

Course: Polymer Science (11546PB-2015)
Grade level: 10-12
Sources: Mississippi Polymer Science Instructors

Advanced Polymer Manufacturing Process Manual Teacher Instructions

The PBA project is designed to be embedded into normal instruction, meaning that course instructors can guide students through the project during class time. All student products are due to the RCU by 5:00 PM on Friday, March 22, 2018. Instructions for submitting student products can be found in the PBA Manual (<http://rcu.msstate.edu/Assessment/Performance-Based-Assessment.aspx>).

Essential question: How are materials and processes integrated to produce quality manufactured products?

Overview:

The students will create a polymer process training manual for their chosen process and end product. See student materials for a list. When completed, the students should have a process manual to include: labeled illustrations of machinery used during the process, process flow diagrams with explanations, a depiction of the expected quality product, a troubleshooting guide to include the process and materials, safety concerns, and citations for any references and/or images used. The manual should address the essential question for the purpose of educating the audience.

Alignment:

- 21st Century Skills
 - CS1,2
 - CS 6
 - CS 8-13
 - CS 15
- College and Career Readiness Standards
 - W.11.2. Write informative/explanatory texts to examine and convey complex ideas, concepts, and information clearly and accurately through the effective selection, organization, and analysis of content.
- CTE Curriculum Unit
 - Unit 7

Time requirements:

2-4 weeks or as appropriate for each district's schedule

Materials and resources:

- Computers
- Internet
- Printer/scanner
- Word processing software such as Word, Publisher, Google Docs
- Examples of manuals, process flowcharts, and troubleshooting charts

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Advanced Polymer Manufacturing Process Manual Student Instructions

Essential question: How are materials and processes integrated to produce quality manufactured products?

Overview:

You are a (your choice) process engineer for Polymers, Inc.

- Blow molding (injection or extrusion)
- Blown film
- Calendering
- Thermoforming/vacuum-forming
- Rotational molding
- Injection molding
- Extrusion

Your role at the plant is to instruct and oversee technicians at the plant as they safely operate machinery in completing the (your choice) process. You need to train a new team of technicians on each step of the (your choice) process used in the plant including a description of the desired end product. You need to create a training manual to train your team on safely completing the process with plant machinery and troubleshooting common defects for the process. The manual should include labeled illustrations of machinery used during the process, process flow diagrams with explanations, a depiction of the expected quality product, and a troubleshooting guide to include the process and materials. The instructions should emphasize the safety concerns that should be at the forefront of each technician's mind as the process is completed. The manual should be ready for immediate delivery to your supervisor (teacher) and for later delivery to your team (classmates). The information will be graded using the rubric provided.

Keep in mind that you are developing a manual. Maintain notes and be sure to organize the information you gather along the way.

Part 1. Choose the process and end product

From the list above, choose a process and an end product commonly produced by that process.

Part 2. Collect data and research

Research what a quality training manual looks like. Research your chosen process, common defects and solutions/remedies, and describe an acceptable product.

Part 3. Develop a manual

Compile the information you have gathered in the previous steps into a coherent training manual, making sure to cite all sources as appropriate *including images*.

Part 4. Submit your work

Convert your document to a PDF to prepare it for upload. Name the PDF as your MSIS number, last name, and first name (ex. 000123456 Smith John).