two-sentence format:

**Standard 9: Commercial Photography**

Students will understand the photographic process (lighting, exposure, printmaking, and so forth). Under natural and studio lighting conditions, they will produce black-and-white and color prints and slides of various subjects.

**Standard 5: Environmental Principles**

Students will understand the effects of energy conversion systems on the environment with an emphasis on transportation vehicles. Students will apply industry-specific regulations regarding hazardous communications and materials in the workplace.

What the student *will know* is in the first sentence; what the student *will be able to do* is found in the second sentence.

These two-part (cognitive/skill) career–technical performance standards are designed specifically to facilitate the objectives of the California C–TAP. (C–TAP is discussed under “Program and Student Assessment” in Chapter 1.) These standards can also be described as *process standards* because they contain both the cognitive and skill elements; that is, they describe the goal of student competency attainment in terms of what the student will understand and be able to do. Previous industrial and technology education standards documents, specifically those published by the State of California in 1990, contain *product standards*, emphasizing what the student will be able to do.

The industrial and technology education standards in this document are presented in random order except in Chapter 3, “Technology Education for Children.” The standard numbers used in that chapter refer to grade-level applications. All other standard numbers used in this document are for reference and communication purposes only. While standards may appear to have been organized in some type of order or hierarchy, no such serialization or classification is intended or implied. Initially, curriculum developers should consider that all standards have equal weight in program development. Weighting of standards will occur naturally as the process of course sequencing is achieved.

## Career Performance Standards

Career performance standards include performance standards that are common across industrial and technology education curriculum clusters. Career performance standards, like curriculum-specific career–technical performance standards, were developed as a product of C–TAP. Career performance standards

are designed to contain two major elements: (1) a cognitive attainment or achievement element that describes what a student will know or understand; and (2) a psychomotor or skill element that describes what a student will be able to do. In addition, career performance standards are often written in a two-sentence or three-sentence format, making it easy to identify each of the two elements of a standard.

## Standards

### **Career Performance Standard 1: Personal Skills**

Students will understand how the development of personal skills affects their employability. They will exhibit positive attitudes, self-confidence, honesty, perseverance, self-discipline, and personal hygiene. They will manage time and balance priorities and demonstrate a capacity for lifelong learning.

### **Career Performance Standard 2: Interpersonal Skills**

Students will understand important concepts in group dynamics, conflict resolution, and negotiation. They will work cooperatively, share responsibilities, accept supervision, and assume leadership roles. They will demonstrate cooperative working relationships across genders and cultural groups.

### **Career Performance Standard 3: Thinking and Problem-Solving Skills**

Students will exhibit critical and creative thinking skills, logical reasoning, and problem-solving skills. They will apply numerical estimation, measurement, and calculation, as appropriate. They will recognize problem situations; identify, locate, and organize needed information or data; and propose, evaluate, and select from alternative solutions.

### **Career Performance Standard 4: Communication Skills**

Students will understand principles of effective communication. They will communicate both orally and in writing. They will listen attentively and follow instructions, requesting clarification or additional information as needed.

### **Career Performance Standard 5: Occupational Safety**

Students will understand occupational safety issues, including the avoidance of physical hazards in the work environment. They will operate equipment safely to prevent endangering themselves or others. They will demonstrate proper handling of hazardous materials.

### **Career Performance Standard 6: Employment Literacy**

Students will understand career paths and strategies for obtaining employment in their chosen fields. They will assume responsibility for professional growth. They will understand and promote the role of their field in a productive society and the purpose of professional organizations.

### **Career Performance Standard 7: Technology Literacy**

Students will understand and adapt to changing technology by identifying, learning, and applying new skills to improve job performance. They will effectively employ technologies relevant to their fields.

# Academic Performance Standards

Industrial and technology education academic performance standards include standards that are common to industrial and technology education curriculum clusters. These standards, like curriculum-specific career-technical performance standards and career performance standards, were developed as a product of C-TAP.

Academic performance standards must be carefully evaluated, along with curriculum-specific standards and career performance standards, in the curriculum development process. They are important in the development of programs that address restructuring initiatives, including curriculum integration, course articulation, and other program restructuring concepts. (The importance of curriculum integration and related issues is discussed in Chapter 1.)

Academic performance standards in this document include standards for science, mathematics, language arts, history-social science, and visual arts, as described below. Industrial and technology education integrated standards have been identified by their association with curriculum-specific performance standards. This process of integration is described in context with industrial and technology education integrated performance activities. A selection of those activities is included in Chapters 3 through 12, dealing with specific curriculum cluster areas.

Science (1-6)

## **Standard 1: Life Science**

Students will understand biological structures and functions in relation to technological processes and systems. They will apply this knowledge to activities related to processes and systems.

## **Standard 2: Physical Science**

Students will understand the mechanical, fluid, electrical, and thermal energy systems that make up simple and complex technological devices and systems. They will solve problems that deal with physical science principles, including force, work, rate, resistance, energy, power, momentum, and time.

## **Standard 3: Chemical Science**

Students will understand chemical structures and characteristics in relation to technological processes and systems. They will apply this knowledge to activities related to processes and systems.

## **Standard 4: Earth Science**

Students will understand geologic structures and systems in relation to technological processes and systems. They will apply this knowledge to activities related to processes and systems.

## **Standard 5: Marine Science**

Students will understand marine structures and systems in relation to technological processes and systems. They will apply this knowledge to activities related to processes and systems.

**Standard 6: Aerospace Science**

Students will understand environmental concepts of air and space in relation to technological processes and systems. They will apply this knowledge to activities related to processes and systems.

Mathematics (10–16)

**Standard 10: Calculation and Computation**

Students will be able to perform the computations of addition, subtraction, multiplication, and division, using whole numbers, integers, fractions, and decimals, to solve problems. They will use numbers in different ways (fractions, decimals, ratios, proportions, percents); estimate answers; measure in English and metric units; measure area and volume; deal with data; and use graphs, charts, and tables.

**Standard 11: Geometry**

Students will understand geometric concepts and relationships in various forms. They will apply geometric concepts when working with lines, angles, and shapes in two and three dimensions.

**Standard 12: Algebra**

Students will identify, analyze, and solve problems using algebraic equations, inequalities, and functions. They will use ratios and proportions; work with scale drawings; use formulas to solve problems; ensure precision, accuracy, and tolerance; solve problems that involve linear and nonlinear equations; solve quadratic equations; generate quadratic sections and trajectories; and graph data.

**Standard 13: Trigonometry**

Students will use right-triangle relationships and trigonometric functions to solve problems. They will apply trigonometric functions in activities related to processes and systems.

**Standard 14: Engineering Mathematics**

Students will understand the practical application of numerical computations, units of measure, and scales used in a technological area, applied geometry, trigonometry, and descriptive geometry. They will apply the principles of engineering mathematics to solve problems involving questions that arise in the workplace and other life situations.

**Standard 15: Business Mathematics**

Students will know business mathematics, including banking, payroll, simple and compound interest, financial statements, taxes, insurance, depreciation, financial statements, proposal preparation, contract bidding, cost accounting, and cost reporting. Students will research, develop, and write a proposal with full justification to show knowledge of the business world.

**Standard 16: Statistics**

Students will have knowledge of the basic concepts of probability and statistics and ability to use non-parametric techniques. They will be able to infer conclusions based upon probability, distribution, tests of hypothesis, estimation, regression, and correlation.

Language Arts (20–22)

**Standard 20: Reading**

Students will be able to comprehend, interpret, evaluate, and use written material. They will recall, summarize, and apply interpretive skills to solve technological problems.

**Standard 21: Oral Communication**

Students will understand the relationship of critical listening and speaking. They will communicate effectively in formal and informal situations to convey ideas, organize presentations, develop central themes, ask questions, and offer appropriate responses to questions.

**Standard 22: Writing**

Students will understand the importance of writing in industrial and technology education. Students will be able to write in a grammatically correct, well-organized, coherent manner for a variety of purposes. They will use appropriate language and style in writing. Students will develop and maintain a focus with a clear thesis, main idea, theme, or unifying event when writing. They will use descriptive details; support and develop reasons for opinions; articulate concrete examples of solutions; organize ideas clearly, coherently, and logically; and revise, edit, and proofread written work.

History–Social Science (30)

**Standard 30: History**

Students will understand the sociohistorical impact of technology. This knowledge may be applied to the students' progress in the selection of an industrial and technology education career path.

Visual Arts (40)

**Standard 40: Design**

Through creative activities students will understand the relationships in design and nature. They will incorporate proper design techniques that include symmetry, color, balance, and contrast in a variety of activities related to processes and systems.

Health and Nutrition (50)

**Standard 50: Health and Nutrition**

Students will understand industrial and technology-related concepts of health and nutrition and corresponding applications. Students will use these concepts and skills to demonstrate competence and to record, evaluate, and communicate ideas.

## Summary

Career–technical performance standards, career performance standards, academic performance standards, and integrated performance activities must be considered together in a holistic, integrated context. The reader should review all career–technical performance standards of interest concurrently with related career performance standards and academic performance standards. Examples of integrated performance activities, provided in each career–technical performance standard cluster (Chapters 3 through 12), incorporate this holistic, integrated context.

## Chapter 3

# Technology Education for Children Standards

Programs in industrial and technology education for children in elementary school are designed to enhance and reinforce the educational goals of the whole elementary school curriculum. Students in elementary school are at the ideal level to begin developing an understanding of the technological world. Activities in Technology Education for Children are integrated into the elementary school curriculum. These experiences orient students in technology, develop their psychomotor skills, and refine their attitudes about the influence of technology on society.

Programs in Technology Education for Children provide students with experiences which:

- Introduce them to tools, materials, processes, and systems of industry and technology.
- Integrate and reinforce skills across disciplines.
- Improve children's psychomotor skills.
- Promote cognitive synthesis.
- Develop informed attitudes about the influence of technology on society.

Career–technical performance standards, academic performance standard 50, and model curriculum integrated performance activities for Technology Education for Children are presented in this chapter. The reader should review career–technical standards concurrently with related career performance standards and academic performance standards, described fully in Chapter 2, “Industrial and Technology Education Model Curriculum Standards.”

## Career–Technical Performance Standards

### Kindergarten

#### **Standard 1: Technology Is Used Every day**

Students will understand what technology is and how it is used in the classroom, home, and community. Students will identify, classify, measure, use various hand tools and materials safely in the construction of projects, and be able to perform simple computer operations. Students will identify basic careers.

### Grade One

#### **Standard 2: Change Through Technology**

Students will understand that humans have changed their environment through technology. Students will follow directions in sequential order, draw simple plans, learn assembly techniques, and be able to identify various careers involving production and computers.

Grade Two

**Standard 3: Processes and Systems in Technology**

Students will understand that systems and processes are primary concepts of technology. Using a team approach, students will safely participate in a production activity that incorporates the business organizational structure used in operating a company. Students will comprehend various careers that relate to these activities.

Grade Three

**Standard 4: Components of Technology**

Students will understand that communication, transportation, and production are components of technology and that people and energy enable technology to work. Students will develop safe work habits in the use of basic tools and materials while constructing activities relating to communication, transportation, and production.

Grade Four

**Standard 5: Technology Can Protect or Harm**

Students will understand the effects of technology on people and the environment. Students will identify ways in which technology will benefit or harm the environment and identify careers related to the environment.

Grade Five

**Standard 6: Technology Requires Both Mental and Physical Skills**

Students will understand the interrelatedness of education and technology in pursuing a career path. Students will be able to research, categorize, and evaluate various charts relating to standards; investigate the basic use of systems; and use a team approach and computers to create various documents.

Grade Six\*

**Standard 7: Interrelatedness of technology and the future**

Students will understand fundamental concepts about how people create and control their environment and the interrelationship of the future and technology. Students will use the scientific method of discovery and observation and be able to describe how technology utilizes processes and systems that bring about change. Students will become aware that careers and jobs require lifelong learning.

\*Standard provided for schools with a sixth grade.

# Academic Performance Standard 50

Health and Nutrition (50)

## **Standard 50: Health and Nutrition**

Students will understand industrial and technology-related concepts of health and nutrition and corresponding applications. Students will use these concepts and skills to demonstrate competence and to record, evaluate, and communicate ideas.

## Model Curriculum Integrated Performance Activities

Standards in all the industrial and technology education curriculum clusters are written as broad-based performance standards. Integrated performance activities describe classroom or workplace student activities that reflect two or more performance standards. They are specifically intended to provide instructors and curriculum developers with examples of activities designed to promote the student's acquisition of selected standards. Classroom teachers will have the option of using the integrated performance activities as developed here or of modifying them to fit local needs, objectives, or individual teaching styles.

A limited selection of integrated performance activities is provided in this document to facilitate an understanding of performance standards. Subsequent and companion handbooks or curriculum development guides will provide a complete reference to integrated performance activities for all industrial and technology education curriculum clusters. Integrated performance activities are subject to constant change, including additions, item corrections and rewrites, deletions, and the like. Integrated performance activities are subject to constant modification to keep pace with the changing needs of students, business and industry, and the educational milieu.

Selected activities are as follows (draft copies of an activities handbook are available on request from consultants listed on pages xiii and xiv):

### **Activity 1**

Students will bring in various containers that are used to transport goods (such as plastic bottles, cereal boxes, etc.). Students will sort them by size, shape, particular use, materials. What are the containers made from? What technology is used? What careers are related to packaging of materials and goods? How do tools and machines relate to careers and people?

Elementary Standards	1, 2
Career Performance Standards	1, 5
Academic Performance Standards	1, 2, 10, 11, 20, 21, 30, 40, 50

### **Activity 7**

After discussing various careers, students will construct a hat relating to their career choice (that identification can be made by using pictures or labels). Why is it important to follow rules and directions? Can machines do what people do? What technology would be used to make hats? What careers would be involved?

Elementary Standards	2, 3
Career Performance Standards	1, 2, 3, 5
Academic Performance Standards	2, 3, 10, 11, 20, 21, 22, 30, 40

### **Activity 9**

Students will study the history of textiles and weaving processes. Students will form a company to produce a product (such as a bracelet), using yarn and colored macaroni, for each member of the class. The class will elect officers for the company producing the product. The class will divide into teams of five or six students, and each team will develop a procedure for the production of the product. One procedure will be chosen and used by the entire class to produce the item.

Elementary Standards	3, 4, 5
Career Performance Standards	1, 2, 3, 4, 5
Academic Performance Standards	2, 3, 10, 11, 20, 21, 22, 30, 40

### **Activity 13**

Students will construct a model airplane and discuss the importance of communication, transportation, and production in the aerospace industry. They will study the theory of flight, air transportation, communications systems, and the production of aircraft. Students will fly their models, chart time and distance, and discuss their design. Students will develop safe work habits in the use of tools, materials, and processes. Students will learn about various aerospace careers.

Elementary Standards	4, 5, 6, 7
Career Performance Standards	1, 2, 3, 4, 5, 6, 7
Academic Performance Standards	2, 6, 10, 11, 12, 20, 21, 22, 30, 40

### **Activity 23**

Students will work in cooperative groups to design, create, use, and evaluate the effectiveness of an obstacle course to be used by fifth graders in preparing for physical fitness tests. Students will collect data on student performance and graph the information for comparison. A new obstacle course will be created in accord with the data and will be used by all fifth-grade students in preparing for the fitness tests. Scores will be compared with those of previous years, and a final evaluation prepared.

Elementary Standards	6, 7
Career Performance Standards	1, 2, 3, 4, 5, 6
Academic Performance Standards	1, 2, 10, 11, 12, 21, 30, 40, 50

### **Activity 28**

Students will design paper gliders after studying concepts of lift, thrust, and drag; examining the forces of gravity; and experimenting with air flow. They may use preprinted designs or their own designs. A competition course may be set up to give students the opportunity to measure distance and observe altitude. A stopwatch may be used to measure the glider's time in the air. Students can calculate averages and make modifications to improve performance. The necessity of "test modification" before production is emphasized.

Elementary Standards	4, 6, 7
Career Performance Standards	1, 2, 3, 4, 5, 6, 7
Academic Performance Standards	2, 6, 10, 11, 12, 20, 21, 22, 30, 40

## Chapter 4

# Exploring Technology Education Standards

The Exploring Technology Education program at the middle school level is a broad-based exploratory experience designed for both boys and girls. Using recommendations from the *Caught in the Middle* report, the explorations program seeks to acquaint students with technology through hands-on experiences while reinforcing the academic core of language arts, mathematics, science, history–social science, and visual and performing arts. The explorations program seeks to meet the needs of the “at-risk” students by providing them with positive learning experiences. Because of the constant technological changes in society, students need to possess a strong foundation in the academic core areas and a broad base of career awareness.

The explorations program is based on the modular delivery system, which encourages students to become responsible for their own learning. The students work in pairs, using a set of self-directed instructions that guide them through the learning activity. Students rotate from one module to the next every five or eight days. They change partners on each rotation and prepare for life by learning to work with other students.

The activities in the explorations program are grouped into five cluster areas: biotechnology; communications; construction; manufacturing; and power, energy, and transportation. The biotechnology cluster exposes students to the “fast plants” technology and the ever-growing biomedical industry. Students are shown the ways in which advances in the construction, manufacturing, power and energy, and transportation sectors influence advances in communications systems. Students explore the construction cluster through activities that include house construction, bridge building, city planning, and other phases of construction. Students in the manufacturing cluster explore activities involving robotics, research and development, composites, and CNC (computer numerical control). The power, energy, and transportation cluster challenges students to learn about small gas engines, pneumatics, simple machines, and air and space transportation.

The explorations program at the middle school level allows both boys and girls to learn about the technology that affects their daily lives through hands-on activities while reinforcing the academic core. By participating in a program in Exploring Technology Education, the student will be able to make informed career, occupational, and educational decisions based on the knowledge and skills acquired at the middle school level.

Career–technical performance standards and model curriculum integrated performance activities for the Exploring Technology Education program are presented in this chapter. The reader should review career–technical standards concurrently with related career performance standards and academic performance standards, described fully in Chapter 2, “Industrial and Technology Education Model Curriculum Standards.”

# Career–Technical Performance Standards

## **Standard 1: Biotechnology**

Students will understand the application of biology and technology. Students will demonstrate and explain methods of biotechnology in the investigation of living systems (agriculture, bioprocessing, health, medicine).

## **Standard 2: Communication**

Students will understand a variety of communication processes (audio, computer-aided design [CAD], electronic, laser, visual) and their importance in communications technology. Students will use different processes and media to communicate a message.

## **Standard 3: Construction**

Students will understand a variety of construction processes (planning, framing, plumbing, wiring) and their importance in construction technology. Students will build models or projects incorporating these processes.

## **Standard 4: Machine and Tool Safety**

Students will understand the safe and appropriate use of tools and machines. Students will demonstrate the correct operation of tools and machines to form, separate, combine, and condition materials.

## **Standard 5: Manufacturing**

Students will understand a variety of manufacturing processes (research, tooling, casting, forming, combining, conditioning) and their importance in manufacturing technology. Students will create models or products incorporating different processes.

## **Standard 6: Materials**

Students will understand the ways in which raw materials (animal, mineral, vegetable) are collected and processed to produce industrial materials (composites, metals, wood products). Students will demonstrate and explain the processes and testing used to produce and recycle common industrial materials.

## **Standard 7: Power and Energy**

Students will understand sources and systems of power and energy (electrical, simple machines, solar, thermal, water, wind). Students will build models or projects incorporating different processes.

## **Standard 8: Transportation**

Students will understand the applications of transportation technology in relation to land, water, air, and space. Students will incorporate the technology into the design and construction of a model or functional vehicle.

# Model Curriculum Integrated Performance Activities

Standards in all the industrial and technology education curriculum clusters are written as broad-based performance standards. Integrated performance activities describe classroom or workplace student activities that reflect two or more performance standards. They are specifically intended to provide instructors and curriculum developers with examples of activities designed to promote the student's acquisition of selected standards. Classroom teachers will have the option of using the integrated performance activities as developed here or of modifying them to fit local needs, objectives, or individual teaching styles.

A limited selection of integrated performance activities is provided in this document to facilitate an understanding of performance standards. Subsequent and companion handbooks or curriculum development guides will provide a complete reference to integrated performance activities for all industrial and technology education curriculum clusters. Integrated performance activities are subject to constant change, including additions, item corrections and rewrites, deletions, and the like. Integrated performance activities are subject to constant modification to keep pace with the changing needs of students, business and industry, and the educational milieu.

Selected activities are as follows (draft copies of an activities handbook are available on request from consultants listed on pages xiii and xiv):

## Hydroponics

### **Activity 1: Introduction**

Students are provided with reference materials about hydroponics and biology (books, videotapes, software, laser disc, CD-ROM). Students will use these materials to study techniques of hydroponic gardening and the way in which plants grow. Students will list and define the functions of the components of a hydroponic system. Provided with a diagram, students will trace the flow of a nutrient solution from root to leaf of a plant and compare their diagram with a model.

Exploring Technology Standards	1, 2, 6
Career Performance Standards	2, 4, 6, 7
Academic Performance Standards	1, 4, 20, 21, 22

## Computer-Aided Design (CAD)

### **Activity 5: Introduction**

Students are provided with CAD reference materials. Students will be introduced to the meaning, use, and impact of CAD systems. Students will use these materials to complete an activity for evaluation by the teacher, and the evaluations will be placed in the students' portfolios.

Exploring Technology Standards	2
Career Performance Standards	2, 4, 7
Academic Performance Standards	20, 21, 22

## Framing

### **Activity 17: Planning**

Students are provided with a set of working drawings (foundation, floor, rafters, elevation) for a model storage building. These drawings have the parts of the building labeled. Students will develop a list of required framing materials according to a predetermined size. Students will then present, in writing, a list of materials and labels for the building.

Exploring Technology Standards	2, 3
Career Performance Standards	2, 4, 7
Academic Performance Standards	10, 20, 22

## Machine and Tool Safety

### **Activity 24: Machine Nomenclature**

Students are provided with reference materials (books, videotapes, slides, diagrams). Students will identify the major parts of appropriate machines. Students will correctly label the parts on an activity sheet, which will be placed in a teacher's file.

Exploring Technology Standards	4
Career Performance Standards	4, 7
Academic Performance Standards	20, 21, 22

## Manufacturing

### **Activity 31: Universal Systems Model**

Students are provided with reference materials (state-approved Agency for Instructional Television [AIT] videotapes) covering the universal systems model (input, processes, output, feedback). Students will list the steps in the universal systems model and draw an example of the universal systems model to be evaluated by the teacher. The drawings will then be placed in the students' portfolios.

Exploring Technology Standards	2, 5
Career Performance Standards	2, 3, 4, 7
Academic Performance Standards	20, 21, 22, 30, 40

## Flight

### **Activity 44: Video Introduction to Transportation**

Students are provided with reference materials (state-approved AIT videotapes) covering transportation. After viewing the videotape, students will identify and describe the basic model of transportation.

Exploring Technology Standards	8
Career Performance Standards	2, 4, 7
Academic Performance Standards	20, 21, 22, 30