Technology Applications Work Group D Recommendations

Strand: Creativity and Innovation									
Substrand: Innovative Design Process									
Kindergarten	**Grade 1**	**Grade 2**	**Grade 3**	**Grade 4**	**Grade 5**	**Grade 6**	**Grade 7**	**Grade 8**	**Rationale**
Creativity and innovation--innovative design process. The student takes an active role in their learning using a design process to solve authentic problems for a local or global audience using a variety of technologies. The student is expected to:						Creativity and innovation – Innovative Design Process. The student takes an active role in their learning using a design process and creative thinking to develop and evaluate solutions considering a variety of local and global perspectives. The student is expected to:			ISTE 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. ISTE 1 Empowered Learner Student leverage technology to incorporate CCRS C for problem-solving and D Academic Behaviors CSTA inferences, models, algorithms
NEW (A) identify beneficial character traits and dispositions to set personal goals through guided discussion to support the design processes	NEW (A) identify beneficial character traits and dispositions to set personal goals through guided discussion to support the design processes	NEW (A) connect beneficial character traits and dispositions in order to set personal goals and use guided reflection to analyze their progress through the design processes	NEW (A) develop personal character goals and use feedback to reflect and make decisions through the design processes	NEW (A) develop personal character and group goals such as demonstrating perseverance and flexibility while receiving feedback and making decisions through the design processes	NEW (A) create personal character and group goals such as demonstrating compassion and tolerance while giving feedback and making decisions through the design processes	NEW (A) utilize goal setting and personal character growth independently such as demonstrating courage and confidence to resolve challenges in design processes	NEW (A) utilize goal setting and personal character growth independently such as demonstrating responsibility and appropriate self-advocation to resolve challenges in design processes	NEW (A) utilize goal setting and personal character growth independently such as demonstrating calculated risk-taking and tolerance to innovate using design processes	TEKS Chapter 120, Character Traits MA Standards 4.d Students demonstrate perseverance when working with open-ended problems MA Standards students articulate personal learning goals, select, and manage appropriate technologies to achieve them, and reflect on their success and areas of improvement in working toward their goals. ISTE 1 Empowered Learner - setting goals and reflecting and 4d Innovative Designer - tolerance for ambiguity, perseverance, . . . CCRS D - Academic Behaviors and E - Work Habits Habits of Mind by Arthur L. Costa

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NEW (B) use a guided design process to identify and solve authentic problems with components such as asking questions, brainstorming, or storyboarding to generate ideas and develop original products using digital tools resources	NEW (B) use a guided design process to identify and solve authentic problems with components such as asking questions, brainstorming, or storyboarding to generate ideas and develop original products using digital tools and resources	NEW (B) apply a design process to identify and solve for authentic problems with components such as testing and reflecting to create new and useful solutions and develop original products using digital tools and resources	NEW (B) apply an appropriate design process using components such as peer and teacher feedback to create new and useful solutions for authentic problems and develop original products using digital tools and resources	NEW (B) apply an appropriate design process using components such as utilizing feedback to improve and refine processes and original products for authentic problems using digital tools and resources	NEW (B) apply an appropriate design process including components to generate multiple solutions for an authentic problem and develop original products using digital tools and resources	NEW (B) discuss and implement a design process using digital tools to compare, contrast, and evaluate student-generated outcomes	NEW (B) discuss and implement a design process to plan and select digital tools to develop and refine a prototype or model through trial and error	NEW (B) discuss and implement a design process to plan and select digital tools to develop, test, evaluate design limitations, and refine a prototype or model and how the design process is used in various industries	Students understand that these components connect into a larger design process that becomes cyclical in nature. Students should develop an understanding of multiple design process models. Students should recognize multiple solutions to a problem and be able to evaluate them. ISTE 1.4. know and use a deliberate design process for generating ideas, testing theories, creating innovative artifacts or solving authentic problem CCRS Foundational Skills - Writing across the curriculum and CCRS solving a problem standards MA Standards K-2 ETS1-1 CSTA K-12 standards: inferences, models, and algorithms

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Strand: Creativity and Innovation

Substrand: Emerging Technologies

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						~~Technology operations and concepts~~ Creativity and innovation--emerging technologies. The student demonstrates a thorough understanding of the role of technology throughout history and its impact on the evolution of technology. ~~concepts, systems, and operations.~~ The student is expected to:			This concept is picked up in grades 6 through 8. Removed concepts that are not addressed.
						~~6.6.H~~ (A) discuss how changes in technology throughout history have impacted various areas of study;	~~7.6.H~~ (A) explain how changes in technology throughout history have impacted various areas of study;	~~8.6.H~~ (A) evaluate how changes in technology throughout history have impacted various areas of study;	Retained Social Studies 6.20 the student understands the influences of science and technology on Contemporary Societies. Social Studies 7.20 Technological innovations political, economics, and social development of Texas Social Studies 8.28 The students understands the impact scientific discoveries and technological innovations on daily life in the U.S. Prior knowledge from Social Studies, Science, and literature allows students to handle these skills
~~discuss how changes in technology throughout history have impacted various areas of study;~~						NEW (B) discuss how global trends impact the development of technology	NEW (B) explain how global trends impact the development of technology	NEW (B) evaluate and predict how global trends impact the development of technology	Rogers, E. (2003). Diffusion of Innovation (5th ed.). New York, Y; Free Press, Simon & Schuster Inc. Bosch-Sijtsema, P., Claeson-Jonsson, C., Johansson, M. and Roupe, M. (2021), "The hype factor of digital technologies in AEC", Construction Innovation, Vol. 21 No. 4, pp. 899-916. X. Chen and T. Han, "Disruptive Technology Forecasting based on Gartner Hype Cycle," 2019 IEEE Technology & Engineering Management Conference (TEMSCON), 2019, pp. 1-6, doi: 10.1109/TEMSCON.2019.8813649.

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						6.4.F (C) transfer current knowledge to the learning of newly encountered technologies.	7.4.F C. (C) transfer current knowledge to the learning of newly encountered technologies.	8.4.F C. (C) transfer current knowledge to the learning of newly encountered technologies.	Retained
K-2.1.A apply prior knowledge to develop new ideas, products, and processes;									
K-2.1.B create original products using a variety of resources;			3-5.1.A create original products using a variety of resources;			6.1.B create original works as a means of personal or group expression;	7.1.B create and present original works as a means of personal or group expression;	8.1.B create, present, and publish original works as a means of personal or group expression;	

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						6.1.C explore complex systems or issues using models, simulations, and new technologies to make predictions, modify input, and review results; and	7.1.C explore complex systems or issues using models, simulations, and new technologies to make predictions, modify input, and review results; and	8.1.C explore complex systems or issues using models, simulations, and new technologies to develop hypotheses, modify input, and analyze results; and	Subsumed in new (B) in Innovative design process. Both substrandsexplore complex systems or issues using . . . new technologies - emerging explore complex systems or issues using models, simulations, develop hypotheses, modify input, and analyze results - innovative defining complex systems
			3-5.2.A draft, edit, and publish products in different media individually and collaboratively;			6.4.B plan and manage activities to develop a solution, design a computer program, or complete a project;	7.4.B plan and manage activities to develop a solution, design a computer program, or complete a project;	8.4.B plan and manage activities to develop a solution, design a computer program, or complete a project;	Subsumed in Innovative Design Process Student Expectation (B). Computer programming is covered by computational thinking. The planning and managing activities are covered in the innovative design substrand.
						6.4.E make informed decisions and support reasoning; and	7.4.E make informed decisions and support reasoning; and	8.4.E make informed decisions and support reasoning; and	Creativity - Innovative Design - Cyclical design process refining This is addressed in the Innovative Design Process substrand