2015 Achievement Awards
Virginia Association of Counties

APPLICATION FORM

All applications must include the following information. Separate applications must be submitted for each eligible program. **Deadline: June 1, 2015.** Please include this application form with electronic entry.

PROGRAM INFORMATION

Locality: Henrico County

Program Title: Education in Racing: How STEM Plays a Role in NASCAR

Program Category: Health and Human Services

CONTACT INFORMATION

Name: Shawn Gross

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SIGNATURE OF COUNTY ADMINISTRATOR OR CHIEF ADMINISTRATIVE OFFICER

Name: John A. Vithoulkas

Title: County Manager

Signature:

Overview/Summary of the Program

The field of technology education involves the understanding of the human-made world. Education in Racing began in September 2012 and is a joint effort among Henrico County Public Schools, Richmond International Raceway and the Center for Sports Leadership at VCU to integrate the principals of STEM – Science, Technology, Engineering and Math—into unique sporting activities such as NASCAR. This program includes age appropriate, technology-based activities that enhance, not add to, any local, state or national standards.

To date, over 1,000 eighth-grade middle-school students and their teachers have had the opportunity to participate in this program. Teachers have been trained to provide instruction using STEM and the role it plays in NASCAR. Students have been able to explore the world of NASCAR and how STEM education is applied through hands-on, real-world problem-solving activities.

Problem or Challenge

In today's educational world many students have difficulty connecting the concepts of what they learned in math and science classes to real-life applications. This leads to a gap in student understanding of how these concepts affect and play a role in everyday life.

This program has been developed to allow students the opportunity for hands-on learning activities that lead to a fuller understanding of the concepts taught in science, math and technology education classes.

The objective of the Education in Racing program is three-fold. The main objective allows eighth-grade students to make the connection of STEM concepts to real world applications. When included in the classroom curriculum, Education in Racing servers to bridge the gap between memorization of material and understanding of skills and processes through meaningful, hands-on activities that motivate even the most reluctant student. The second objective is to expose more female and minority students to STEM-related careers that have not traditionally been filled by these populations. This allows all students to see the numerous career opportunities related to the auto sports industry.

During the first year of the program, VCU's Center for Sports Leadership, in conjunction with Richmond International Raceway and Arena Racing, collaborated with eighth-grade technology education students from across Henrico County. One part of the middle school curriculum allows students to design, build, test and race a CO2 powered model vehicle. The Education in Racing program takes it one step further: the students experience what went on behind the scenes for two different types of auto sports. They also learn the STEM principles involved, such as coefficient of drag, how tire temperature affects friction, how banking affects the car as well as the engineering of the car body. This allows students to see that there is much more involved with the sport than just driving a car, and that the principles they learned and applied to their models apply to full-size vehicles too.

The culminating event is a day with the hands-on activities at Richmond International Raceway. The students are able to walk on the track and view its surface and banking, along with the engineered safety-feature of the crash wall. Students then have the opportunity to rotate through different stations that provide mini-lessons on topics such as weather forecasting, lubrication and safety features of the cars and clothing worn by the drivers.

In the second year of the program, almost 500 students participated and the Math Science Innovation Center joined the effort, providing STEM-based activities specifically designed to support the principles being taught. These original mini-units have led to the development of a larger unit that the center has adapted for use throughout the entire consortium area in any middle or high school STEM class.

The educational purpose of this program does not stop at the secondary level. The program design gives the VCU Center for Sports Leadership students the opportunity to help plan and lead the program.

Use of Technology

Technology has been a key component of the success of the Education in Racing program. Today's students are used to a fast-paced, technologically based world. In order to keep the students engaged, we need to capitalize on this and create an environment that piques the interest of all students. Within this program at the school level, students use computers equipped with computer-aided design (CAD) software to design cars, CNC routers to cut the cars out and

wind tunnels to measure and record drag. In the offsite portion of the program, students use race simulators. They also have access to full-size sectional race engines, race vehicles, NASCAR and Arena Racing test instruments, as well as all of the technology built into the track facilities.

Cost of the Project

The cost of this program for Henrico County Public Schools has been the provision of bus transportation for the field trips. This cost is approximately $1,000 for 12 middle schools to attend the event each year. Other funding is provided by Richmond International Raceway and donations that the VCU Center for Sports Leadership students solicit.

Results

Since the program was started in the fall of 2012, the data has shown that students realize the connection between what they learn in their classes and the world they live in. Further analysis shows that more minority and female students have developed an interest in pursuing STEM-related careers. In a 2014 survey, 49 percent of female students said they were interested in a STEM-related career and 61 percent said they would pursue a STEM-related college degree program. The excitement is carried back to the schools. Several teachers reported that they have had students come up to them in the hallways inquiring about the program and how they can be a part of it.

One teacher shared how a student came up to him and asked, “Is this the class that does the real neat stuff at the racetrack, and you understand it, because it’s fun?”

Another reported that the day after the trip a group of seventh-graders approach him wanting to know “if we’ll do all the same neat stuff next year in your class.”

The program provides the students with the unique opportunity to go beyond basic classroom instruction and make real-world connections.

Education in Racing is designed to help students connect classroom concepts to the real world and to allow students to explore careers that may be considered nontraditional for them. The program crosses all socioeconomic lines and provides opportunities for community stakeholders to help in the educational process. The knowledge and opportunities that the students gain from this experience will allow them to make career choices relevant to today’s world and more importantly, the world of tomorrow. Understanding connections between class material and real-world situations may encourage them to become lifelong learners.

Program Category: Health and Human Services

Submitted By: Shawn Gross, educational specialist for pre-engineering and industrial careers

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