

**University of Wisconsin-Extension
Eastern District Innovative Grant Program**

**SET Project Resources and Volunteer Training to Reach New
Audiences Final Report**

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Situation:

As the need for scientists, engineers, and technologists increases worldwide, the United States is falling significantly behind other countries in the number of college students graduating with SET degrees. In response, National 4-H launched its Science, Engineering, and Technology Mission Mandate in 2008 and emphasized its commitment to helping prepare youth for the 21st century workforce by providing them with opportunities to develop SET skills.

In the state of Wisconsin, a 4-H STEM (Science, Engineering, Technology, and Math) Work Team was established to provide training, identify and develop curriculum, and provide support for counties implementing STEM programs. Locally, Project Lead the Way (PLTW), offered through several high schools in the metro Green Bay area, helps prepare high school students for careers in science, engineering, and technology. Youth enrolled in the county 4-H program also have opportunities to develop science competencies through traditional projects but many of these projects do not appeal to youth who live in the more populated urban areas of the county.

Census data shows that youth living in the urban Green Bay area are underrepresented in the 4-H program. Outreach efforts, such as Afterschool programs were well received in the past but were not sustainable when grant funds were no longer available for these programs. Implementing a SET program, with new projects and activities that appealed to urban youth, and was designed to be sustainable would be a new endeavor for the Brown County 4-H Youth Development program.

Response:

In April 2009 the Eastern District Resource Management Team awarded \$5,000 to fund the *SET Project Resources and Volunteer Training to Reach New Audiences* grant proposal submitted by Judy Wolniakowski, 4-H Youth Development Educator. The objective of the project was to expand programming efforts to reach underserved youth in the city of Green Bay by developing new clubs and/or educational events that focused on Science, Engineering, and Technology (SET) projects and activities.

The original proposal anticipated that a project coordinator would be hired to establish the new SET program. Upon further consideration, the 4-H Youth Development Educator felt a team approach for establishing and conducting the SET program would be more effective and provide greater success for sustainability. The Brown County Department Head approved using the funds originally allocated for a project coordinator as stipends for SET Team members. Job descriptions were developed and a team of youth and adult volunteers were recruited to establish the first 4-H SET Club in Brown County. Two experienced adult volunteers served on the team to recruit and mentor new volunteers and to serve as organizational leaders for the club during the first year. Two new 4-H volunteers were recruited to serve as technical professionals on the team and were responsible for conducting project meetings. A current 4-H member served as the youth leader for the club and the 4-H Youth Development Professional provided support and resources for the project as well as assisting with project activities. The \$2,000 allocated for salary and benefits was reallocated and paid as stipends to the five volunteers that served as 4-H SET Team members. The remaining grant funds were used to purchase seven LEGOS Mindstorms NXT robotics kits and software, two additional sensors, robotics resource books, two GPS units and miscellaneous supplies.

The 4-H Youth Development Educator also submitted a grant proposal to the Brown County 4-H Leaders Association to purchase laptop computers for the program and to ESRI for GIS software and resources. Robotics and Geospatial project evaluations were also developed by the 4-H Youth Development Educator

In order to recruit both youth and new volunteers, the new SET program was promoted through traditional methods including newspaper, radio, television, flyers, and newsletters as well as through online media and community calendars. The first Brown County 4-H Open House was held on October 8 to provide the public with an opportunity to learn more about 4-H, specifically the new SET program. This event was co-hosted by the Brown County 4-H Leaders Association and UW-Extension 4-H Youth Development staff during National 4-H Week. Community leaders, politicians, and business leaders received invitations to the event which was widely publicized in the media. The National 4-H Youth Science Day *Biofuel Blast* was one of the activities at the event as was a demonstration of the new Robotics project.

Results:

The first Brown County 4-H SET Club was established and began meeting in October 2009. Ten of the fourteen youth that enrolled in the new club were first year 4-H members and eleven lived in the city of Green Bay. Ten of the members were in 3rd through 5th grade, three were females, and one was an ethnic minority. These youth and their parents met weekly with the 4-H SET Team where they participate in hands-on SET activities. From October through January the 4-H members built and programmed robots to perform various functions and to navigate through a variety of obstacle courses. They also learned about different types of robots and how they are used to perform a variety of tasks. Additionally they participated in activities to help them learn and practice valuable life skills related to team work, following directions,

critical thinking, and problem solving. The Brown County 4-H Leaders Association provided funding for 5 laptop computers.

Twelve of the 4-H SET Club members also participated in the Geospatial project from February through April. In this project members learned how to use a compass, read various types of maps, use professional GPS units, and create maps using GIS software. They used their new skills to map coordinates of park entrances, baseball diamonds, basketball courts, tennis courts, and playgrounds at Green Isle Park in Green Bay and develop a map of the park using GIS software. This data was downloaded into the Brown County 911 system.

As a result of the media publicity, the Senior Geographical Information System Manager, Phi Paradies, and the Survey Manager, Howard Herrild, for Mi-Tech Corporation offered to lead the 4-H Geospatial project. In addition, Seiler Instruments provided professional Trimble Global Positioning System (GPS) units and ESRI provided state-of-the-art ArcGIS mapping software, with a combined value of \$60,000 for 4-H members to use for their project. Brown County Park Supervisor Matthew Kriese taught the youth how to use a compass. Chuck Lamine, Brown County Planning Director, Jeff DuMez, Brown County LIO/GIS Coordinator, and the Brown County 911 Public Safety Communications center provided input and cooperation for the Green Isle Park project. Additionally, the ESRI grant provided a basic GIS software program and a variety of GPS and GIS reference books.

The 4-H SET Team also conducted the *Biofuel Blast* at the first National Youth Science Day event held in Brown County. Fifty percent of the 80 people who attended the event were not currently involved in the 4-H program. Approximately 20 adult and youth volunteers also conducted the *Biofuel Blast* at The Einstein Project *Science Expo* held on March 13th. Approximately 350 *Biofuel Blast* experiments were conducted that day reaching over 1000 youth.

In addition, 32 4-H staff, volunteers, and youth from 10 Wisconsin counties participated in robotics, GPS, and GIS training held in Green Bay on November 7th and 8th. The 4-H Youth Development Educator organized the training, which was conducted by the University of Nebraska GEAR-Tech-21 Project Manager.

Evidence:

Youth enrolled in the 4-H Robotics project demonstrated their ability to program and troubleshoot the robots they built to perform a variety of functions and maneuver through various obstacle courses. These youth also completed formal written evaluations that assessed their perceptions and knowledge related to robotics and programming. (*4-H Robotics Project Evaluation Results* – attached). One of the parents commented, “Everything about this 4-H experience is positive. The kids are focused, they all get along and help each other, and are learning skills that most adults don’t know.”

The youth enrolled in the Geospatial project also completed a knowledge test. (*4-H Geospatial Project Evaluation Results* – attached). These youth also demonstrated their skills and knowledge by using professional GPS units to acquire a variety of coordinates at Green Isle Park and generating a map of the park using a professional GIS software program. This data was submitted to the Brown County 911 Public Safety Communications department and downloaded into the 911 database. In a written communication from the Brown County 911 Public Safety Communications center they wrote, “We would like to extend our sincere thanks to each of the 4-H members who helped collect additional data points to help our center better locate people in their greatest time of need!” They have asked 4-H to do a similar project for the 25 mile long Fox River Trail.

A long-time 4-H leader, not involved with the 4-H SET Club in any way, felt the SET program was so valuable that she applied for a grant through her employer. She was awarded \$500 and donated the money to the Brown County 4-H Leaders Association to be used specifically to support SET programs.

As a result of the GEAR-Tech-21 training, several counties are planning to implement 4-H SET programs. One of the counties is offering a GEAR-Tech-21 Summer Camp and several have contacted the Brown County 4-H Youth Development Educator to learn about funding sources, ordering robotics kits, and conducting robotics activities.