A New Way to See STEM

This publication celebrates the progress made by Dow people who are committed to making Science, Technology, Engineering and Math (STEM) the foundation of prosperity around the world. Dow has identified several gaps that must be filled for that prosperity to be achieved: The Interest Gap, The Achievement Gap, The Resources Gap and The Vision Gap. Filling those gaps is the objective of a coordinated effort that is focused on four strategic pillars: Teach, Learn, Work, Advocate.

Inside are stories about some wonderful accomplishments in those areas, including:

- **Challenge Accepted**
  The inaugural STEMtheGAP™ Teacher Challenge drew input from hundreds of educators, with 100 of them earning special recognition and $1,000 each to help make a difference in their classrooms. **PAGE 4**

- **Going Places**
  Top students from three countries in the Middle East will be able to broaden their horizons through the new Young Scientists Program, offering not only hands-on experience, but also important industry contacts. **PAGE 11**

- **Mastery of a Craft**
  Using lessons learned in Europe, Dow is expanding its apprenticeship system in the United States, with plans to put people at a number of production sites for on-the-job training coupled with academic preparation for a fulfilling career. **PAGE 12**

- **Togetherness Works**
  Building a partnership of business, education and public service organizations has proven to be an ideal way to make effective progress in a community, as demonstrated by the Great Lakes Bay Region STEM Impact Initiative. **PAGE 14**

Check out the Back Page for a collection of resources that can help teachers, students, parents, workers and anyone else who has an interest in improving STEM education.

People have always been the heart and soul of The Dow Chemical Company. Smart people. Enthusiastic people. Innovative people. All of the inspiration and inventions, patents and products, sales and success comes down to people understanding what needs to be done, and then doing it well.

That’s why it’s so important to Dow that there are enough people with the skills demanded by the modern economy. These days, companies that aren’t constantly improving get left behind.

And the skills needed to stay competitive are increasingly in the areas of science, technology, engineering and math (STEM). A steady stream of data shows that jobs requiring STEM skills are in higher demand than ever before, and will be an even bigger part of the economy in the future.

Dow people understand this, and they are taking action.

Recent months have seen a number of great leaps forward in the Company’s effort to improve the STEM training available in the communities it is a part of. This publication is filled with story after story of contributions, participation, leadership and encouragement for STEM programs.

“Dow is committed to investing in STEM education in our communities because we believe that investing today in the leaders that will drive the innovation of tomorrow will create value for our Company, and society as a whole.”

– Meredith Morris, Dow STEM Programs and Communication Manager

Perhaps the most fundamental achievement was the expansion of Dow STEM Ambassadors. The idea began in Indianapolis, Indiana, home to Dow AgroSciences, as folks developed ways to make their employee outreach in the community more organized and effective. They built kits with instructions, so an employee could visit a school or a science festival without having to gather materials or worry about how to do a demonstration. They held meetings to brainstorm new presentations and creative ways to publicize their activities. They actively recruited new members, giving each person who joined the effort a custom-made shirt.

Recognizing a good thing on its hands, Dow formed STEM Ambassador chapters in several locations, including Michigan, Louisiana, the Delaware Valley, Texas and California, with work underway to add additional sites around the country and across the world.

“There is a huge buzz for the STEM Ambassadors program all around Dow and in our communities,” said Jaime Curtis-Fisk, a Dow Research and Development Scientist and Program Leader for Dow STEM Ambassadors. “People are excited to be involved in this, in part because it’s so important to the future, but also because we are taking a very innovative approach to several aspects of outreach to truly break new ground.”

Those unique elements include:

- **AMBASSADOR TRAINING**
  All STEM Ambassadors go through special training to maximize their effectiveness. Ambassadors don’t have to be scientists – anyone from accountants to office professionals to truck drivers to sales people are welcome – so they all learn about the basics of the science behind each demonstration. At the same time, even a person with an extensive science background might not know the best way to explain the important principles in a way that is most engaging, so they all benefit from some education training.

- **CURRICULUM-CENTERED CONTENT**
  Working with educators and highly respected researchers, STEM Ambassador leaders developed demonstrations that connect with school curricula, so that a visit to a classroom can be an enhancement to lessons, not a break from them.

- **SAFETY**
  Using Dow’s world-class safety standards means all STEM Ambassador demonstrations meet the highest levels of safety.

In the end, though, the most important factor is the people who become STEM Ambassadors. It’s that people power, what Dow calls The Human Element, that makes STEM Ambassadors so successful.
INevolvement
inspiring chemistry excitement and
people across the globe. At Dow, we
prosperity and creates solutions
fuels innovation and economic
quality chemistry teaching materials
summits and create more than 750
teachers (AACT), will work with
American Association of Chemistry
Society (ACS). This new organization, the
American Chemical Society
chemistry education is the mission
American Association of Chemistry T eachers Will Develop K-12 Resources

Smithsonian Experience Is a
Bright Idea

INDIANA: When 21 educators from Zionsville Community Schools met with Dow AgroSciences volunteers for an Essential Elements workshop on Nov. 15, they not only learned a great deal, they offered ideas about putting the elements into practice in classrooms.

“The teachers were so enthusiastic, and a number of them said that they would begin using the activities that Monday,” said Larry Sernyk, who helped organize the event on behalf of the Dow AgroSciences Science Ambassadors.

“There was a lot of collaboration between the educators and sharing of great ideas on how to enhance the activities and adapt them for different grade levels.”

Essential Elements is one aspect of the You Be The Chemist® (YBTC) program developed by the Chemical Educational Foundation®. YBTC is a nationwide competition for middle school students across America. Students receive organized preparation, then compete in several rounds of competition, with top performers gathering for a national championship each spring. Essential Elements is part of the YBTC preparation program, and provides teachers with activities, materials and guidance to help them maximize the benefit to students.

“I really encourage middle school educators to get involved with the You Be The Chemist Challenge. I explain to them how easy it is to get involved, and by the end of the workshop they were very interested,” Sernyk said.

For more information about YBTC and Essential Elements, go to www.chemed.org/ybtc. ■

American Association of Chemistry Teachers Will Develop K-12 Resources

UNITED STATES: Invigorating chemistry education is the mission of a new organization created by the American Chemical Society (ACS). This new organization, the American Association of Chemistry Teachers (AACT), will work with Dow to convene a series of teacher summits and create more than 750 lesson plans, multimedia resources, demonstrations and other high-quality chemistry teaching materials for use in K-12 classrooms.

“A skilled STEM workforce fuels innovation and economic prosperity and creates solutions that improve the quality of life for people across the globe. At Dow, we value teachers’ critical role, both in inspiring chemistry excitement and in helping students to gain the key skills they need to be successful in STEM careers,” said Dow Chairman and CEO Andrew N. Liveris. “As the founding partner of this program, we are proud to collaborate with ACS on this first-of-its-kind community to empower chemistry teachers, inside and outside of the classroom, as they work to inspire the next generation of innovators and entrepreneurs.”

The first AACT teacher summit will take place this summer in Midland, Michigan. Approximately 30 chemistry teachers from surrounding communities will attend the weeklong summit. They will work with Dow volunteers, known as Dow STEM Ambassadors, to identify improvement opportunities in K-12 classroom resources and develop lesson plans, multimedia presentations and other materials that better meet teachers’ needs.

As part of this effort, Dow STEM Ambassadors will help teachers incorporate career-based examples into their teaching resources, educating students on future potential career opportunities. Similar summits will follow in cities around the United States. Dow also has committed to funding AACT for the next four years.

“This new partnership comes at a critical time,” said Adam Boyd, AACT Program Director. “Enrollment in high school chemistry classes is on the rise. Yet, only 35 percent of high school chemistry teachers have both a bachelor’s degree in chemistry and are actually certified to teach it.”

Lesson plans and other classroom materials developed at the Dow-AACT teacher summits will be available to AACT members via the association’s website, www.teachchemistry.org.

“We are thrilled to be working together with Dow to support teachers of chemistry across the country and develop a workforce of tomorrow,” said Madeleine Jacobs, ACS Executive Director and CEO. “We hope that this partnership can serve as a model that will catalyze greater engagement between chemical industries and local communities.” ■
BRAZIL: Teachers have a kindled spirit in Rui Cruz. Cruz, recently appointed Research & Development Director for Dow’s Industrial Solutions business, spent a semester as a high school chemistry teacher in Brazil while he was starting his Dow career. “I was still in training, when the public school a few blocks away lost their chemistry teacher, and they were desperate to replace him,” Cruz recalled. “They saw ‘Dow Chemical’ in the phonebook and called the Human Resources department, asking if there were any chemists or chemical engineers who wanted to be a teacher.”

It was the school’s good luck to be connected with Cruz, who agreed to take over for the chemistry teacher, learning the lessons of his new Dow career each day before heading to the school to present chemistry lessons to students.

That increased my admiration for teachers a great deal, seeing all those challenges,” Cruz said. “The public school in Brazil, their elementary and junior high education wasn’t perfect. So I had to work to close some gaps. Getting them to be fond of chemistry and spend their time learning about molecules and doing experiments, that wasn’t easy.”

The key, Cruz discovered, was to help the students see a connection between science and the real world.

“I tried to make the chemistry relate to their lives. It made it more interesting to them.” Cruz said. “Science is so wonderful. It’s impossible to hate it if properly taught.”

That spirit has remained with Cruz all these years. He’s now based in Freeport, Texas, but maintains ties with his native Brazil and mentors a few Latin American Dow employees. At the closing of the International Year of Chemistry in 2011, he spoke to about 250 high school and university students from all over Europe about a vision of a better future thanks to chemistry, and kept them engaged by creating the International Year of Chemistry Young Leaders community on Facebook. For the past four years, he also has taken part in an annual program through which about 200 children of Dow employees visit the Freeport site to

Pennsylvania: Nearly 60 teachers from the Norristown Area School District spent a day in early October learning new ways to get their students excited about science.

In partnership with the Chemical Educational Foundation® (CEF), Dow employees presented a number of activities to the teachers, as well as a wealth of resources for their classrooms, including materials for hands-on student activities, a flash drive with 60 You Be The Chemist® experiments, additional teaching materials, and gift bags filled with a variety of items to help capture and engage students during the learning process.

“This was really great,” said one participating teacher in her program evaluation. “So many engaging activities to get all the kids excited about science concepts.”

STEM News • Turkey: Chemistry of Teaching Project Expands Into New Regions • Michigan: Hundreds Hear About Range of Programs at Teacher Resource Day • Thailand: Classroom Equipment Gives Teacher Heightened Ability to Demonstrate Science

Looking at Learning from Students’ Point of View – Hands-on Activities Increase Excitement

Teachers from Pennsylvania’s Norristown Area School District get a unique perspective on student-centered learning during a day of special training.

The professional development day for teachers was completed by a “train the trainer” workshop at Dow’s Northeast Technology Center for employees interested in participating in or leading Essential Elements workshops in the community or just increasing experience with hands-on chemistry demonstrations. The workshop was led by a CEF facilitator and attended by 10 Dow employees interested in STEM education.

“Providing our employees with the necessary tools to be STEM Ambassadors is critical,” said Melissa Johnson, Senior R&D Manager based in Collegeville, Pennsylvania, and one of the leaders behind Dow’s STEM Ambassadors movement. “Through the passion and expertise of Dow scientists, we have a real possibility in building STEM education into a driver for innovation, manufacturing and economic prosperity.”

Dow Engineer Injects Extra Realism Into College Courses

Germany: College professors are known for having a good handle on the theories of their subjects, but keeping up with real-world application can be difficult. Thomas Koehler is helping with that at Anhalt University of Applied Sciences, where students supplement their studies through a relationship with Dow Central Germany (DCG) that provides site visits, information on career opportunities, internships and, for the second year now, a lecture series organized by the DCG university contact.

Koehler, Dow’s Associate Engineering Director at Schkopau and initiator of the lecture series, said it focuses on project execution and the required collaboration of different functions during planning, construction and startup of a chemical plant, as well as plant operations and maintenance.

Board Games, Cards to Provide Creative Learning Opportunities

Korea: Education kits designed to use STEM and sustainability concepts in an exploration of climate change issues are being developed in conjunction with elementary and middle school teachers and the Korea Green Foundation’s Eco Children’s Center. An agreement between Dow and the Center for the Environment was announced on Dec. 10, with completion of the kits expected by June. The kits will use board games and cards popular among students to enable a multidisciplinary and creative learning approach.

New Ways to Teach Science Being Explored by Researchers

Michigan: A multi-year effort to develop new ways to teach science to middle schoolers is being funded by a grant from the Herbert H. and Grace A. Dow Foundation. Based at Michigan Technological University, the Michigan Science Teaching and Assessment Reform program intends to “shake up” the standard curriculum, said Dr. Brad Baltensperger, an MTU research professor.

“This project is really about a new science curriculum for the middle school. The exams assess to determine if the students are learning and new preparation for teachers, whether it’s new teachers or existing teachers, so that they be prepared to teach this new high-standards science curriculum,” Baltensperger said.

Annual Award Recognizes Impact of Great Teachers

Ohio: Twelve teachers from the Newark area were presented with Dow Excellence in Education awards at a ceremony on Sept. 9. The award includes an apple trophy and $250 to use however the winner desires. For the past 27 years, Dow has partnered with the Licking County Educational Service Center to honor teachers from every county school district.

Joshua Spung, a math teacher at Utica High School, told the Newark Advocate newspaper that he was honored to receive the award as he begins his seventh year of teaching. “It’s evidence that I’m doing the right thing,” Spung said. “We try to make an impact on the lives of students, and to be recognized for that is pretty cool.”

Range of Programs at Teacher Resource Day • Thailand: Classroom Equipment Gives Teacher Heightened Ability to Demonstrate Science

3
UNITED STATES: A proud history of supporting teachers reached new heights in July with the first STEMtheGAP™ Teacher Challenge awards. This unique process recognizes the potential of working with teachers to identify the challenges they face every day, developing solutions to those challenges, then providing support for putting those solutions into action.

Teachers were asked to describe their greatest challenges in providing a quality STEM education, as well as possible solutions to those challenges. A total of 953 entries were submitted for the Challenge, which was divided into three phases, Spring, Summer and Fall. From those entries, The Center for Science Teaching and Learning, a New York-based nonprofit educational organization, selected 100 winners. Dow provided $1,000 to each winner as a way to kick start their proposed solutions.

“As a corporate citizen, Dow, like so many others, has a responsibility to give as much support as possible to teachers as well as other advocates of STEM education,” said Rob Vallentine, Dow Director of Corporate Citizenship. “We are extremely proud to see that these grants are helping to motivate and encourage teachers while also making an impact in the classrooms, schools and communities overall.”

A look at a few of the winning teachers demonstrates the results that are possible when people work together to seek creative solutions.

Donna Himmelberg – Fairport, New York

“Hands-on research needs to infiltrate the curriculum.”

Donna understands the financial limitations that many schools face trying to explore STEM subjects. Science, technology, engineering and math often require extensive resources that stretch beyond what is allotted within the traditional curriculum. However, the valuable skills that students develop from STEM projects will last a lifetime. Donna has had to be resourceful and creative to provide her students the most beneficial and exciting lessons. She believes that education should include as much authentic research and practice as possible.

“Opens up their eyes and gets them over their fears.”

Many students are intimidated by STEM subjects and are turned off from wanting to explore them further once they leave high school. To pique the interests of even her most academically reserved students, Donna and her colleagues formed a club devoted to the science behind space exploration. In conjunction with the NASA HUNCH Extreme Science program, students are able to design and test different experiments like the Weightless Wonder – a plane that flies parabolas to simulate weightlessness.

Erich Ziegler – Crystal Falls, Michigan

“It’s important to prepare students for a changing future.”

Erich is one of only two science teachers in his K-12 district in rural Crystal Falls, Michigan, but he isn’t letting that sap his motivation to teach students the importance of STEM careers at home and across the country. Erich is using his small rural community to his advantage, and explained how, with such a small department in science and math, teachers are able to collaborate on cross-curricular activities with ease. Working in this area of the Upper Peninsula of Michigan does present its challenges. “We live in a community where jobs are limited, and it’s my responsibility to prepare kids to be adaptable and learn to work in different situations,” said Erich.

“Teachers are working hard, and finances are limited.”

Erich was inspired to begin his teaching career after being positively impacted by family members and past teachers who embraced education. Erich explained that one of the biggest challenges facing teachers is limited finances to purchase resources to make hands-on learning possible. With his STEMtheGAP™ grant, Erich plans on purchasing learning tools for his classroom that will allow him to engage his students in passionate, tangible learning opportunities.
**And the Winners Are...**

Here are the 100 winners in the 2014 STEMbeGAP™ Teacher Challenge

**SUMMER**

**Maria Zwemmer** – Coleman, Michigan

“Students today need to see the connection between what they are learning in the classroom and real-life experiences.”

Maria’s love for agriscience comes from her childhood — she grew up on a farm and saw the first-hand role that agriculture plays in our lives. In time, she also realized how far removed people are from agriculture, which sparked her love to share why it’s so important. Maria learns by doing, and this practice is something she wishes to share with her students. Maria explained that STEM allows for making hands-on learning not only possible, but also fun and applicable. “Students will be able to see the hands-on aspect that STEM includes.”

**Heather Sevier** – Jacksonville, Florida

“Heather plans on using her grant to help fund a project that will raise broiler chickens in her school’s livestock program. Students will be met with the task of raising chicks, tracking feeding and comparing their growth to that of control pens. With this project, her students will learn hands-on about the scientific method, business costs and research investigation. By having students participate in this real-life, beginning-to-end business venture, they will be able to see for themselves the value of STEM in their everyday lives.”

**Kent Schielke** – Naperville, Illinois

“I’ve always been fascinated by the physical world around us and how it works.”

Kent is a science teacher for grades 6 through 8. He encourages his students to pursue STEM careers that will put them in a position to make a difference in our world. “I believe it’s critical for students to develop into participating citizens by having a solid base of scientific theory.”

**FALL**

**Hilary Hall** – Bethesda, MD

“An educator, Tawasha realized that how saturated with technology her students are outside of the classroom, but not necessarily inside of it. Many of the careers that she hopes her students will transition into after college rely heavily on technology. So she believes that in order to have a strong foundation, her students must be able to explore technology in the classroom. Like so many others, Tawasha’s school district has not had the funding to equip her classroom with updated technology such as microscopes and tablets. “Laboratories are essential to garnering and sustaining student interest in science.”

When she began her career as an educator, Tawasha realized that she needed to come up with a way to engage her students with science. Most of the information available in school is through textbooks and is often diluted as students lose interest before they ever get a chance to really explore STEM subjects. One of the programs that Tawasha has developed to immerse her students in science and pique their interest is by demonstrating blood typing. The process always fascinates her students, but due to financial constraints she is unable to hold these demonstrations very often. With her Dow STEMbeGAP™ grant, Tawasha hopes to hold science workshops with more frequency.”

**Andrea Watson** – Mandeville, LA

“Everyday is technology-based for them at home; we need to incorporate it more.”

Tawasha keenly aware of how saturated with technology her students are outside of the classroom, but not necessarily inside of it. Many of the careers that she hopes her students will transition into after college rely heavily on technology. So she believes that in order to have a strong foundation, her students must be able to explore technology in the classroom. Like so many others, Tawasha’s school district has not had the funding to equip her classroom with updated technology such as microscopes and tablets. “Laboratories are essential to garnering and sustaining student interest in science.”

When she began her career as an educator, Tawasha realized that **Heather Sevier** – Jacksonville, Florida

“Students today need to see the connection between what they are learning in the classroom and real-life experiences.”

Heather is an elementary school science teacher and is planning on using her STEMbeGAP™ grant to continue her professional development with the National Science Teachers Association and purchase supplies for her cross-curricular and grade level projects. By engaging her students in different areas concerning math, design, communication and building while working with their younger peers to build a project, she hopes to spark their interest in STEM.

“When I work with other teachers … it impacts the students in a positive way.”

Heather and her colleagues enjoy working together to create cross-curricular projects that can engage their students from all angles. Last spring, students built severe weather structures and were engaged not only in the science classroom but also in the computer lab doing research and in math finding dimensions. Even parents got involved in the project and in return it created a lot of excitement among students, their families and teachers.
Festival Gives Thousands of Kids a Chance to Explore, Excel

MICHIGAN: Among the thousands of middle school students at the second annual Dow Great Lakes Bay Science & Engineering Festival, Brock Atkins was special. He defeated a robot.

The two-day festival featured chemical reactions, flying contraptions, burning concoctions and a seemingly limitless collection of other demonstrations in the gym and surrounding hallways of Delta College, near Dow’s Midland headquarters. More than 3,500 students and chaperones registered for Day 1, swarming the displays in rolling waves of excitement and discovery, while Day 2 was an opportunity for the public to experience the fun.

Part of Dow’s display featured a robotic arm programmed to complete a puzzle made up of pieces in the shape of numbers, which had to be assembled in numerical order. An identical puzzle was nearby for students to race the robot in a frenzied battle of human versus machine. One by one, the students tried their luck, most of them scrambling through the puzzle in a flurried arms race with the robot coolly and quietly picking up pieces and putting them in place.

When Brock got to the front of the line, however, the robot’s good fortune ran out. An eighth-grader at Christa McAuliffe Middle School in Bay City, Michigan, Brock likes tennis, jogging and engineering. And he had a plan.

“I tried to memorize the colors and the shapes of the pieces,” Brock said after defeating the robot, a rare occurrence. “It was no big deal.”

The robot was operated by a group from Dow’s Information Research team, which handles a variety of technology tasks in support of the Company’s operations. Matt Ninke and Lyle McCarty were on hand to not only run the exhibit, but to talk to students about the many ways Dow uses technology – and the many jobs available to people with the right skills.

“Spending a day in a gym filled with excited middle schoolers might be an intimidating activity for some adults, but Ninke said he was glad to pitch in.

“These kids are the future,” Ninke said. “Dow’s done so much for us. It’s a great place to work. So this is kind of giving back a little.”

Building Bridges to the Future:

Students Work Together to Develop Engineering Skills in Rewarding Summer Program

PENNSYLVANIA: Using nothing more than pasta, epoxy and a newfound understanding of engineering, small teams of high school students competed to build the strongest bridge during the culmination of an enriching summer experience.

The Johns Hopkins Engineering Innovation Summer Program at Montgomery County Community College (MCCC) in Blue Bell, Pennsylvania, provided a month of instruction and lab activities in computer, chemical, electrical, civil and mechanical engineering, as well as material science and robotics. It was led by MCCC Faculty Diversity Fellow Gayathri Moorthy and adjunct science instructor Frederick Schlick.

“This experience has truly changed my life,” participant Carolyn Sweeney wrote in a letter thanking Dow for providing scholarships that helped offset tuition costs for students. “The exposure to the different fields of engineering has completely opened up my eyes to all that the career has to offer. I am now 100 percent positive that engineering is the path for me.”

Part of that challenge was building a pasta bridge with a maximum width of 250 grams, maximum height of 25 centimeters, span of 50 centimeters and minimum width of five centimeters. The winning bridge, built by Roger Yu, Juyeong Oh, held 35 pounds, beating last year’s record of 16.5 pounds. In second place were Albert Abreveya, Sandy Tang and Vashveer Singh; their bridge held 20 pounds.

STEM News • Australia: Liveris Helps Inaugurate Dow Centre for Sustainable Engineering Innovation • China
THEM News • Australia: Liveris Helps Inaugurate Dow Centre for Sustainable Engineering Innovation • China: Agreement Reached with Heilongjiang Science and Technology Museum to Open Dow Chemistry Lab

"And there's a lot more to it than building a robot. There's marketing. There's financing. It's a business." — Rehberg said.

Rehberg is the President of FIRST of the Great Lakes Bay Region, a nonprofit organization that supports more than 17 teams in Michigan. That support ranges from funding for new teams to running a Michigan district competition in March. In 2014, the organization’s big accomplishment was launching a dedicated FIRST Robotics facility in a recently closed school in Midland, Michigan. Christened the Franklin Robotics Center, the building offers a safe, efficient environment for several teams to do the intense work needed to create a successful robot.

Rehberg is a Senior Investment Manager in Dow’s Corporate Venture Capital operation in Midland. He identifies companies and technologies that might help Dow. He was trained as a chemical engineer and started at Dow in 1980 as a process control engineer. “That’s pretty much what’s happening with FIRST Robotics process control,” said Rehberg, who began helping as a mentor for his son’s team eight years ago. “And there’s a lot more to it than just doing it.”

Mike Rehberg helps out during a FIRST Robotics event in Midland, Michigan.

Summer Camp at SLU Teaches Technology

LOUISIANA: About 50 students developed a broad understanding of robotics and computer programming during a week of day camp sessions in July that were sponsored by Dow and hosted by Southeastern Louisiana University (SLU).

The university’s Department of Computer Science and Industrial Technology joined forces with the Department of Kinesiology to craft two distinct camp experiences for two age groups. Students 17 to 15 years old were on campus from noon to 4 p.m. each day, working in teams to program robots to complete specialized tasks. Students 14 through 12 years old met from 9 a.m. to 1 p.m. each day, not only working with robots and computers but also taking part in fitness activities such as swimming, games and an obstacle course.

Michael Faulkner, Production Leader, St. Charles Operations, spoke to the students on the last day of the week and helped give out prizes. The camp was run by Sebastian van Delden, SLU Professor and head of the university’s Department of Computer Science and Industrial Technology. “Most all of the kids were very engaged,” van Delden said after the camp. “Learning by doing is usually the best way to reinforce concepts and also apply math concepts that otherwise might seem abstract or unimportant to a student.” Feedback from parents indicated that the camp was a success.

“I really appreciate you and your colleagues organizing it and Dow for sponsoring it,” the mother of one student wrote to van Delden about the camp. “The spark of interest that [my son] gained at the camp has him ready to see what his future in the world of engineering thanks to your department.”

Top: Robotics are a key component of the day camp sessions hosted by Southeastern Louisiana University. Bottom: Guiding a multicopter serves to develop an interest in technology as well as building technical skills.

Engineering Academy Opens in Oldham County

KENTUCKY: Students demonstrated projects and discussed why they want to be engineers at an Oct. 13 open house for the new Oldham County School District Engineering Academy in Crestwood.

Superintendent Dr. Will Wells, state legislator David Osborne, teachers and students thanked Dow and other sponsors of the academy, which opened in August.

Initiative and Sustainability Awards Recognize Top Students

THAILAND: Students from 20 educational institutions around the country took part in this year’s Science & Technology Initiative and Sustainability Awards, which recognize the importance of applying knowledge in science and technology to the development of innovations that have economic potential and are eco-friendly.

Dow Thailand and a number of business and research partners organized the program, which also encourages Thai youth to learn and develop their research capacity with a focus on sustainable use of resources and business planning that is suitable for implementation in the real business environment.

Innovation Day at University of Queensland Expands Partnership

AUSTRALIA: Building on a partnership with the University of Queensland, Dow leaders met on campus with university students and researchers for Innovation Day on July 7.

More than 40 people took part in speeches, discussions and ceremonies at the university, which is the home of the Dow Centre for Sustainable Engineering Innovation. A six-year Dow funding commitment enabled creation of the Centre, designed to address sustainability challenges of the 21st century by bringing together cutting-edge research expertise and world-class science and engineering education.

Innovation Day also included a ceremony for the Dow Sustainability Innovation Student Challenge Awards. Three finalists were evaluated by a panel of people from Dow and the university, and prizes were awarded to the winners.

SEEK Camps Give Kids Inspiration Along With Information

UNITED STATES: For three weeks, students dive into STEM concepts with all their energy at the Summer Engineering Experience for Kids (SEEK), run by the National Society of Black Engineers (NSBE).

Dow is one of the program’s biggest sponsors, making it possible for camps to serve students in cities including Detroit, Michigan, and Philadelphia, Pennsylvania. And it’s all free to every single camper.

A key part of the SEEK experience is the involvement of young NSBE members, college students and early professionals who serve not only as camp teachers but as role models.
MicroSociety Has Big Outcomes for Participating Students

**CANADA:** Critical thinking and innovative problem solving are key parts of the MicroSociety program at Aspen Heights Elementary School in Red Deer, Alberta. Through MicroSociety, students are part of a functioning economy, with student-run banks, businesses, an elected government, police, postal service, newspaper and non-governmental organizations. Each student fills out a job application, goes through an interview process and has a work performance assessment completed by a manager. "This program engages students in demanding and relevant learning experiences that generate genuine enthusiasm," said Shawna Bruce, Public Affairs Manager for Dow Canada, which sponsors the program at Aspen Heights. "Hands-on projects that require integration of STEM subjects help students develop useful skills and take what they learn in the classroom and apply it to everyday life."

A study by Northwest Regional Educational Laboratory of 29 MicroSociety schools found that most reported significant increases in test scores as well as increased attendance and reduced disciplinary infractions. "The reality is that for the next generation of students to succeed, they must develop a basic understanding of engineering design and have hands-on experience creating, building and refining new ideas, inventions and innovations," emphasized Bruce. "Dow needs future employees that embody Micro-like skills.”

Dow is funding PLTW programs at the following schools in key Dow communities:

**INDIANA**
- Indianapolis: Guion Creek Middle School
- Indianapolis: Lincoln Middle School
- Indianapolis: New Augusta Academy North
- Bay City: Bay City Central High School
- Bay City: Handy Middle School
- Freeland: Freeland High School
- Freeland: Freeland Middle School
- Midland: Bullock Creek High School
- Midland: Bullock Creek Middle School

**MICHIGAN**
- Bay City: Bay City Central High School
- Bay City: Handy Middle School
- Freeland: Freeland High School
- Freeland: Freeland Middle School
- Midland: Bullock Creek High School
- Midland: Bullock Creek Middle School

**PENNSYLVANIA**
- Levittown: Devine site (Mary W. Devine, Lafayette, and Maple Shade Elementary Schools)
- Levittown: Emson site (Ralph Waldo Emerson, Clara Barton and Abraham Lincoln Elementary Schools)
- Levittown: Buchanan site (James Buchanan, George Washington and John Fitch Elementary Schools)

**LOUISIANA**
- Plaquemine: Plaquemine High School
- Reserve: East St. John High School
- Laclede: East St. John Elementary
- Port Allen: West Baton Rouge STEM Academy
- Brusly: Brusly High School

**UNITED STATES:** Students at 17 schools in Indiana, Louisiana, Michigan, and Pennsylvania will benefit from the inspiring power of Project Lead The Way (PLTW) thanks to a new partnership between PLTW and Dow. Through PLTW’s hands-on, activity-based K-12 programs, students become engaged in STEM fields while developing critical thinking, problem solving, and collaboration skills. More than 6,500 elementary, middle, and high schools in all 50 states and the District of Columbia offer PLTW courses to their students.

With Dow’s support, the PLTW model will be extended to 17 selected schools, all within Dow communities. In addition, Dow employees will work with teachers and students in PLTW classrooms through the Company’s STEM Ambassadors program. These trained STEM Ambassadors aim to support teachers and inspire students by providing real-life examples to make challenging concepts easier to understand, while incorporating a strong focus on sharing exciting opportunities available through pursuing STEM careers.

"The United States is facing a significant skills gap, and Dow is taking action to fill that gap. They are leading by example," said PLTW President and CEO Vince Bertram. "Not only are they creating skilled jobs in our economy, but they are helping to develop the workforce to fill those jobs. We are grateful for Dow’s support of Project Lead The Way, which is giving students across the country access to high-quality educational opportunities.”

For more information, visit www.pltw.org.

Partnership to Support 17 Schools

STEM News • Michigan: Saginaw Valley State University’s STEM Scholar Network Taking Shape • Korea: Dow Korea • Dow

Students develop deeper understanding through hands-on activities in Project Lead The Way classes.
Students, Professionals Can Be Recognized for Outstanding Ideas

ARGENTINA: The fourth edition of the Dow Chemistry and Sustainability Awards got underway in Argentina, with the goal of improving understanding of chemistry as an enabling science.

Awards recognize work from students of chemistry, physics, biology, engineering and math, as well as university professors, scientists, professional journalists and students of journalism or social communications.

Sponsored by the National Minister of Science and Technology and the National Agency for Science and Technology, past winners have included articles on renewable energy, energy-efficient buildings, reuse of water, waste management technologies, sustainable food, health care, carbon emission reductions and many others.

Visit to Izolan Facility Includes Hands-on Learning

RUSSIA: Students from the secondary school at the Lukchitnovskiy orphanage learned about chemistry first-hand during a visit to the nearby Dow Izolan facility on Nov. 6.

Mikhail Tsarfin, General Manager of Dow Izolan, welcomed the guests and spoke about the importance of chemistry in everyday life. The children watched a video about the plant and visited its high-technology laboratory, where the employees demonstrated experiments with polyurethane foams and other substances. The students got interested in the Company’s technologies and actively participated in the experiments.

“I’m glad that our employees support such initiatives and take an active part in events like this one,” Tsarfin said. "I really wish the students of the Lukchitnovskiy orphanage success and happiness in future!"

Youth Learn Leadership Skills Along With Science

TEXAS: Employees from Dow’s Seadrift Operations participated in the YOUth LEADership Conference at Victoria College this summer, providing a full day of hands-on experiments, science-based activities and other experiences for 120 graduating sixth-graders.

The program gives students an opportunity to develop leadership skills and to reinforce sound moral character. The conference also allowed students to work on service projects, understand business etiquette and even learn how to pick the correct fork at a formal meal.

The Seadrift Operations site’s Science Demonstration Team, New Professionals Network, I&E and Maintenance groups took part in the activities.

China: Graduate students from several Dow strategic universities visited the Shanghai Dow Center in July to learn safety practices.

Dow Safety Open Day was hosted by Research & Development and Environment Health & Safety Delivery and External Technology team members. In addition to discussing safety, the 30 students who attended had an opportunity to meet with the Dow Human Resources University Relations Team to build a better understanding of career development.

In addition to welcoming students to the Shanghai Dow Center, Company representatives have traveled to a number of Chinese universities since 2012 to discuss lab safety practices, reaching more than 1,200 students and staff members.

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Changing the World

SISCA Recognizes, Motivates Innovative Researchers at Leading Universities

Emily Woods, left, earned the top prize in the 2014 Dow Sustainability Innovation Student Challenge Award program at the University of California-Berkeley.

Emily Woods has a vision of a better world, and she’s not afraid to deal with some unpleasantness to make change a reality. Emily is a Ph.D. student at the University of California-Berkeley. She is the 2014 winner of the university’s Dow Sustainability Innovation Student Challenge Award (SISCA).

Every year, Dow works with some of the world’s top universities to identify graduate student research with the potential to solve world challenges. Each university establishes its own SISCA selection process in line with Dow’s high-level criteria, which include interdisciplinary nature of the work, innovative thinking and research excellence. Grand prize winners receive $10,000 and runners-up receive $2,500.

The project that earned top honors for Emily involves toilets. More specifically, it involves what goes into toilets. She has spent the past few years in Kenya developing a technology that uses solar energy to turn human waste into a usable fuel source. Her start-up organization, Sanivation, distributes free, high-quality toilets in rural areas where most people would otherwise be forced to use communal latrines. Customers pay an affordable monthly fee for regular collection of the toilet waste. Sanivation transforms it into sanitary briquettes that are cleaner and more affordable than the charcoal that most area residents use for fuel.

Other 2014 SISCA winning projects from around the world included: • A University of Minnesota student’s research into magnets made of iron and nitrogen instead of more problematic rare earth elements • A King Abdullah University of Science and Technology student’s research into technology that can convert waste heat to useful electrical power • A Penn State student’s research into optimizing irrigation water consumption using a special sensor • A University of São Paulo student’s research into techniques for studying diseases in citrus fruits

“With the SISCA award, I feel completely honored and encouraged to continue to do science and search for innovative solutions that contribute to global needs,” said Anielle Coelho Ranulfi, the student who conducted the University of São Paulo citrus research.

For a complete report on the SISCA program, go to www.dow.com/sustainability/studentchallenge.

Lessons Relate to Life in the City

INDIA: Science became real for 180 middle school students during the City As a Lab initiative, which focused on real-world issues and solutions in Mumbai.

The initiative is a platform for students from low-income backgrounds to present original research to an authentic audience. Teachers and volunteers working in under-resourced schools guided the students to complete research projects that address questions relevant to Mumbai and their own lives in their city. Participants submitted research papers on various topics and the top 10 finalists presented to a panel of scientists and educators on Sept. 20 at the city’s Prince of Wales Museum.

“The high passion and enthusiasm was visible in each of the presentations,” said B.K. Sethuram, Product Director, Dow Coating Materials and Acrylics, Asia Pacific. Sethuram was a judge and many Dow volunteers assisted at the event, which was sponsored by Dow India in collaboration with Reniscience Education, an organization that works with teachers, children and schools to present highly engaging, self-directed learning experiences inside and outside the classroom.

“I am sure initiatives like this can develop critical thinking amongst the students and help them bring the change that will enable them to make this city a better place,” Sethuram added.

One of America’s Top Engineering Schools Is About to Get Better

TEXAS: Shared-use laboratories, flexible classrooms and a state-of-the-art educational environment will soon be the new academic learning ground for engineering students at Texas A&M University.

A nearly $50,000-square-foot Engineering Education Complex, part of Texas A&M’s Dwight Look College of Engineering, will become the hub of the university’s undergraduate engineering program. Built with support from Dow, it will be adjacent to the existing Zachry Engineering Center, which will be renovated during the construction project.

“This generous donation from Dow is more than just a contribution to a building, it is support for our vision to provide a unique learning environment for our students,” said Dr. M. Katherine Banks, Vice Chancellor and Dean of Engineering.

“This new facility will change the way we deliver our engineering education and thus help us to produce the next engineering leaders.”

With more than 350 tenured and tenure-track faculty members and more than 12,000 students, the Look College is one of the largest engineering schools in the country, ranking third in undergraduate enrollment and ninth in graduate enrollment. The college is ranked by U.S. News & World Report seventh in graduate studies, eighth in undergraduate programs and second in research expenditures among public institutions.

For more information about the project, visit http://engineering.tamu.edu/25by25.
University Students Visit Lavrion Facilities

GREECE: Seven students from the University of Patras visited Dow facilities in Lavrion. The session included an introduction by Despina Anastasiou, General Manager of Dow Greece and Cyprus, and a presentation by Anna Mathaiou, Lead Production Engineer.

“These students are the next generation of our potential employees and leaders,” Anastasiou said. “Their orientation towards chemistry and their insightful questions are positive signs for the sustainable future of our industry.”

Centre for Applied Technologies Will Be Hub of an Enriching Environment

CANADA: The Centre for Applied Technologies now under construction at Northern Alberta Institute of Technology (NAIT) will enrich the learning experience for 5,000 full-time students.

Dow Canada recently announced a major donation to NAIT, where funds will not only support the Centre for Applied Technologies but will also make possible a biennial seminar for NAIT’s power engineering students showcasing the career possibilities at Dow’s Fort Saskatchewan site.

Forty Students Take Part in Materials Engineering Week

BRAZIL: With 40 students eager to learn, Dow’s sponsorship of the 50th annual Materials Engineering Week at the University of São Paulo was a big success.

Dow employees spent several hours with the students on Sept. 23, including a hands-on activity in which students designed custom packages for given products.

Campers Spend Time Among Top Minds in Chemistry

TAIWAN: About 150 high school students gained valuable insight at the Madam Curie Chemistry Camp. The week-long camp included lectures, forums, an educational trip to top research institutions and speakers including Nobel Prize winner Ting Zhaohong.

The program concluded on July 11 with the camp award ceremony, which was sponsored by Dow for the fourth consecutive year.

Top-Level Support

Liveris Welcomes Students to Young Scientists Program

UNITED ARAB EMIRATES: Students from three countries in the Middle East have a special opportunity to explore STEM fields with the launch of the Young Scientists Program, a cooperative effort between Dow and the Gulf Petrochemicals and Chemicals Association (GPCA).

From educational institutions in the United Arab Emirates, Saudi Arabia and Kuwait, the program’s talented students are participating in a range of activities, including a visit to Dow’s Jebel Ali Coatings Plant, an orientation program at Dow’s regional head office and attendance at the Annual GPCA Forum, the GPCA announced in November.

Dow Chairman and CEO Andrew Liveris highlighted the Young Scientists Program, and its attending inaugural class, during his remarks at the GPCA Meeting on Nov. 24 in Dubai, UAE, emphasizing that the region will benefit greatly by supporting its students.

“Through their work, through their aspiration to pursue careers in the sciences, they represent the future we all want to build for the region and for our industry,” Liveris pointed out. “They will help write the next chapter of advanced manufacturing in the Middle East – an exciting development for those who call this region home – and for businesses who do the same.”

In addition to enjoying many hands-on experiences with the downstream petrochemical industry, the students will also receive accreditation for their achievements. The program will offer students access to some of the biggest names in the petrochemical sector and provide them with opportunities to network with renowned experts from across the industry at the GPCA Forum, the industry’s flagship event in the Arabian Gulf region.

“Dow is a firm believer in developing and investing in the next generation to help build a better future,” said Markus Wildi, Dow’s President for the Middle East, North Africa and Turkey. “This program endorses Dow’s firm belief that the health of our sector is firmly intertwined with the health of the communities where we operate and supports Dow’s STEM mission to help build the workforce of tomorrow by empowering and developing the youth of today.”

Awards Encourage Putting a Variety of Skills to Use in Solving Some of the World’s Great Challenges

MICHIGAN: Three University of Michigan student teams representing seven schools and colleges were honored on Nov. 15 with the Dow Distinguished Award for Interdisciplinary Sustainability.

They were among more than 70 Dow Sustainability Fellows who gathered with faculty advisers, community members and other students to showcase and discuss their research at the first annual Dow Sustainability Symposium.

It’s all part of U-M’s Dow Sustainability Fellows Program, which includes groups of graduate-level students spanning multiple academic levels and seeks to prepare future sustainability leaders to make a positive difference in organizations worldwide. The goal of the program’s Distinguished Awards competition is to spur multidisciplinary strategies to help solve pressing sustainability challenges.

“Distinguished Award winners hail from a wide range of academic disciplines, and they include the full range from undergraduate students to doctoral candidates,” said Special Counsel to the U-M President on Sustainability Don Scavia, who opened the symposium. “It’s wonderful to see them coming together to do such meaningful, solutions-focused sustainability work.”

Welcomes Almost 800 Graduating Students • Thailand: Mobile Science Learning Center Encourages Exploration of Science • United Arab Emirates: Dow Supports Clemson University Team in Auto Challenge • Singapore: ChemEx 2014 Welcomes Almost 800 Graduating Students • Thailand: Mobile Science Learning Center Encourages Exploration of Science
Apprenticeship Program Expanding

UNITED STATES: Dow has begun to put in place a pilot program that will expand its U.S. Apprenticeship activities to several sites across the nation in 2015. This pilot program supports a major initiative of the Advanced Manufacturing Partnership (AMP), a national effort to secure U.S. leadership in emerging technologies, create high-quality manufacturing jobs and enhance America’s global competitiveness.

“Skills training in manufacturing is crucial for America’s global competitiveness,” Dow Chairman and CEO Andrew N. Liveris said as the program was announced in October. “Today, when Americans graduate from high school, there are simply too few options for skills-based continuing education. Apprenticeship programs provide an opportunity for the public and private sectors to partner in a meaningful way and to prepare the next generation of Americans for tomorrow’s high-skilled, high-paying advanced manufacturing careers.”

The paid apprenticeships will offer high school graduates three to four years of world-class training and on-the-job experience in some of the most sought-after and highest-earning technical specialties in the industry.

Through partnerships between Dow and local community colleges, the program will combine classroom training and hands-on learning to build in-depth skills and experience. Upon completion of the program, apprentices will be evaluated for employment opportunities at Dow.

After the October announcement of the program, the process for selecting the initial class of apprentices began. Each site will have an apprenticeship trainer to coordinate the curriculum and oversee the site’s apprentices. Several of those trainers have been hired, and five of them, along with the program curriculum leader, accompanied program owner Lisa Skaggs, Dow Human Resources Director, to Germany in December to study existing Dow apprenticeship programs there.

“We went to Germany to benchmark their program and learn from their experience,” Skaggs said. “We were able to meet several of their trainers and apprentices and learn more about the overall program, including the hiring process, the curriculum and what works well.”

The first U.S. apprentices are scheduled to begin in March at Dow sites in Freeport, Texas; Seadrift, Texas; and Pittsburg, California. From there, the program will spread to other sites, with plans for approximately 60 apprentices to start the program in 2015. They will train for roles as Chemical Process Technicians, Instrumentation & Equipment Technicians and Analyzer Technicians. Apprenticeship trainers are searching now for candidates to take apprenticeships that begin in summer 2015.

For more information, go to www.dow.com/careers/what/manufacturing-engineering/apprenticeship.htm.

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Leaders of Dow’s U.S. Apprenticeship pilot program meet with apprentices at a Dow site in Germany in preparation for the launch of the U.S. program.

Career Videos Cut Through Uncertainty

Choosing a career is easier when you know what you’re getting into. So Dow provides online videos that anyone can view for a peek into some of the STEM careers available with the company. Each video profiles a different career by introducing viewers to a Dow employee who works in the field. The careers include a research scientist, chemical engineer, mechanical engineer, welder, electrician and environmental engineer.

“I wanted to be doing something in the real world that would impact the place that I live and the world, right now and in the future,” explains Erin McGregor, a Dow Environmental Engineer who is profiled in one of the videos. “I had to go to school for four years at an engineering accredited university. It does take a lot of work. It takes a lot of studying and preparing, and it takes a lot of thinking.”

Opening Doors Opens Opportunities

LOUISIANA: Students preparing for possible careers in process technology got a glimpse of the real world during a visit Nov. 6 to Dow’s St. Charles Operations (SCO). More than 25 students from the Satellite Center for Hahnville and Destrehan High School toured the Emergency Services and Security EOC building, Energy and Environmental Operations control room, and the SCO Oxide II facility.

The Satellite Center, which opened in 2001, provides a progressive learning environment for students embarking on career paths ranging from process technology (PTEC) and engineering to culinary arts and television production.

“The students in the PTEC program are dual enrolled in a PTEC program at a local technical college, so they can actually earn up to seven credit hours for college if they want to pursue this career after high school,” said Taylor Domengeaux, SCO Training Coordinator and one of the Dow hosts.

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Apprenticeship Program Expanding

STEM News • Pennsylvania: Philadelphia Area Girls Enjoying Science Hosts STEM Conference for Aspiring Female Scientists • Russia: “Secrets of the Chemistry World” is a Joint Educational Project of Dow and the Experimentanium Scientific Museum

Knazs sets ambitious goals for the internship program for LMC students. California, site as part of the program. Employees host tours of the Pittsburg, knowledge on to students, Dow employees who support the ETEC programs.

“We need to see that Dow fulfills its social responsibility as an educator as well,” Horgen Site Leader Marc Winet said.

William Cruz of Los Medanos College talks with Dow’s Kevin Murray about the college’s outdoor lab.

Kevin Murray explains part of the operations process at Dow’s site in Pittsburg, California, to students as part of the company’s Cooperation with Los Medanos College to train people for new careers.

William Cruz of Los Medanos College talks with Dow’s Kevin Murray about the college’s outdoor lab.

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Successful Apprentices Earn Recognition

SWITZERLAND: A celebration was held at Dow in Horgen on July 10 to applaud the successful completion of the final commercial apprenticeship exam of Noemi Schminke and Samed Mehovic.

“Apprenticeships play an important role in Switzerland, and therefore it is good to see that Dow fulfills its social responsibility as an educator as well,” Horgen Site Leader Marc Winet said.

Workshops Provide Inspiration to Girls

JAPAN: The career possibilities available to women were detailed at workshops conducted as part of a partnership between Dow and the TOMODACHI Initiative.

Three Dow employees, Sayaka Ito, Dow Water and Process Solutions; Chikayo Sekiguchi, Dow Automotive Systems; and Noriko Kajitani, Dow Microbial Control, were among the professionals providing inspiration to 120 high school girls from the area of Fukushima, which is still recovering from a devastating earthquake and tsunami in 2011.

Technology Helps Make Fair a Success

ENGLAND: More than 100 students at Imperial College in London learned about career possibilities at Dow during the college’s annual engineering careers fair.

Dow was one of several companies at the fair, and used new mobile technology to help connect with the students who expressed interest.

Full-time. As an additional motivator, all graduates of the PTEC program are guaranteed an interview with Dow.

For Casey Pierce, a 2012 LMC graduate and now a Dow Operations Technician, the PTEC program provided an opportunity for growth in a stalled career as a contractor. During his two-year coursework, he interned for Dow and was quickly hired full-time after graduating.

“PTEC is essential for anyone looking to be a part of the team bringing value to the customers and therefore it is good to see that Dow fulfills its social responsibility as an educator as well,” Horgen Site Leader Marc Winet said.

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Leaders representing business, education and public service organizations joined forces in new ways at the Great Lakes Bay Region STEM Impact Initiative Summit.

**MICHIGAN:** More than 400 educators, business people and others who understand the power of STEM education to transform their community joined forces at the Great Lakes Bay Region STEM Impact Initiative Summit to begin the march toward prosperity.

The cornerstone of the Nov. 13 summit at Central Michigan University was the unveiling of a comprehensive study of the region and its potential for success in the modern economy. Months of research and analysis by experts from across the nation produced a game plan for STEM excellence in the region, which includes Dow headquarters in Midland. The STEM Impact Initiative is a long-term effort organized by the Great Lakes Bay Regional Alliance with significant financial and leadership support from Dow and other regional organizations.

The study proposes specific steps that people and organizations can take to align the STEM education opportunities available in the region with the needs of regional employers. That alignment, along with cooperation between people on both sides, is the key to prosperity, the Initiative insists.

After hearing the details of the study, participants broke into small groups built around aspects of its recommendations. They added their perspectives, discussed opportunities and began planning the path forward.

“We’ve made so many connections,” attendee Linda Englehardt said. “So much enthusiasm, and a real willingness to share.”

For more details about the Great Lakes Bay Region STEM Impact Initiative, including the regional study, go to www.greatlakesbay.org.

**TEXAS:** Padma Narayan, Dow Senior Research & Development Manager in Freeport, was invited to participate as a “STEM to STEAM” panelist at the Houston Arts Partners Conference on Sept. 6. Other panelists included Dr. Billy Cohn, Texas Medical Center; Travis Herzog, Houston ABC-13 meteorologist; Dr. Reagan Flowers, Center; Travis Herzog, Houston ABC-13 meteorologist; and Tony Castilleja, Boeing and panel moderator.

The conference focused on how science and engineering programs can incorporate a creative approach, including such elements as arts, design, music, etc., to improve performance. One of the goals of the panel was to address the misconception that having a penchant for the arts diminishes one’s ability to be successful in STEM fields.

“Personally I can relate to this, as I am involved with playing violin as a hobby in community orchestras and volunteering for programs at the Houston Symphony,” Narayan said. “I feel that elements of creativity and design are absolutely paramount to ensure we can develop new technologies, viable product concepts, and have fun at work. Integrating this in school systems early on is important for brain development, and also should continue into the workplace.”

**CALIFORNIA:** A team of Dow employees attended the 2014 Society of Women Engineers (SWE) Global Conference held Oct. 22-26 at the Los Angeles Convention Center. The annual event attracted more than 8,000 attendees, including female engineering students and experienced professionals, to discuss opportunities available in the region.

Dow was represented at the conference by a cross-functional team made up of representatives from Operations, Commercial, Purchasing and Information Systems, and hosted two workshops:

- Developing “You” – Tools and Techniques to Evaluate Yourself and Your Career Development: presented by Jessica Synder, Associate M&E Manager, External Manufacturing; and Lisa Cashbaugh-Sanchez, Wilimington Site Leader and Chicago Area Hub Leader.
- The Fascinating World of Packaging as an Engineer: presented by Rashi Tiwari, Senior Engineer in Materials Science, Core R&D.

The presidents of six colleges and universities in the Great Lakes Bay Region of Michigan shared their insights on STEM education with the more than 400 participants at the Great Lakes Bay Region STEM Impact Initiative Summit.

After learning about a comprehensive study of the Great Lakes Bay Region’s STEM opportunities, summit participants broke up into small groups and began making plans for implementation.

**Society of Women Engineers Conference Attracts Many**

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- Developing “You” – Tools and Techniques to Evaluate Yourself and Your Career Development: presented by Jessica Synder, Associate M&E Manager, External Manufacturing; and Lisa Cashbaugh-Sanchez, Wilimington Site Leader and Chicago Area Hub Leader.
- The Fascinating World of Packaging as an Engineer: presented by Rashi Tiwari, Senior Engineer in Materials Science, Core R&D.

The presidents of six colleges and universities in the Great Lakes Bay Region of Michigan shared their insights on STEM education with the more than 400 participants at the Great Lakes Bay Region STEM Impact Initiative Summit.

After learning about a comprehensive study of the Great Lakes Bay Region’s STEM opportunities, summit participants broke up into small groups and began making plans for implementation.
Brendy Lange isn’t a scientist, but he knows that they are key to a prosperous future for economies across the globe. So he’s doing what he can to make sure there are enough of them.

Lange is Director of Strategy for Dow Japan as well as Commercial Leader for Dow’s Electronic Materials Business in Japan, where he leads the Company’s participation in the semiconductor, printed circuit board and display markets.

“As someone who works in a very technical business without a science and technology background, the incredible power that a STEM education can have,” Lange said. “I am continually amazed by the capabilities, the way of thinking and the overall impact that our technical team has - no problem is too big to be solved.”

Lange represented Dow at the second Open Forum for Science, Technology, Innovation and Education Cooperation between Japan and the United States. The forum took place on July 1 in Tokyo and was hosted by the Japanese Ministry of Foreign Affairs, Ministry of Education, Culture, Sports, Science & Technology and the Japan Science & Technology Agency, with support from the U.S. Embassy. Lange was part of a panel discussion on the role of human resources development in fostering innovation.

“Although Japan is known globally as a technology leader, you may be surprised to know that Japan is seeing a trend of declining enthusiasm in STEM education - despite the broad awareness that this background is mission-critical to the growth of the Japanese economy. In fact, the percentage of students pursuing STEM education has declined steadily since 1970,” Lange said. “In many respects, Japan has many of the same challenges regarding STEM that the U.S. has. In a recent study by the National Institute for Youth Education in Japan, the percentage of students that were interested in nature and/or science was lower in Japan than in the U.S.”

Japan hopes to boost its economy by attracting more high-tech manufacturing operations. But that can only work if there are enough people with the skills required for modern operations.

“Dow Japan has done its part by participating in events like the Open Forum, taking a leadership role in promoting STEM via the partnership with the TOMODACHI initiative, while also encouraging local governments and communities to support STEM education via our local community development activities,” Lange said. “In Japan, just as it is everywhere Dow operates, our greatest asset is our people, and so it is our job to make sure the next generation of Dow Japan leaders and employees have the necessary education and skill set to lead us in the future.”

**NOBCChE Focused on Providing Opportunity**

**UNITED STATES:** Part of the solution to the shortage of people with STEM skills is making sure that all people have an honest chance to develop those skills. The National Organization for the Professional Advancement of Black Chemists and Chemical Engineers (NOBCChE) is committed to overcoming a historical underrepresentation in the sciences through a number of programs as well as through the dedication of many professional scientists. The NOBCChE 2014 STEM Festival, which this year took place Sept. 27-28 in New Orleans, Louisiana, is an example. A Science Bowl and Science Fair are the cornerstones of the A Science Festival, Science Bowl and Science Fair are the cornerstones. The festival also features demonstrations and presentations to engage students, parents and the general public.

NOBCChE invites scientists, science centers, planetariums, science museums and other individuals and organizations that do STEM outreach to do their best to engage visitors. The national organization also puts on Step up to Science, the NOBCChE Teachers Workshop, NOBCChE in Your Community and the NOBCChE Young Entrepreneurs Program. In addition to these national programs, NOBCChE supports a network of local professional and academic chapters, each of which is active in supporting STEM outreach. In Saginaw, Michigan, for instance, members from the nearby Midland, Michigan, professional chapter offered a Summer Science Enrichment Camp at Thompson Middle School this year. Students met for four Saturdays in July and August to learn a variety of scientific principles and apply the scientific method to several technical challenges, including making liquid rainbows, identifying “mystery” markers through chromatography, building robust structures out of spaghetti noodles and constructing balloon rockets.

Dow partners with NOBCChE to make possible the Enrichment Camp, a local Science Quiz Bowl competition, and many other programs. Perhaps more importantly, many Dow employees devote their time, energy and expertise to make NOBCChE events possible. The 22 volunteers at the Enrichment Camp included 12 Dow employees. For more information about NOBCChE, including the 2014 STEM Weekend, go to www.nobcche.org. For information about the Midland Chapter, go to www.michn Nobcche.org.

**NOBCChE puts professional scientists together with students as a way to overcome some of the challenges that stand between the students and careers in STEM fields.**

**Project Lead The Way Provides Forum**

**INDIANA:** Eunice Heath, Dow’s Global Director for Sustainability, Business Engagement and Education, was one of the keynote speakers at the 2014 Project Lead The Way Summit, Nov. 2-5, in Indianapolis, Indiana. The event brought together nearly 1,500 educators and leaders in the corporate, nonprofit and government sectors who work together to help students develop the knowledge and skills they need to succeed. Dow is proud to support PLTW in a number of schools throughout its key U.S. communities.

**Project Lead The Way (PLTW)** is a leading provider of K-12 STEM programs, offering activity-, project- and problem-based curriculum and high-quality teacher professional development. More than 6,500 elementary, middle, and high schools in all 50 states and the District of Columbia offer PLTW courses to their students. For more information, visit www.pltw.org.
A variety of resources is available to anyone who wants more information about science, technology, engineering and math. Here are some of those resources, as well as people within Dow who are involved in the Company’s STEM education activities around the world.

**STEMtheGAP® Education Movement:** A worldwide STEM education community built on the premise that many people have insights into the challenges and opportunities that exist in the real world, and communication between those people is the best path toward progress.

www.facebook.com/STEMtheGAP

**Chemical Educational Foundation:**
A nonprofit organization that runs the You Be The Chemist® Challenge, a nationwide competition for middle school students. In conjunction with the competition, the foundation provides several resources for students and teachers.

**You Be The Chemist® Essential Elements:**
A professional development program designed to assist K-8 educators – the “essential elements” in education – in teaching chemistry concepts through hands-on learning and connecting those concepts to students’ everyday lives.

www.chemed.org/ybtc/essential

**You Be The Chemist® Activity Guides:**
Nearly 1,000 pages of free lesson plans, science content, activity sheets and study materials designed to provide enriching scientific engagement in the classroom – plus several online videos showing experiments that are economical and feasible for any class.

www.chemed.org/ybtc/guides

**You Be The Chemist® Newton & Kelvin’s Laboratory:**
Online activities and interactive lessons.

www.chemed.org/ybtc/lab

**Dow Lab Safety Academy:**
A digital learning academy that leverages Dow’s best-in-class industrial safety culture and practices for laboratory safety. The Academy is divided into a series of modules defining the next steps toward building a sustainable, safe work culture in academia that will help prevent serious incidents and better prepare students for a transition to industry from academia.

www.safety.dow.com

**Here’s How to Learn More**

**Career Videos:**
A series of online videos that describe some of the many jobs available to people with STEM skills.

www.dow.com/company/citizenship/STEM/student.htm

Chemical engineer MacKenzie Stangohr is one of the Dow employees featured in the videos on the Careers in STEM website.

**Online Experiments:**
Several fascinating experiments that kids can do at home or in the classroom, grouped by grade level.

www.dow.com/company/citizenship/STEM/student.htm

**Key Dow People:**
Dow is involved in a number of STEM initiatives around the world. To learn more about what is happening, or to get involved, contact one of these people:

<table>
<thead>
<tr>
<th>Name</th>
<th>Email</th>
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<tbody>
<tr>
<td>Marianne Berthelot, Africa</td>
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Dow also works with and supports a number of organizations that contribute to the quality of STEM education. Here are the Dow contacts for some of those organizations:

<table>
<thead>
<tr>
<th>Organization</th>
<th>Contact</th>
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<tbody>
<tr>
<td>Project Lead The Way</td>
<td>Meredith Morris</td>
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<tr>
<td>You Be The Chemist®</td>
<td>Meredith Morris</td>
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<tr>
<td>FIRST™ Robotics</td>
<td>Jordan Tremblay</td>
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For more information about Dow's education initiatives, contact Meredith Morris, Coordinator of STEM Education Communications, at MMorris@dow.com.