Manufacturing Systems Research Project

Manufacturing, like any other system, consists of inputs, processes, outputs, and feedback. It is necessary for students to comprehend the fact that the all seven inputs (people, natural resources, capital, finance, knowledge, energy, and time) must be present for this system to function properly. This activity is designed for individual students to recognize this through survey format with a willing participant (manufacturing company). This activity will also provide necessary contact and coordination between the school and local industry.

Technological Literacy Standards and Benchmarks

1. **Students will develop an understanding of the designed world. (Standard 5)**
   a. **Analyze the principles, concepts and applications of manufacturing technologies as part of the designed world.**

2. **Students will develop an understanding of technology and society within the designed world. (Standard 2)**
   b. **Assess the role of society in the use and development of technology.**

Objectives

1. **Students will recognize the inputs necessary for a manufacturing system to function properly and demonstrate their knowledge through a final presentation.**

2. **Students will recognize the various manufacturing systems within the community and surrounding area.**

Teacher Preparation

Teacher must preview *Yahoo Local* and become familiar with the available tools, and narrow the search to identify the regional area necessary to fit the scope of the lesson.

The students should have prior knowledge of manufacturing systems, to include inputs (the previously mentioned seven), processes (transformation and management), output (product), and feedback (expected or unexpected outcome of product).

Content Outline

A. Manufacturing Systems

- **1. Inputs**
  - **a. People**
  - **b. Natural Resources**
  - **c. Capital**
    - **1. tools**
    - **2. machines**
  - **d. Finance**
    - **1. money**
  - **e. Knowledge**
    - **1. information**
  - **f. Energy**
  - **g. Time**
- **2. Processes**
- **3. Outputs**

Activities/ Case Studies

This activity takes approximately three to four days. The first and second days are spent introducing the project, becoming familiar with the search engine, and identifying the various manufacturing companies available. The third day is spent choosing companies, making the contacts, and preparing for the presentation. The fourth day is spent of the presentation. This may take longer depending on your class numbers. I don't have any time constraints with the presentations, as long as they include all necessary information.

Students will access the Yahoo Local search engine. When this site is accessed, they will then type each bold word for the italicized query (see below). The students will then get a list of manufacturing companies with addresses to choose from. There is also a map of the region searched in which you can zoom in and out to get a specific location. I also provide phone books to use as resources. The students then acquaint themselves with the scripted survey. Students need to choose three companies. Rank them in order of interest. Once the students have chosen three companies, I make a courtesy call to the business prior to the students calling. The students will then call their first choice. If the company declines to participate, they move on to other choices. After the students call the company, they will present results to class. This is where evaluation will occur.

This search can be modified depending on how large of a manufacturing community you want to focus on. I teach in a rural school with very little manufacturing. I broadened the scope of the search to compensate for this.

***Search for*: Manufacturing**
***Address*: Pembine, WI**
***Refine results*: show results within 25 miles**

***Content used to form survey questions were obtained from the textbook Manufacturing and Automation Technology by Thomas Wright**

Pembine High School

Manufacturing Systems Presentation

Name: _____ Teacher: Mr. Anderson

Date of Presentation: _____ Title of Work: _____

	Criteria				Points
	1	2	3	4	
Organization	Audience cannot understand presentation because there is no sequence of information.	Audience has difficulty following presentation because student jumps around.	Student presents information in logical sequence which audience can follow.	Student presents information in logical, interesting sequence which audience can follow.	____
Content Knowledge	Student does not have grasp of information; student cannot answer questions about subject.	Student is uncomfortable with information and is able to answer only rudimentary questions.	Student is at ease with content, but fails to elaborate.	Student demonstrates full knowledge (more than required)with explanations and elaboration.	____
Visuals	Student used no visuals.	Student occasional used visuals that rarely support text and presentation.	Visuals related to text and presentation.	Student used visuals to reinforce screen text and presentation.	____
Mechanics	Student's presentation had four or more spelling errors and/or grammatical errors.	Presentation had three misspellings and/or grammatical errors.	Presentation has no more than two misspellings and/or grammatical errors.	Presentation has no misspellings or grammatical errors.	____
Delivery	Student mumbles, incorrectly pronounces terms, and speaks too quietly for students in the back of class to hear.	Student incorrectly pronounces terms. Audience members have difficulty hearing presentation.	Student's voice is clear. Student pronounces most words correctly.	Student used a clear voice and correct, precise pronunciation of terms.	____
				Total---->	____

Teacher Comments:

Name_____

Manufacturing Research Project

Company Name: _____

Company Address: _____
_____
_____

Company Phone Number: (_____)_____

Good Morning, This is_____**, a student at Pembine High School. In one of my classes, we are learning about manufacturing systems and our local manufacturing industry. I am wondering if you or an individual from your company would please take a minute to answer a few brief questions.**

If no: Thank you for your time.
If yes: Begin questions.

Human Resources

1.) How many people does you company employ? _____

2.) What are some of the departments in your company?

_____
_____
_____
_____
_____
_____

Knowledge

3.) What skills or educational background do you require for employees?

_____
_____
_____
_____
_____
_____

4.) What are some of the job titles or job descriptions of some of your employees?

_____

_____

_____

_____

Materials

5.) Does your company use raw natural resources or refined/engineered materials? (Circle one)

Raw resources **Refined materials**

Capital

4.) What equipment is used in the manufacturing process?

_____

_____

_____

_____

Time

5.) How long does it take to produce the final product?

_____

_____

6.) How do you promote your product for sale? How long does this take to achieve this?

_____

_____

_____

Energy

What form of energy is used by your company?

Electrical **Thermal** **Chemical** **Mechanical** **Nuclear**

Outputs:

7.) What is the finished product?

_____

_____

8.) The manufacturing class at Pembine High School greatly appreciates your time.

Assessment

Project is assessed using a scoring rubric. This can be adapted to fit your needs. The students receive a copy of this with their survey.

Resources

Phone books
Computer with Internet
***Textbook*: Wright, T. Manufacturing and Automation Technology; 2004; Goodheart Wilcox; Tinley Park, IL;**

Academic Connections

Although I don't have standards linking this activity to other disciplines, I feel it would also be beneficial in the business/marketing, communications, English, Social Studies, and Science courses.

About the Author

I am a second year teacher in a rural school district in northeastern Wisconsin. Our manufacturing and industry is limited, but I feel it's imperative that I as well as the students have an understanding of what employment is available within the region as well as what products are made. I feel it's important to make the connection to industry so that my curriculum is as authentic as possible. If you have any questions about the lesson feel free to use the contact information below. Because I work with students of various abilities, I feel this activity could be beneficial at various levels or disciplines.

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