

## REGISTRATION / INFORMATION

Register me for the following courses/workshops:

*\* Note that some classes are held on the same date - please register for only one class per date.*

- |  |   |
|--|---|
| <input type="checkbox"/> Science and Art<br>June 23 - 25       | <input type="checkbox"/> Light and Energy<br>June 30 - July 2 |
| <input type="checkbox"/> Organisms<br>June 23 - 25             | <input type="checkbox"/> Measurement<br>June 30 - July 2      |
| <input type="checkbox"/> Force, Motion, Energy<br>June 26 - 28 | <input type="checkbox"/> Inquiry Methods<br>August 8 - 9      |
| <input type="checkbox"/> Water<br>June 26 - 28                 | <input type="checkbox"/> Simple Machines<br>August 23         |

Name: \_\_\_\_\_

School: \_\_\_\_\_

Grade(s) you are teaching in 08-09: \_\_\_\_\_

- |   |  |
|---|--|
| <input type="checkbox"/> I teach all subjects             | <input type="checkbox"/> I specialize in teaching math |
| <input type="checkbox"/> I specialize in teaching science |  |

School Address: \_\_\_\_\_

\_\_\_\_\_

School Phone: \_\_\_\_\_

Home Address: \_\_\_\_\_

\_\_\_\_\_

Home Phone: \_\_\_\_\_

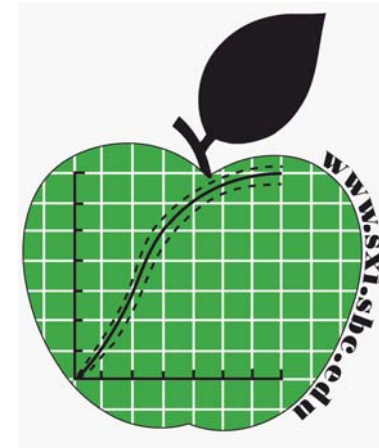
E-mail: \_\_\_\_\_

Do you check your e-mail daily, weekly, or rarely? (Circle one)

The program will be filled on a first come, first served basis, with the approval of the teacher's school administration. Applications will be accepted from teachers currently serving Central Virginia public school divisions and private schools. Enrollments are limited.

Questions about the program may be addressed to:

Jill Granger, Project Director at 434-381-6166, granger@sbc.edu; Hank Yochum, Co-Project Director at 434 381-6357, hychum@sbc.edu; Arlene Vinion-Dubiel, Instructional Support Specialist at 434 381-6118, dubiel@sbc.edu; or Pam Simpson, Project Assistant at 434 381-6443, psimpson@sbc.edu.



## INQUIRY APPROACHES TO MATH AND SCIENCE

A PROFESSIONAL DEVELOPMENT PROGRAM FOR  
CENTRAL VIRGINIA TEACHERS OF GRADES 3-8

SWEET BRIAR COLLEGE

SUMMER 2008

[WWW.SXI.SBC.EDU](http://WWW.SXI.SBC.EDU)

SPONSORED BY THE STATE COUNCIL OF HIGHER EDUCATION FOR  
VIRGINIA (SCHEV) THROUGH THE FEDERAL NO CHILD LEFT BEHIND,  
TITLE IIA, IMPROVING TEACHER QUALITY INITIATIVE



## **GRADES 3-8 TEACHER DEVELOPMENT SUMMER PROGRAM**

Our teacher education projects focus on teaching by inquiry, which means teaching the principles of science through the process of discovery. We develop activities and materials that are suitable for adult education, can serve as resource material for classrooms, and model the inquiry approach. Our aim is to move away from an instructor-centered classroom and provide the students (in this case, *teachers*) with opportunities to construct new knowledge.

### **SCIENCE AND MATH COURSES JUNE 23 – JULY 2**

Teacher-participants in these one-credit, three-day summer courses will engage in in-depth exploration of scientific concepts, linked to a broad range of SOLs in grades 3-8. They will conduct experiments and interpret and present the data they collect, gaining a deeper understanding of science and math while learning activities that they can transfer directly to their classrooms. Participants will be expected to complete online pre- and post-tests and nightly homework assignments. Class will run from 9:00 am to 4:00 pm each day for three days, with a one-hour break each day for lunch.

### **INQUIRY METHODS IN MATH AND SCIENCE AUGUST 8 - 9**

Participants in this two-day workshop will work on understanding an inquiry-based approach to teaching math and science. Participants will initially be enrolled in a year long, three-credit graduate level course in Education, EDUC 656, "Inquiry Methods in Math and Science," which continues through Spring 2009 (syllabus online at [www.sxi.sbc.edu](http://www.sxi.sbc.edu)).

### **ACADEMIC YEAR PROGRAM SATURDAY WORKSHOP, AUGUST 23**

Our first academic year Saturday workshop is scheduled for August 23! This workshop will be five instructional hours. Participants will conduct experiments with simple machines linked to math and science SOLs in grades 3-8 and interpret and present the data they collect. Class will run from 9:00am to 3:00pm, with a one-hour break for lunch.

### **WHAT'S PROVIDED**

Participants will earn graduate credit or continuing education hours that may be used toward recertification. All necessary supplies and materials for the program will be provided. Lunch will be provided at the College for workshop attendees. **There is no cost to Virginia certified 3-8 grade teachers to attend; plus, there is a \$60 / day stipend.** All is paid for by the "Inquiry Approaches to Math and Science" grant.

### **CONTINUING SUPPORT**

Arlene Vinion-Dubiel, the Instructional Support Specialist (ISS), provides continuing support to participating teachers throughout the school year. She helps plan activities, answers conceptual and practical questions, provides equipment and training in its use, and works alongside teachers in the classroom. Help is only a phone call away!

#### **Mail the completed registration form to:**

Pam Simpson, SCHEV-NCLB Project Assistant  
206 Guion Science Center, Sweet Briar College  
Sweet Briar, VA 24595

**OR**

#### **Email your registration information to:**

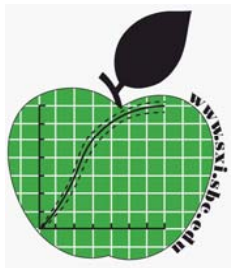
Pam Simpson  
[psimpson@sbcc.edu](mailto:psimpson@sbcc.edu)  
Put "SCHEV REGISTRATION" in the subject line

Please note:

**E-mail registrations must be complete!**

QUESTIONS?

**WWW.SXI.SBC.EDU**

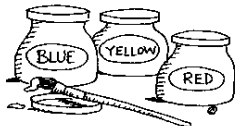


## ART AND SCIENCE

1-credit course  
CHEM 500-level  
“Chemistry by Inquiry: Art and Science”

**Instructors:** Ruth Beeston and Jill Granger

**When?** Monday, June 23 – Wednesday, June 25  
Class will run from 9:00 am – 4:00 pm each day for three days, with a one-hour break each day for lunch.



### *What does the course involve?*

Learn to teach science through art! We will investigate topics in physics and chemistry as applied to visual art, including light and color, solutions/solubility, and the chemistry of pigments, paints, dyes, and inks.



Hands-on activities include making and using a shoebox spectroscope, synthesizing a pigment, mixing paint, painting a fresco and a "cave painting", and using chemical tests to separate and identify substances. Case studies will illustrate how chemistry can help solve mysteries in art.

### *What SOLs apply?*

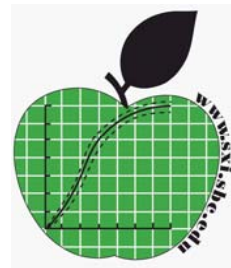
SOL Science: 3.1, 3.3, 4.1, 4.4, 5.1, 5.4, 6.1, 6.4, PS.1, PS.2, PS.9,  
SOL Visual Art: 3.4, 3.12, 4.3, 4.4, 4.11, 5.2, 5.7, 5.16, 5.17, 5.19, 6.1, 6.11,  
7.1, 7.15

### *Who is eligible?*

All Central Virginia grade 3-8 teachers are eligible. Enrollment is limited to 16. *Priority will be given to two-person teams that include an art teacher and a science teacher from the same school.*

### *What do participants get?*

- 1 Graduate Credit in CHEMISTRY, free!
- A \$180 stipend for completion of the three-day course.
- Materials and supplies for hands-on science in the classroom; teachers may also request advice and in-class assistance from the Instructional Support Specialist in implementing inquiry-based instruction in the classroom.
- Free lunch each day in the Sweet Briar College cafeteria.

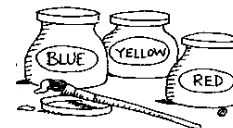


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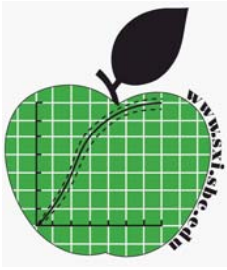
SOL Science: 3.1, 3.3, 4.1, 4.4, 5.1, 5.4, 6.1, 6.4, PS.1, PS.2, PS.9,  
SOL Visual Art: 3.4, 3.12, 4.3, 4.4, 4.11, 5.2, 5.7, 5.16, 5.17, 5.19, 6.1, 6.11,  
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- Free lunch each day in the Sweet Briar College cafeteria.



**ORGANISMS**  
**1-credit course**  
**BIO 500-level**  
**“Science by Inquiry: Organisms”**

**Instructors:** Robin Davies, Donna McLaughlin, and John Morrissey

**When?** Monday, June 23 – Wednesday, June 25  
 Class will run from 9:00 am – 4:00 pm each day for three days, with a one-hour break each day for lunch.

**What does the course involve?**

There are billions of organisms on our planet Earth, all interacting with and affecting one another and their environment. We will explore the topic of organisms using hands-on and inquiry-based activities on classification, behavioral and physical adaptations, and food webs. We will explore both the impacts of organisms on their environment and how organisms adapt to their surroundings. Functions of the human body and population dynamics will also be discussed.



**What SOLs apply?**

SOL Science: 3.1, 3.4, 3.5, 4.1, 4.5, 5.1, 5.5, LS.1, LS.5, LS.8, LS.9, LS.10

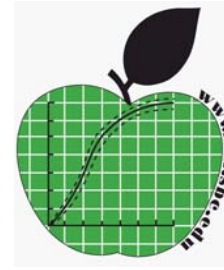
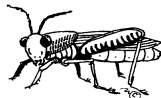


**Who is eligible?**

All Central Virginia grade 3-8 teachers are eligible. Enrollment is limited to 16.

**What do participants get?**

- 1 Graduate Credit in BIOLOGY, free!
- A \$180 stipend for completion of the three-day course.
- Materials and supplies for hands-on science in the classroom; teachers may also request advice and in-class assistance from the Instructional Support Specialist in implementing inquiry-based instruction in the classroom.
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**What SOLs apply?**

SOL Science: 3.1, 3.4, 3.5, 4.1, 4.5, 5.1, 5.5, LS.1, LS.5, LS.8, LS.9, LS.10

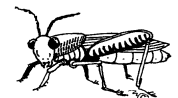


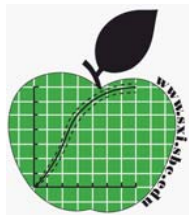
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**FORCE, MOTION, ENERGY**  
**1-credit course**  
**PHYS 500-level**  
**“Physical Science by Inquiry:**  
**Using Math to Explore Force, Motion, and Energy”**

**Instructors:** Hank Yochum and Marcia Yochum

**When?** Thursday, June 26 – Saturday, June 28  
Class will run from 9:00 am – 4:00 pm each day for three days, with a one-hour break each day for lunch.

**What does the course involve?**

By doing a variety of hands-on experiments with a small single-person hovercraft, hot wheels cars and tracks, and remote control cars (all available for teachers to borrow during the academic year) teachers will investigate topics in force, motion, and energy. Participants will gain an increased understanding of the concepts of position, speed, acceleration, force, kinetic energy, potential energy and friction. Emphasis will be placed on the mathematical skills necessary for data analysis and the applications of these skills to scientific investigations.



**What SOLs apply?**

SOL Science: 4.1, 4.2, 6.1, 6.2, PS.1, PS.6, PS.10  
SOL Math: 3.21, 3.22, 4.20, 5.18

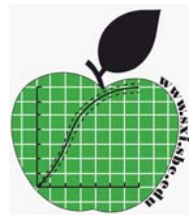
**Who is eligible?**

All Central Virginia grade 3-8 teachers are eligible.  
Enrollment is limited to 16.



**What do participants get?**

- 1 Graduate Credit in PHYSICS, free!
- A \$180 stipend for completion of the three-day course.
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**What SOLs apply?**

SOL Science: 4.1, 4.2, 6.1, 6.2, PS.1, PS.6, PS.10  
SOL Math: 3.21, 3.22, 4.20, 5.18

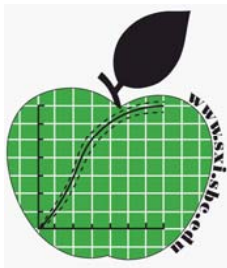
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- Free lunch each day in the Sweet Briar College cafeteria.



**WATER**  
**1-credit course**  
**CHEM 500-level**  
**“Science by Inquiry: Water”**

**Instructors:** Robin Davies, Rob Granger, and Abraham Yousef

**When?** Thursday, June 26 – Saturday, June 28

Class will run from 9:00 am – 4:00 pm each day for three days, with a one-hour break each day for lunch.

**What does the course involve?**

The science of water soaks through the grade 3-8 curriculum in many and surprising ways. This course will take a close look at our most valuable natural resource and what makes the little H<sub>2</sub>O molecule so special.



Hands-on and inquiry based activities will be used to explore the properties of water and its role in living systems. Methods of water analysis will be practiced as applicable for real-world investigations that can be accomplished in the classroom using a simple hand-held device to collect data. Connections to math will be made as the data is analyzed to answer student questions.

**What SOLs apply?**

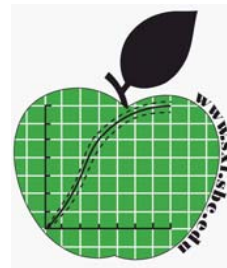
SOL Science: 3.1, 3.9, 6.1, 6.5, 6.7, 6.9, LS.1, LS.4, LS.7, PS.1, PS.2

**Who is eligible?**

All Central Virginia grade 3-8 teachers are eligible. Enrollment is limited to 16.

**What do participants get?**

- 1 Graduate Credit in CHEMISTRY, free!
- A \$180 stipend for completion of the three-day course.
- Materials and supplies for hands-on science in the classroom; teachers may also request advice and in-class assistance from the Instructional Support Specialist in implementing inquiry-based instruction in the classroom.
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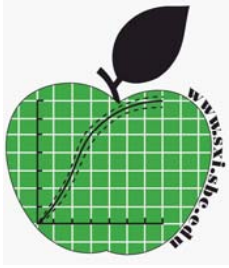
SOL Science: 3.1, 3.9, 6.1, 6.5, 6.7, 6.9, LS.1, LS.4, LS.7, PS.1, PS.2

**Who is eligible?**

All Central Virginia grade 3-8 teachers are eligible. Enrollment is limited to 16.

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## LIGHT AND ENERGY

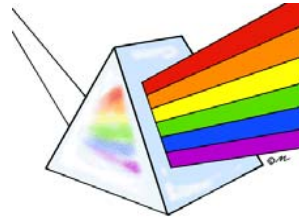
1-credit course  
PHYS 500-level  
“Physical Science by Inquiry:  
Light and Energy”

**Instructors:** Hank Yochum and Jill Granger

**When?** Monday, June 30 – Wednesday, July 2  
Class will run from 9:00 am – 4:00 pm each day for three days, with a one-hour break each day for lunch.

### *What does the course involve?*

This course will approach the fundamentals of light and energy through class discussions and hands-on investigations appropriate for the middle grades. Topics will include the electromagnetic spectrum, behavior of light (basic optics), origins of color, and interactions of light and matter. Teachers will learn to use simple equipment, including the spectrophotometer, that will be available for classroom use during the academic year.



### *What SOLs apply?*

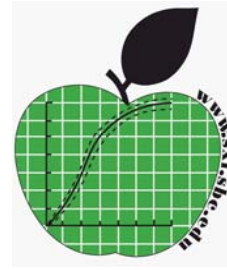
SOL Science: 5.1, 5.3, 6.1, 6.2, LS.1, LS.4, LS.6, PS.1, PS.2, PS.5, PS.6, PS.9

### *Who is eligible?*

All Central Virginia grade 3-8 teachers are eligible. Enrollment is limited to 16.  
*This course is open to grade 5-8 teachers only.*

### *What do participants get?*

- 1 Graduate Credit in PHYSICS, free!
- A \$180 stipend for completion of the three-day course.
- Materials and supplies for hands-on science in the classroom; teachers may also request advice and in-class assistance from the Instructional Support Specialist in implementing inquiry-based instruction in the classroom.
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## LIGHT AND ENERGY

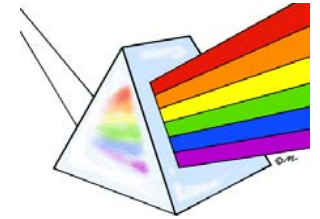
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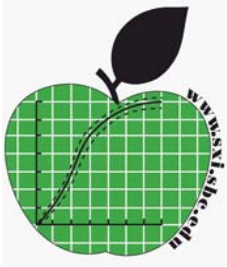
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- Free lunch each day in the Sweet Briar College cafeteria.



**MEASUREMENT**  
**1-credit course**  
**MATH 500-level**  
**“Math by Inquiry: Measurement”**

**Instructors:** Beth Williams and Gigi Sweeney

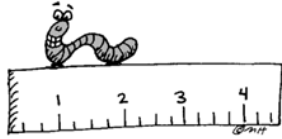
**When?** Monday, June 30 – Wednesday, July 2

Class will run from 9:00 am – 4:00 pm each day for three days, with a one-hour break each day for lunch.

**What does the course involve?**

This class will explore meaningful measurement in the classroom setting.

Teachers will learn to incorporate measurement activities into their daily classroom routines. They will become familiar with several different tools and measuring devices, using both customary and metric units. This work will connect fractions to measuring and deepen number concepts and number sense. Formulas will be explored to be understood, and questioning techniques will be modeled and practiced.



**What SOLs apply?**

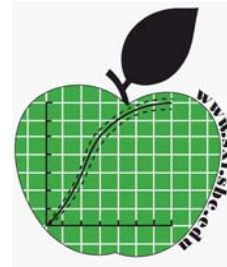
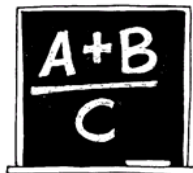
SOL Mathematics: 3.5, 3.14, 4.2, 4.10, 4.11, 4.12, 5.11, 6.9, 6.10

**Who is eligible?**

All Central Virginia grade 3-8 teachers are eligible. Enrollment is limited to 16.

**What do participants get?**

- 1 Graduate Credit in MATH, free!
- A \$180 stipend for completion of the three-day course.
- Materials and supplies for hands-on science in the classroom; teachers may also request advice and in-class assistance from the Instructional Support Specialist in implementing inquiry-based instruction in the classroom.
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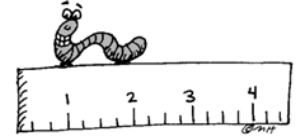
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**What SOLs apply?**

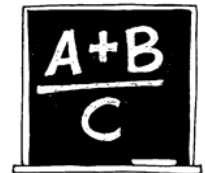
SOL Mathematics: 3.5, 3.14, 4.2, 4.10, 4.11, 4.12, 5.11, 6.9, 6.10

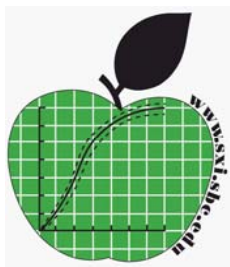
**Who is eligible?**

All Central Virginia grade 3-8 teachers are eligible. Enrollment is limited to 16.

**What do participants get?**

- 1 Graduate Credit in MATH, free!
- A \$180 stipend for completion of the three-day course.
- Materials and supplies for hands-on science in the classroom; teachers may also request advice and in-class assistance from the Instructional Support Specialist in implementing inquiry-based instruction in the classroom.
- Free lunch each day in the Sweet Briar College cafeteria.





## **SIMPLE MACHINES**

### **One day Workshop**

### **Program Anticipated**

(pending funding)

**Instructor:** Dorsa Sanadgol

**When?** Saturday, August 23

Class will run from 9:00 am – 3:00 pm, with a one-hour break for lunch.

#### ***What does the workshop involve?***

Starting with a variety of different simple machines, we will explore how they work and why they're useful. Next, we will build machines using LEGOS and study their effectiveness through data analysis and observation. Your challenge will be to design and build your own simple machine. This is a great way to practice problem solving with math and science through direct application. This workshop is the first in our fall 2008 Academic Year program of workshops.

#### ***What SOLs apply?***

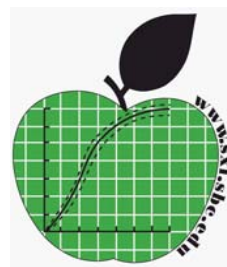
SOL Science: 3.1, 3.2, 4.1, 4.2, 5.1, 6.1, 6.2, PS.1, PS.10

#### ***Who is eligible?***

All Central Virginia grade 3-8 teachers are eligible.  
Enrollment is limited to 16.

#### ***What do participants get?***

- A certificate of participation (provided upon request) documenting 5 instructional hours that may be used toward recertification.
- A \$60 stipend for completion of the workshop
- Materials and supplies for hands-on science in the classroom; teachers may also request advice and in-class assistance from the Instructional Support Specialist in implementing inquiry-based instruction in the classroom.
- Free lunch in the Sweet Briar College cafeteria.



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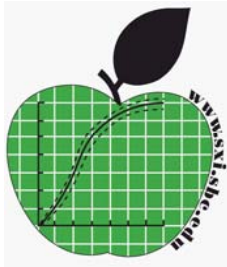
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## INQUIRY METHODS IN MATH AND SCIENCE

Program Anticipated  
(pending funding)

**Instructors:** Jill Granger and Jim Alouf

**When?** Friday and Saturday, August 8-9. Class will run from 9:00 am – 4:00 pm each day, with a one-hour break each day for lunch.



### *What does the program involve?*

Teachers will work on understanding an Inquiry Approach to teaching and how to apply it to lessons that support Virginia SOL content objectives in math and science. The program will focus on fundamental aspects of investigation such as variables, measurement, and data analysis utilizing hands-on materials suitable for students.

Teachers who enroll in the August workshop will initially be enrolled in a 3-credit graduate level course in Education, EDUC 656, "Inquiry Methods in Math and Science," a course that continues through the academic year and finishes in Spring 2009. See the syllabus online at [www.sxi.sbc.edu](http://www.sxi.sbc.edu).

Teachers who cannot complete the course will get Continuing Education credits (that can be translated into recertification points) based on number of instructional hours completed. Each day of the program will be 6 instructional hours.

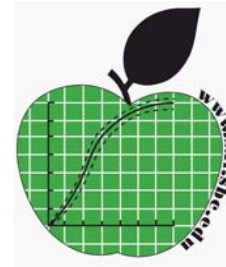
### *Who is Eligible?*

All Central Virginia grade 3-8 teachers.

### *What do participants get?*

Teachers who complete the course will get...

- 3 Graduate Credits in EDUCATION, free!
- A \$480 stipend for completion of the 3-credit course; or \$60/day for teachers who do not complete the course.
- Materials and supplies for hands-on science in the classroom; teachers may also request advice and in-class assistance from the Instructional Support Specialist in implementing inquiry-based instruction in the classroom.
- Free lunch each day in the Sweet Briar College cafeteria.



## INQUIRY METHODS IN MATH AND SCIENCE

Program Anticipated  
(pending funding)

**Instructors:** Jill Granger and Jim Alouf

**When?** Thursday and Friday, August 7-8. Class will run from 9:00 am – 4:00 pm each day, with a one-hour break each day for lunch.



### *What does the program involve?*

Teachers will work on understanding an Inquiry Approach to teaching and how to apply it to lessons that support Virginia SOL content objectives in math and science. The program will focus on fundamental aspects of investigation such as variables, measurement, and data analysis utilizing hands-on materials suitable for students.

Teachers who enroll in the August workshop will initially be enrolled in a 3-credit graduate level course in Education, EDUC 656, "Inquiry Methods in Math and Science," a course that continues through the academic year and finishes in Spring 2009. See the syllabus online at [www.sxi.sbc.edu](http://www.sxi.sbc.edu). Teachers who cannot complete the course will get Continuing Education credits (that can be translated into recertification points) based on number of instructional hours completed. Each day of the program will be 6 instructional hours.

### *Who is Eligible?*

All Central Virginia grade 3-8 teachers.

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