

## UNIT PLAN

### ADVANCED MANUFACTURING - WAHS CTE

Name \_\_\_ Clark Sarge

Grade(s): \_\_\_ 9-11 \_\_\_\_\_

Subjects /Strands:Level II Engineering & Robotics \_\_\_\_\_

Number of days: 3-5

#### STEP 1: CURRICULUM CONNECTIONS

<b>Big Idea for This Unit</b>	What is Advanced Manufacturing and why is it important?
<b>Inquiry Questions</b>	What skills are required for advanced manufacturing? What are some careers in advanced manufacturing?
<b>Overall Expectation(s) [OE]</b>	Students will understand... <ol style="list-style-type: none"><li>1) The demand for technical skills in the field of advanced manufacturing</li><li>2) Some processes and tools used in advanced manufacturing</li><li>3) Potential career paths and opportunities in advanced manufacturing</li></ol>
<b>Specific Expectation(s) [SE]</b>	Have a grasp of modeling and design aspects of AM. Understand basic CAM/CAD program requirements Explain how to create prototypes and parts by machining or additive manufacturing. Assemble/modify a robot using AM practices.
<b>Cross-Curricular Connections</b>	MATH – Use of algebraic and geometric computation skills as they apply to design and manufacturing SCIENCE – Develop understanding of material properties and energy transformation in the area of manufacturing. TECHNOLOGY – Understand basic level functions of manufacturing hardware and software.
<b>Learning Skills &amp; Work Habits to be Addressed/Assessed in Unit</b>	Study skills, research skills, software skills, mechanical skills Work ethic, professionalism

## STEP 2: CULMINATING TASKS – ASSESSMENT ‘OF’ LEARNING

<b>Rich Performance Assessment Task</b>	<p>Students will build a robotic arm using 3D printed parts and servos. They will then design/modify at least two of the components to provide an improved overall design. Through this project they will learn design, modification, manufacturing, and prototyping.</p>
<b>Assessment Tools</b>	<p>What recording tools will ATs use for the culminating task: Describe when/how these will be used. Include tools in unit plan.</p> <p> <input type="checkbox"/> Checklist              <input type="checkbox"/> Rubric              <input type="checkbox"/> Rating Scale              <input type="checkbox"/> Anecdotal Comments       </p> <p> <input type="checkbox"/> Feedback Form              <input type="checkbox"/> Self/Peer              <input type="checkbox"/> Other       </p>
<b>Learning Goals</b>	<p>See above</p>
<b>Success Criteria</b>	<p>Research paper on careers in Advanced manufacturing. Students will show that they understand the wide range of growth potential in these career paths.</p> <p>Robot project – student teams will successfully design, manufacture and test, a 3-axis robotic arm.</p>
<b>Questions and prompts to guide learning – respond, challenge, extend</b>	<p>How are new products developed and manufactured?</p> <p>What is advanced manufacturing?</p> <p>What kind of skills are needed to support advanced manufacturing?</p> <p>What career paths in manufacturing exist in our area?</p>

### STEP 3: ASSESSMENT 'AS' AND 'FOR' LEARNING

#### LESSONS

A sequence of numbered/dated lessons must be developed. Lessons should flow together, with prompts to scaffold learner learning.

Outline each lesson in the unit incorporating the following components:

1. Specific expectations for the lesson
2. Brief description of the lesson - instructional strategy, questions and prompts
3. Assessment purpose, mode, strategy, tool (with criteria)
4. Connection of lesson to culminating task
5. Resources and materials

\* First lessons must introduce the unit, culminating task, and grading tool.

\* Last lesson is an opportunity to share and celebrate the culminating task.

\* All other lessons should indicate opportunities for intentional teacher/ learner interactions.

**Choose one of the two formats below.**

#### *EXAMPLE 1: Lesson Sequence Organizer*

**Lesson # 1**

<b>Specific Expectations</b>	<b>Assessment Purpose</b> <input type="checkbox"/> AS <input type="checkbox"/> FOR <b>Mode (say/write/do) assessment tool with criteria</b>
<b>Lesson Description – instructional strategies</b>	<b>Questions and prompts</b>
<b>Connection of lesson to the culmination task (What skills are being developed in lesson?)</b>	<b>Resources and materials</b>

#### *EXAMPLE 2: Lesson Sequence Organizer*

**Lesson #**

<b>Specific expectations</b>	<b>Lesson description with instructional strategies, prompts, questions</b>	<b>Assessment purpose, mode, strategy, tool with criteria</b>	<b>Connection with culminating task (What skills are being developed in lesson?)</b>	<b>Resources and materials</b>
------------------------------	---	---	--	--------------------------------