

THE MISSISSIPPI SCHOOL FOR MATHEMATICS AND SCIENCE
PRESENTS

LAB WORKSHOPS FOR SCIENCE TEACHERS

**-MISSISSIPPI'S ONLY
LABORATORY BASED
WORKSHOPS FOR
SCIENCE TEACHERS.**

-EARN CEUS.

**-SELECT FROM EIGHT
DIFFERENT SESSION
CHOICES.**

**-LEARN COST-EFFECTIVE
AND ENGAGING LABS
FOR YOUR CLASSROOM.**

**-LEARN FROM
SOME OF THE MOST
EXPERIENCED AND
INNOVATIVE SCIENCE
EDUCATORS IN
MISSISSIPPI.**

**JUNE 5-9
2017**

FOR MORE INFO OR TO REGISTER, VISIT
WWW.THEMSMS.ORG/SCIENCEWORKSHOPS



MSMS Science Teacher Workshop

Course Offerings

2017

Computer Science:

Introduction to Computer Science for Middle School Teachers:

This session is designed for middle school teachers interested in teaching computer science or mathematics and science teachers who are interested in learning how to incorporate computer science into their classes. Participants will be provided with a basic understanding of computer science and engaged in labs that will model ways to increase their students' problem solving abilities. Teachers will receive computer science lab-based activities that rely on computer science basics and give students the opportunity to explore a variety of other subjects through computer science.

Introduction to Computer Science for High School Teachers:

This session is designed for high school teachers interested in teaching computer science or mathematics and science teachers who are interested in learning how to incorporate computer science into their classes. Participants will be provided with a basic understanding of computer science and engaged in labs that will model ways to increase their students' problem solving abilities. Teachers will receive computer science lab-based activities that rely on computer science basics and give students the opportunity to explore a variety of other subjects through computer science.

Biology:

Bioengineering: pGLO and Transcriptional Control (Bio-Rad) – This session focuses on the pGLO bacterial transformation lab from Bio-Rad: preparation, implementation and analysis. This kit serves as many as 8 stations (potentially 32 students, 4/station); however, given the many limitations imposed by space and time in the high school classroom, the discussion will focus on issues unique to each participant's work environment. Participants will complete the lab considering these constraints. Discussions will also address biological macromolecules: structure, function and pedagogy. This lab is an excellent example of the control of gene expression.

Cell Bio 101 – This is a crash course in cell biology, from the periodic table to metabolism. Inexpensive and simple labs will be used to teach complex ideas in cell biology. The first experiment is a simple titration lab. Next, there will be a calculation (graphing calculator (Ti83) or MS Excel) heavy exercise followed by graphing and analysis and ultimately making comparisons with prokaryotic and eukaryotic cells. From potato funk to fermentation, several labs will be performed addressing a host of modifications for participants' individual

situations. Cell structure and function can be distilled down to a dozen or so concepts, one building upon another, ultimately addressing some sophisticated biological ideas. How does one go from molecular interactions and biological macromolecules to metabolic control?

Chemistry:

Chemistry from the Discount Store – This session deals with teaching chemistry on a limited budget. How can labs be incorporated when the budget is \$35? Discount store supplies to the rescue! A wide variety of chemistry topics can be demonstrated or experienced using simple, readily available equipment and supplies, like plastic or Styrofoam cups, balloons, vinegar, and baking soda. From thermodynamics, to stoichiometry, to gas laws, a lot can be learned from safe, easy, cheap demonstrations and labs using supplies from the discount or hardware store. Participants will gain hands-on experience and work with comparing high-tech experiments to their low-tech counterparts.

Lab Prep: How Do I Use This Lab I Found?! – This session deals with adapting experiments to your reality. The internet is filled with examples of excellent experiments to support a variety of concepts; however, those labs seldom come with preparation instructions and may not be practical considering the equipment and supplies a teacher actually has. It can be really frustrating and daunting to have a great lab and not know where to start! Here's a chance to gain some practical preparation skills. The session will start with three common labs and work on how to plan the lab, prepare the materials and supplies, and run the experiment. Participants are also invited to bring a lab they are interested in trying or one they have done that did not work as planned, and they will work on trouble shooting with the session presenter by estimating student needs realistically, preparing supplies, and making labs flow as easily as possible.

Physics:

Math, Measurements, & Modeling in the Lab: This session demonstrates physics and physical science experiments in which students take measurements, plot data, and model their results based on expectations. By incorporating data collection, graphing, and mathematical analyses, students gain multiple skills while engaging in hands-on activities. Each activity uses materials that are easily available at low cost. The session will also show how to expand the activities for enrichment, promoting more rigorous analyses if warranted by grade level and available technology.

Activities in Astronomy & Astrophysics: This session focuses on activities involving the sky and seasons, the Earth-Moon system, our solar system with comparative planetology, features of stars, and basic motion of orbiting bodies using Kepler's Laws. Some activities will involve computer use for generating solar system models and other visuals (all software is free or easily available). Activities can be expanded upon request to suit the desired grade or content level.

MSMS LAB WORKSHOPS FOR SCIENCE TEACHERS

The Mississippi School for Mathematics and Science is pleased to offer the state of Mississippi's only LAB-BASED workshop for middle and high school teachers!

MSMS is home to some of the country's best and most cutting-edge science educators. All MSMS faculty members hold at least a Master's degree in their subject areas or above, and all are multi-year veterans of lab-based classrooms. For nearly 30 years, MSMS has been a national leader in STEM education. Now, the faculty of MSMS wishes to share their expertise and experience with science teachers from all corners of the Magnolia State.

- **When:** June 5-9
- **Where:** The campus of the Mississippi School for Mathematics and Science in Columbus, Mississippi.
- Eight different LAB-BASED workshops are available.
- CEU's are also available and included in the registration fee.
- Each five-day, three hour session is \$500 or \$750 for two sessions.
- Room and board is available for an additional fee. Contact MSMS for details.

Participants will learn how to design simple and cost-effective labs for middle and high school students in the fields of chemistry, biology,

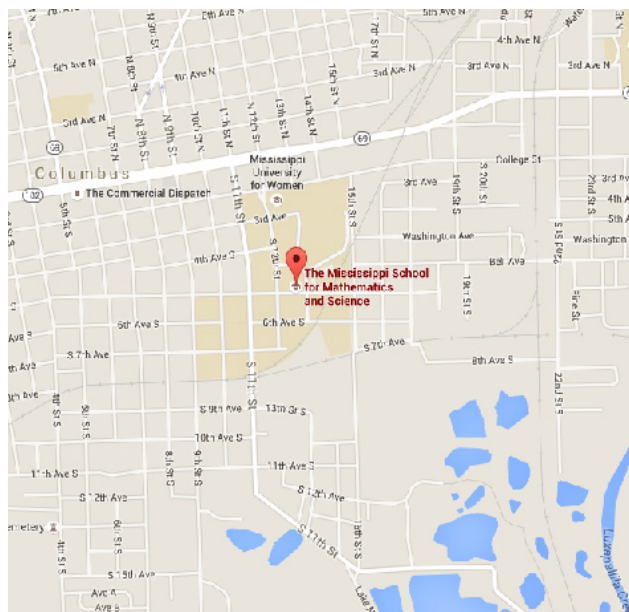
physics, and computer science that will enrich and enhance the instruction of the participants' students.

During the course of the workshops, teachers will learn lab designs and techniques that will:

- **Provide meaningful, inquiry-based experiments.**
- **Reinforce laboratory skills, data collection, and analysis.**
- **Adapt to all student levels; from lab beginners to advanced students.**
- **Align to the College and Career Readiness Standards.**
- **Use affordable and readily available supplies.**
- **Teachers may choose up to two sessions to attend, and may focus upon one subject or mix and match subject areas.**

You may register for sessions online at www.themsms.org/scienceworkshops or by contacting MSMS Director for Academic Affairs Kelly Brown at 1-800-400-4656 or by emailing kbrown@themsms.org

Please make checks payable to: MSMS
Attn: Kelly Brown
1100 College Street
MUW-1627
Columbus, MS 39701



“I gained knowledge of instructional practices, lab techniques, and encouragement that I feel will greatly improve my teaching and benefit my students.”

-2016 Workshop Participant

“I gained confidence to have labs in my classroom.”

-2016 Workshop Participant

FOR FULL SESSION DESCRIPTIONS AND TO REGISTER FOR YOUR SESSIONS, PLEASE VISIT

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