Presentation Briefs: March 1st, 2019

10:20 – 11:10AM Concurrent Workshop Sessions

Power UP your MakerSpace with Arduino
Presented By: Jeff Oswald and Samuel Reisner
Grade Level: M, H
Learn about the Arduino platform and how to use it. Participants will be able to see a variety of student made items that are powered by Arduino. Participants will then get their feet wet by actually creating a basic build. Once the build is complete participants will then "hack the code" to modify the original build results to produce a new outcome. No experience needed!

Physical Science is LiT
Presented By: Katherine Grady
Grade Level: E, M
Katherine Grady's session will review and demonstrate an engineering design that can be used in the K - 12 science school setting. The lesson uses a single board microprocessor, like Arduino, to investigate and illustrate the fact that the flow of electricity requires a closed circuit (a complete loop). This session will demonstrate an applied lesson facilitated with undergraduate pre-service teachers at the University of Central Florida. Katherine Grady will share an engineering design inquiry based lesson for all attendees to offer students an opportunity to design and problem solve like a 21st century STEM worker.

Explore Before Explain: A Case Study on Zika
Presented By: Dr. Marjorie Miles Dozier
Grade Level: H
In this presentation, we will model how to incorporate Explore-Before-Explain into the classroom to increase student engagement, content knowledge and achievement levels using the recent Zika outbreak.

Renewable Energy Research, Anyone?
Presented By: Robert Reedy
Grade Level: M, H
Come and find out about the latest on the renewable energy research. What do you think of when you consider alternative sources for energy: solar, wind, biofuel, etc. Indeed any of these can be used for producing energy to be used in our daily lives. In this presentation, we will focus on solar and wind energy as the renewable energy types and share our experiences on our DoE funded FEEDER Consortium that consists of twelve Universities across the United States, seventeen utility companies, ten supporting industry partners, and two national labs. Apart from the research contributions, FEEDS aims to produce the future workforce in electrical power industry.

An Integrated Curriculum Approach to STEM Learning
Presented By: Jennifer MacDonald and Heather Vickers
Grade Level: E
Learn successful strategies for creating and implementing standards-based, integrated STEM units in a curriculum progression for grades K-5. These innovative units integrate ELA, math, and science state standards while providing real-world engineering design problems for students to solve in collaborative groups. See how we incorporated technology and the arts to help students make connections and deepen the learning. Specific examples of units with lesson plans and student samples will be shared and get hands-on experience with one of our engineering challenges. Discover how engaging students with an innovative, integrated curriculum made the difference in the dramatic turnaround in our school.

How Ecosystems and Humans Harness the Energy of Waves
Presented By: Nilsa Hernandez Maldonado and Humberto Rodriguez
Grade Level: E, M
The intention of the presentation is the use of differentiated learning strategies to expand your understanding of waves, natural systems and the electromagnetic spectrum (EMS), including online and classroom resources that engage participants in the applications related to harnessing energy to improve society and understand the world around us and beyond the earth's ecosystem. The activities included utilize simple materials that are easy to obtain. Nevertheless, all activities provide an online resource to replace any face to face activity. The session provides conceptual explanations and practical application using illustrative explanations, links to online resources, laboratory and hands-on activities, assessment and other resources."

Plugging In to Computer Science Educator Professional Development
Presented By: Emily Beth Langley
Grade Level: E, M, H
Orlando Science Center is proud to be one of Code.org's Regional Partner organizations. Their computer science curriculum can be implemented with students of all ages and grade levels. The AP Computer Science Principles curriculum has been pre-approved by the College Board Course Audit. In this session, we will explore these K-12 courses and experience "unplugged" hands-on activities from the lessons.

11:20-12:10 Concurrent Workshop Sessions

Engineering Design with Ohm's Law and Carbon Nanotubes
Presented By: Erika Trnka
Grade Level: M, H
This workshop includes two class activities that can be incorporated into a single a multi-day lesson or in two separate units. The first is a mini Engineering Design Challenge using the concept a space age material called carbon nanotubes. The second is an Ohm's Law electricity lesson incorporating hand held electricity generators and carbon nanotube strain sensors.

Connecting Classrooms to Subject Matter Experts
Presented By: Amanda Allen and Jennie Ablanedo
Grade Level: E, M, H
stemCONNECT is a free resource connecting educators across Florida to Subject Matter Experts from industry and academia to reinforce classroom topics and introduce their students to relevant careers.

What's the pH?
Presented By: Jared Herretes
Grade Level: H
This hands on activity has students learn how to use linear regression and correlation to predict the pH of an unknown solution and how to apply the same process to other real world scenarios.

STEM Projects of the American Association of University Women
Presented By: Drs. Leslie Sue Lieberman, Hanna Kruczek, Anne Bubriski-McKenzie, and Parveen Wahid
Grade Level: M
The American Association of University Women (AAUW) is a national organization of 170,000 members with a mission of advancing gender equity for women and girls through research, education, and advocacy. AAUW has conducted research and developed educational programs and materials for girls and women in STEM. This workshop provides teachers with the latest gender-relevant research, interactive applications and hands-on projects for middle school girls drawn from Tech Savvy (day-long workshops), Tech Trek (week-long summer program) and STEM packs (e.g., Cyber Security, Aerospace Engineering). Opportunities and eligibility for individual fellowships, research grants and Community Action Grants are presented.

An Integrated Curriculum Approach to STEM Learning: With a Technology Focus
Presented By: Angela Tiffany
Grade Level: E
Learn successful strategies for creating and implementing standards-based, integrated STEM units in a curriculum progression for grades K-5. These innovative units integrate content standards while providing real-world engineering design problems for students to solve in collaborative groups. See how we incorporated virtual reality, augmented reality and 3D printing to help students make connections and deepen their learning. Opportunities for you to experience the latest in 21st Century technology will be provided. Discover how engaging students with innovated engineering and technology curriculum made the difference in the dramatic turnaround in our school.

Incorporating STEM Into my Core Curriculum?
Presented By: Rachel Knight
Grade Level: E
Feeling overwhelmed about how to fit STEM into everything else that you do? How is STEM beneficial when we have standards to cover that we will be tested on? STEM can fit in with standards in any grade! The main goal is for the students to be inspired to explore the world around them and have FUN while learning about science, technology, engineering, and math. Come to this session to find ideas and take home lesson plans on how to incorporate STEM activities across the curriculum easily in the classroom!

Robot, Schmobot, Meet the Ozobot!
Presented By: Lara Sharp and Susan Garrett
Grade Level: E, M, H
Robots have been a part of our lives for decades. Participants will be taken on a short journey of the history of robots and take a quick look into the future. Participants will have the opportunity to experience the fun and ease of robotics through the Ozobot by using lines, colors, and codes as well as writing a simple program to accomplish autonomous navigation. Participants will take away two Ozobot lesson plans.

1:05 – 1:55 Concurrent Workshop Sessions

Enduring Effect of Project Based Learning
Presented By: Abdul Siddiqui
Grade Level: M, H
The presentation and robotics hands-on experience will highlight the benefits of Project Based Learning. The observations that are captured in the presentation are based on the High School Engineering Internship and Robotics Teams the US Army PEO STRI has supported. The High School Internship is intended to be a practical approach for mentoring high school students in developing and incorporating processes needed for accomplishing successful technical projects. The Robotics Teams mentoring is the best process for implementing the lessons for successful project development and management in a competitive environment.

Carbon Fiber Materials in the Classroom
Presented By: Terry Barchfeld
Grade Level: H
Carbon fiber starts off feeling like cloth but ends up sturdy enough to make cars and rockets. The chance to see these materials in person, ask questions, and propose uses for them provides an engaging modern physics moment for students.

When the Wheels are Turning the Students are Learning: Elementary
Presented By: Beth Smith and Don Worcester
Grade Level: E
Let's put math in motion! This session is designed for 4th and 5th grade teachers and will address geometry standards. Learn how to engage your students as they develop a conceptual understanding of geometric figures. We will program a robotic vehicle (called a Rover) to perform different challenges such as navigating a path or obstacle course and drawing quadrilaterals. No coding experience is necessary.

STEM in the Elementary Realm
Presented By: Amy Monahan
Grade Level: E
Join our seasoned STEM specialist as she explores STEM lessons for the elementary classroom! Come and "learn by doing" 3 different STEM activities that align with Florida standards.

Exploring the Spread of Invasive Plants: The Hydrilla Game
Presented By: Laura Schendel
Grade Level: E, M, H
Invasive plants such as Hydrilla verticillata, are easily spread throughout a freshwater ecosystem such as our many Florida lakes and rivers. Come and participate in an interactive lesson that simulates the variety of locations and methods that hydrilla uses to multiply and cause its destruction to our state. We will play a simple game that you can use in the classroom and get access to many more free lesson plans.

2:05 – 2:55 Concurrent Workshop Sessions

STEM in Nature
Presented By: Mary Lynn Hess
Grade Level: E
Bring the excitement of engineering to your elementary classroom through nature. This hands-on lesson will emphasize critical thinking, problem solving, collaboration and communication in the transdisciplinary context of STEM by creating a nature mobile. Get ready to brainstorm, predict, construct, analyze and test your new creation!

Fabrication of Micro-Sensors
Presented By: Ron Sandrin-Litt
Grade Level: H
"The Florida curriculum for Chemistry is extremely dated, covering topics relevant to Chemistry not much beyond the science in the 1950's. Students need to get exposure to cutting edge technology and to test out their hypotheses during Chemistry labs. Micro-sensor technology offers an opportunity to measure chemical elements and compounds directly in the field, which is a huge step beyond laborious biochemical testing (i.e. taking samples in the field and then completing assays in the lab). We set ourselves the goal of designing and fabricating a sensor which could feasibly be completed at a high school level and then testing it in the lab.
By way of comparison, students conducted the time-honored ascorbic acid assay for phosphates along with testing their designed phosphate micro-sensor in order to appreciate the sensitivity of both techniques."

When the Wheels are Turning the Students are Learning: Middle and High
Presented By: Beth Smith and Don Worcester
Grade Level: M, H
Let's put math in motion and integrate STEM into the mathematics classroom! Learn how to program a robotic vehicle (called a Rover) to perform different challenges. Code your Rover to navigate an obstacle course, draw a star, or crash two Rovers into each other to illustrate an intersection point of two lines. A perfect solution for middle and high school classrooms to engage students and teach tough to learn concepts. No coding experience is necessary.

Keep Your Cool: Introducing the Engineering Design Process Through Heat Transfer
Presented By: Lauren Bracken
Grade Level: E, M
What better way to teach science and engineering than with a hands-on experience? Join us in this project-based activity to show students how to using their knowledge of heat transfer to beat the heat in while teaching the engineering design process. No prior engineering lesson experience needed. Come bring engineering to your classroom in this approachable, fun, standards-based activity.

Assessing with BrainPOP Creative Coding and Games
Presented By: Amy Trujillo
Grade Level: E, M, H
Learn about BrainPOP features like creative coding and educational games that will encourage learners to show what they know by using innovative skills and creativity. Participants will have the chance to log in to BrainPOP and explore the myriad of games and be able to showcase their knowledge with a coding activity.