

## CLASSIC CENTER CTL PRESENTATION OVERVIEW OF OUR CTL CASE-STUDY PROJECT

During Fall Semester, 2000, we developed an interdisciplinary CTL case-study project to enhance our students' understanding about workplace knowledge, skills, and dispositions that are important and necessary to develop and implement in authentic learning situations. Approximately forty-five students enrolled in four elementary and middle school education courses (ELAN 5200, EDMS 5020, EDMS 5030 and EMAT 5310) participated in this study. The foundation for this project was a field experience where students toured a local business, Oliver Rubber Company, which produces re-treaded tires.

Implementation of this study occurred in several phases: (1) introduction of project to students; (2) organization of a site visit to Oliver Rubber Company; (3) students write-up of site visit; (4) faculty collaboration of students' papers to understand what students learned and on reviewing papers as data sources for scholarly writing. Below we present initial perceptions of what students learned from participating in this Oliver Rubber Company Tour.

Oliver Rubber Company (ORC) is the worldwide leader in retreading - including the controlled manufacturing of tread rubber and retreading equipment. ORC provides a wide variety of precure and mold cure tread rubber to meet the needs of both retreaders and commercial end users. Oliver Rubber Company turns raw and synthetic rubber into rolls of rubber used for treading truck tires and for creating the backing for carpets. ORC's Athens's plant is approximately 120,000 square feet located on 35 acres of land 65 miles due east of Atlanta. ORC employs 27 salaried and 159 wage employees. The average wage of the employees is \$11.00 per hour. ORC has a turnover rate of employees substantially less than the national average.

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### **MATHEMATICS EDUCATION SKILLS OBSERVED AT OLIVER RUBBER COMPANY**

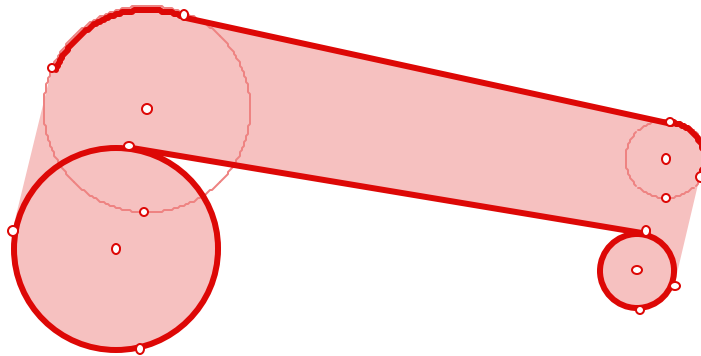
- Calculate Weights
- Read and Interpret Graphs And Charts
- Convert Fractions to Decimals
- Possess Knowledge of Metric Conversions

#### Mathematics Education: Emphasis on Problem Posing

- Preservice teachers posed problems related to the workplace
- Sketched the solution of problem
- Reflected on the problem and it's solution
- Posed related problems
- Proposed teaching strategies

### Example of Preservice Teacher's Work

Mathematics Problem: Oliver Rubber Company manufactures threads for tires. Conveyer belts are extensively used to move products from one process area to the other. The conveyer belt shown below runs over two cylinders with radii  $a$  and  $b$ . Draw the cross section (side view) of the conveyer belt. If the larger cylinder spins at a rate of 10 revolutions per second, what is the rate of revolution of the smaller cylinder? If an object is placed on the conveyer belt, how fast will it be moving?

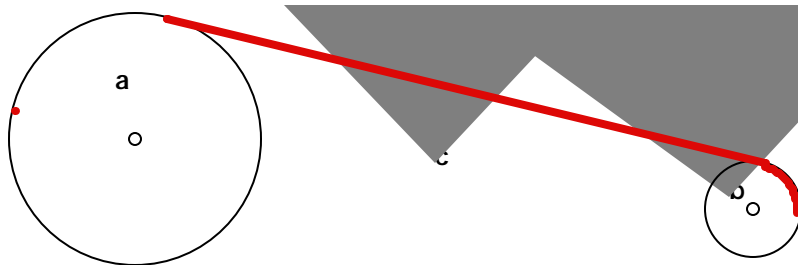


Student's partial solution:

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The cross section of a cylinder from the side is a circle. The belt will be a line from the side.

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Students reflected on the problem and its solution. How reasonable was the problem? How did they check the solution? Did the problem and its solution connect the workplace with mathematics?

Students posed related problem:

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A car is fitted at the factory with 13-inch tires (radius of tire is 13 in). How will the speedometer readings of the car change if the tires are replaced with 14-inch tires?

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Students discussed the implications for teaching middle school mathematics and other ways mathematics was used at ORC: calculating weights, reading and interpreting graphs, converting fractions to decimals, and using the metric system.

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## LITERACY SKILLS OBSERVED AT OLIVER RUBBER COMPANY

- Basic Writing Skills to Log Information
- Read Charts and Graphs
- Read Warning Signs
- Read and Follow Directions

“Employees must also have basic literacy skills in order to fill out and read charts, read graphs and thermometers, calculate weights, and read warning signs. Without these basic literacy skills, someone could not only mess up the rubber production by completing a chart incorrectly, but they could seriously injure themselves or someone else if they could not read and understand the warning signs. It is extremely important for all employees to know and understand that their actions not only has an impact upon themselves, but also impacts the company and other employees.”

Middle School Preservice teachers in 2<sup>nd</sup> year of program

“Language education such as reading is extremely important. Employees need to be able to read different memos and signs throughout the plant. Employees also need good communication skills in order to produce a good product. One of the managers told me that it is extremely important that the employees show up on time. Each job depends on another person’s job within the plant. Therefore, if the communication lines breakdown, either verbal or written, then the product is compromised.”

Middle School Preservice teachers in 2<sup>nd</sup> year of program

“In the content area of language arts, it is so obvious that each person needs to know how to read. In the company [Oliver Rubber], there are many work manuals to be read and comprehended. There are also many warning and hazard signs that have to be read; in this company it could be detrimental to one’s life to not be able to read.”

Middle School Preservice teachers in 2<sup>nd</sup> year of program

## Skills Observed at Oliver Rubber Company that Integrates Middle School Concepts and Skills in Language Arts and Mathematics

- Collaboration
- Multicultural Issues
- Gender Issues
- Power Issues

*...The ethnic makeup was fairly mixed between Caucasian and African American workers. It was probably sixty to seventy percent African American factory workers and thirty to forty percent Caucasian. There was definitely a strong gender difference with this company being dominated by males. Though there were two to three female*

*secretaries.... We were told that there were five females who had been hired to work the late shift... Questions that were raised as a result of this tour that affect the way I see education...Why was their only one African American supervisor on our tour in a place where the majority of workers appear to be African Americans? Why were all the people working in research and development older Caucasian men? What does this imply about the company? What does this say to our students? What does this mean to us (as teachers)? Why is this important?...*

*Middle School Preservice teachers in 1st year of program*

*...It is my opinion that the educational system we have today trains children for jobs at places like Oliver Rubber Company...the tools they receive from most middle school classrooms teach them to use a tape measure...whereas those students who excel in academics are the ones who run Oliver Rubber Company, and the others are the ones who are run by Oliver Rubber Company...I certainly think that there are things missing from the public school curriculum that would allow students to run Oliver Rubber Company...*

*Middle School Preservice teachers in 1st year of program*

*... Working together at Oliver Rubber Company is as important as getting your own job done...I think the whole team concept was important, but the whole aspect of the workers being their own link in the chain was also emphasized. The entire plant worked together to form systems and eventually a finished product for the plant, but individual strengths added to the strengths of the group...*

*Middle School Preservice teachers in 1st year of program*