Expanding Your Horizons

EYH: A STEM Conference for Young Women in Grades 6-10

Saturday, March 21, 2015
James Madison University
Harrisonburg, VA

www.jmu.edu/mathstat/eyh

Why should you come?
- Discover how interesting and fun math & science can be
- Learn about career opportunities in math & science
- Form personal contacts with women and college students in math & science
- Meet other young women in your area with similar interests in math & science

Who is invited?
- Young women in grades 6-10
- Interested parents, teachers, and other adults

What will you do?
The conference begins with introductions, opening remarks, and breakfast. The rest of the day is devoted to workshops, a keynote address, and an exciting demonstration. Each workshop for students is a small class involving hands-on activities led by a professional mathematician or scientist. This year, we are also offering two workshops for parents and teachers. Adults can attend the adult sessions or student sessions. Lunch will be provided, and you will have the opportunity to eat with current female JMU students who are majoring in math & science. This is an excellent opportunity for you to ask questions and get a feel for what it is like to study these areas in college. Note that you do not need to be planning on majoring in math or science to attend this conference. The goal is to come, have fun, and learn some math & science in the process!

Keynote Address: Dr. Kimberly Sellers, PhD

Kimberly Sellers, Ph.D. is an Associate Professor of Statistics at Georgetown University. Dr. Sellers held previous faculty positions at Carnegie Mellon University as a Visiting Assistant Professor of Statistics and the University of Pennsylvania School of Medicine as an Assistant Professor of Biostatistics and Senior Scholar at the Center for Clinical Epidemiology and Biostatistics (CCEB).

In her spare time, Dr. Sellers enjoys spending time with her 7th grade son as well as traveling and the arts.

Conference Schedule:

8:45-9:30am  Registration, packet pickup, breakfast
9:30-10:00am Welcome
10:10-11:00am Workshop Period I
11:10-12:00 Workshop Period II
12:00-12:45pm Lunch
12:45-1:15pm Keynote Speaker, Dr. Kim Sellers
1:30-2:20pm Workshop Period III
2:30-3:00pm Chemistry Demo
3:00-3:15pm Closing Remarks, Conference Evaluation

Other Information:
Student responsibility – if you attend this conference, you must act maturely and follow the directions and instruction provided by the faculty, JMU students, and facilitators of the conference. You must attend all of the events scheduled for you, including lunch. You must remain on the JMU campus from 9:30am until the end of the conference at 3:15pm.

Photography release – a photographer may take pictures of you or your child. These photos may appear on our website or in publications. If you register yourself or your child, you have given us permission to use your/her photos.

There are no conference registration fees. Breakfast and lunch are provided to registered attendees. PLEASE contact us if you cannot make it to the conference after registering.

(Registration is available online at www.jmu.edu/mathstat/eyh.)
STUDENT WORKSHOPS

1. **3D Printing: The Wave of the Future**  This workshop will include 3D printers and samples of 3D printed objects. Participants can even take a little bit of the future home.

2. **An Hour of Code with Scratch**  In this session, you will have hands-on experience designing your own world of animation and games with the help of the free computer programming language “Scratch”.

3. **Are We There Yet? - Hilbert’s Tenth Problem**  Explore how Hilbert’s 10th problem and the work of Julia Robinson illuminate an exciting area of modern mathematics in a tale of intrigue and invention.

4. **Breaking Pasta**  We’ll do experiments, make predictions, and use a high-speed camera to catch every instant not seen with the naked eye to reveal the mathematics behind pasta noodles breaking.

5. **Coding with Finch Robots**  Using Finch robots and Python code, you and a partner will program the Finch to do a dance, avoid obstacles, or follow a light. No experience necessary...anyone can do it!

6. **Designing Our World to Last**  Learn how engineers are rebuilding the systems in our communities using innovative materials and methods and get hands-on experience with these materials.

7. **Engineering Candy Bridges**  This workshop will explore the engineering principles related to bridges. Workshop participants will design, build, and test candy bridges in teams.

8. **Engineering Design for Good: Fighting Ebola**  Learn how engineering design can help you tackle challenging problems by investigating the Ebola challenge and designing creative solutions.

9. **Estimating the Unseen**  In this workshop, you will learn how biologists estimate the population sizes of endangered species by doing your own mark-recapture experiment with ladybugs.

10. **Exploring Polymers**  Come participate in hands-on activities to explore the properties of polymers and learn how these long chains of molecules influence the behavior of materials you use everyday.

11. **Hands-on Convex Optimization**  Convexity is the notion of curving or bulging outward. You’ll do hands-on experiments to understand convex sets and functions and learn why they are important.

12. **How Likely are You to Develop Type II Diabetes**  This session will explain how probability theory is used to examine how different epidemiologic factors affect the odds of developing Type II Diabetes.

13. **Let’s Make a Deal: The Monty Hall Problem**  In the Monty Hall problem, a contestant chooses from three doors, one of which has a prize. We will find the best strategy to maximize the odds of winning.

14. **Magical Numbers and Card Tricks**  Learn some new number and card tricks to impress your friends and family and investigate the simple mathematics behind the tricks.

15. **Mapping a Difference**  Maps can do much more than get you from here to there. Come learn how to create maps that make a difference in solving local, national, and global challenges.

16. **Smartphones and Cyber Alerts**  This workshop provides a simulated demonstration of how smartphones share information, such as your location, date/time, and travel patterns.

17. **Tour of the Solar System**  Using JMU’s Science on a Sphere exhibit, we will take a virtual tour of the Solar System. Science on a Sphere (SOS) is a sphere-shaped, visualization tool developed by NOAA.

18. **Watching Worms Wiggle**  Did you know there are itty-bitty worms living pretty much everywhere in your environment? We will attempt to answer the burning question: How fast can a worm wiggle?

ADULT WORKSHOPS

1. **Helping Your Daughter Prepare for a STEM Career**  Help your daughter navigate middle and high school with the intent of preparing for a career in STEM (science, math, technology, and engineering). Meet other like-minded parents and gain insights from this open discussion workshop lead by a high school counselor and university math professor.

2. **Admissions and Financial Aid**  Attend this presentation by the JMU Dean of Admissions to find out what a school like JMU is looking for in terms of college preparation and to learn about financial aid and scholarships. Bring your questions!

Full descriptions of the workshops are available on the EYH website:  
www.jmu.edu/mathstat/eyh

Register online at http://www.jmu.edu/mathstat/eyh