

Unit 4 - Working Unit

Content Area: **Unified Arts**
Course(s): **Tech Apps 8**
Time Period: **September**
Length: **1 week**
Status: **Published**

Unit Summary

Standards

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| SCI.MS-ETS1-1 | Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions. |
| SCI.MS-ETS1-4 | Develop a model to generate data for iterative testing and modification of a proposed object, tool, or process such that an optimal design can be achieved. |
| SCI.MS-ETS1-3 | Analyze data from tests to determine similarities and differences among several design solutions to identify the best characteristics of each that can be combined into a new solution to better meet the criteria for success. |
| SCI.MS-ETS1-2 | Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem. |
| TECH.8.1.8 | Educational Technology: All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and to create and communicate knowledge. |
| TECH.8.1.8.A | Technology Operations and Concepts: Students demonstrate a sound understanding of technology concepts, systems and operations. |
| TECH.8.1.8.A.1 | Demonstrate knowledge of a real world problem using digital tools. |
| TECH.8.1.8.A.2 | Create a document (e.g., newsletter, reports, personalized learning plan, business letters or flyers) using one or more digital applications to be critiqued by professionals for usability. |
| TECH.8.1.8.A.3 | Use and/or develop a simulation that provides an environment to solve a real world problem or theory. |
| TECH.8.1.8.A.CS1 | Understand and use technology systems. |
| TECH.8.1.8.A.CS2 | Select and use applications effectively and productively. |
| TECH.8.1.8.B.1 | Synthesize and publish information about a local or global issue or event (ex. telecollaborative project, blog, school web). |
| TECH.8.1.8.B.CS1 | Apply existing knowledge to generate new ideas, products, or processes. |
| TECH.8.1.8.B.CS2 | Create original works as a means of personal or group expression. |
| TECH.8.1.8.C.1 | Collaborate to develop and publish work that provides perspectives on a global problem for discussions with learners from other countries. |
| TECH.8.1.8.C.CS1 | Interact, collaborate, and publish with peers, experts, or others by employing a variety of digital environments and media. |
| TECH.8.1.8.C.CS2 | Communicate information and ideas to multiple audiences using a variety of media and formats. |

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| TECH.8.1.8.C.CS4 | Contribute to project teams to produce original works or solve problems. |
| TECH.8.1.8.D.1 | Understand and model appropriate online behaviors related to cyber safety, cyber bullying, cyber security, and cyber ethics including appropriate use of social media. |
| TECH.8.1.8.D.5 | Understand appropriate uses for social media and the negative consequences of misuse. |
| TECH.8.1.8.D.CS1 | Advocate and practice safe, legal, and responsible use of information and technology. |
| TECH.8.1.8.D.CS2 | Demonstrate personal responsibility for lifelong learning. |
| TECH.8.1.8.D.CS3 | Exhibit leadership for digital citizenship. |
| TECH.8.1.8.F.1 | Explore a local issue, by using digital tools to collect and analyze data to identify a solution and make an informed decision. |
| TECH.8.2.8.A.1 | Research a product that was designed for a specific demand and identify how the product has changed to meet new demands (i.e., telephone for communication - smart phone for mobility needs). |
| TECH.8.2.8.A.2 | Examine a system, consider how each part relates to other parts, and discuss a part to redesign to improve the system. |
| TECH.8.2.8.A.3 | Investigate a malfunction in any part of a system and identify its impacts. |
| TECH.8.2.8.A.4 | Redesign an existing product that impacts the environment to lessen its impact(s) on the environment. |
| TECH.8.2.8.A.5 | Describe how resources such as material, energy, information, time, tools, people, and capital contribute to a technological product or system. |
| TECH.8.2.8.B.1 | Evaluate the history and impact of sustainability on the development of a designed product or system over time and present results to peers. |
| TECH.8.2.8.B.2 | Identify the desired and undesired consequences from the use of a product or system. |
| TECH.8.2.8.B.3 | Research and analyze the ethical issues of a product or system on the environment and report findings for review by peers and /or experts. |
| TECH.8.2.8.B.4 | Research examples of how humans can devise technologies to reduce the negative consequences of other technologies and present your findings. |
| TECH.8.2.8.B.5 | Identify new technologies resulting from the demands, values, and interests of individuals, businesses, industries and societies. |
| TECH.8.2.8.B.6 | Compare and contrast the different types of intellectual property including copyrights, patents and trademarks. |
| TECH.8.2.8.B.7 | Analyze the historical impact of waste and demonstrate how a product is up cycled, reused or remanufactured into a new product. |
| TECH.8.2.8.C.1 | Explain how different teams/groups can contribute to the overall design of a product. |
| TECH.8.2.8.C.2 | Explain the need for optimization in a design process. |
| TECH.8.2.8.C.3 | Evaluate the function, value, and aesthetics of a technological product or system, from the perspective of the user and the producer. |
| TECH.8.2.8.C.4 | Identify the steps in the design process that would be used to solve a designated problem. |
| TECH.8.2.8.C.6 | Collaborate to examine a malfunctioning system and identify the step-by-step process used to troubleshoot, evaluate and test options to repair the product, presenting the better solution. |
| TECH.8.2.8.C.7 | Collaborate with peers and experts in the field to research and develop a product using the design process, data analysis and trends, and maintain a design log with annotated sketches to record the developmental cycle. |
| TECH.8.2.8.C.8 | Develop a proposal for a chosen solution that include models (physical, graphical or mathematical) to communicate the solution to peers. |
| TECH.8.2.8.C.5a | Explain the interdependence of a subsystem that operates as part of a system. |

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| TECH.8.2.8.C.5b | Create a technical sketch of a product with materials and measurements labeled. |
| TECH.8.2.8.D.1 | Design and create a product that addresses a real world problem using a design process under specific constraints. |
| TECH.8.2.8.D.2 | Identify the design constraints and trade-offs involved in designing a prototype (e.g., how the prototype might fail and how it might be improved) by completing a design problem and reporting results in a multimedia presentation, design portfolio or engineering notebook. |
| TECH.8.2.8.D.3 | Build a prototype that meets a STEM-based design challenge using science, engineering, and math principles that validate a solution. |
| TECH.8.2.8.D.4 | Research and publish the steps for using and maintaining a product or system and incorporate diagrams or images throughout to enhance user comprehension. |
| TECH.8.2.8.D.5 | Explain the impact of resource selection and the production process in the development of a common or technological product or system. |
| TECH.8.2.8.D.6 | Identify and explain how the resources and processes used in the production of a current technological product can be modified to have a more positive impact on the environment. |
| TECH.8.2.8.E.1 | Identify ways computers are used that have had an impact across the range of human activity and within different careers where they are used. |
| TECH.8.2.8.E.2 | Demonstrate an understanding of the relationship between hardware and software. |
| TECH.8.2.8.E.3 | Develop an algorithm to solve an assigned problem using a specified set of commands and use peer review to critique the solution. |
| TECH.8.2.8.E.4 | Use appropriate terms in conversation (e.g., programming, language, data, RAM, ROM, Boolean logic terms). |

Student Learning Objectives

Essential Questions

Enduring Understandings

Application

Skills
