| Time Frame: **4-5 weeks (approximately 20-25 instructional days)** | Unit Title: Exploring Digital Fabrication: From Design to Creation | Course Name: STEAM |
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## Stage 1 - Desired Results

| Established Goals | Transfer | |
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| What content standards will this unit address?<br><br>**1.International Society for Technology in Education (ISTE) Standards for Students:**<br><br>3a. Students plan and employ effective digital tools to explore creative ideas, solve problems, and make informed decisions.<br><br>4a. Students critically select digital tools and resources that enhance their learning and productivity.<br><br>4b. Students evaluate the accuracy, perspective, credibility, and relevance of digital resources.<br>**4c.** Students curate information from digital | *Students will be able to independently use their learning to…*<br><br>- Develop proficiency in using CAD software and digital fabrication tools.<br><br>- Apply the design thinking process to ideate, prototype, and refine design solutions.<br><br>- Collaborate effectively in teams to solve design challenges and create functional objects.<br><br>- Analyze the impact of digital fabrication on society, culture, and the environment. | |
| | **Meaning** | |
| | UNDERSTANDINGS<br>*Students will understand that….*<br><br>*Digital fabrication combines creativity, design, and technology to bring ideas to life.*<br><br>*CAD software allows for precise and detailed design creation and modification.*<br><br>*Prototyping and iteration are essential steps in the design process.*<br><br>*Collaboration and teamwork enhance the quality and effectiveness of design solutions.* | ESSENTIAL QUESTIONS<br>*Students will keep considering*<br><br>What is digital fabrication, and how does it merge design and technology?<br><br>How does CAD software facilitate the design and modification process?<br><br>What are the steps involved in the design thinking process for digital fabrication?<br><br>How can collaboration and teamwork enhance the design and fabrication process? |

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| resources using a variety of tools and methods to create collections of artifacts that demonstrate meaningful connections or conclusions. | *Digital fabrication has the potential to revolutionize manufacturing and impact various industries.* | What are the implications of digital fabrication on society, culture, and the environment? |
| **Next Generation Science Standards (NGSS):**<br><br>**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.<br><br>**MS-ETS1-2:** Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.<br><br>**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 | **Acquisition** | |
| | *Students will know…*<br><br>CAD software and design basics.<br><br>Basic design skills such as design principles, measurements, and 2D/3D modeling techniques.<br><br>The design thinking process which includes problem identification, brainstorming, concept development, prototyping, testing and iteration.<br><br>How to prepare digital designs for fabrication.<br><br>How to collaborate using teamwork and effective collaboration. | Students will be skilled at…<br><br>Using CAD (Inventor) and Corel Draw software for design.<br><br>Incorporating the design thinking process to iterate and refine their designs.<br><br>Identifying real world problems and create digital design solutions using CAD software.<br><br>Fabricate a physical prototype using digital fabrication tools. |

| into a new solution to better meet the criteria for success.<br><br>**Common Core State Standards for English Language Arts (CCSS-ELA):**<br><br>CCSS.ELA-LITERACY.RST.6-8.3: Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks.<br><br>**CCSS.ELA-LITERACY.W.**6-8.6: Use technology, including the Internet, to produce and publish writing and present the relationships between information and ideas efficiently. | | |

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