A STEM Makerspace for All Students

Winding Creek Elementary School Overview

Winding Creek Elementary School (WCES) is one of 17 elementary schools in the Stafford County Public School District. WCES can be found in northern Stafford County, Virginia which is located 38 miles south of Washington D.C. This school serves 900 students and 125 staff. Racial and ethnic groups are broken down as follows: 41.2% white, 24.2% black, 19.6% Hispanic, 6.6% Asian, and 8.4% multiple races; 11.4% are students with disabilities; 27.2% are economically disadvantaged; and 11.4% are English language learners. (VDOE, 2022).

Stafford County Public School's Library Mission and Vision Statements

The mission of the library is to ensure that the staff and students are critical thinkers, enthusiastic readers, skillful researchers, and ethical users and creators of information. The library will create a student-centered community to promote the love of knowledge and reading, provide a collaborative environment with teachers and students, and be an integral part of the school and community. The vision of our library is to create a student-centered community that challenges and develops inquiring, knowledgeable and actively involved learners who have the tools to successfully participate in a global society. The library will provide students and the community with materials to prepare students to be intellectually engaged in the 21st Century through critical thinking, problem solving, collaboration, communication, creativity, and innovation (Stafford County Public Schools, 2022). The WCES library will continue to support and promote the mission and vision of the school district by providing access to information for

students and staff, building a community of lifelong learners, and challenging students to be independent thinkers and problem solvers who embrace having a growth mindset.

Why Winding Creek Elementary School Library?

Although the WCES library was renovated four years ago and a makerspace area was added at that time, it is still lacking in the hands-on technology necessary to provide students with the project based STEM activities required to educate our future global citizens. We want our students to be independent thinkers and problem solvers while at the same time ensuring they are also collaborators and communicators allowing them to thrive in today's technology centered world. The Toshiba America Foundation's grant program is aligned with our goals to support student learning and achievement through STEM programs. Our current makerspace has hands-on activities for student team building but is sorely lacking in the area of technology, which is why this grant will be used to purchase Snap Circuits and Ozobots (refer to Appendix A). Both incorporate math, science, physics, and computer science into lessons and can be done both independently or collaboratively through project based learning. The Ozobots will be used with grades 2-5 while the Snap Circuits will be used with kindergarten and grade 1. Both STEM activities promote a hands-on approach or a learn-by-doing philosophy which is something both the Toshiba America Foundation and WCES are striving to achieve.

Due to the COVID-19 pandemic, students were isolated from peers and are still feeling the effects even as our students returned to in person learning this school year. As stated in The Library with the Lead Pipe (2020), "In this time of pandemic, the ability to

get a book or some information and feel connected to the rest of the world is pretty important" which is another of our goals - connecting students with each other while building a foundation for their connection to the outside world. The American Library Association (2022) discusses that "School libraries have traditionally faced significant challenges…[including] being chronically under-funded and under-staffed" shows yet another reason for this grant request; our budget is quite limited, so we are looking for creative ways to keep our students current with STEM related learning.

Sample Lessons

Grades 2- 5: Objective - Students will be introduced to the concept of functions by using color codes to represent a function. Computer Science & Math.

Grades K & 1: Objective - Students will utilize problem solving skills to build a circuit that creates a light turn on and off. Computer Science, Math, Following Step by Step Instructions.

Evaluation

Students will be given the same pre-test and post-test to evaluate student achievement when participating in these STEM projects. Exit tickets or online surveys will be utilized to evaluate the success of Snap Circuits and Ozobots. Those surveyed will include students, staff, administration, and teachers who observe the use of these learning tools. Lesson planning will be adjusted by the teacher-librarian according to data compiled and reviewed from the pre-tests, post-tests, and surveys.

Conclusion

As the teacher-librarian at Winding Creek Elementary School, in addition to fostering a love of reading while making the library and its resources accessible to all students, embracing hands-on-learning by providing STEM projects for all 900 of our students is a priority. Specifics of the STEM products that will be purchased with Toshiba America Foundation's grant funds can be found in Appendix A. The funds will be used solely to purchase STEM activities to enhance our current makerspace area through project based learning. The objective is to have all 900 of our diverse student population utilize the makerspace area to enhance learning, to reinforce student achievement, and to promote a learning-while-doing philosophy while embracing science, technology, engineering, and math.

Appendix A

Electronics Snap Circuits https://www.demco.com/electronics-snap-circuits-reg-project-kit	$89.99 each, 3 for $269.97
Ozobot Evo Robotics Kit, https://www.demco.com/ozobot-reg-evo-robotics-kits	$179.99 each, 4 for $719.96
Total Expenditures	$989.93

Appendix B

TOSHIBA America Foundation K-5 STEM Grant

Grants For Grades K - 5

- Do you teach in an elementary school classroom?
- Do you have an innovative idea for improving Science, technology, engineering and math learning in your classroom?
- Is your idea project based learning with measurable outcomes?
- What do you need to make learning math and science fun for your students?

K-5 grade teachers are invited to apply on-line for a Toshiba America Foundation grant of not more than $1,000 to help bring an innovative project into their own classroom.

With a Toshiba America Foundation grant, elementary teachers can bring their best new teaching ideas to life.

To begin the application process, please click here and you will be redirected to short questionnaire.

Grant applications are due on OCTOBER 1st each year.

Please note the following:

We only accept on-line applications through the designated links above.

Applications must be for project based learning. Any Application received after October 1 will not be considered or retained, but you may submit it again for consideration next year. We do not consider requests for computers, laptops or tablets.

http://www.toshiba.com/taf/k5.jsp

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