## Budget

Cincinnati City (043752) - Hamilton County - 2014 - Straight A Fund - Rev 0 - Straight A Fund - Application Number (357)

### U.S.A.S. Fund #:

### Plus/Minus Sheet (opens new window)

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### Adjusted Allocation

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### Remaining

|            |            |            |            |            |            |            |            | -2,212,539.30 |
Hughes STEM High School (HSHS) purports to increase student achievement (goal 1) and increase utilization of resources in the classroom by developing an innovative, state-of-the-art Hughes Information Technology Trajectory Initiative (HITII) that will impact all HSHS students - grades 7-12. The key components of the IT Trajectory will be to ensure all students have access to state-of-the-art quality technology resources and are instructed/coached by learning facilitators highly qualified in the integration of technology into the classroom from the core curriculum subjects, to specialized IT courses. The Trajectory design is crafted to incorporate a combination of new delivery models challenging traditional teaching paradigms and social media including but not limited to blended learning, distance learning (synchronous & asynchronous), technology enabled project-based learning, flip teaching, and learning management systems with the objective being to develop those skills essential for success in navigating a 21st century world.

The Hughes project team will be directed by Principal, Kathy Wright, the STEM Program Facilitator, Ronnda Cargile and Technology Facilitator & Career Tech Pathway Manager, Melissa Sherman. All Project Team members were instrumental in developing the Hughes STEM High School Initial launch in 2010. Each member of the Project Team is an experienced educator with in-depth knowledge of program development, implementation and management of complex innovations in a multi-faceted school setting, as well as, being highly proficient in their areas of educational expertise. Kathy Wright, is the Principal and Chief Learning Officer of Hughes STEM High School and serves nationally as the Multicultural /Equity Division Director for the National Science Teachers Association. Kathy is an Ohio certified comprehensive science teacher and has achieved the distinction of a Lead teacher in the Cincinnati Public school district and Master teacher with Minorities in Mathematics, Science and Engineering STEM program. Kathy has worked with the non-profit for over 15 years to bring extended learning opportunities in the STEM areas to students throughout the region. Additionally, Kathy sits on the Board of Directors for the InterAlliance; an IT educational collaborative and is a member of the Advisory Board of the Greater Cincinnati STEM Collaborative. Ronnda Cargile is a veteran teacher and is lead teacher credentialed in the Cincinnati Public School District. Having entered the realm of education through nontraditional alternative pathways Ronnda holds a teaching license in General Science and has a Masters degree in education. In her role as Program Facilitator, Ronnda Cargile establishes and maintains community and business partnerships, oversees and designs STEM program initiatives, and helps in identifying and delivering professional development beneficial in promoting a thriving and rich STEM environment. As an original member of the Hughes STEM instructional team, former Science Department Chair, District Science Content Innovation Specialist and I-TEST-NSF teacher she has designed curriculum for national, district and school outlets. Ronnda facilitates creation and execution of authentic STEM projects and experiences that assist in preparing our students for college and career. Melissa Sherman has been the technology facilitator and Career Tech Pathway Manager since the school’s inception in 2009. She was hired as part of the original teacher design team for the Hughes STEM High School. Her responsibilities include integrating and implementing technology based learning for all grade levels, creating professional development for teachers in both face to face and blended learning formats; and managing multiple budgets including Battelle-OSLN as a federal grant. She co-developed curricular and instruction to integrate technology into authentic project based learning and performance based experiences. She is a lead teacher and certified in history and mathematics with a Masters degree in Instructional Design & Technology. Melissa also sits on a number of district technology committees and currently serves in a lead teacher position as the district’s Curriculum Council Chair for Career and Technical education.

Ohio has a dual need for workers, those who are fluent users of information technologies, and those who are technology innovators and producers. It is anticipated in Ohio’s southwestern region that (26% growth rate for Ohio) IT workers will be needed to sustain and enhance the region’s economic development. Preparing students to efficiently and effectively use electronic technologies for learning and production is a necessary goal for all Ohio schools, however this mandate is even more imperative in Ohio’s STEM schools that are charged with preparing the next generation of STEM workers. In the rapidly changing IT environment, STEM schools must have sufficient computing capacity to effectively assume a leadership role in meeting these future workforce demands. As a means of meeting these critical IT
12. Describe how it will meet the goal(s) selected above. If school/district receives school improvement funds/support, include a brief explanation of how this project will advance the improvement plan.

The project as implemented will improve student achievement in both core content and STEM career pathway courses. Hughes STEM High School is a 7-12 School of Choice in the Cincinnati Public School System. Its overall educational approach is project and inquiry based. Prior to opening in 2009, the Hughes STEM staff participated in extensive training on student-centered inquiry and group learning. Hughes STEM students are engaged in rigorous and relevant areas of study where the learning environment is student centered and their core academic success is measured by an internal challenge. Students in grades 7-9 participate in the STEM preparatory academy which includes all required core Ohio curriculum and foundational experiences and courses to introduce STEM pathways and careers. At the conclusion of grade 10, students present a Gateway project during which they articulate which STEM major they are interested in pursuing and their reasons why based on evidence and inquiry-based reasoning. The four current career pathways are: Health Sciences, Engineering, Plant and Animal Sciences. It has been demonstrated that the appropriate use of technology engages students in the subject matter at a deeper cognitive level than typical instruction if you require students to transform content into new representational forms. This process of knowledge transformation is more cognitively demanding than what is typically asked of students in schools, thus leading to deeper conceptual learning and better retention.

13. Financial Documentation - All applicants must enter or upload the following supporting documentation. Responses should refer to specific information in the financial documents when applicable:

a. Enter a project budget

b. Upload the Straight A Financial Impact Template forecasting the expected changes to the five-year forecast resulting from implementation of this project. If applying as a consortia or partnership, please include the five-year forecasts of each school district, community school or STEM school member for review.

c. If subsection (b) is not applicable, please explain why, in addition to how the project will demonstrate sustainability and impact.

Subsection b is not applicable to this project as the grant is seeking a one-time purchase and installation of updated computer technologies for the STEM school. Initial professional development for the new equipment will be funded through the grant, but on-going professional development for all teachers is already part of their contractual workloads. The school currently owns a site license for Lynda.com and Atomic Learning which provides online professional development for a range of computer software and integration of 21st century skills. These programs will be used for on-going PD and the on-boarded school materials. Moreover, the school will also have the requisite skills to take responsibility for their IT backpack’s management and maintenance. Students in the Digital Education pathway will also develop the appropriate knowledge base to develop apps to support core content learning and coding skills to carry into post-secondary IT courses and future STEM careers. This project is innovative in its ability to provide greater access to ALL students at Hughes STEM High School to rich and engaging IT learning experiences. Since these experiences are tied to the learning of Ohio Academic Content Standards it will increase student motivation and prepare them for college and careers as effective creators and users of technology.

14. What is the total cost for implementing the innovative project?

2,247,227.30  Total project cost

15. What new/recurring costs of your innovative project will continue once the grant has expired? If there are new/recurring costs, please explain why.

21,600.00  * Specific amount of new/recurring cost (annual cost after project is implemented)

16. Are there expected savings that may result from the implementation of the innovative project?

400,000.00  * Specific amount of expected savings (annual)

17. Provide a brief explanation of how the project is self-sustaining. If there are ongoing costs associated with the project after the term of the grant, this explanation should provide details on the cost reduction strategies that will be in place that are at least equal to the amount of new/recurring costs detailed above.

The project is fiscally self-sustaining as the funds for teacher Professional Development and equipment maintenance exist within the school’s permanent funding as well as the cost savings from purchasing new hardware. The program is intellectually self-sustaining as the CREATE school structures– the preparatory academy and career pathways– are in place and working in previous years. The
more intensive use of technology by content area teachers and the career majors teachers will be able to sustain beyond the funding since these are extensions of the requirements for the teachers in the schools. Once the grade level learning experiences are developed they will be refined and expanded upon in future years, but would not require an intensive infusion of additional funds.

D) IMPLEMENTATION - Timeline, communication and contingency planning

18. Fill in the appropriate dates and an explanation of the timeline for the successful implementation of this project. In each explanation, be sure to briefly describe the largest barriers that could derail your concept or timeline for implementation and your plan to proactively mitigate such barriers. In addition, the narrative should list the stakeholders that will be engaged during that stage of the project and describe the communication plan that occurred as the application was developed.

Describe the ongoing communication plan with the stakeholders as the project is implemented. (Stakeholders can include parents, community leaders, foundation support and businesses, as well as educational personnel in the affected entities.)

* Proposal Timeline Dates

Plan (MM/DD/YYYY): 01/01/2014

* Narrative explanation

19. Proposal timeline and dates January 2014 - February 2014: Assets planning and organization An asset is an asset that will be used to obtain the IT infrastructure. The planning and the management of the IT infrastructure is planned in order to mitigate the potential for the IT infrastructure to be used in a manner consistent in the five years of implementation. The frequency and quality of computer technology planning for the old computers and electronic equipment. This plan will be used to ensure that the classroom instruction is updated. Grade level computer labs will be upgraded first, beginning with the labs that have the oldest equipment.

A plan for lab upgrades will be developed to ensure that all equipment is installed and ready for student use when school opens in August 2014.

Implementation (MM/DD/YYYY): 02/10/2014

* Narrative explanation

February 2014 - April 2014: Purchasing and initial installation of Grade level computer labs will be purchased from appropriate vendors and installed in the grade level labs in accordance to the plan above. Implement the 21st century skills Atomic Learning Pre-Assessment to all students and teachers April - June 2014: Purchasing and installation The remaining computers will be purchased and installed at the conclusion of the academic year and prior to the end of the grant period. In June the support services team will work with teacher supervisors and a team of Hughes High School students from the IT pathway to install and set up the network computers with school-based servers. June 2014: Teacher Professional Development All teachers will participate in a one day PD to use the Lynda.com system already in place at Hughes High School. This program provides online professional development across a range of software programs. Teachers will design a team PD plan for the up-coming year to develop the skills to integrate the Lynda.com supported software into their instruction. Teachers need in-depth sustained professional development to learn new instructional strategies needed to integrate technological skills into the learning process.

Summative evaluation (MM/DD/YYYY): 06/30/2014

* Narrative explanation

Feb 24-2014 An asset map of computer needs in each classroom will be conducted. A computer use self-report evaluation will be given to each teaching team. This self-report usage will create a baseline of current computer use in the five years of implementation about the frequency and quality of computer technology that is planned into the learning activities. A student self-report of computer use will be given to all students in the school. This will evaluate the students access to computers during classes in school, at other school events, during out-of-school experiences and at home. Students will also be surveyed about how they use computer technology during these times. May - June 2014 The summative evaluation report will include: 7 A new assets map of the equipment to be purchased and installed correctly. 7 Tracking of the other use and understanding of the Lynda.com online professional development modules. ? Teacher PD plans for the up-coming year on the Lynda.com system. ? Team plans for technology integration into their core content instruction for the upcoming year. A data gathering instruments and timeline for gathering student achievement data, student attitude data, student usage data for the next five years.

16. Describe the expected changes to the instructional and/or organizational practices in your institution.

It is anticipated technology throughout the STEM High will be used more productively and engaging instruction for students. The utilization of the digital tools necessary for success in the 21st century STEM - centered society will additionally: 1. Increase teachers’ digital knowledge and increase the high quality implementation of technological tools integrated into units of instruction. 2. Increase student Digital citizenship by aiding the students’ understanding and utilization of the norms of appropriate, responsible technology use in the classroom and beyond. 3. Develop a cadre of IT students who are equipped with the knowledge and tools to effectively support technology deployment and issues in the building.

E) SUBSTANTIAL IMPACT AND LASTING VALUE - Impact, evaluation and replication

20. Describe the rationale, research or past success that supports the innovative project and its impact on student achievement, spending reduction in the five-year fiscal forecast or utilization of a greater share of resources in the classroom.

The missing “T” in STEM. The current focus in STEM continues to be focused on science and mathematics performance. What we like to call the bookends of STEM. This bookend focus can create the illusion of totality, but it is clear in US schools today that comprehensive coverage of STEM is an illusion. If we do find the “T” in STEM education, too often technology education is singularly thought of as preparing students to be consumers of technology rather than designers in the development of technologies (Workforce Readiness Project, 2006). The overutilization of substantial technology education, and the confounding technology use focus in schools, limits students’ potential for post-secondary technology programs and careers. The need for technology professionals is growing. By 2018, the bulk (57%) of STEM jobs will be in Computing (STEM Connector.org). We must prepare students to master Information and computer technology driven innovations. As IT is the fastest growing STEM area the current demand for STEM ready workers is escalating. Preparation in IT provides an entry point into the workforce and future college degrees for high school graduates from traditionally under-represented groups in the STEM fields such as urban youth. If we are going to prepare students for careers for the effective and efficient use and development of IT, students need regular access to up-to-date hardware. The Community of Designers program (Mishra, Koehler and Zhao, 2006) required students to collaboratively develop solutions to IT authentic problems. Duran and Sendag (2012) used this framework in their IT3 project specifically to develop urban students creative and problem solving skills in STEM based model. Mrsha et. al. and Duran & Sendag's model reflect the Problem Based Learning (PBL) structure used at Hughes STEM School currently. The results of their work found the students significantly improve their critical thinking skills, including mathematical thinking and ability to draw inferences. Duran & Sendag (2012) states that the students' critical and mathematical thinking in order to support their learning in formal mathematics courses, and increase students desire to learn and use mathematics. Additionally, Hughes STEM High School conducted an evaluation of student attitudes and an analysis of student achievement as part of an IT3 grant funded by the National Science Foundation. The IT3/3 grant provided science-focused digital backpacks with similar technologies requested in this grant. The IT3/3 evaluation asked students to self-report on the Student Activity Feedback Forms (SAFF) whether these projects helped them learn science, and whether or not the projects helped them use technology to learn science. Results were generally positive (mean agreement ratings of 3.46-4.25 out of 5 and 3.40-4.38 out of 5, respectively) with a lot of variation; the second implementations were rated higher than the first implementations in most cases. These CincySTEM/IT3 Evaluation Results 23 results are consistent with more focused teacher professional development and increased teacher comfort with technology integration (see Table 9 for results). Written responses to SAFF open-ended questions were encouraging. For example, students described how much they learned about global warming and greenhouse gases in different countries, the positive and challenging aspects of teamwork, doing research and presenting findings on PowerPoint slides, and assuming different roles in the project. With regard to the F-SET digital backpack equipment, students reported using the TI Inspire calculators, Kodak video cameras, and iPads. Results indicated that the most experienced teachers incorporated these and other devices in their instructional activities.

21. Is this project able to be replicated in other districts in Ohio?

Yes

22. Is so, how?

Although the specific goals of this grant funding would be difficult to replicate in other schools or districts because of the extensive infrastructure already in place at Hughes STEM High school including the preparatory academy and majors pathways, the specific technology rich learning units can serve as a model and be adapted to meet local needs.

23. Describe the substantial value and lasting impact that the project hopes to achieve.

Increased student achievement in core academic subjects and computer literacies needed to perform in a work or college environment. The value of a better preparation of students is essential to both the students ability to perform in their chosen post-secondary career or education. They will be advanced users of computer technologies who understand the productive value of the variety of computer consumer products. * Increased usage of computer technologies by both students and teachers * Increased student access to state of the art computer technologies * Improved student engagement and motivation in core subjects * High-quality Student digital products * Technology rich lessons and units designed by Hughes STEM teachers

24. What are the specific benchmarks related to the fund goals identified in question 9 that the project aims to achieve in five years? Include any other anticipated outcomes of the project that you hope to achieve that may not be easily benchmarked.

Increased student achievement in core academic subjects as measured by district exams and State testing. * Increased usage of computer technologies by both students and teachers * Increased student access to state of the art computer technologies * Improved student engagement and motivation in core subjects and STEM majors * High-quality Student digital products * Technology rich lessons and units designed by Hughes STEM teachers

25. Describe the plan to evaluate the impact of the concept, strategy or approaches used.

* Include the method by which progress toward short-term and long-term objectives will be measured. (This section should include the types of data to be collected, the formative outputs and outcomes and the systems
In place to track the program's progress).

* Include the method, process and/or procedure by which the program will modify or change the program plan if measured progress is insufficient to meet program objectives.

**Instruments and Data Collection Procedures**

- **Student Activity Feedback Form.** A student activity feedback survey that was originally developed as part of an NSF RET project (#EEC0808696; PI Dr. A. Kukreti) and will be modified for this project to create the Student Activity Feedback Form (SAFF). This survey will be used to collect feedback on project implementation in academic years 2013-2014 and 2014-2015 from students. All students who consent will be given an opportunity to complete the surveys. The evaluation will not only measure if the educational technology equipment used during the project engaged students at a higher level but will also assess impact on student learning. *Teacher Focus Groups.** The evaluation team will conduct end-of-the-semester focus group to the participating teachers during regularly scheduled school professional development. The teachers will be asked questions about the project's classroom implementation, perceived student reactions and learning, support provided by the project team, future plans for using these technologies, either in whole or in part, and any feedback for improving the IT project in the future. *21st Century Skills Assessment.** All teachers and students will take the Atomic Learning 21st Century skills assessment as both a pre and post assessment within the scope of the this project. * Include methods by which the program will modify or change plan if measured progress is insufficient. Evaluation of project will be conducted both internally and externally at the end of each semester. Internal evaluation will be facilitated by a select group of teachers and externally by committee of IT program advocates.

By virtue of applying for the Straight A Fund, all applicants agree to participate in the overall evaluation of the Straight A Fund for the duration of the evaluation timeframe. The Governing Board of the Straight A Fund reserves the right to conduct evaluation of the plan and request additional information in the form of data, surveys, interviews, focus groups, and any other related data to the legislature, governor, and other interested parties for an overall evaluation of the Straight A Fund.

**PROGRAM ASSURANCES:** I agree, on behalf of this applicant agency and/or all identified partners to abide by all assurances outlined in the Assurance section of the CCIP. In the box below, enter "I Accept" and indicate your name, title, agency/organization and today's date.

I Accept, Kathy Wright Principal Hughes STEM School / Cincinnati City School district 10/25/2013