The Edgar Fahs Smith STEAM Academy, with its emphasis on project-based learning and acquisition of 21st Century skills, will enrich the academic experience for a greater number of students in grades 3-12 at the School District of the City of York. The District will train teachers to use a blended learning model in classrooms that empowers students to pursue their individual interests while learning to work together cooperatively. Using a non-traditional approach to education, the District will transform classrooms into a work environment where students contribute directly to solving problems in the community. We envision a setting where STEAM careers, experiences and skills drive the curriculum. For Academy students, the District will enhance its current curriculum, newly aligned to state standards, to include problem-based learning that is STEAM career-oriented and cross-disciplinary. Eventually, the District aims to enhance educational opportunities by providing each Academy student with a computer/tablet for use at home and in the classroom.

This proposal from the Superintendent of Schools, supported by a committee of District educators and many months of research, boldly builds on the success of the STEAM program housed eight years at Ferguson K-8. This proposal is based on the conviction that students of all backgrounds and abilities deserve access to opportunity, rigor and meaningful instruction at school.
Background

The District has operated a STEM/STEAM program at Ferguson K-8 since 2009. The current program offers STEAM instruction in one classroom each for grades 4, 5, 6, 7 and 8. The curriculum for these students is enriched through project-based and cooperative learning opportunities built into their schedule. The program emphasizes creativity and artistic expression each year by involving every STEAM student in the production and performance of a musical.

Students throughout the district’s seven K-8 schools are invited to apply for the STEAM program. However, the bulk of the students enrolled in the program live in the Ferguson attendance zone. In 2015, the District formed a partnership with Penn State York to provide a part-time STEAM coordinator. Funds donated by the late Arthur Glatfelter, originally allocated for the Project: Connections program at Hannah Penn, are being used to support this partnership.

In 2016, the District formed a committee of District educators to explore the potential value and feasibility of an expanded STEAM program. The committee has met as a full group four times since October 2016. The District also contracted with the Lincoln Intermediate Unit to secure a facilitator, Ben Smith, to assist the team with investigating how the district could improve the current STEAM program and to provide professional development on the six foundational elements of the program. Those six elements, or pillars, are:

- Curriculum
- Instruction
- Professional Development
- Technology
- School Structure
- Parent and Community Engagement
Those six pillars defined the roles of subcommittees, whose members were charged with the task of developing recommendations for the Board of School Directors. Their work was further informed by visits to schools defined by the STEAM philosophy of learning.

In December 2016, 34 members of the STEAM committee visited the Science Learning Academy in Philadelphia. Then, in March 2017, 29 members of the STEAM team visited the Schiller and Woolslair Schools in Pittsburgh. Four members also visited the Lancaster Mennonite Middle School on Feb. 28. The purpose of those site visits was to gather first-hand knowledge of the operations, management and curriculum implementation of successful STEAM elementary, middle and high schools. The cost of the overnight trip to Pittsburgh was partially funded by a grant from the Pennsylvania State Education Association, which has supported the efforts of the STEAM team throughout this process.

Proposal

The Administration of the School District of the City of York proposes the following:

- Re-open the Edgar Fahs Smith building and move the existing 4-8 grade STEAM program from the Ferguson K-8 building to the Smith building
- Expand the existing STEAM program from grades 4-8 with 150 students to a program incorporating grades 3-8 with 300 students
- Continue expanding the program over the next five years to create a high school (grades 9-12) STEAM Academy model
- Adopt and utilize a project-based learning model as the pedagogical basis for student instruction

Rationale

Why re-open Smith and move the existing program?

- Issues of limited classroom space at the Ferguson K-8 School preclude the expansion of the STEAM program in that building.
- The Smith building has a physical plant that would provide the program with the necessary facilities for a true STEAM curriculum. Advantages of the Smith facility include an auditorium for performances, classrooms designed for robotics and technology education, ample rooms for maker-spaces, and available classrooms to expand the program through grade 12.
- A greater number of students district-wide will have access to the STEAM curriculum.
- The STEAM Academy will serve as a lab school/test site for the use of a project-based learning instructional model the District could eventually adopt to be used by all teachers in the school district.
- The re-opening of the Smith building will help to reduce enrollment in the seven K-8 buildings by 300 students, thus reducing class sizes in grades 3-8 throughout the district.
- Parents and guardians will have additional educational options for their children that the District was not able to offer them previously.
Format

Initially, the Academy will offer two classes each in grades 3-8. Enrollment in each class will be capped at 25 students. District staff will consider students’ academic performance, attendance records and behavioral history in reviewing applicants for admission. Students will need at least one teacher recommendation. However, the Academy is within reach of all students with the demonstrated ability and expressed desire to experience a different way of learning. If more than 50 students apply in each grade the first year, a lottery system will be utilized.

- Year 1: Two classrooms each for grades 3-8. Total of 300 students
- Year 2: Two classrooms each for grades 3-9. Total of 350 students
- Year 3: Two classrooms each for grades 3-10. Total of 400 students
- Year 4: Two classrooms each for grades 3-11. Total of 450 students
- Year 5: Two classrooms each for grades 3-12. Total of 500 students

Structure

The Academy will use the District’s looping model for 3-8 grade teams. In grades 3-6, one teacher will focus on math and science and the other on ELA and social studies. On the 7-8 grade team, the district will employ four certified teachers – one each for social studies, ELA, math and science. Students will keep the same two teachers for two years in grades 3 and 4, the same two teachers for two years in grades 5 and 6 and the same four teachers for two years in grades 7 and 8.

Teachers will have common PLC time to collaborate. Administrators and teachers will also collaborate with external school partners to integrate STEAM opportunities in the classroom.
Pedagogy

The Mission of the School District of the City of York: As a professional learning community we educate the whole child by providing an engaging and challenging learning environment to ensure each student receives a premier education.

To fulfill this mission through an innovative approach to education, the Administration is recommending the STEAM Academy adopt the Engineering Design Process.

Simply put, the Engineering Design Process gives students a strategy for identifying and solving problems. By empowering students to identify problems, education becomes drastically more relevant to students in the context of their own communities without sacrificing academic rigor.

This design process requires teachers to instruct students in a certain manner so that students are always involved in one of the following steps during their learning:

1. Identifying a problem
2. Researching that problem
3. Brainstorming solutions to that problem
4. Analyzing the proposed solutions and ideas regarding the problem
5. Building, testing, sharing and, if necessary, re-designing the solution to the problem
6. Sharing and communicating the finished product

Through the use of this process, we hope to develop the following competencies in our students:

1. Effective reading, writing, listening and speaking skills
2. Sense of purpose and sense of self
3. Resiliency
4. Collaboration
5. Problem solving
6. Critical and creative thinking
7. Technological fluency
8. Physical and social-emotional wellness
9. Leadership

We envision a student learning environment that focuses on project-based instruction in every classroom.
Courses Offered

The courses offered at the Academy will be aligned to the current District curriculum, which is aligned to Pennsylvania standards. The Academy will provide project-based learning that will offer real world, relevant and complex problems. This may include internships, co-ops, work studies, mentorships and job shadowing. Classrooms will be facilitated by teachers who guide students to ask questions, research, solve problems and develop new technologies. For the first year of the program, the following middle-level courses are proposed:

- English Language Arts
- Environmental Science
- Earth Science
- Pennsylvania History
- World History
- United States History
- Math
- Pre-Algebra
- Algebra 1
- Computer Science
- Technology Education
- Robotics
- Art
- Music
- Creative Arts
- Health/Physical Education
- Foreign Language

Instructional Staff

In addition to the core group of 12 classroom teachers in the first year, the District will employ the following staff:

- Part-time STEAM program coordinator, provided by the Penn State York campus, to work with the building principal to plan activities and develop community partnerships
- Technology education teacher
- Computer science teacher
- Art, music and physical education teachers
- One special education and one English language teacher

Projected Cost

The Administration anticipates a cost of about $2.57 million to open and operate the Academy in its first year. Emphasis will be on hiring high-quality teachers and other staff who can successfully implement the STEAM philosophy and Engineering Design Process in the classroom. Installation of new technologies to enhance the learning process will be a priority for a later time.

The District will cover the cost of the Academy’s opening and operation in three ways. Most significantly, we anticipate receiving the $2 million increase in Gov. Tom Wolf’s budget proposal. We also believe the Academy will attract students who might otherwise attend charter schools, further increasing the District’s revenue expectations. Finally, we will use fund balance to cover the difference.