



hosted by

ROSE-HULMAN
INSTITUTE OF TECHNOLOGY

January 2017
Volume 7, Issue 1

Newsletter

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PRISM Moodle Training Courses

We are offering three FREE online training courses beginning in February. We offer Professional Growth Plan (PGP) points for each course.

Basic Moodle for Teachers (10 PGP Points)

February 14 - March 14

A basic introduction to Moodle 3.2. You will learn how to build a classroom course and populate it with files, assignments and quizzes.

Intermediate Moodle for Teachers (10 PGP Points)

February 15 - March 15

A continuation from the Basic Moodle for Teachers course. Choose this course if you already have Moodle experience and would like to learn how to use some of the more advanced features like wikis, databases, lessons, and RSS feeds.

Advanced Moodle for Teachers (10 PGP Points)

February 16 - March 16

A continuation from the Intermediate Moodle for Teachers course. This course will take the Intermediate level course a step further as participants learn advanced gradebook features, groups and groupings, conditional activities, and the workshop activity module.

All of the courses are completed online at your-own-pace during your own free time.

If you would like to register for a course, please visit the PRISM website, log-in, and click the 'Event Registration' link. Use the drop-down menu to select the appropriate course and click the 'Registration Form' button. You will see a complete description of the course. To sign up, scroll down and enter your information. You should receive a confirmation email. If you do not receive a confirmation email, please contact us.

VEX Robotics in the Math Classroom

Math/Science Partnership Grant between Rose-Hulman PRISM & Vigo County Schools

2016-2017 School Year



In June 2016, eleven math teachers from five Vigo County School Corporation middle schools participated in a 3-week intensive institute for math and science teachers. Facilitated by Rose-Hulman PRISM, the institute took place at Sarah Scott Middle School in Terre Haute, IN. One week of the institute was dedicated to practical, everyday math and VEX Robotics. The other two weeks were dedicated to physical and life science activities and lessons.

The main objectives of bringing VEX Robotics into the Vigo County Schools Middle School math classrooms are to:

1. Get students more interested in math.
2. Integrate computer science and robotics into the math curriculum.
3. Get students more interested in Career and Technology Education courses and realize the importance of math skills in these areas.
4. Get students interested in robotics competitions and enable them to be better participants in such competitions by gaining knowledge of the importance of math skills in robot programming.

During the second week of the June 2016 institute, teachers learned to program the VEX IQ robots to do simple movements and tasks on the floor. ModKit for VEX was the program used by teachers. The culminating experience was to program their robots to move through a maze drawn out on the classroom floor and do some simple tasks. Essential skills for programming the VEX robots to migrate through a maze or do simple tasks on the floor are:

- Basic Algebra
- Geometry Skills
- Percentages
- Unit Conversions
- Measurement
- Calculation of Rates (Speed)
- Graphing of Data (Distance-Time Graphs)
- Problem-solving

From January through May 2017, VEX Robotics is being taken into the classrooms of all five of the Vigo County Schools' Middle Schools. Bob Jackson, Education Liaison of Rose-Hulman PRISM, will be assisting the participating teachers at integrating VEX Robotics into their math classes. The participating schools are Honey Creek Middle School, Sarah Scott Middle School, West Vigo Middle School, Otter Creek Middle School and Woodrow Wilson Middle School. Forty VEX IQ Robotics kits purchased with funds obtained through a Math-Science Partnership Grant obtained through the Indiana Department of Education. Students will have instruction provided on how to program the robots and how to use appropriate math skills to do all the activities and lessons.

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VEX Robotics in the Math Classroom

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Students first learn to make the robots go set distances on the floor. They must measure and convert measurements to metric units to program into their robots using ModKit. After programming, students test their robots and determine if programmed calculations and true floor measurements match. If there is not a match, the students have to reprogram and adjust accordingly (problem-solving skills). After attaining mastery of these skills, students move to programming of their robots to move a given distance across the floor, turn around and come straight back to home and land the robot wheels on the exact same starting point. This requires accurate measurement, detailed programming and calculation of total distances. Once they reach mastery of this skill, they move to programming their robots to

move a given distance across the floor but going around an obstacle in the straight-line path, going to the given distance, turning around and coming back to home on the same spot the robot started. (More math skills including geometric angles.)

Students then are taken through a lesson in which they learn to power their robots down to lower power levels (i.e: 20% power, 30% power, 40% power, etc....) and program their robots to drive forward for 1 second, then 2 seconds, 3 seconds etc.. For each time interval, they measure how far the robot moved. They must record this data and then produce a distance-time graph for this data. After plotting data and drawing a "best-fit" line in for the graph, the students should see that the data represents a linear function. They can also calculate the speed of their robots at the given power levels.



These activities should enable the students to learn the behaviors of the robots, as well as, apply sound math skills in the lessons. After completing these lessons, students will compete in a maze competition. Students will have to program their robots to migrate through a maze drawn on the classroom or hallway floor, complete some required tasks and return to home.

After completing the classroom experiences by May, Rose-Hulman PRISM staff and Vigo County teachers will continue to develop this project in a June 2017 institute. Current plans are to develop more VEX activities and to articulate lessons from grade 6 to grade 8.

Professional Development for Teachers

NASA's LIFTOFF Summer Institute: Starry Night

PROGRAM ANNOUNCEMENT

Beginning in the summer of 1990, the NASA's Texas Space Grant Consortium initiated weeklong professional development training for teachers. This aerospace workshop, called LiftOff, emphasizes science, technology, engineering, and mathematics (STEM) learning experiences by incorporating a space science theme supported by NASA missions. Teacher participants are provided with information and experiences through speakers, hands-on activities and field investigations that promote space science and enrichment activities for themselves and others.

PROGRAM HIGHLIGHTS

A solar system is a star and all of the objects that travel around it – planets, moons, asteroids, comets, and meteoroids. NASA is conducting an unprecedented array of missions that will seek new knowledge and understanding of Earth, the solar system and the universe.

Multiple NASA missions are studying our sun and the solar system, unraveling mysteries about their origin and evolution. By understanding variations of the sun in real-time, we can better characterize space weather, which can impact exploration and technology on Earth. In August 2017, a total eclipse of the Sun is visible from a narrow corridor that traverses the U.S. Educators will receive background information on the Sun while analyzing the characteristics of objects in the solar system that allow life to exist. Learn about Day and Night, Seasons, and Tides.

The first human footsteps on Mars will follow rover tracks. A fleet of robotic explorers already is on and around Mars, dramatically increasing our knowledge about the Red Planet. The planet once had conditions suitable for life, making it a rich destination for scientific discovery and robotic and human exploration as we expand our presence into the solar system. The formation of Mars and its evolution are comparable to Earth, helping us learn more about our own planet's history and future. Future exploration could uncover evidence of life on Mars, answering one of the fundamental mysteries of the cosmos: Does life exist beyond Earth?

NASA telescopes also are peering into the farthest reaches of the universe and back to its earliest moments of existence, helping us understand the universe's origin, evolution, and destiny.

Technology drives exploration. On Earth and in space, NASA is developing, testing and flying transformative capabilities and cutting-edge technologies for a new future of human and robotic exploration. We take emerging technologies and mature them, delivering innovative solutions that can improve our capabilities to explore, save lives and create economic growth.

To help humans reach an asteroid and Mars, we'll continue to evolve technologies like advanced solar electric propulsion, large-scale solar sails, new green propellants, and composite cryogenic storage tanks for refueling depots in orbit. These new space technologies will spawn new knowledge and capabilities to sustain our future missions.

Join us as we reach for new heights to reveal the unknown.

Professional Development for Teachers

NASA's LIFTOFF Summer Institute: Starry Night

PROGRAM FEATURES:

- Presentations by NASA scientists and engineers
- Tours of NASA and Space Center Houston
- Hands-on, inquiry based classroom activities aligned to educational standards
- Career Exploration
- Teacher Feature (sharing of classroom lessons and activities)
- Opportunity to interact with researchers dedicated to space missions

ELIGIBILITY REQUIREMENTS

1. Currently employed as a 4-12 grade classroom educator
2. Minimum one year teaching experience prior to workshop
3. Demonstrate willingness to share information with others
4. Must be a U.S. citizen

REGISTRATION INFORMATION

- Texas Participants: FREE - All expenses paid by TSGC upon selection
- Out-of-State: \$750 registration fee + travel to Houston, Texas
- Applications: Must be submitted online

This program announcement is contingent upon receiving NASA funding.

Read more online at: <http://www.tsgc.utexas.edu/liftoff/>

Indiana Science Initiative

In April 2016, Indiana adopted new science standards to be implemented in the 2017-2018 school year. A curriculum review committee is currently working to ensure that ISI partner schools will have that same access to high quality science curriculum that is aligned to the new 2016 Indiana Standards for Science. The curriculum review is being done by ISI teachers (past and present) and district science curriculum facilitators. A preliminary new ISI curriculum matrix is shown [here](#).

The new matrix does not consist of entirely new materials, but integrates old and new materials to ensure alignment to the new standards. Many of the current ISI curricula have been revised to match the Next Generation Science Standards and the committee reviewed them to ensure they align to Indiana's standards as well.

Indiana has also added computer science standards for grades K-8. To meet these requirements, I-STEM recommends using the free resources from [Code.org](#). Teacher professional development is also available from Code.org. In Indiana we are fortunate to have an organization, [Nextech](#), which is dedicated to expanding the CS skills for all ages. Nextech delivers the Code.org curriculum and training in Indiana.

Now that the curriculum matrix is complete, new ISI adoption costs will be available soon. We strive to always keep costs low and this new adoption is no exception. For example, if some of the same kit modules are adopted, and new teacher's guides are required, these savings will be passed along to participating schools. Adoption costs are about 40% less than the first ISI adoption in 2011. Per teacher and per student cost estimates are available [here](#).

Additionally, professional development across Indiana is being planned for summer 2017. Now that new materials have been identified, teacher training dates and locations will be determined taking into consideration the amount of training needed for current teachers, along with how many new schools are going to adopt the ISI. We anticipate this will occur in mid-February. Because of the substantial difference in student performance based upon a teacher's professional development, this adoption cycle there is a mandatory requirement that all teachers are trained on the curriculum before they receive the materials. To help facilitate this, teachers will have the option to attending training by Webex, allowing those at a distance to attend and receive credit for professional development. For further information, go to: isikits@istemnetwork.org.

What PRISM Can Do For You!

- Easily find the perfect teaching and learning resources from our library of over 4,000.
- Store your classroom materials online so that they are available to you from any computer.
- Select from free learning resources that emphasize visualization, rich context, staged-problem solving, and electronically enabled collaboration / communication.
- Save a list of your favorite resources for quick retrieval.
- Reach your students more effectively by using web media for the digital age.
- Augment your own dynamic presence in the classroom with teaching tools that mirror the skills needed for success in higher education and the 21st Century workplace.
- Create and share lesson plans that teach your subjects utilizing your favorite resources.
- Earn PGP points by completing PRISM led online Moodle course – either Beginning Moodle or Intermediate Moodle courses are available to you at no cost several times throughout the year.
- Develop online classrooms with interactive assignments, lessons, quizzes and more!

Through our strong support from the [Lilly Endowment](#) and others, we are constantly growing and improving. Check our site regularly to see what new resources you can use in your classroom.

www.rose-prism.org



PRISM is a free website that provides collections of online resources for Indiana educators in the fields of science, technology, engineering, and mathematics (STEM). The primary collection of digital teaching materials is indexed according to the Indiana Academic Standards for 6th, 7th, and 8th grade and secondary education courses.