

Woodwork to Enhance Boys' Understanding of Mathematical Principles

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The Research Question

How does woodwork enhance understanding of the mathematics curriculum in grade 10/11 boys?



The Research Action

Through differentiated projects students were encouraged to explore and understand the mathematical principles involved in woodwork. Students were expected to describe, examine, and articulate their learning.



Analysis

Journals were the most effective way to analyse student learning. Using an Applied Learning Model proposed by Clayton and Ash (2009), students described, examined, and articulated learning. Observations were also valuable. Themes were coded.

Students described the math involved

putting in shelf using dado joint. shelf 24" and dado will be 0.5 the distance of width of end $7/8" / 2 = 7/16$ Shelf should be $24 \frac{7}{16}"$

Students examined their understanding in relationship to prescribed learning outcomes and goals

For the ramp to not be too steep I needed to start with the angle and then determine the length

I calculated the volume to be 12 bf and if walnut is \$5/bf then the cost of my project is \$60

Students attempted to and succeeded in articulating their learning

you can use max/min problems to maximize area and minimize wood in garden beds but you have to still be able to reach everything



Key Findings & Discussion

From analysis, themes present included:

- engaging and persevering in problem solving
- communicating and reasoning mathematically
- making connections between mathematics and its application



Conclusions

- through differentiated projects students are able to gain a stronger understanding of mathematical principles and make connections between mathematics and its applications
- woodwork and design programs (i.e SketchUp) can be incorporated into mathematics classes or the mathematics can be emphasized in woodwork classes
- as the learning was applied, reflection/journaling was a key component of the learning process for students and a valuable way to assess student learning

