

MANUFACTURING RESEARCH PAPER

(To be used in conjunction with the assessment developed for Standard 5B.J)

Performance Standard 5A.J

Each industrial technology student will complete a research paper which follows the conventions of the selected format (e.g., MLA, APA, Chicago Manual of Style). The student will survey a topic related to past or present manufacturing practices. Each student will narrow the focus to a specific set of questions to answer and conduct research to find the information needed to answer the research questions. The student will write a research paper using the information accordingly:

Research Process

- *Developing research design/questions:* develop the central research question; answer the central research question in the report thesis; develop answers to the central research question through supporting questions; answer the supporting questions in the outline of body paragraphs.
- *Developing research technique:* locate sources of information; document each source; paraphrase or quote supporting information.

Research Report

- *Developing documentation format:* include required information in works cited/bibliography entries; use correct format parenthetical notation in the report; follow the proper format and placement in the text.
- *Integrating sources:* use proper introductions and explanations for included information; support both the topic sentence of the paragraph and the thesis of the report with the included information.

Procedures

1. **In order to locate, organize and use information from various sources to answer questions, solve problems and communicate ideas (5A)**, students should experience sufficient learning opportunities to develop the following:
 - Survey a subject and select a topic.
 - Distinguish among kinds of data needed to solve a problem, present possible solutions or extend information about a topic or problem (e.g., fact/opinion, example/evidence).
 - Evaluate a number of informational sources for relevancy and accuracy.
 - Develop, collect and analyze various kinds of information related to a topic.
 - Organize information for a presentation.

Manufacturing executives increasingly indicate their employees need to be able to prepare accurate and concise written communications. Being able to conduct research and communicate it effectively is an important skill for industrial technology students to obtain. This assessment aligns with the Illinois Workplace Skill D4 (Communicating on the Job/Prepare written communication).
2. Have industrial technology students review and discuss the assessment task and how the rubric will be used to evaluate their work.
3. The student will be familiar with techniques for gathering and evaluating information.
4. The student will have completed an orientation to available resources and technology.
5. The industrial technology student will be familiar with ways to formulate research questions.
6. The student will be familiar with the purposes for writing (e.g., persuasion, cause/effect, argumentation).
7. The student will be familiar with a standard format for documentation (e.g., MLA, APA).
8. Prepare a set of research topics from which research assignments will be generated. These topics could include:
 - a. Manufacturing in a Global Economy
 - b. A Review of the Most Significant Changes in Manufacturing in the United States in the Last 50 Years
 - c. Manufacturing in the 21st Century
 - d. Where Have All the Manufacturing Jobs Gone?
 - e. Role of Manufacturing in the United States Economy
 - f. Impact of Just-in-Time Practices on Manufacturing
 - g. Manufacturing: It's not Your Father's Factory Anymore
 - h. The Importance of Quality Control in Manufacturing

(Note: The teacher may brainstorm research topics with the class.)

9. Using available resources, the student will develop research questions to guide inquiry, answer the questions by researching the subject and record his/her findings using an appropriate system for recording and documenting information.
10. Once the research is complete, the student will write a manufacturing research paper to answer the question, solve the problem or communicate the results of his/her inquiry, according to the requirements of the assignment.
11. Evaluate each student's performance using the rubric. Add each student's scores to determine the performance level.

Examples of Student Work

- [Meets](#)
- [Exceeds](#)

Time Requirements

- Five to six weeks
- Actual class time required should be no more than ten to twelve class periods, spaced to accommodate the teaching of the steps in the process

Resources

- Copies of the documentation format
- Available technology for researching sources and writing the report
- A guide to available resources in the school or community (optional)
- Manufacturing Research Paper Rubric

MANUFACTURING RESEARCH PAPER

NAME _____ DATE _____

- Exceeds standard (must receive 15 - 16 total points) Approaches standard (must receive 7 - 10 total points)
 Meets standard (must receive 11 - 14 total points) Begins standard or absent (must receive 4 - 6 total points)

	Research Process		Research Paper	
	Research Design/Questions	Research Technique	Documentation Format	Integration of sources
4	<ul style="list-style-type: none"> Central research question is clearly worded; the report thesis clearly and accurately answers the central research question. Supporting questions develop answers to the central research question. Outline of body paragraphs clearly and accurately answer the supporting questions. 	<ul style="list-style-type: none"> Student locates eight or more sources of information. Student records all necessary information to properly document each source. All supporting information is properly paraphrased or quoted directly. 	<ul style="list-style-type: none"> All works cited/ bibliography entries consistently contain required information. Consistently uses correct format. Parenthetical notation in the report follows the proper format and placement in the text. 	<ul style="list-style-type: none"> All information is inserted in the report with proper introductions and explanations. All information supports both the topic sentence of the paragraph and the thesis of the report.
3	<ul style="list-style-type: none"> Central research question is clearly worded; the thesis can be developed from the question with some minor revision/editing. Supporting questions usually develop answers to the central research question. One question may not develop a necessary supporting point. Outline usually answers the supporting questions. 	<ul style="list-style-type: none"> Student locates six or seven sources of information. Student usually records necessary information for proper documentation of each source. Supporting information is usually paraphrased or quoted properly. 	<ul style="list-style-type: none"> Works cited/bibliography entries usually contain required information. Some minor information may be missing or inaccurate. Usually uses correct format. Parenthetical notation in the report usually follows correct format and placement in the text. 	<ul style="list-style-type: none"> Most information is inserted in the report with proper introductions and explanations. Most information supports both the topic sentence of the paragraph and the thesis of the report.
2	<ul style="list-style-type: none"> Central research question is not clearly worded; thesis sentence is developed from the question only with considerable revision/editing. Supporting questions develop some of the answers to the central research question. Outline may not answer all supporting questions. 	<ul style="list-style-type: none"> Student locates three to five sources of information. Student records some necessary information for proper documentation of the source. Supporting information may be inaccurately paraphrased or quoted. 	<ul style="list-style-type: none"> Works cited/bibliography entries occasionally contain some required information. Some significant information may be missing or inaccurate. Occasionally uses correct format. Some parenthetical notations in the report contain erroneous information or cite the wrong source. 	<ul style="list-style-type: none"> Some information is inserted in the report with proper introductions and explanations. Some information does not support the topic sentence of the paragraph or the thesis of the report.
1	<ul style="list-style-type: none"> Central research question is vaguely worded or absent. Supporting questions may develop one or none of the answers to the central research question. <li style="text-align: center;">OR Supporting questions absent. Outline does not answer supporting questions. 	<ul style="list-style-type: none"> Student locates two or fewer sources of information. Student records little or no necessary information for proper documentation of the source. Supporting information is recorded inaccurately. <li style="text-align: center;">OR Supporting information is absent. 	<ul style="list-style-type: none"> Works cited/bibliography entries contain little or no required information. Some significant information may be missing or inaccurate. Seldom or never uses correct format. Parenthetical notations in the report are misplaced, contain information errors or are absent. 	<ul style="list-style-type: none"> Little or no information is inserted in the report with proper introductions and explanations. <li style="text-align: center;">OR Information is absent. Little or no information supports the topic sentence of the paragraph or the thesis. <li style="text-align: center;">OR Support is unclear or missing.
Score				