

No. \_\_\_\_\_(for office use only)

## Team Mini-Grant Application

**1. Project Name: “HTC Vive Pro: 6 Degrees of Motion With Virtual Reality Field Trips: Cybrary Lab”**

**2. Project Narrative:**

**Project Description:**

This grant proposal “HTC Vive Pro: Six Degrees of Motion With Virtual Reality Field Trips: Cybrary Lab” is seeking to further develop our library’s collaboration learning center which began four years ago when it was turned into a technology enhanced, 21st century learning hub for our students, providing differentiated instruction to help them achieve greater academic and career success. The HTC Vive Pro will be available to students and teachers as an easy-to-deploy VR system fully equipped with a headset, two controllers, and a PC computer to launch all virtual reality applications. According to Vive, “from seated environments to expansive, multi-user deployments, VIVE Pro delivers the highest fidelity, clearest audio and most immersive VR experience.” We see this project having an immediate impact on the availability of abstract curriculum for facilitators there for, connecting students to content that facilitates higher levels of learning regardless of their intellect.

As our student population increases, providing access to more technology to help meet teachers’ and students’ growing needs has become a priority. Daily we hear in the news of the many challenges facing this new generation -- from rising sea levels to clean water to a growing world population subject to the socio political upheavals of cyber warfare, artificial intelligence, and an increasing demand on energy consumption. To comprehend the enormity of such complex issues requires an informed public and perhaps even more importantly a well-prepared workforce that will need the wherewithal to tackle these potentially catastrophic world problems. As learning institutions, it is irresponsible if we do not acknowledge this monumental shift or ignore what a highly digitally diverse society will demand of its citizens. The pace of technology and scientific change continues to accelerate. Innovations and advancements, we see even today did not exist a mere decade ago, when our students began their education. Clearly, we must find ways to strengthen our students’ understanding not only of history and geography but also, of science, technology, engineering and mathematics [STEM]. By next year, it is said that there could be as many as 2.4 million unfilled STEM jobs in the U.S. alone. Providing equitable STEM opportunities is therefore fundamental if we want our students to compete in the future career market.

To help envision ways to meet this critical demand, we have purchased for the library media center a single zSpace, which combines elements of Virtual Reality [VR] and Augmented Reality [AR] on an all-in-one computer, to create lifelike experiences that are immersive and interactive. By lifting and manipulating objects out of the screen and into the air and into their own personal space, students can now look inside a human heart valve, peel off layers of a cactus or dissect various microorganisms without the expense of purchasing real models. We hope to take this augmented reality tool and pair it with the world of virtual reality through HTC

Vive's six degrees of motion. Through HTC Vive Pro there's a multitude of different realms to explore, from architecture to job shadowing, to the aftermath of a nuclear blast, and much more. The fun and discovery is seemingly endless. Each layer is met with "ah-hah" moments, suddenly erasing in our students those typical bored stares, as they experience a novel way to learn. Because HTC Vive Pro is hands-on and intuitive, language is often not necessary and students of all levels can learn at their own pace. Early adopters of this state-of-the-art virtual reality teaching tool report in their students a degree of mastery of the content that has not been seen in the past. The HTC Vive Pro's features, like the zSpace can truly captivate a student's attention and provide individual students and large classes access to virtual reality tools. It is like having a panel of experts at your fingertips taking complicated abstract concepts and breaking them down into understandable chunks for you personally. Psychologists claim that the typical student's attention span is about 10 minutes; what I've found with this platform shatters that perception. Arguably, HTC Vive Pro is as engaging as any entertainment tool as students become mesmerized as they explore different realms, losing track of the passage of time, and are disappointed when they need to leave or have to take turns. With a growing library of STEM activities, the HTC Vive Pro virtual reality experience proves the well-known adage that we truly learn best by doing.

Through this grant initiative, we hope to create a unique learning commons, an engaging "Virtual Reality space", or a learning lab starting with one HTC Vive Pro. Through the use of virtual reality, activities as far ranging as exploring pathways to Mars, painting in 3D, exploring parts of the body, and simulating what it is like to be homeless; will tremendously impact our students' comprehension of the many theoretical concepts they need to master. Intellectual curiosity, perseverance, and rigor are as difficult to measure as to instill; and yet these habits are vital if our students are to thrive in the future. Embracing such a powerful state-of-the-art tool that mixes the real world with the virtual should better prepare our students as they struggle to defy the stresses of tomorrow's technological progress.

### **Goals and Objectives:**

In a world of touch screens, texting, and all things digital, our secondary-level students are technology addicts. Our goal four years ago was to meet students where they are by creating a flexible space where modern comforts and learning can be combined. By taking existing school technology and joining it together with iPads, DVD players, microphones, and interactive books and apps library, we were able to transform a sterile, predictable, computer lab adjacent to the library media center. Due to space requirements, the Cybrary Multimedia lab has moved to the main library reading room so access is still available to the entire school. It has become a more comfortable, creative environment where collaborative research and presentations can take place, helping to foster an exciting collaborative learning environment between students and teachers. This year we want to continue this process by adding additional software to our IMacs and iPads that will open the portal for virtual reality lessons, facilitated by teachers, to enhance classroom concepts and bring them to life.

The HTC Vive Pro will add another layer to this already student centered Cybrary. Immersing students in life-like experiences the HTC Vive Pro provides an experience for students that can only be rivaled by students actually being there. As the digital age evolves we

find that an overwhelming majority of our students identify as visual or kinesthetic learners, after taking learning types assessments. With this shift away from teachers being a “sage on a stage” and instead stepping into a facilitator role that guides students in discovery of knowledge; a main objective in this project is giving teachers the tools necessary for students to discover abstract ideas.

Like in previous years, there were other funding sources which helped to complete the vision for our repurposed “Cybrary Multimedia” design concept. The space was enhanced with items purchased such as:

- A 65 inch HD Smart TV
- Rugs, charging tables, Apple TV, adjustable podium coffee table and framed pictures

Today we have access to:

- 50 iPads & docking carts
- 1 MacBook Air laptop
- 6 IMacs with IMovie presentation software
- iPad docking cart with room to store and which can charge 30 iPads
- 35 desk-top computers
- HD microphone
- DVD player and Apple TV
- Wireless internet capability throughout the school

### **Classroom Activity**

HTC Vive Pro engenders active learning, enabling students to connect with their work—putting the viewer on and immediately being placed into various virtual reality realms facilitates hands-on learning. Teachers can choose from any of the thousands of free and paid experiences that are offered. Field trips can drop students on mars, take them on college visits, explore the great barrier reef, or show them the inner workings of the body. These classroom activities of course will be determined by our teachers. The HTC Vive will help them meet many of the Tennessee State Curriculum requirements such as: using visuals to establish the purpose of the lesson; finding a way to organize the content being taught so that it is personally meaningful and relevant to students; and having lessons that induce student curiosity and suspense. Also by incorporating multimedia and technology they will be meeting the requirements for utilizing resources beyond the school curriculum texts, such as simulations, or games that demand complex thinking and analysis. One of our continuing goals is to instill empathy in students who are growing up in a diverse world. Virtual Reality gives students an alternative perspective that can only be rivaled by real world experiences.

- **Summary and source of relevant research supporting best teaching practice**

By creating a warm and welcoming “Cybrary Multi-Media Lab” we are providing a dynamic, school-wide setting for not only classroom instruction, but also project-based learning and in-service professional development opportunities, directly aligned with technology mandates in our School Improvement Plan and Tennessee State Curriculum.

Studies have shown that an open space classroom concept encourages collaboration, exploration, and communication. So, similarly by providing a space with an HTC Vive Pro system full of an amazing assortment of simulations and interactive field trips directly tied to the curriculum, will help set a stage for reaching all learning styles and abilities. Also, by using virtual reality tools to bring classroom concepts to life, students will have interactive opportunities which should help inspire and motivate these socially driven students, while meeting new curriculum requirements for writing and expressing ideas on a deeper more critical level.

Studies have also shown that fourth-grade students in Massachusetts who reported greater frequency of technology use at school were likely to have higher total English/language arts test scores and higher writing scores on the Massachusetts Comprehensive Assessment System (MCAS) than students who did not. (O’Dwyer, Russell, Bebell and Tucker-Seeley, 2005)

In the coming years students will need to blend and fuse with this ever-changing digital landscape, in many cases authoring their own learning. It is a sad fact that American students consistently rank poorly against their global counterparts in STEM subjects. The United States ranks 25th in math and 17th in science out of 31 countries according to the Organization for Economic Cooperation and Development. And tragically, only about 18 percent of our high school seniors perform at or above proficiency in science subjects, as reported by the National Math and Science Initiative. These alarming numbers are forcing America to rethink and evaluate how we teach the ever-evolving STEM world. Just as the field of education has redefined knowledge as being more than simple memorized, disconnected facts, we need to foster a culture of innovation, experimentation and discovery in all we do in the classrooms. In the past 60 years, technology has dramatically changed the way we function as a society. From the invention of the Internet in 1960 to GPS technologies in 1978 to DNA fingerprinting in 1984, to the advent of the iPod in 2001, the march of technology continues...just as we cannot return to the 1950s, we simply cannot rely on the same classroom strategies of that past era to train our students. STEM-based virtual reality learning tools like Google Expeditions present for them a future equally, if not more, exciting and filled with promise.

Because HTC Vive Pro is a relatively new tool in education, little long-term empirical research has been conducted to determine how they impact student achievement. Many school systems however appreciate these virtual reality devices’ immediate value and engender in their students. School administrators appreciate that these VR devices help to provide greater access to a wider, more diverse range of educational resources for teachers and students. There are nevertheless, key studies that demonstrate the HTC Vive Pro’s promise as a tool in the classroom. Perhaps its greatest value will be in allowing teachers to customize each

student's experience with different immersive tasks to enhance their individualized education plans making it an ideal tool for our special needs and English as a Second Language [ESL] students, which we have successfully put to test this year with a greater influx of students enrolled with little English language ability.

Other studies which highlight many of the HTC Vive Pro's strengths as a teaching tool include:

**Key Findings:**

- Riconscente reports in the landmark study "Mobile Learning Game Improves 5th Graders Fractions Knowledge and Attitudes" that the advent of the iPad, tablet computers and educational applications has introduced a new era of mobile computing that encourages learners to interact and engage in academic subjects on a deeper level.

*Riconscente, M. (2012). Mobile learning game improves 5th graders fractions knowledge and attitudes. Game Desk Institute, 1-44.*

**Key Findings:**

- Research has emerged showing that games can aid learning in several areas: kinesthetic learning and skills to operate the interface, strategic thinking, ability to solve complex puzzles (e.g., resource allocation, planning, scientific methods), and a variety of cognitive skills that facilitate interaction with the game world (e.g., three-dimensional mental rotation, targeting, etc.).

*Boyan, A., & Sherry, J. L. (2011). The challenge in creating games for education: Aligning mental models with game models. Child Development Perspectives, 5(2), 82-87.*

**Key Findings:**

- E-text readers exhibited significantly higher transfer learning scores compared to traditional textbook readers. Because teachers are incorporating various lessons paired with virtual reality, the viewers allow students to be presented with content through a new platform other than a traditional textbook.

*Gertner, R. (2011). "The Effects of Multimedia Technology on Learning," Graduate Thesis releasing, Spring 2012, PDF.*

**Key Findings:**

- Digital devices such as HTC Vive Pro can be a creative tool helping students to become familiar with the technology design process. The apps incorporate user-centered design, participatory design, cooperative inquiry, allowing children to become involved in the technology design process.

Markopoulos, P., Read, J., Hoysniemi, J., & MacFarlane, S. (2008). *Child computer interaction: Advances in methodological research, Introduction to the special issue of cognition technology and work*. *Cognition, Technology & Work*, 10, 79-81. doi:10.1007/s10111-007-0065-0

### **Key Findings:**

- Curiously, there was no difference in recall among the three types of media explored in this study (hard, iPad or desktop computer). On average the groups missed 33%, 32% and 33% of the questions respectively.
- However, respondents who read on the desktop computer (60% indicated some level) indicated a much lower comprehension of the meaning of the article than those reading on iPad (73.4% ) or paper (83.4%).
- Of those respondents who indicated comprehension of the themes, the platforms compared more closely – desktop (23%), iPad (27%) and paper (32%).

*“iPad Effect: How Platform Choice Affects Information Consumption and Retention.”*  
*The Hawaii International Conference on Social Sciences, Communication Division. Honolulu, HI. June 1-4, 2011.*

### **Key Findings:**

- When students have access to several technological applications, including iPad, translators, computer software, and projectors, innovation improves.
- Students use technology to obtain starting ideas for various projects.
- Of the eight students in the classroom, all have shown improvements in their group communication skills and their ability to work with one another fluidly, using technology access project documents and research topics.

*Dr. Billie McConnell, and Stacie McConnell, International Society for Technology in Education (ISTE) conference, June 2011. ACU Undergraduate Research Festival, Abilene Christian University. Abilene, TX. 28 March, 2011. Society for Information Technology and Teacher Education (SITE) Conference, Nashville, TN. 9 March, 2011.*

### **Key Findings:**

Similar to HTC Vive and a platform for running the application the iPad was found to be:

- A true mobile learning device
- Increases student engagement
- Enables collaborative learning
- Allows potential student productivity
- Allows potential student efficiency
- Improves student technology competency

*Researcher(s): Dr. Ian Shepherd and Dr. Brent Reeves, "iPad or iFad - The reality of a paperless classroom," ACU Connected, Abilene, TX, March 2011, PDF.*

### **3. Justification:**

Virtual reality viewers offer educators more diverse methods for delivering instruction and engaging students for learning in the 21st century. Benefits of using virtual reality in schools:

- Tablets/Virtual Reality Viewers fit students' lifestyles – They have similar appeal as in using iPads, for students find them more intuitive and easier to use than traditional computers.
- Some of the most innovative instructional software is being developed specifically for tablets and virtual reality.
- Collaborative content creation – Never before has it been easier to create and share content with others. The touch interface of iPad revolutionizes the way we interact with computers, making it easier to use databases and social networking technology, like wikis, to promote collaboration and communication for enhanced learning.
- HTC Vive Pro's allow teachers to more easily integrate instruction in cross-curricular lessons. Also, teachers can now instill a sense of empathy within their students for communities in crisis by stepping into their shoes.
- Students who have regular access to technology score higher in writing assignments, demonstrate improved analytical and problem-solving skills, and tend to be more collaborative and engaged.

By providing a 21st century teaching lab, available to the entire school, where students and teachers can together, research any number of topics using the myriad of educational apps invites an atmosphere of creativity and innovation. Differentiation is more evident when the students can pause to take notes and rewind when something goes by too quickly.

- **Characteristics of student/classroom/population served as related to project:**

All the students of various learning styles and abilities in our secondary school will be able to benefit from this new technology rich "Cybrary, Multi-Media Lab." This includes our English Language Learners [ELL] and the nearly 20% of our population that have special needs. These multimedia tools and devices provide translation services and read-aloud functions that will make the material covered more accessible with nearpod.

Grades 6-8:

Present population: 1400 students

End of Year: 2017-2018 School Demographics

District-wide there are 5,524 students. Of these students 63.7% students qualify for free and reduced lunches. There are 1,054 students in special services and 548 students who are ESL.

<b>Ethnicity</b>	<b>School</b>
White, non-Hispanic	58.6%
Asian	2.7%
Black, non-Hispanic	13.8%
Hispanic	23.0%
Native American, Hawaiian or Other Pacific Islander	2.1%

### **Instructional levels of target group**

Middle School level students in grades 6 through 8. The technology being requested will be used long-term - not simply for a one-quarter or even one-year. It will be available to all of our students now and future students in the coming years.

Time will be set aside to train our teachers. They will need to know the skills or appropriate apps available for their students to be productive with the addition to the cybrary of HTC Vive Pro.

### **Data which determined need**

A continuing goal for the district is to:

Provide a safe and secure state-of-the-art learning environment for our students.

- By providing state-of-the-art tools we are hoping to improvement the overall achievement levels of all three grades here at our school. HTC Vive Pro is all about discovery and exploration and there are many learning connections that can be made with these devices which should be reflective in the student's overall achievement scores.
- We should and can be doing better at incorporating the National Education Technology Standards [NETS] into our daily lessons. With the advent of the Internet, and as we become a global society, our students need technical expertise to be competitive. From

the data below, you can see that many of our students still struggle with state expected math and science strands that typically focus on abstract concepts such as understanding fractions or the parts of a cell. Having a technological tool that allows students to experiment with enhanced models and programs, mimicking gaming techniques, help keep our young “dot.com” population engaged. VR headsets and computer software like HTC Vive act like incubators; exciting and engaging, they encourage budding scientific interests. From the human body to the skeletal structure of a woolly mammoth, from simple machines to a diesel engine, and from an arctic ecosystem to the planet Mars, HTC Vive experiences advance student academic achievement. Although we do not have recent individual data test scores we have seen similar trends in past years with some overall gains in math and science. See most recent test score data below:

**Grades: 6<sup>th</sup>-8<sup>th</sup>:**

TN READY TEST SCORES	GRADE 6		GRADE 7		GRADE 8	
	STATE	SCHOOL	STATE	SCHOOL	STATE	SCHOOL
2017-2018						
LANGUAGE ARTS	34	33	36	33	31	31
MATH	39	37	32	28	31	21
SOCIAL STUDIES	87	89	84	81	83	75
SCIENCE	59	52	62	59	65	65
<b>RECENTLY PUBLISHED TN READY OVERALL SCORES 2017-2018</b>						
OVERALL COMPOSITE	LITERACY	NUMERACY	LITERACY & NUMERACY	SCIENCE	SOCIAL STUDIES	
5	3	5	5	5	3	

- Taking a look at the TN Ready scores from the previous year of 2017-2018, we notice that as a school, we are consistently scoring below Tennessee state averages. In each of the four subject areas of study, there were one or more grade level measurements that were significantly below the state's average. There's still a lot of work left for us to do to bring our students up to state and even national grade-level expectations. Gaps were evident in our targeted populations between Black/Hispanic/Native American vs. all of the other students in reading. Test scores for low income students to, fall below the state average for all students. We're hoping to see growth not only in these special populations, but, in all students' engagement and by encouraging reading and learning through our digital library, we're anticipating improvement in students' performances on the state achievement tests.
- Our School Improvement Plan is goal-oriented, identifying that students with various learning styles and needs will be more closely monitored and served, increasing, "the percentage of students classified as low risk in reading." It also states that we will continue to build capacity in the area of technology and make it more available to all teachers, specifically, we will "fully implement use of digital media and explore emerging platforms/channels for information dissemination [app, web, social media, video, etc.]". This grant request meets both requirements, placing the library media center at the heart of this initiative in providing online resources to our teachers and students. By incorporating these requested special collections in our newly established digital library, we will promote the value of the library media center and strategically place it central in our school's culture, redefining how many of our students find information.
- The use of technology by teachers and students impacts the quality, content and structure of teaching and learning. In essence, implementation of this grant will help cultivate a love and excitement for reading and confidence in researching using technology, both critical aspects of the Tennessee State Curriculum and the National Education Technology Standards.

#### **4. Relationship to Curriculum:**

- By adding a virtual reality technology tool like HTC Vive to the "Cybrary Multimedia Lab" we will be adding another instructional platform at which our students can learn, expanding the rigor of the technology-based projects across the curriculum. With over 1,000 applications and various virtual reality tools that can be paired with the viewer for students and teachers. We have had much success with the apps made available the last three years in the Cybrary and believe that the addition of the HTC Vive Pro virtual reality software will only further our reach. Since for each subject taught, technology needs to be incorporated; the viewers will help, providing an invaluable tool to enhance the content while still engaging students.

- Teachers will need to be trained on how to teach using the HTC Vive Pro. As a school, we will need to make a concerted effort to practice with one another in how to incorporate virtual reality experiences into lessons, sharing best practices and how to embed such innovative learning tools into what we are teaching. A school-wide blog between the teaching staff will be added to the library media center's website, to help publicize and launch these collaborative efforts.

### **Examples of potential uses of the HTC Vive Pro in the classroom...**

- For Math classes... students will be able to use HTC Vive Pro to make math concepts more abstract. Teachers can use applications to explore landmarks show students math concepts, like geometry, can be useful beyond the classroom. For example, when exploring The Great Wall of China students can see how right angles contribute to the stability of the structure. After visiting real world places students will be able to connect these math concepts to their experiences through viveport.
- For Art class... students can go on viveport to explore monuments, photos of art, and sculptures from around the world to inspire their own creations. Using applications from viveport like "Singularity" students can start from a big bang of particles, throw them, attract them, and defy gravity as they paint their own constellations. By having these experiences that most students wouldn't have in a life-time they will be able to make deeper connections when thinking about how objects relate to the world.
- For Science class... students will be able to now visualize these concepts that are often hard to imagine. When looking at the parts of the body students can go on a trip through the respiratory system or anatomy. Our science teachers trying to get students to grasp the concepts of outer space? No problem, HTC Vive Pro can place students directly in outer space and allow them to move, pick up, and manipulate the planets.
- For all teachers... students can be empowered by leading their own experiences. When students lead their peers, they are more likely to immerse themselves in the content and ask each other different questions that engage collaboration and higher-level learning. Teachers can also use the virtual reality headset to facilitate their own lessons through Nearpod or their own classroom applications.

The key to the Tennessee learning standards is to steer instruction away from memorization and, instead, promote the acquisition of higher-order skills (analysis, cooperation, creating, etc.). Digital literacy skills will help our students navigate with confidence from the tech world to real world and meet many of the basic needs required by today's learning standards. Instilling strong levels of digital literacy creates great avenues to learn and practice these higher-order skills, ranging from students working collectively on virtual reality applications to being guided through many places in the world that can only be imagined.

Integration of project with \*

- School Improvement Plan
- TN Comprehensive School Planning Process
- TN Standards / Core Curriculum & NETS
- Classroom goals and objectives

*\*Specify those applicable to project*

**5. Project Evaluation:**

- **Monitoring techniques**

Both the site technology supervisor and the library media specialist will be involved in expanding this technology-rich environment envisioned in this grant proposal. It will unfold in three phases...

PHASE ONE	PHASE TWO	PHASE THREE
<p>Submit “HTC Vive Pro” grant proposal by due date: 24 September 2018 for Academic Year 2018-2019</p>	<p>If awarded the grant, the HTC Vive Pro and partnered PC will be purchased and applications will be downloaded.</p> <p>A survey will be sent to teachers for requests considered in selecting the applications...efforts will be made to select applications covering all of the curriculum taught at our school. Preloaded applications will support learning in the core subject areas, as well as the elective subjects of music, art, communications, and medical science.</p>	<p>Download the applications to the device and use supplemental material on the library iPads.</p> <p>Gather statistics, observe and survey students and teachers as to the success of this project. Write-up evaluation of the project in May 2018.</p>

### **Further comment on the Assessment of the Cybrary Multimedia Lab...**

We acknowledge that this project will be evolving, for we will be trying new and exciting teaching techniques, apps and technology applications which takes time to determine their value.

Since virtual reality is such an innovative concept this project will require support and training of both students and teachers, as well as collaboration with the tech department to ensure its ongoing success.

The HTC Vive Pro Requires the following minimum computer specs:

Processor: Intel Core i5 - 4590 or AMD FX 8350, equivalent or better

Graphics: NVIDIA GeForce GTX 970 or AMD Radeon R9 290 equivalent or better

Memory: 4 GB RAM or more

Video out: DisplayPort 1.2 or newer

USB ports: 1x USB 3.0 or newer port

Operating System: Windows 7, Windows 8.1 or later, Windows 10

The HTC Vive Pro Wireless Adapter Requires the following minimum operating system:

64 - bit Windows 10 or Windows 7 SP1

Requires available PCIe slot

Transmission at Over 60 GHz

The added necessary capabilities to run this system requires a high powered gaming computer. We will be solving this dilemma by pairing the technology with a VR ONE 6RE VR Backpack PC. This will also allow for further high frequency applications to be run through this machine.

The library media specialist will be responsible for the day-to-day monitoring and care of the HTC Vive Pro, locking and unlocking the kit, charging, and making sure the viewer is returned to the designated secure location and are locked safely in the kit at the end of the day's usage. Students will not have access without a staff member present so the devices do not get damaged or lost.

- **Methods to measure results**

By introducing HTC Vive Pro to our students we're providing web-based opportunities for teachers to align their instruction with the Tennessee State Curriculum and SPIs whose central tenet is to prepare our students to reason, to think critically and to develop their creative skills helping them adapt to whatever their future endeavors may require.

In order to measure the degree in which this proposed addition to the developing "Cybrary Multi-Media Lab" increases our students' achievement through technology integration, the following assessments will be considered:

**Data-Gathering Plan:**

The success of this grant project will be measured through a combination of the following methods:

- Demonstration of student success (in course grades and performance on standardized tests and relative to students in other areas)...such as: Pre and Post Benchmark test scores. Basically, their progress will be measured by the improvement they show in their overall levels or measurements for the academic year.
- Student and teacher focus groups and surveys
- Statistics gathered from number of sign-ins for teachers' use of the "Cybrary Multimedia Lab" and its complement of HTC Vive software and VR headsets.

**Evaluation of program:**

- Comparison of average grades for classes to those from prior years
- Pre-and post-survey regarding the student experience with HTC Vive and virtual reality viewers.
- Conduct focus groups to get honest and forthright feedback about the implementation of HTC Vive and VR in the classroom

Integration of virtual reality technology into the curriculum should be more complete in the second year. Lessons learned from the first year will be "tweaked" and included in materials for years to come.

Since we are using software that facilitates some virtual reality lessons from previous year's grants we are already noticing an uptick in our statistics and in the enthusiasm of our teachers and students. Such invaluable circumstantial evidence speaks highly of this initiative. And as teachers we are hoping that the Cybrary Multimedia Lab will continue to assist us in our efforts to transform our school into a high-performing, research-based, technology-enriched learning environment.

## 5. Budget

Total Request: \$4988.77

Total Project Budget\*: \$4988.77

\*If partial funding requested, list source(s) of additional funds:

Is this project a component of a multi-year project/resource building process?

**Yes** No

If yes, will Public Education Funds be requested in subsequent years?

**Yes** No

## 6. Attachments:

- Itemized budget:

NUMBER OF ITEMS	DESCRIPTION	COST
1	HTC VIVE Pro Virtual Reality System	\$1,399.00
1	MSI VR ONE 7RE-065US Virtual Reality Backpack PC Intel Core i7-7820HK	\$2,199.00
1	MSI Full HD RGB Gaming Monitor	\$349.90
1	Azio Mechanical Keyboard	\$219.99
1	Razer Mamba Rechargeable Wireless Gaming Mouse	\$64.95
1	Fovitec Gaming Lighthouse Mount Stand Kit	\$45.95
1	Vive Wireless Adapter	\$359.99
1	HTC Vive Pelican Travel & Storage Case	\$349.99
<b>GRAND TOTAL: \$4988.77</b>		

8. Please submit 3 copies typewritten Cover Sheet and Mini-Grant Application to

Mailing Address:  
Bradley/Cleveland Public Education Foundation  
PO Box 4354  
Cleveland, TN 37320-4354  
423.476.0034

Or by e-mail attachment:  
Bradley/Cleveland Public Education Foundation  
[bcpefoundation@bellsouth.net](mailto:bcpefoundation@bellsouth.net)