Engineering Goes to Parkwood-Upjohn Elementary School

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Overview

• Big Picture
• Project Goal
• Project Implementation
• Preliminary Evaluation
• Conclusion
Big Picture

NSF Bridges for Engineering Education: ENGR 101 for Engineering & Education Students

Enhance K-16 STEM Teaching & Learning

NSF Design Center:
1) Build Instructional Manipulatives
2) Support WMU Student Volunteers to Implement After-School STEM Activities

Engineering Goes to School:
Deliver In-Service Professional Development
Project Goal

Provide In-Service Professional Development

• Uses examples of engineering to teach mathematics and science

• Is useful to teachers

• Ties to professional development plan

• Is convenient to teachers
Project Implementation

• Orientation – Survey 4th-6th Teachers to Identify Needs in Content Enhancement in Math and Science

• Discussion with School Principal regarding In-Service Professional Development Days

• Four Topics for Content Enhancement
  - How Tall Is It? – Implemented Sept. 24
  - Electrical Energy – To be implemented Nov. 19
Project Implementation

“How Tall Is It?”

• Use triangulation to determine height of various objects at Parkwood-Upjohn Elementary School
Project Implementation

“How Tall Is It?”

• Build sighting tube

• Measure and calculate: \( H = h + d(\tan \phi) = h + d(\text{slope}) \)
Preliminary Evaluation

Project Evaluation Form

Part I: General Information

• Number of teachers at grades 4-6 participating in Session I: __________
• Number of contact hours with teachers in Session I: __________
• Integrated science/mathematics curriculum materials created as a result of the grant for Session I: __________

Part II: Teacher Self Evaluation *(to be completed and returned at Session 2)*

• While teaching the activity, “How Tall Is It?”, what went well? Why?
• What would you do differently next time you teach this activity? Why?
Preliminary Evaluation

Results from “How Tall Is It?”- September 24, 2003

Part I:

• Number of teachers at grades 4-6 participating in Session I: 9

• Number of contact hours with teachers in Session I: 1.5

Teacher Comments Immediately Following the Session:

- “Kids would love doing this.”
- “Students will have to think about order of operations.”
- “Students will use measuring.”
- “They will be using tools (e.g., protractor).”
- “Students will be applying the math and that’s fun.”
- “Be sure to use protractors when students draw pictures so the angles are to scale.”
- “Building the measuring tool with the tube will be a positive learning experience for the students.”
Conclusion

• Research the Dynamics of In-Service in One School Building (Parkwood-Upjohn Elementary School) to Identify Best Practices for System-wide Implementation

• Preliminary Evaluation Results Indicate Teachers Find “Hall Tall Is It?” Useful

• Continue implementation of
  “Electrical Energy” – Nov. 19
  “How Far Away Is Mars” – Spring 2004
  “How Small Is It?” – Spring 2004
Acknowledgement

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Questions & Comments