

TechCenter21: Technology Education

Elk Grove Unified School District Exploring Technology

9-12 Standards

Instructional Content Areas (Modules)

Introduction to Technology

Aerodynamic Principles

Aerospace

Alternate Energy

Biosphere

CAM/CNC Mill

Communications

Construction & CAD

Desktop Publishing

Electronics & Control

Engineering Structures

Environmental Management

Graphic Design

Hydraulics

Lasers & Fiber Optics

Manufacturing/Automation

Mechanisms

Multimedia Basics

Pneumatics

Power & Energy

Road Transportation

Robotics

Video Production

Waste Management

Weather Monitoring

CO₂ Race Car Design

Structure Design for Earthquake



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Overview

This document demonstrates the correlation between the Techcenter21 curriculum supplied by Applied Educational Systems and the Elk Grove Unified School District's Exploring Technology Standards, published on the Elk Grove web page. The Techcenter21 (TC21) units are listed across the top row. The checkmarks in the second column indicate that the standard is covered as part of the TC21 course. The X's marked in the remaining columns show where the standard is covered in the TC21 curriculum.

TC21 curriculum includes *core themes* written into each and every module as part of the planning and development of the curriculum. Core themes are areas of educational content deemed of critical importance. Repeated exposure to core themes enables students to internalize and apply critical concepts in real world scenarios. Through repeated exposure in a variety of contexts, students achieve ever-increasing levels of sophistication in understanding and application.

Source for standards listed on the following pages:

Elk Grove Unified School District, Standards and Benchmarks – Industrial Technology

<http://www.egusd.k12.ca.us/StandBenchmark/stdbench/it/expltech.pdf>

Elk Grove Exploring Technology Content Standards 9-12	TechCenter21 Course	Introduction Unit	Aerodynamics	Aerospace	Alternate Energy	Biosphere	CAM/CNC Milling	Communications	Construction/CAD	Desktop Publishing	Electronic Control	Engineer Structures	Environmental Management	Graphic Design	Hydraulics	Lasers and Fiber Optic	Manufacturing & Automation	Mechanism	Multimedia	Pneumatics	Power and Energy	Road Transportation	Robotics	Video Production	Waste Mgt.	Weather	CO ₂ Race Car Design	Structure Design Earthquakes
	Industrial Technology - Biotechnology																											
1. The student will know that bio-related technologies are related to plant and animal life.	✓					X																						
2. The student will explain how biotechnology developed.																												
3. The student will know the impact of the newer bio-related technologies	✓					X							X													X		
4. The student will be able to discuss bio-ethics																												
Industrial Technology - Communication																												
1. The student will be able to define communication technology and explain the importance of communications systems.	✓						X	X				X		X			X								X			
2. The student will be able to identify trends in communication systems.	✓						X	X				X		X			X								X			
3. The student will explain some of the impacts of communication systems	✓						X	X				X		X			X								X			
4. The student will communicate with others using a variety of processes and media.	✓						X	X				X		X			X								X			
Industrial Technology – Construction																												
1. The student will be able to define and give examples of four basic types of construction: residential, industrial, commercial, and public works.	✓								X			X																
2. The student will identify and explain how resources are used in construction (e.g., people, information, materials, tools and machines, energy, capital and time).	✓								X			X																
3. The student will be able to detail some advantages and disadvantages of several types of structural materials.	✓					X			X			X																
4. The student will be able to discuss regulations that apply to construction.																												
5. The student will list the steps in the design process used for construction.	✓								X			X																

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	6. The student will know the titles and description of jobs in related construction fields.	✓				X				X			X																
Industrial Technology – Machine and Tool Safety																													
1. The student will know and demonstrate the safety procedures appropriate for the lab setting.	✓	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
2. The student will be able to explain the purpose of Occupational Safety and Health Administration (OSHA)																													
Industrial Technology - Manufacturing																													
1. The student will develop an understanding of the history of manufacturing.	✓																X												
2. The student will explain how manufacturing and the economy influence each other.	✓																X												
3. The student will understand the four parts (inputs, outputs, processes, and feedback) of a manufactured production system and be able to demonstrate the system.	✓																X												
4. The student will know and demonstrate the three types of drawings used in manufacturing: thumbnail sketches, rough sketches, renderings	✓																										X	X	
5. The student will create a mock-up of a proposed product.	✓					X		X	X	X			X									X					X	X	
Industrial Technology - Materials																													
1. The student will be able to define and give an example of each of these items: natural materials, synthetic materials, raw materials, industrial materials, standard stock, alloy, composite, ceramics.																													
2. The student will understand the following processing methods for materials: forming, separating, conditioning, combining.																													
3. The student will understand and demonstrate each of the following testing methods and importance of testing: hardness, tensile strength, compression, strength, fatigue strength																													

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Industrial Technology – Power and Energy																													
1. The student will be able to distinguish between energy and power.	✓				X																	X							
2. The student will be able to define and give an example of these sources of energy: inexhaustible, renewable, nonrenewable.	✓				X																	X							
3. The student will identify the forms of energy used by technology systems: heat (thermal), light (solar), sound, chemical, nuclear, mechanical, electrical, water.	✓				X										X	X		X		X	X								
4. The student will complete at least one model or project incorporating at least two different processes.	✓				X											X		X		X	X								
Industrial Technology - Transportation																													
1. The student will be able to name the five modes of transportation the types of vehicles used for each.	✓	X	X	X											X								X						
2. The student will explain the reasons for selecting one (transportation) mode over another.	✓	X																					X						
3. The student will select a mode of transportation, then design and construct an appropriate model or functional vehicle.	✓		X	X																			X						
Industrial Technology – Career Exploration																													
1. The student will explore career opportunities available in the field of industrial technology.	✓		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
2. The student will understand the career paths available and the education, skill, and training requirements of technology careers.	✓		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
Focus on Physical Science																													
1a. Students know position is defined in relation to some choice of a standard reference point and a set of reference directions.	✓						X											X					X						
1b. Students know that average speed is the total distance traveled divided by the total time elapsed and that the speed of an object along the path traveled can vary.	✓																						X					X	

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	1c. Students know how to solve problems involving distance, time, and average speed.	✓	X																X				X					X
2a. Students know a force has both direction and magnitude.	✓																	X										
2b. Students know when an object is subject to two or more forces at once, the result is the cumulative effect of all the forces.	✓		X	X																		X					X	
2c. Students know when the forces on an object are balanced, the motion of the object does not change.																												
2d. Students know how to identify separately the two or more forces that are acting on a single static object, including gravity, elastic forces due to tension or compression in matter, and friction.	✓		X	X								X						X								X	X	
2e. Students know that when the forces on an object are unbalanced, the object will change its velocity (that is, it will speed up, slow down, or change direction).																												
2f. Students know the greater the mass of an object, the more force is needed to achieve the same rate of change in motion.	✓																	X				X						
3a. Students know the structure of the atom and know it is composed of protons, neutrons, and electrons.																												
5c. Students know chemical reactions usually liberate heat or absorb heat.	✓					X																						
5e. Students know how to determine whether a solution is acidic, basic, or neutral.																												
6a. Students know that carbon, because of its ability to combine in many ways with itself and other elements, has a central role in the chemistry of living organisms.																												
8a. Students know density is mass per unit volume.																												
8c. Students know the buoyant force on an object in a fluid is an upward force equal to the weight of the fluid the object has displaced.	✓														X													

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Investigation and Experimentation																														
9a. Plan and conduct a scientific investigation to test a hypothesis.	✓			X	X										X															
9c. Distinguish between variable and controlled parameters in a test.	✓		X							X					X															
9e. Construct appropriate graphs from data and develop quantitative statements about the relationships between variables.	✓				X					X																		X	X	
9f. Apply simple mathematic relationships to determine a missing quantity in a mathematic expression, given the two remaining terms (including speed = distance/time, density = mass/volume, force = pressure x area, volume = area x height).	✓		X	X						X	X				X		X		X	X	X									
9g. Distinguish between linear and nonlinear relationships on a graph of data.	✓	X																												