ENABLING STUDENTS TO BE CREATORS OF TECHNOLOGY,
NOT JUST CONSUMERS OF IT

TEKS Alignment 2021

TECHNOLOGY APPLICATION STANDARDS (MIDDLE SCHOOL):

MAD-learn's alignment with standards for student achievement developed by both TEKS and the International Society for Technology in Education (ISTE) represents a keen balance between technical skill development and how such skills can be viewed as vital and transferable across not just STEM-related courses, but throughout the entire curriculum.

Sessions begin with an ideation phase, in which a whole group brainstorming activity helps students consider ideas about what their mobile app should be about. Normally these sessions focus on issues that students feel should be addressed or for which more information should be made available to the public. Issues can be as immediate as publicizing a school's athletic program or as broad as global water conservation. At this point, teams of up to three like-minded individuals are formed.

Students then select a viable topic for an app and begin to build an organizational chart known as a "mind map." This is a critical phase of the project, as it is the mind map that guides both the logistical functionality of the app and its content. Once a foundation has been established, students research and collect content from the Internet, etc. to add to their informational apps, even before being introduced to the online app builder they will utilize the actual building of their apps.

With content and direction in hand, students are next introduced to the exclusive online tool, which provides a user-friendly program for efficiently and effectively developing a professional looking mobile app.

Throughout the building phase, students continue to add content while keeping one eye on their mind maps. Specific screens requiring HTML, CSS and JavaScript codes development can also be used, and students learn basic programing in these languages
via a backward design approach. They also explore graphic designs that complement their app and learn how to develop a tool that is both useful and aesthetically pleasing for the end user.

Content, form and functionality are key elements to the mobile app's ultimate ability to become published and marketed, and students learn how to be successful in these areas through beta testing and modifying their app accordingly.

Finally students consider ways in which their app could be monetized. They discuss how their School, local Chamber of Commerce, businesses or larger government agencies might be recruited to finance the app.

This combination of project-based learning, research skills development, problem solving, technical training, and lessons in entrepreneurship combine to make MAD-learn a program that directly addresses learning standards related to both general and technical skills development.

ï126.14. Technology Applications, Middle School

(a) General requirements. Districts have the flexibility of offering technology applications in a variety of settings. Districts are encouraged to offer technology applications in all content areas. This content may also be offered in a specific class while being integrated in all content areas.

(b) Introduction.

(1) The technology applications curriculum has six strands based on the National Educational Technology Standards for Students (NETS·S) and **performance indicators developed by the International Society for** Technology in Education (ISTE): creativity and innovation; communication and collaboration; research and information fluency; critical thinking, problem solving, and decision making; digital citizenship; and technology operations and concepts.

(2) Through the study of technology applications, students make informed decisions by understanding current and emerging technologies, including technology systems, appropriate digital tools, and personal learning networks. As competent researchers and responsible digital citizens, students use creative and computational thinking to solve problems while developing career and college readiness skills.

(3) Statements that contain the word "including" reference content that must be mastered, while those containing the phrase "such as" are intended as possible illustrative examples.

(c) Knowledge and skills.

(1) Creativity and innovation. The student uses creative thinking and innovative processes to construct knowledge, generate new ideas, and create products.

Students use a variety of technologies within a design process to identify and solve problems by creating new, useful or imaginative solutions.

Students know and use a deliberate design process for generating ideas, testing theories, creating innovative artifacts or solving authentic problems.

Students select and use digital tools to plan and manage a design process that considers design constraints and calculated risks.

Students develop, test and refine prototypes as part of a cyclical design process

Students exhibit a tolerance for ambiguity, perseverance and the capacity to work with open-ended problems.

Students create original works or responsibly repurpose or remix digital resources into new creations.

(2) Communication and collaboration. The student collaborates and communicates both locally and globally to reinforce and promote learning.

Students communicate complex ideas clearly and effectively by creating or using a variety of digital objects such as visualizations, models or simulations.

Students publish or present content that customizes the message and medium for their intended audiences.

Students use digital tools to connect with learners from a variety of backgrounds and cultures, engaging with them in ways that broaden mutual understanding and learning.

(3) Research and information fluency. The student acquires, analyzes, and manages content from digital resources.

Students plan and employ effective research strategies to locate information and other resources for their intellectual or creative pursuits.

Students evaluate the accuracy, perspective, credibility and relevance of information, media, data or other resources.

Students curate information from digital resources using a *v*ariety of tools and methods to create collections of artifacts that demonstrate meaningful connections or conclusions.

Students build knowledge by actively exploring real-world issues and problems, developing ideas and theories and pursuing answers and solutions.

(4) Critical thinking, problem solving, and decision making. The student makes informed decisions by applying critical-thinking and problem-solving skills.

Students formulate problem definitions suited for technology-assisted methods such as data analysis, abstract models and algorithmic thinking in exploring and finding solutions.

Students collect data or identify relevant data sets, use digital tools to analyze them, and **represent data** in *v*arious ways to facilitate problem-solving and decision-making

Students understand how automation works and use algorithmic thinking to develop a sequence of steps to create and test automated solutions.

Students break problems into component parts, extract key information and develop descriptive models to understand complex systems or facilitate problem-solving.

(5) Digital citizenship. The student practices safe, responsible, legal, and ethical behavior while using technology tools and resources.

Students are encouraged to create mobile apps that follow a "social entrepreneurial" path, in that apps that are created to help improve some aspect of the student's community (school, neighborhood, or even the world).

Students build upon existing knowledge of copyright and fair use; further, they learn how to include citations on a mobile app format.

Students collaborate with each other on first apps then create others on their own, within the confines of a secure server. Work from this point is private, and teachers can monitor any projects that are made public.

Students learn how to apply citation standards to a mobile app format.

During the research and acquisition phase, students assess resources and confirm viability of content before including the information on the app.

Students understand the negative impact of inappropriate technology use, including online bullying and harassment, hacking, intentional virus setting, invasion of privacy, and piracy such as software, music, video, and other media.

(6) Technology operations and concepts. The student demonstrates a thorough understanding of technology concepts, systems, and operations.

Students choose the appropriate platforms and tools for meeting the desired objectives of their creation or communication.

Students must first confirm logical sequence in the development of their content then decide which platform templates are appropriate for the information being conveyed on a given screen. Confirming the legitimacy of resources is also required.

Groups are comprised of three members, and specific roles are assigned to each. Individuals are each responsible for one major aspect of authentic mobile app development, and they must work together to make sure all elements of the app complement each other.

Discussions involving template selection and functionality for each help groups make intelligent decisions about how to best represent their ideas through their app.

Students create a mind map to inform both functionality and content development of the app then select appropriate templates from an online platform to create mobile app screens for the content.

File management strategies such as file naming conventions, location, backup, hierarchy, folder structure, file conversion, tags, labels, and emerging digital organizational strategies are most prominent throughout the building of content-rich screens and graphic design.

CAREER DEVELOPMENT STANDARDS (HIGH SCHOOL):

The MAD-learn CTE Program uses the building of a mobile app as a vehicle for teaching skills related to building and monetizing a product or business tool. The student expectations listed within the standards (see below) are all addressed during the implementation of this program. The program is aligned with these standards and is delivered in three modules:

Module #1 – Mobile App Development Driven by the Design Thinking Process
Students will become expert mobile app builders, becoming proficient in all aspects of the MAD-learn Platform and creating a sophisticated app about a topic of their choosing. Emphasis will be on process over content, with students building apps related to topics of personal interests/passions.

Topics Include:
Introduction to the Design Thinking Process
Using the MAD-learn Platform
Using Third Party Resources and other tools to create graphic designs

Module #2 – Developing Coding Skills to Do More
Students will learn how to develop HTML, CSS and JavaScript codes, driven by apps developed in previous modules. A competition for "Best Code Design" will be conducted at the end of this module.

Topics Include:
Recognizing and Using HTML
Recognizing and Using CSS
Recognizing and Using JavaScript
Combining codes to create more interactive and engaging screens

Module #3 – Becoming an "Appreneur"
Students will use the knowledge gained in the previous modules to build an app as a marketable product or as a tool for a business. There will be greater attention paid to the Design Thinking Process, especially as it relates to marketing. This module culminates in a "Shark Tank" event, in which teams and individuals "pitch" their apps to have them approved for full publication on MAD-store.

Topics Include:
Review of Modules #1 & #2 Elements
Building an App as Part of a Business Plan
Making an Effective "Pitch" for an App / Mastering Presentation Skills

§127.12. Project-Based Research (One Credit), Adopted 2015.

(a) General requirements. This course is recommended for students in Grades 11 and 12. Students shall be awarded one credit for successful completion of this course. Students may repeat this course with different course content for up to three credits.

(b) Introduction.

(1) Career and technical education instruction provides content aligned with challenging academic standards and relevant technical knowledge and skills for students to further their education and succeed in current or emerging professions.

(2) Career development is a lifelong pursuit of answers to the questions: Who am I? Why am I here? What am I meant to do with my life? It is vital that students have a clear sense of direction for their career choice. Career planning is a critical step and is essential to success.

(3) Project-Based Research is a course for students to research a real-world problem. Students are matched with a mentor from the business or professional community to develop an original project on a topic related to career interests. Students use scientific methods of investigation to conduct in-depth research, compile findings, and present their findings to an audience that includes experts in the field. To attain academic success, students must have opportunities to learn, reinforce, apply, and transfer their knowledge and skills in a variety of settings.

(4) Students are encouraged to participate in extended learning experiences such as career and technical student organizations and other leadership or extracurricular organizations.

(5) Statements that contain the word "including" reference content that must be mastered, while those containing the phrase "such as" are intended as possible illustrative examples.

(c) Knowledge and skills.

(1) The student applies mathematics, science, English language arts, and social studies in an independent study.

(A) select an original independent study project for personal enrichment and career development;

(B) use reading and research skills to investigate self-selected topics and compile a research portfolio;

(C) collaborate with an interdisciplinary team to develop a project;

(D) identify community, state, national, or international issues to select a project;

(E) conduct a project under the supervision of a mentor;

(F) use scientific methods of investigation;

(G) apply statistical concepts to analyze data, evaluate results, and draw conclusions;

(H) compare and contrast findings in a coherent and organized manner; and

(I) present the independent research project to an appropriate audience of experts in the field using a variety of technologies.

(2) The student uses verbal and nonverbal communication skills. The student is expected to:

(A) listen actively and effectively in group discussions;

(B) use a variety of resources to access, process, and collect data relevant to the project; and

(C) document the time and cost to accomplish the project goal.

(3) The student demonstrates professional ethical behavior standards and legal responsibilities. The student is expected to:

(A) analyze ethical challenges determined by factors such as cost, new and emerging technologies, and allocation of limited resources; and

(B) review legal issues related to the research project.

(4) The student designs and develops a research project related to their career interests. The student is expected to:

(A) identify processes to be used in the independent research project; and

(B) use resources to complete a project.

(5) The student uses technology needed to complete a research project. The student is expected to:

(A) use search engines, databases, and other digital electronic tools effectively to locate information;

(B) evaluate quality, accuracy, completeness, reliability, and currency of information from any source;

(C) prepare, organize, and present independent research and mentor experiences;

(D) receive constructive criticism and revise personal views when valid evidence warrants; and

(E) prepare and present research information in appropriate formats to a panel of experts in the field.

(6) The student evaluates the research project. The student is expected to:

(A) create weekly progress reports that address time management and goal setting;

(B) meet periodically with the teacher for conferences about progress, concerns, successes, and needs;

(C) conduct self-evaluations of presentations;

(D) compose written reflections regarding strengths and weaknesses as well as areas of growth;

(E) analyze the feedback from the panel of experts; and

(F) submit project results and analysis to mentors and experts.