The UbD Template, Version 2.0

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<tr><td>Time Frame: 4-5 weeks (approximately 20-25 instructional days)</td><td colspan="2">Unit Title: Exploring Digital Fabrication: From Design to Creation</td><td>Course Name: STEAM</td></tr>
<tr><td colspan="4">Stage 1 - Desired Results</td></tr>
<tr><td rowspan="4">Established Goals

What content standards will this unit address?

<u>1.International Society for Technology in Education (ISTE) Standards for Students:</u>

3a. Students plan and employ effective digital tools to explore creative ideas, solve problems, and make informed decisions.

4a. Students critically select digital tools and resources that enhance their learning and productivity.

4b. Students evaluate the accuracy, perspective, credibility, and relevance of digital resources.
<u>4c.</u> Students curate information from digital</td><td colspan="3">Transfer</td></tr>
<tr><td colspan="3">Students will be able to independently use their learning to…
- Develop proficiency in using CAD software and digital fabrication tools.
- Apply the design thinking process to ideate, prototype, and refine design solutions.
- Collaborate effectively in teams to solve design challenges and create functional objects.
- Analyze the impact of digital fabrication on society, culture, and the environment.</td></tr>
<tr><td colspan="3">Meaning</td></tr>
<tr><td>UNDERSTANDINGS
Students will understand that….

Digital fabrication combines creativity, design, and technology to bring ideas to life.

CAD software allows for precise and detailed design creation and modification.

Prototyping and iteration are essential steps in the design process.

Collaboration and teamwork enhance the quality and effectiveness of design solutions.</td><td>ESSENTIAL QUESTIONS
Students will keep considering

What is digital fabrication, and how does it merge design and technology?

How does CAD software facilitate the design and modification process?

What are the steps involved in the design thinking process for digital fabrication?

How can collaboration and teamwork enhance the design and fabrication process?</td></tr>
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<tr><td rowspan="4">resources using a variety of tools and methods to create collections of artifacts that demonstrate meaningful connections or conclusions.

<u>Next Generation Science Standards (NGSS):</u>

<u>MS-ETS1-1:</u> 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.

<u>MS-ETS1-2:</u> Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.

<u>MS-ETS1-3:</u> Analyze data from tests to determine similarities and differences among several design solutions to identify the best characteristics of each that can be combined</td><td>Digital fabrication has the potential to revolutionize manufacturing and impact various industries.</td><td>What are the implications of digital fabrication on society, culture, and the environment?</td></tr>
<tr><td colspan="2">Acquisition</td></tr>
<tr><td>Students will know…

CAD software and design basics.

Basic design skills such as design principles, measurements, and 2D/3D modeling techniques.

The design thinking process which includes problem identification, brainstorming, concept development, prototyping, testing and iteration.

How to prepare digital designs for fabrication.

How to collaborate using teamwork and effective collaboration.</td><td>Students will be skilled at…

Using CAD (Inventor) and Corel Draw software for design.

Incorporating the design thinking process to iterate and refine their designs.

Identifying real world problems and create digital design solutions using CAD software.

Fabricate a physical prototype using digital fabrication tools.</td></tr>
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into a new solution to better meet the criteria for success. **Common Core State Standards for English Language Arts (CCSS-ELA):** CCSS.ELA-LITERACY.RST.6-8.3: Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks. **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.		