Workshops
(Attendees will participate in two assigned workshops)

18. Brain Freeze
(Physics Bldg. 213)
Presenters: Dr. Allan Pringle, Curators Teaching Professor of Physics, S&T
Experience first-hand how materials behave at very low temperatures. Find out what a marshmallow would taste like during a hot day on Pluto. Taste what happens when a mixture of cream and sugar is cooled to several hundred degrees below zero.

19. Operation Egg Drop
(Havener Center, Mark Iwan/ Miner Lounge)
Presenter: Ms. Elizabeth Reed, MoDOT Human Resources Specialist; Ms. Kita Mitchell, MoDOT Human Resources Specialist
When making decisions, transportation engineers consider performance, cost, safety, appearance, etc. Keeping all those factors in mind, students will work in groups to design and test an egg transportation system. Through this activity, students will learn how existing or future transportation systems can be created to be an efficient transportation system.

20. Pane in the Glass
(Fulton Hall G-3)
Presenters: Dr. Mary Reidmeyer, Assoc. Teaching Professor, Materials Science & Engineering S&T; Gaffers Guild Student
Glass is a material that has intrigued many generations because of its beauty and wide variety of applications. Students will learn what glass is made of and how glass objects are formed. They will also learn how to change the color and make it glow in the dark, and how to make a impact resistant “soda souvaher and mini demo kits are part of the experience.

21. The Edible M&M Histogram
(Havener Center, Missouri)
Presenters: Ms. Kathy Smith
This workshop will focus on how descriptive statistics are applied in our everyday lives. We will use descriptive statistics to characterize the color composition of M&M candy. The results will be visual and discussion will focus on how descriptive statistics are present in many aspects of our lives.

22. Rip, Tear, Crunch – Exploring Plate Tectonics Using Sandbox Models
(McEneil Hall 316)
Presenters: Members of Sigma Gamma Epsilon, S&T
Understanding Deep Time begins with reading the rock record. In this workshop you will experiment many times with the “Mason Jar Basin” to discover on your own using scientific skills some of the fundamental laws of Geology – laws that Geologists use to establish a chronological order of events for the history of the Earth. You will use the results of your experiments to read part of the story of the Earth as written in the fabric of a rock. We will share these rock stories with your friends in the workshop.

23. Adventures in Aerospace – We are the Rocket Scientists
(Toomey Hall 315)
Presenters: Ms. Katelyn Bouxhorn, Mr. Anan Takroori & The S&T Satellite Team
Come see what it takes to fly with S&T’s Satellite Team. See how rocket scientists solve problems and keep our hair looking like Justin Bieber’s using one of our high speed wind tunnels. Meet the cutest couple on campus – MR & MRS SAT – a pair of satellites being built by students for launch in outer space. And have fun on our flight simulators.

24. Goopy Globs of DNA
(Schrenk Hall 111)
Presenters: Ms. Terry Wilson, Assoc. Teaching Professor, Biological Sciences; Ms. Lisa Snoddy-Foster, Biological Sciences Graduate Teaching Assistant, S&T
Learn to perform the first step in genetic engineering – the isolation of DNA! You will learn about the structure of DNA and the basic techniques used to isolate DNA from plant cells. We’ll also discuss how DNA carries the unique information for every living thing in a secret code!

25. Minerals in Your Face
(McEneil Hall 818, 820)
Presenters: Ms. Clarissa Wiener, SEM Specialist; Dr. Jessica Fathelb, Senior Research Specialist, MRC, S&T
Mineral makeup is more than just a new beauty trend – it offers health benefits for skin as well. Discover what the mineral world has to offer the cosmetic world.

26. The Mason Jar Basin
(McEneil Hall 312)
Presenters: Members of Sigma Gamma Epsilon, S&T
Unusual adventures begin with reading the rock record. In this workshop you will experiment many times with the “Mason Jar Basin” to discover on your own using scientific skills some of the fundamental laws of Geology – laws that Geologists use to establish a chronological order of events for the history of the Earth. You will use the results of your experiments to read part of the story of the Earth as written in the fabric of a rock. We will share these rock stories with your friends in the workshop.

Welcome
Welcome to Missouri University of Science and Technology’s 14th Annual Expanding Your Horizons Conference. Today you will enjoy a day designed to help students learn about the many careers that you can pursue in “S.T.E.M.” areas: Science, Technology, Engineering and Mathematics. After listening to our keynote speaker you will participate in two workshops assigned to your team, and attend a memorable final presentation.

Keynote Speaker: Helene Hardy Pierce
Vice President of Technical Services, Codes and Industry Relations, GAF
Helene has spent over 30 years in the roofing industry and has been very active in many of the industry’s organizations. She received the ASTM Award of Merit and title of Fellow from ASTM Committee D08, the James Q. McCawley award from the Midwest Roofing Contractors Association, and the title of Fellow of the Institute from the Roof Consultants Institute.

Among the many groups in which she has been active are the Asphalt Roofing Manufacturers Association; ASTM International; the Construction Specifications Institute; the RC1 Foundation; Center for Environmental Innovation in Roofing; Single Ply Roofing Institute; Roof Coatings Manufacturers Association; Polysocyanurate Manufacturers Association; and the Cool Roof Rating Council. Helene has also authored and presented numerous papers for the roofing industry and is a frequent contributor to industry publications. Helene has a B.S. in Engineering Management from the Missouri University of Science and Technology (formerly University of Missouri-Rolla) and in 2007 she was inducted into Missouri S&T’s Women in Science and Engineering Hall of Fame.

Conference Schedule
8:00 – 8:45 a.m. Check-in
(Cashman Hall Lobby)
8:45 – 9:00 a.m. Welcome
(Leach Theatre)
Speaker: Misty Rowe – Principal Scientist, Team Lead, Cementing, Halliburton
10 minute transition
9:00 – 9:45 a.m. Keynote Address
(Leach Theatre)
Speaker: Helene Hardy Pierce
Vice President of Technical Services, Codes and Industry Relations, GAF
1:10 – 1:50 p.m. Lunch
(St. Pat’s Ballroom
Havener Center)
1:50 – 2:30 p.m. Closing Session
(Leach Theatre)
Magician
Closing Session
2:30 p.m. Departure

The College Dilemma – Is college right for me?
Choosing the right college is a big decision and it takes a long time to make sure that you’ve made the right one. Go online to diplomaguide.com and read “8 Factors to Consider When Choosing a College.”

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**Workshops (Attendees will participate in two assigned workshops)**

1. From Dirt to Bling: How Rocks Turned into Precious Metals & Diamonds (McNutt Hall 124) 
   **Presenters:** Dr. K. Al-Agha, Assistant Professor, Dr. Kwame Akuot-Oaffe, Associate Professor, Mining & Nuclear Engr.; S&T Chapter Women in Mining
   Humans have always adorned themselves with jewelry for various reasons. Do you know how precious metals, diamonds, and other gems are produced from the earth's crust? In this workshop, you will learn the processes involved in turning dirt into precious metals and gemstones. You will get to sell for gold using the same gold panning techniques that miners used years ago. Whether you know, you might find that turning dirt into bling is your thing.

2. Trashcano (McNutt Hall 231) 
   **Presenters:** Members of Sigma Gamma Epsilon, S&T
   When volcanoes erupt violently they send towering clouds of hot molten magma, shattered fragments of crystals and rocks skyward 10% of kilometers into the stratosphere. This volcanic debris, called tephra, lead to catastrophes and in the past they may have even triggered mass extinctions of life on the planet. In this workshop you will explore the forces that drive volcanic eruptions in order to better predict when they will erupt in order to lessen volcanic hazards.

3. Exploring the Mathematical World of Shapes (Havener Center, Meramec) 
   **Presenters:** Members of the Mathematical Association of America
   Linoleum floors, hobnobs, soccer balls, and dice. What do these objects share? Each is constructed using simple geometric shapes. In the mathematical world of shapes we will see why certain shapes are used in these objects and other are not.

4. Expect the Unexpected (Townsend Hall 317) 
   **Presenter:** Mr. Mitchell Cottrell, Senior Research Electronics Technician, Mechanical & Aerospace Engr.; Gabrielle Hallier, S&T student
   One of the most important tasks a scientist or engineer can perform is to carry out an experiment to prove that their assumptions are correct. However, the results of an experiment may turn out to be quite surprising. Let’s take a look at a common situation, conduct an experiment and see if the results are what you expect, or if they are unexpectedly surprising.

5. ElecTricks (Emerson Electric Co. Hall 136) 
   **Presenter:** Dr. Marisa Crov - Finley, Professor of Electrical Engineering, S&T
   Magnets have fascinated people for thousands of years. During ancient times, magnets were called “lodestone” and were considered magic! In this workshop we will be building our own electromagnets and using them to perform such magic tricks as ringing bells and moving objects. We’ll learn how electrical and magnetic forces combine to make motors that convert wind energy into electricity!

6. You’ll Be in Stitches (Havener Center, Burgess) 
   **Presenters:** Medical Student Kat Pederson
   Learn how to perform simple wound suturing and knot tying used in surgical procedures. There will be also be time for questions and answers for students interested in pursuing a career in health care, particularly medicine or nursing.

   **Presenters:** Mr. Christopher Shickler, members of Engineers Without Borders, S&T
   If you are interested in using engineering to help developing nations, then visit this workshop and learn more about Engineers Without Borders. EWB-Missouri S&T works to bring clean, dependable water supplies to communities in Honduras, Guatemala, and Bolivia. This workshop will also include a fun, hands-on activity in which you will build a model of the projects EWB actually uses.

8. Trust Me (Havener Center, Ozark) 
   **Presenters:** Ms. Susan Em's Kramp, Lead Engineer, F18 Wing/Control Surfaces, Boeing; Dr. Robin L. Shepard, Adjunct Professor, Department of Energy, Environment and Chemical Engineering, Washington University in St Louis
   Cross a bridge that YOU built. Explore the wonders of engineering while you build your own electromagnets and use them to perform such magic tricks as ringing bells and moving objects. We’ll learn how electrical and magnetic forces combine to make motors that convert wind energy into electricity!

**Now You Know**

The Triple-E, the largest ship in the world, is longer than the Empire State Building.

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9. Ready, Set, MOVE With 4-H Robotics (Havener Center, Center) 
   **Presenters:** Ms. Lynn Lawson, University of Missouri-Extension, 4-H Youth Development Specialist; Ms. Amanda Mekeel, University of Missouri-Extension, 4-H Science, Engineering, Agriculture, Technology Educator
   An exciting introduction to the LEGO Mindstorms NXT Robotics kits. Students will practice programming the NXT intelligent brick with servo style motors and sensors, including ultrasonic. In pairs, students use the LEGO Mindstorms software to program their robots to move and react in order to solve challenges.

10. Is it Contagious? (Centennial Hall 206) 
    **Presenters:** Dave Westenberg, Associate Professor of Biological Sciences, Chemical and Biochemical Engineering; members of SCUPLA, S&T
    Learn about the history of infectious diseases and how scientists track the source of an illness. Find out how John Snow tracked down the source of a cholera epidemic and saved the city of London. Participants will do hands-on activities and games to learn about the science and practice skills that help prevent getting sick.

11. You Light Up My Life (Schenck Hall 125) 
    **Presenter:** Dr. R. E. Gerald II, Senior Research Scientist in Chemistry; Ms. Annalise Pfaff, Ms. Ming Haung, & Ms. Lingyu Chi, Ph. D. candidates in Chemistry; Mr. Daylan Smith student in Computer Science & Mr. Robert Black, student in Chemistry
    Accessorize your wardrobe and radiate your jewelry by adding cool neon wire and neon light clips! Learn about the smooth and vibrant glow of electromlucescent wire and the magnetic properties of wire that unleash your creativity to make fascinating patterns and sequences of flashing lights. Impress that special someone in your life with a striking fashion statement and your creativity that put it all together! Come to this exciting workshop and light up your life!

12. Map Challenge! (Havener Center, Gascogne) 
    **Presenter:** Ms. Amanda Lowe, Ms. Leslie Bearden, Ms. Gall Dunn, Ms. Leslie Langford, Mr. Drayton and Archuleta - United States Geological Survey
    Let us show you how geography and technology are used to learn about our world and help solve problems. Also, find out how maps are made and then use the information to make them come from. We will look at several types of data used to make maps, and then use some real examples to play a fun game.

    **Presenters:** Mrs. Cris Sheffel, Math Curriculum Consultant; S&T
    Are you looking for a clever disguise or gag for Halloween? If you’re going for the zombie look, it helps to know a little about materials science. See how the properties of gelatin make it an ideal starting point for making prosthetics (fake) skin and hands for special effects. Learn how an engineer thinks about the structure and properties of substances to develop useful materials for the job. You’ll walk away wearing a (fake) zombie wound of your own along with the seeds of knowledge to plan your own materials science engineering experiments.

14. Adapt and Conquer (Havener Center, Atrium) 
    **Presenters:** Cadet Elizabeth Shuman, Cadet Mary Pong, Cadet Heath McCoy, S&T Army ROTC
    What is leadership? Are you born with it, or do you learn it? Use initiative, communication, and critical thinking to overcome obstacles with your team. But be quick! Time is ticking and only one team will emerge as the winner.

15. Secrets of the Past: FOSSILS... If Rocks Could Talk (McNutt Hall 305) 
    **Presenter:** Ms. Angelica Alvarez Naranjo, Ms. Digi Wang; S&T geology students
    Fossils embedded in rocks are clues to understanding what life and the environment have been like at different times in geologic history. In this hands-on demonstration, led by a geologist, you will see fossils from around the world and from different geologic periods.

16. How to Outsmart Your Computer (Toomey Hall 154) 
    **Presenter:** Mrs. Lauren Oswald, IT Communications Manager; Ms. Brooke Greathouse, Ms. Carl Martin, student assistants, IT Communications, S&T
    Ever wonder how your computer works? Come take a laptop apart with us and see! Learn what RAM is, what motherboard is, and make conclusions about the components of a computer. Leave with the confidence to start building your own computer!

17. Creating Computer Games and Animation (Humanities Building 202) 
    **Presenters:** Ms. Carla Bates, IT - Database Programmer/Analyst, Adjunct Instructor, IST; S&T
    Learn computer programming by creating games and animations with Scratch from MIT Scratch. Scratch is an easy to use but powerful computer programming environment created especially for young programmers. As you create animations and put the characters into computer games while learning computer skills that transfer to higher-level computer languages. Scratch is a free download so students can continue developing computer masterpieces and learning computer programming when they return home. scratch.mit.edu/
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   Presenter: Medical Student Kat Pederson
   Learn how to perform simple, everyday medical procedures such as simple suturing and knot tying used in surgical procedures. There will also be time for questions and answers for students interested in pursuing a career in health care, particularly medicine or nursing.

7. Engineers Without Borders- Changing Lives Around the World (Mason Hall Co. Hall 112)
   Presenters: Mr. Christopher Shidler, members of Engineers Without Borders, S&T
   If you are interested in using engineering to help developing nations, then visit this workshop and learn more about Engineers Without Borders. EWB-Missouri S&T works to bring clean, dependable water sources to communities in Honduras, Guatemala, and Bolivia. This workshop will also include a fun, hands-on activity in which you will build a bridge that you’ll travel over! Explore the LEGO Mindstorms NXT Robotics kits. Students will practice programming the NXT intelligent brick with servo style motors and sensors, including the ultrasonic. In pairs, students use the LEGO Mindstorms software to program their robot to move and react in order to solve challenges.

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   Presenters: Ms. Susan Ems Krampl, Lead Engineer, F18 Wing/Control Surfaces, Boeing; Dr. Robin L. Shepard, Adjunct Professor, Department of Energy, Environment and Chemical Engineering, Washington University in St Louis
   Can you trust your engineering colleagues? What is the strongest shape used in construction? Learn the answers to these questions and more on a working bridge.

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   Are you looking for a clever disguise or gag for Halloween? If you’re going for the zombie look, it helps to know a little about materials science. See how the properties of gelatin make it an ideal starting point for making prosthetic (fake) skin and wounds for special effects. Learn how an engineer thinks about the structure and properties of substances to develop the materials for the job. You’ll walk away wearing a (fake) wound of your own along with the information to make them come back! How do diseases spread and how to prevent getting sick.

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13. Materials Science for Zombies (Humanities & Social Sciences 202)
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