An Overview of RJLee Education

Assisting the educational community in the integration of analytical instrumentation in science curricula

October 23, 2008

RJLG

RJLeeEducation

RJ Lee*Group*, Inc.

Scientists, Engineers and Technicians

- Use analytical tools to solve problems
- Specialize in the development of analytical methods, software and instrumentation
- Education outreach programs

RJ Lee*Education*

Education Outreach Goals

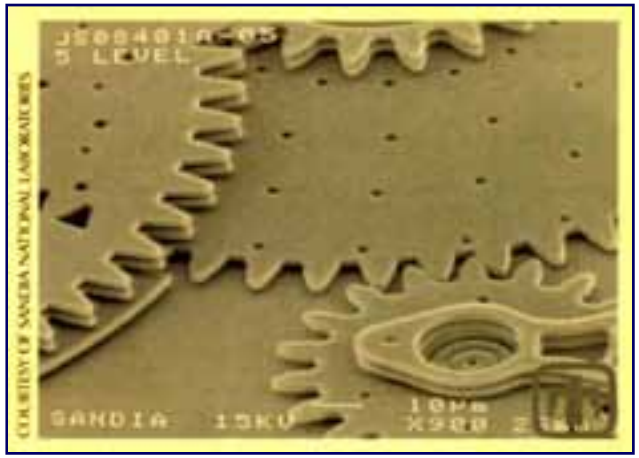
- Provide access to "high-tech" analytical instrumentation
- Motivate students in science/technology education
- Develop technology, tools and products to support the educational community

WGSD-RJ Lee Group Education Partnership

- Objectives…
  - Motivate students in science/technology education
  - Enrich the educational experience
  - Provide assistance to rural community
  - Help improve image of the community for future business growth

WGSD-RJ Lee Group Education Partnership

- Focus on microscopy
  - Ideal tool for hands-on measurements and observations
  - Promotes visual/critical thinking
  - Inquiry driven
  - We see the need
    - workforce development



Microscopy Lab at the West Greene Middle-High School

Appalachian Regional Commission

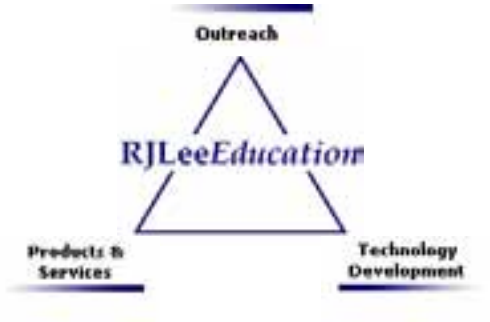
- ARC provided funding to support the project
  - Encourage an after school student program
  - Best Practice: Use of Technology in Education

Pennsylvania Junior Academy of Science (PJAS) Awards

Microscope Simulators

- All teachers/students can have "access" to an optical microscope or SEM
- Cost effective
- Students can perform laboratory experiments at home
- Can be integrated with current science curricula

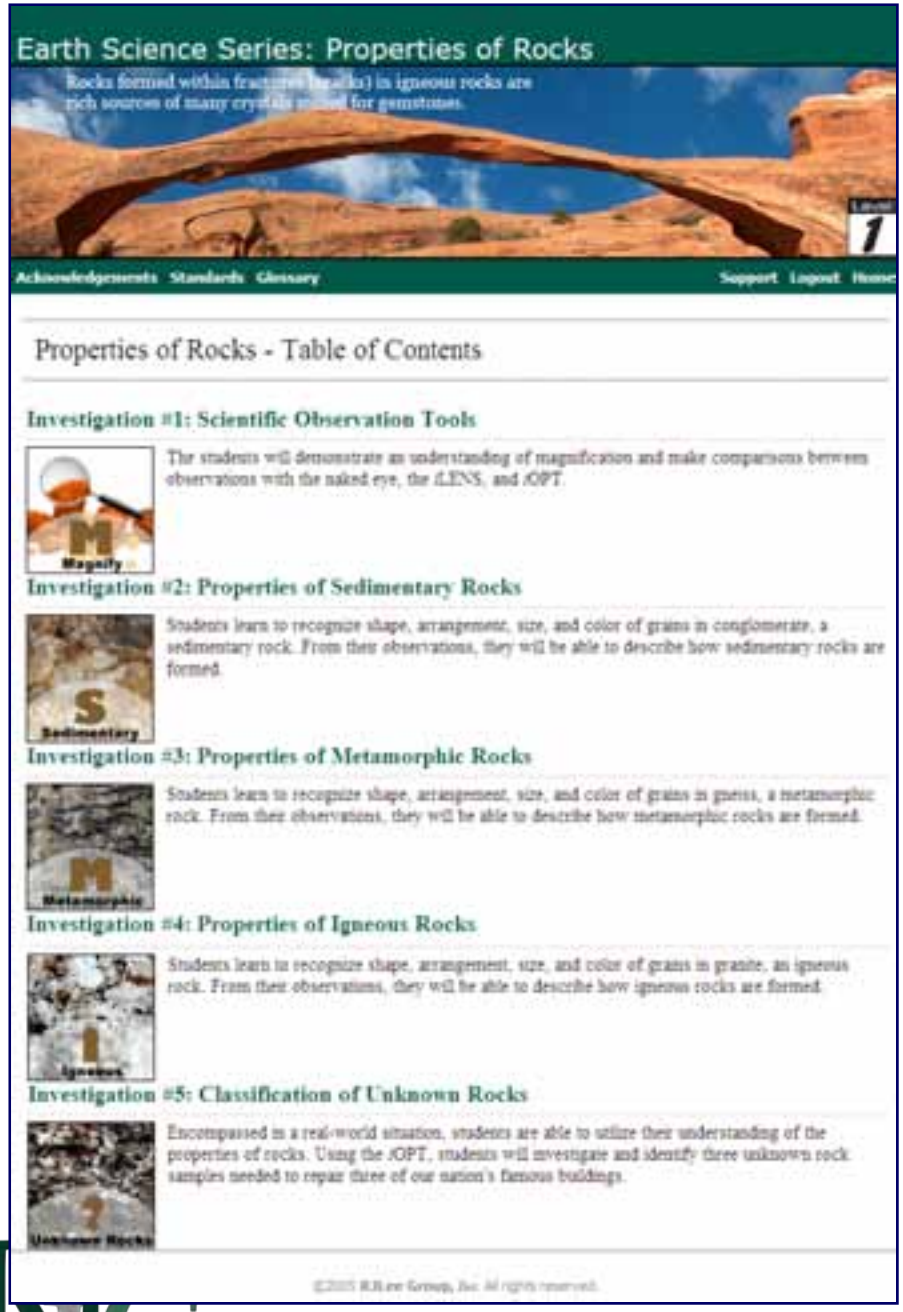
NSF SBIR Grant



- Development of a Scanning Electron Microscope Simulator for Use in Education

"Education Magnified 100,000x"

Properties of Rocks


Earth Science Series: Properties of Rocks
Rocks formed within fractures (cracks) in igneous rocks are rich sources of many crystals mined for gemstones.
Level 1
Acknowledgements Standards Glossary
Support Logout Home
Properties of Rocks - Table of Contents
Investigation #1: Scientific Observation Tools
The students will demonstrate an understanding of magnification and make comparisons between observations with the naked eye, the /LENS, and /OPT.
Magnify
Investigation #2: Properties of Sedimentary Rocks
Students learn to recognize shape, arrangement, size, and color of grains in conglomerate, a sedimentary rock. From their observations, they will be able to describe how sedimentary rocks are formed.
Sedimentary
Investigation #3: Properties of Metamorphic Rocks
Students learn to recognize shape, arrangement, size, and color of grains in gneiss, a metamorphic rock. From their observations, they will be able to describe how metamorphic rocks are formed.
Metamorphic
Investigation #4: Properties of Igneous Rocks
Students learn to recognize shape, arrangement, size, and color of grains in granite, an igneous rock. From their observations, they will be able to describe how igneous rocks are formed.
Igneous
Investigation #5: Classification of Unknown Rocks
Encompassed in a real-world situation, students are able to utilize their understanding of the properties of rocks. Using the /OPT, students will investigate and identify three unknown rock samples needed to repair three of our nation's famous buildings.
Unknown Rocks


Module: Rock Identification and the Rock Cycle (3rd Grade)
Table of Contents Sign-Out
Resources
Glossary
Suggested Links
Materials
Specimen Numbering
Tools
Investigation 1: Scientific Tools - Magnification
Student Background
Objectives
Teacher Background
Units of Measure
Procedure
Student Exploration Activity
Reflection
Done

Successes in the Classroom

- Student interest
  - interests in using a scientific tool
  - feel like real scientists
  - students can visit the Web-site at home

Forensics Initiative

Waynesburg College & RJ Lee Group

- Advanced forensics laboratory program
  - Enhance forensics curriculum
  - Provide real-world experiences
  - Commercial business component
- Equipment resources-analytical instrumentation
  - Center for Research and Economic Development
  - Financial assistance from DCED
- Scientific expertise
  - Strong business experience in forensic analysis
  - Resource curriculum and learning experiences

Waynesburg University/RJ Lee Group Forensics Initiative

- RJLG Role
  - Manage forensics lab and maintain instrumentation
  - Assist in the training of students; and development/implementation of forensics curricula
  - Use instrumentation for commercial purposes to promote economic development in the area

RJLG Wins!

- Meets RJLG's vision in education
- Creates potential for expansion of RJLG's forensics business
- Partnership will promote future commercial service and product opportunities

Waynesburg College Wins!

- Participation in actual research being used in the field of forensics
- Internships
- Future quality employment within the region for graduates
- Maintain curriculum based upon the most recent advances in the field

Microscopy Workshop

A Hands-On Introduction to
Forensics Science

Waynesburg University
RJ Lee Group, Inc.
Appalachian Regional Commission

March 8-9, 2007

Dave Exline (RJLG) provides overview on the use of analytical instrumentation in forensics investigations

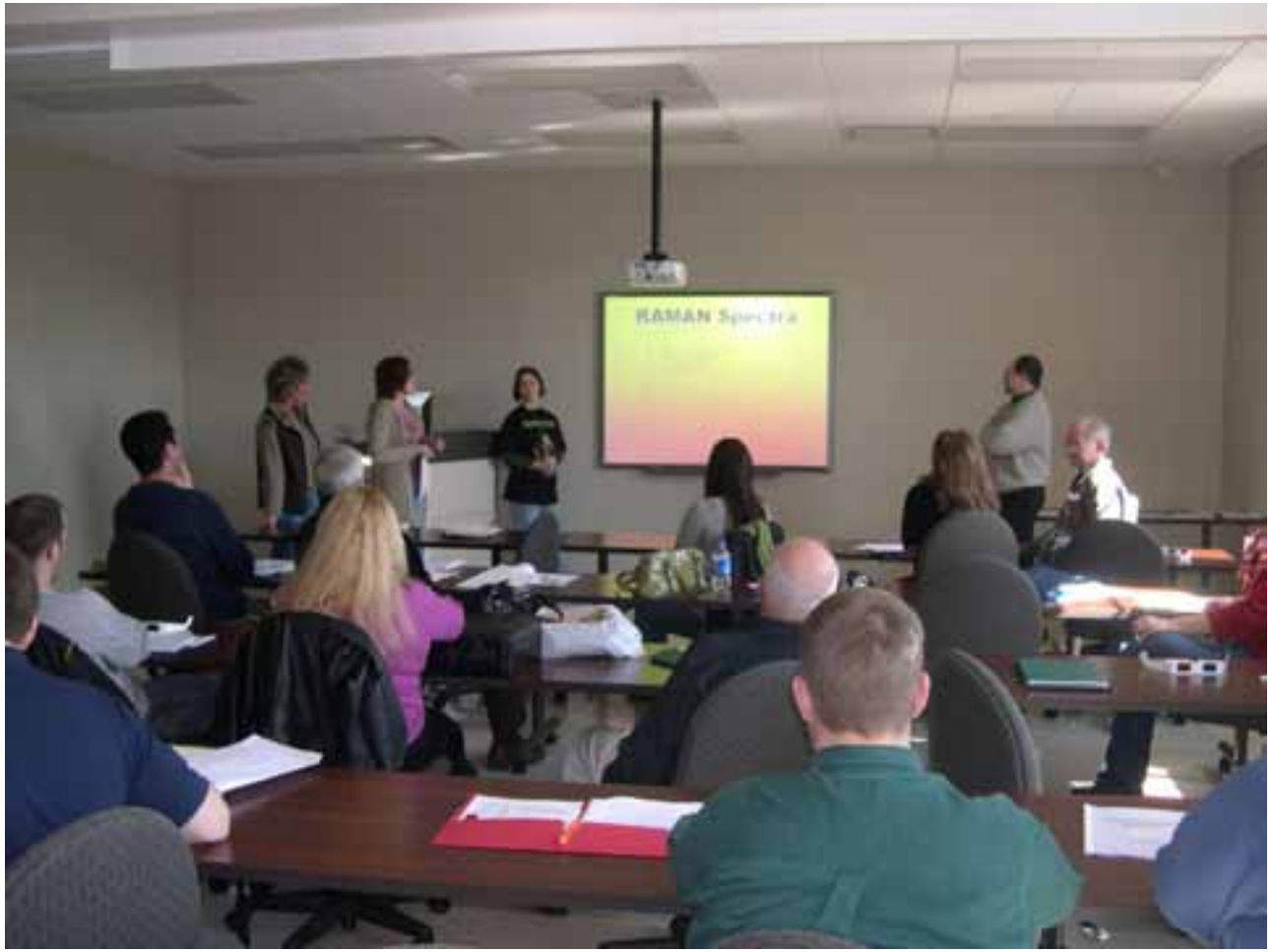
Teachers being given instruction on the Scanning Electron Microscope by Brad Henderson (RJLG)

Teachers being given instruction on the Microspectrometer by Ryan Bittner (RJLG)

Teachers analyzing samples on the Microspectrometer

Teachers being given instruction on the Optical Microscopes by Allison Murtha (RJLG)

Teachers being given instruction on the RJLG SEM simulator on NSF website by Frank Pazzynski (Waynesburg College)



Teachers presenting their results of analysis of unknowns

- Waynesburg University
- C.S.I. Camp Manual

- July 27-31, 2008

Waynesburg University CSI Camp

- 44 campers from around the world
- 15 Waynesburg students as "camp counselors"
- 2 RJ Lee Group employees as directors
- 1 Waynesburg employee as advisor
- Several students who attended the camp are now students at Waynesburg.
- Community involvement & interaction
- Forensic experts including several RJ Lee Group employees.

Waynesburg University CSI Camp Fingerprinting

- Fingerprinting Lab conducted by Sara Rafferty of RJ Lee Group.
- Students learned about collecting, processing, and analyzing latent fingerprints.
- They also learned about the history of latent prints and tried their hand at comparisons.
- Students received hands-on training in all aspects.

Waynesburg University CSI Camp Fingerprinting

Waynesburg University CSI Camp Burial Excavation – Deer Carcass

- Students learned how to quadrant off a burial site.
- They uncovered the burial remains of deer carcasses at several stages of decay and were able to compare them.

Waynesburg University CSI Camp
Burial Excavation – Deer Carcass

Waynesburg University CSI Camp
Surveillance, Search & Seizure

- Students learned the techniques for following a suspect and actually conducted a mock surveillance set in downtown Waynesburg. The students followed the suspect all the way up to the time of arrest.
- Students also conducted a mock search & seizure of the crime scene houses on the campus. They learned the necessity and implications of executing a search warrant as well as the methods for properly searching a house when suspects are present.

Waynesburg University CSI Camp
Downtown Surveillance & Apprehension

Waynesburg University CSI Camp Canine Unit

- Students were treated to a presentation by the Canine Unit from the Cumberland Township Police Department.
- Several other federal, state, and county groups gave presentations during the camp including the ATF, Westmoreland County DA's Office, PA State Police, and the Innocence Project.

Waynesburg University CSI Camp Canine Unit

Waynesburg University CSI Camp
Hit-and-Run & Trace Evidence

- Demonstration and presentation conducted by Mr. David Exline of RJ Lee Group.
- Students learned the methods and techniques for collecting evidence from several types of crime scenes including a hit-and-run and burglary.

Waynesburg University CSI Camp
Mock Hit-and-Run

Waynesburg University CSI Camp
Our Campers