

CTE Curriculum Map: Design My Future

The Scottsdale School District, Career and Technical Education Department, Software and App Design Curriculum Map is aligned to The Arizona Career and Technical Education Quality Commission, the validating authority for the Arizona Skills Standards Assessment System, endorsed these standards on January 25, 2018.

Unit/Topic:	Qtr/Sem/Year	Time Frame:
INTRO: Self Marketing - Graphic Design	1st Intro	2 Weeks
Essential Questions:		
<ol style="list-style-type: none"> 1. How does the use of technology communicate and market oneself and products? 2. What is the relationship between graphic design and digital marketing? 3. How can you communicate complex ideas clearly and effectively by using Graphic Design? 		
Key Concepts:	Key Vocabulary:	
<ul style="list-style-type: none"> ● Visual Communication ● Interpersonal and employability skills ● Elements of design ● Color Theory ● Digital design ● Design process from concept to final product ● History of visual communication 	<ul style="list-style-type: none"> ● Digital Marketing ● Target Market ● Body Copy ● Brand (Brand Identity) ● Complementary ● Gradient ● Margins ● Monochrome ● Resolution ● Rule of Thirds ● White Space 	

Priority Standards:	Supporting Standards:
<p>ISTE Standards for Students</p> <ul style="list-style-type: none"> ● 3. Knowledge Constructor - Students critically curate a variety of resources using digital tools to construct knowledge, produce creative artifacts and make meaningful learning experiences for themselves and others. ● 6. Creative Communicator - Students communicate clearly and express themselves creatively for a variety of purposes using the platforms, tools, styles, formats and digital media appropriate to their goals. <p>Arizona Educational Technology Standards</p> <p>Strand 1: Creativity & Innovation</p> <ul style="list-style-type: none"> ● Concept 1: Knowledge and Ideas - Use Technology to generate knowledge and new ideas ● Concept 4: Original Work - Use technology to create original works in innovative ways 	<p>ISTE Standards for Students</p> <ul style="list-style-type: none"> ● 3. Knowledge Constructor <ul style="list-style-type: none"> ○ 3a - Students plan and employ effective research strategies to locate information and other resources for their intellectual or creative pursuits. ○ 3b - Students evaluate the accuracy, perspective, credibility and relevance of information, media, data or other resources. ○ 3c - Students curate information from digital resources using a variety of tools and methods to create collections of artifacts that demonstrate meaningful connections or conclusions. ○ 3d - Students build knowledge by actively exploring real-world issues and problems, developing ideas and theories and pursuing answers and solutions. ● 6. Creative Constructor <ul style="list-style-type: none"> ○ 6a - Students choose the appropriate platforms and tools for meeting the desired objectives of their creation or communication. ○ 6b - Students create original works or responsibly repurpose or remix digital resources into new creations. ○ 6c - Students communicate complex ideas clearly and effectively by creating or using a variety of digital objects such as visualizations, models or simulations. ○ 6d - Students publish or present content that customizes the message and medium for their intended audiences. <p>Arizona Educational Technology Standards</p> <p>Strand 1: Creativity & Innovation</p> <ul style="list-style-type: none"> ● Concept 1 - Knowledge and Ideas

	<ul style="list-style-type: none"> ○ PO. 1 - Analyze information to generate new ideas and product ● Concept 4 - Original Works <ul style="list-style-type: none"> ○ PO. 1 - Analyze information using digital creativity tools to create original works and express ideas ○ PO. 2 - Use digital tools to analyze information to produce original works and express ideas.
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Instructional Resources/Materials:

- Student computers - Computer Aided Design
- Google Slides to create a Digital Billboard marketing themselves using photos, animations, transitions, audio, shapes and more!

Unit/Topic:	Qtr/Sem/Year	Time Frame:
Explore the 16 Career Clusters - Major Clarity	ALL - Week 1	Length of Term
Essential Questions:		
<ol style="list-style-type: none"> 1. Why is it important to learn about each of the 16 career clusters? 2. Which career pathway can I see myself being successful in? 3. What are the factors that influence which career pathway is best for me? 		
Key Concepts:	Key Vocabulary:	
<p>Job Sectors Career Planning Resume Building Lifelong Learning Common skills needed across all jobs/careers How do your abilities and interests influence your career choice Difference between jobs and careers? Requirements to enter a job/career of your choice</p> <p>Short and Long Term Goals: Post-Secondary Education and Career Goals Align Goals to Who I Am? & What Do I Want to Do? My High School Course Plan (Registration) Early ECAP Post Survey</p>	<p>Overview of the 16 Major Career Clusters in the U.S. Agriculture, Food & Natural Resources Architecture & Construction Arts, Audio/Video Technology & Communications Business, Management & Administration Education & Training Finance Government & Public Administration Health Science Hospitality & Tourism Human Services Information Technology Law, Public Safety, Corrections & Security Manufacturing Marketing, Sales & Service Science, Technology, Engineering & Mathematics Transportation, Distribution & Logistics</p>	

Priority Standards:	Supporting Standards:
<p>STANDARD 3.0 COLLABORATION Collaboration and teamwork enable individuals or groups to achieve collective goals and develop leadership skills.</p>	<p>STANDARD 1.0 CAREER RESEARCH</p> <p>1.2 Explain what is meant by “jobs” and “careers,” and examine how each tends to be distributed regionally, nationally, and globally</p> <p>1.3 Inventory the requirements for entering different career areas of interest using online job information and determining why those requirements are needed for success in a chosen career</p> <p>1.4 Compare and contrast how traditional and non-traditional occupational roles have changed or remained the same regionally, nationally, and globally</p> <p>1.5 Evaluate personal abilities, interests, and motivations and discuss how they might influence job and career selection</p> <p>1.6 Identify common knowledge, skills, and abilities needed within career clusters</p> <p>1.7 Relate academic achievement and course planning to secondary opportunities</p> <p>STANDARD 6.0 ACCOUNTABILITY AND ETHICS</p> <p>6.1 Explore career opportunities for a business assistant (e.g. virtual assistant, receptionist, office manager, clerk, administrative assistant)</p>
Instructional Resources/Materials:	
<p>Teachers: Major Clarity Lessons Major Clarity Link</p>	

Unit/Topic:	Qtr/Sem/Year	Time Frame:
<p>Coding: Introduction to Game Design</p> <p>Students create video game assets using pixel art software. Then they learn the fundamentals of JavaScript and how to utilize object-oriented programming to build a text adventure game.</p>	1	9 Weeks
<p>Game Mechanics and Control Flow</p> <p>Students utilize game mechanics to build player-oriented gameplay and leverage new data types, logical operators, conditionals, loops, and other coding concepts to build a word-guessing game.</p>	Sem / Year	9 Weeks
<p>Canvas Coding & Arcade Project</p> <p>Students use the HTML5 Canvas element to draw and animate their own graphics with code.</p> <p>Students build and theme an arcade game within HTML 5 Canvas. They use tools, math, and creativity to discover the magic of coding.</p>	Sem / Year	9 - 16 Weeks
<p>Essential Questions:</p>		
<ul style="list-style-type: none"> ● What are the basic elements to use to design a game? ● How to create or enhance a game? ● What are the issues and trends affecting computers and information privacy? ● What licensing considerations are used for using third party libraries when creating software for sale? ● What is the difference between ethical and legal uses of information technology? ● What methods and techniques of problem-solving and troubleshooting are applicable to software development? 		

<ul style="list-style-type: none"> • What ergonomics and repetitive strain injuries are common in information technology? 	
Key Concepts:	Key Vocabulary
<ul style="list-style-type: none"> • Identify and explain computer game requirements, components, and solutions. • Explain the various types of simulations, training software, and games that can be achieved using object oriented game development techniques. • Explain and illustrate the game development life cycle (GDPC. • Describe Game Software Development Tools and related Integrated Development Environments (IDE`s). • Describe and diagram how to design effective game consoles to increase replay value. • Describe game development programming languages and compare the appropriate uses of each. • Define and explain script variables, assignment, expressions. • Explain and illustrate the process needed in creating and using variable arrays. • Define and explain if, repeat, and while statements and loops. • Explain the uses and objectives of effective process control and switches. • Define and explain constants, numerical values, and string handling. • Demonstrate event driven functions to control the game by illustrating that process in a game. • Use scripts to manipulate and control game objects and explain the steps involved. • Define and explain proper use of object level and instance variables • Define and explain built-in game development constants, functions, and variables. 	
Priority Standards:	Supporting Standards:

STANDARD 1.0 APPLY PROBLEM-SOLVING AND CRITICAL THINKING SKILLS

- 1.1 Establish objectives and outcomes for a task
- 1.2 Explain the process of decomposing a large programming problem into smaller, more manageable procedures
- 1.3 Explain “visualizing” as a problem-solving technique prior to writing code

STANDARD 5.0 PERFORM BASIC COMPUTER MATHEMATICS IN INFORMATION TECHNOLOGY

- 5.1 Apply basic mathematics to hardware (e.g. bits, bytes, kilobytes, megabytes, gigabytes, terabytes)
- 5.2 Use binary to decimal, decimal to hexadecimal, hexadecimal to decimal, binary to hexadecimal, and binary to hexadecimal conversions to solve hardware and software problems
- 5.3 Identify and correctly use arithmetic operations applying the order of operations (precedence) with respect to programming
- 5.4 Interpret and construct mathematical formulas

STANDARD 9.0 IDENTIFY INTERNET PROTOCOLS AND OPERATIONS

- 9.1 Explain cloud-based computing and content delivery networks
- 9.2 Identify the components and functions of the internet (e.g. HTTP, HTTPS, FTP, IP addresses, IMAP)
- 9.4 Identify performance issues (e.g. bandwidth, internet connection types, pages loading slowly, resolution and size graphics)

STANDARD 10.0 APPLY CLIENT-SIDE INTERNET SOFTWARE

- 10.1 Identify key components and functions of internet and web specialty browsers
- 10.2 Use client collaboration sources/platforms (e.g. GitHub, Google Drive, Dropbox, JSFiddle, browser developer tools)
- 10.3 Analyze remote computing tools and services and their application

Unit Two: Digital Literacy and Ethics

STANDARD 2.0 RECOGNIZE SECURITY ISSUES

- 2.1 Identify common computer threats (e.g. viruses, phishing, suspicious email, social engineering, spoofing, identity theft, spamming)
- 2.2 Describe potential vulnerabilities in software (e.g. OWASP's Top 10)
- 2.3 Identify procedures to maintain data integrity and security (e.g. lock the screen, delete unrecognized emails, use trustworthy thumb drives, use approved software)
- 2.4 Explain best practices to maintain integrity and security in software development (e.g. encryption, hashing, digital signatures)
- 2.5 Describe methods for sanitizing user input to prevent issues (e.g. buffer overflows, SQL injection)
- 2.6 Explain the CIA (confidentiality, integrity, and availability) triad
- 2.7 Explain how software defects relate to software security (e.g. buffer overflows, cross-site scripting)

STANDARD 3.0 EXAMINE LEGAL AND ETHICAL ISSUES RELATED TO INFORMATION TECHNOLOGY

- 3.1 Explore intellectual property rights including software licensing and software duplication [e.g. Digital Millennium

	<p>Copyright Act (DMCA), software licensing, software duplication]</p> <ul style="list-style-type: none"> ● 3.2 Compare and contrast open source and proprietary systems in relation to legal and ethical issues (e.g. data pricing, use of public and private networks, social networking, industry-related data, data piracy) ● 3.3 Identify issues and regulations affecting computers, other devices, the internet, and information privacy (e.g. HIPAA, COPPA, CISPA, FERPA, PCI, GDPR, data brokers)
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Instructional Resources/Materials:

Teachers: [MASTERY CODING LINK](#)
[Course Syllabus Link](#)

Unit/Topic:	Qtr/Sem/Year	Time Frame:
Project Based Learning 1: Sustainable Design	All	3-4 weeks
Essential Questions:		
<ol style="list-style-type: none"> 1. What is sustainable design? 2. Why is sustainable design important for today's society? 3. Which careers are involved with the creation of a sustainable design. 		
Key Concepts:	Key Vocabulary:	
<ul style="list-style-type: none"> • Understand the relevance/impact of your carbon footprint • Repurpose resources to create new designs/products 	<ul style="list-style-type: none"> • Climate Change • Environment • Carbon Footprint • LEED (Leadership in Energy and Environmental Design) • Product Life Cycle • Lifestyle • Sustainability • Production • Recycle 	
Priority Standards:	Supporting Standards:	
<p>ISTE Standards for Students</p> <ul style="list-style-type: none"> • 4. Innovative Designer - Students use a variety of technologies within a design process to identify and solve problems by creating new, useful or imaginative solutions. <p>Arizona Technology Standards</p>	<p>ISTE Standards for Students</p> <ul style="list-style-type: none"> • 4. Innovative Designer - <ul style="list-style-type: none"> ○ 4a - Students know and use a deliberate design process for generating ideas, testing theories, creating innovative artifacts or solving authentic problems. 	

<p>Strand 1: Creativity and Innovation</p> <ul style="list-style-type: none"> ● Concept 3: Trends and Possibilities - Use technology to forecast trends and possibilities. <p>Strand 2: Communication and Collaboration</p> <ul style="list-style-type: none"> ● Concept 2: Digital Solutions - Contribute to project teams to produce original works or solve problems. ● Concept 3: Global Connections - Create cultural understanding and global awareness by interacting with learners of other cultures. 	<ul style="list-style-type: none"> ○ 4b - Students select and use digital tools to plan and manage a design process that considers design constraints and calculated risks. ○ 4c - Students develop, test and refine prototypes as part of a cyclical design process. ○ 4d - Students exhibit a tolerance for ambiguity, perseverance and the capacity to work with open-ended problems. <p>Arizona Technology Standards</p> <p>Strand 1: Creativity and Innovation</p> <ul style="list-style-type: none"> ● Concept 3: Trends and Possibilities <ul style="list-style-type: none"> ○ PO 1. Identify patterns and trends to draw conclusions and forecast possibilities. <p>Strand 2: Communication and Collaboration</p> <ul style="list-style-type: none"> ● Concept 2: Digital Solutions <ul style="list-style-type: none"> ○ PO 1. Communicate and collaborate for the purpose of producing original works or solving problems. ● Concept 3: Global Connections <ul style="list-style-type: none"> ○ PO 1. Participate in communication at a distance with others of different cultures or geographic areas to gain different perspectives of topics.
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Unit/Topic:	Sem / Year	Project Time Frame:
<p>Project Based Learning in CTE (Choose from List)</p> <ul style="list-style-type: none"> ● Pitsco Drones ● Laser Engraving Project ● 3D Print Product 	<p>ALL</p>	<p>3-4 Weeks Each</p>

<ul style="list-style-type: none"> • Architectural Drafting • Entrepreneurship 		
Essential Questions:		
<ol style="list-style-type: none"> 1. How have careers changed for today's society? 2. How does my product improve society? 3. How can I market my created project? 		
Key Concepts:	Key Vocabulary:	
<ul style="list-style-type: none"> • Introduce potential careers and identify skills for the workplace • Provide guest speakers as opportunities to introduce fields • Identify individual student career paths 	Project Management <ul style="list-style-type: none"> • Career • Design Process • Mapping • CAD - Computer Aided Design 	
Priority Standards:	Supporting Standards:	
ISTE Standards for Students <ul style="list-style-type: none"> • 1. Empowered Learner - Students leverage technology to take an active role in choosing, achieving and demonstrating competency in their learning goals, informed by the learning sciences. • 3. Knowledge Constructor - Students critically curate a variety of resources using digital tools to construct knowledge, produce creative artifacts and make meaningful learning experiences for themselves and others. 	ISTE Standards for Students <ul style="list-style-type: none"> • 1. Empowered Learner <ul style="list-style-type: none"> ○ 1a - Students articulate and set personal learning goals, develop strategies leveraging technology to achieve them and reflect on the learning process itself to improve learning outcomes. ○ 1b - Students build networks and customize their learning environments in ways that support the learning process. ○ 1c - Students use technology to seek feedback that informs and improves their practice and to demonstrate their learning in a variety of ways. ○ 1d - Students understand the fundamental concepts of technology operations, demonstrate the ability to choose, use and troubleshoot current technologies and are able to transfer their knowledge to explore emerging technologies. • 3. Knowledge Constructor 	

	<ul style="list-style-type: none">○ 3a - Students plan and employ effective research strategies to locate information and other resources for their intellectual or creative pursuits.○ 3b - Students evaluate the accuracy, perspective, credibility and relevance of information, media, data or other resources.○ 3c - Students curate information from digital resources using a variety of tools and methods to create collections of artifacts that demonstrate meaningful connections or conclusions.○ 3d - Students build knowledge by actively exploring real-world issues and problems, developing ideas and theories and pursuing answers and solutions.
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