

**Kentucky Department of Education  
Office of Career and Technical Education  
Engineering Pipeline Grant Application**

Please check the level of sustainability, adding the:

2<sup>nd</sup> Course                       3<sup>rd</sup> Course                       4<sup>th</sup> course

Funding Amount (See Proposed Budget Summary Form):                      **\$15,000 (HS) & \$15,000 (MS)**

District: Carroll County School District

Address: 813 Hawkins St.

City: Carrollton                      State KY                      Zip 41008

School Name: Carroll County High School

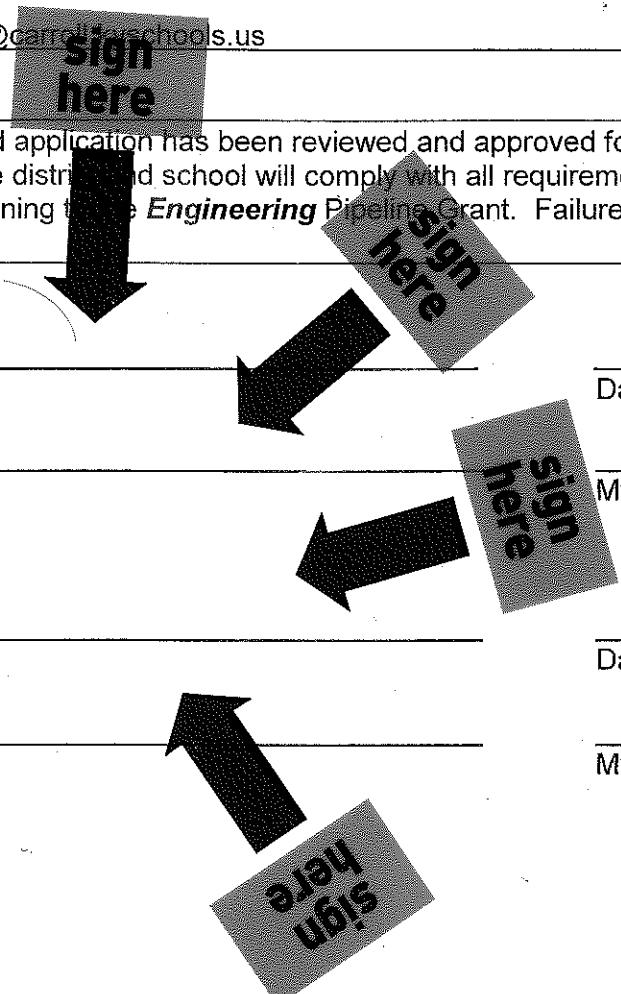
School Name: Carroll County Middle School

School Name: \_\_\_\_\_

Project Director: Bill Hogan                      Phone 502-732-7070

Email: bill.hogan@carroll.kyschools.us

I assure the attached application has been reviewed and approved for implementation by all stakeholders and the district and school will comply with all requirements, both technical and programmatic, pertaining to the **Engineering Pipeline Grant**. Failure to do so could impact future funding.



Principal \_\_\_\_\_ Date \_\_\_\_\_

Notary Public \_\_\_\_\_ My commission expires \_\_\_\_\_

Notary seal \_\_\_\_\_

Superintendent \_\_\_\_\_ Date \_\_\_\_\_

Notary Public \_\_\_\_\_ My commission expires \_\_\_\_\_

Notary seal \_\_\_\_\_

**Student Recruitment Plan:** All students in the district's one middle school take three PLTW courses: Energy and Environment in sixth grade, Green Architecture in seventh grade (will be Medical Detectives next year), and Design and Modeling in eighth grade. This ensures that students of all races, ethnicities, and genders are given access to the PLTW engineering classes. Additionally, to encourage more girls to take the engineering courses, the middle school is forming an engineering/STEM after-school club that utilizes the Girls Excelling in Math and Science (GEMS) curriculum.

Recruiting for high school PLTW engineering classes begins in middle school. Each year, the high school guidance counselor visits the middle school to speak about the benefits of the PLTW engineering courses, and she encourages all students to apply for spots in the classes. Additionally, letters go to the homes of all eighth-grade students specifically to inform parents about the PLTW program.

See the **Student Progress** section below for information on the guidance and advising provided to PLTW students. For growth, one goal of the program is to increase the number of PLTW engineering enrollees by 10% each year.

**Engineering Pipeline Plan:** The school district maintains a K-12 engineering pipeline available to all students. All students in grades K-5 take Engineering is Elementary (EiE), a program that helps young students gain a basic understanding of engineering and technology concepts. The University of Louisville's J.B. Speed School of Engineering provides professional development to district teachers for EiE.

Middle school students in grades six through eight begin the formal PLTW curriculum with the Gateway to Technology. As stated in the section above, all students in the middle school take three of the PLTW Gateway to Technology classes.

The high school will add its third PLTW engineering class next school year. Once students reach the fourth PLTW engineering course in the 2015-2016 school year, PLTW seniors will be given priority for industry co-op positions in the community, which include spots at large steel mills and chemical processing plants, among others.

Since the high school is rolling out its third PLTW class next school year, the district has contacted a local community college to see about establishing dual credit and course articulations for students who complete the fourth engineering course during the 2015-2016 school year.

**Student Progress:** The school district utilizes a full-time College and Career Readiness Counselor who meets with all high school students who are in PLTW classes. The counselor's office is in the same building as the high school PLTW engineering lab. The counselor meets with students to track their progress, help them set goals, and plan their future steps based on the classes that they have taken.

In addition to working with the students, the College and Career Readiness Counselor also communicates with parents in order to keep them informed about their student's progress.

**Industry Partnership Team:** The district's PLTW program originated with local industry need. The very concept of an engineering pipeline originated with local power plants, chemical plants, and steel mills needing replacements for retired and retiring workers. These local industries were keen to help the district establish an engineering pipeline through the PLTW curriculum.

In terms of implementation and finances, local industries have donated \$185,000 to date for PLTW expenses, with \$10,000 more already pledged. These industries have

given their engineers' time to help mentor and guide students along the engineering career path. Additionally, they have paid for speakers like astronaut Mike Mullane to speak to the students about engineering, goal setting, and technology.

The local industries have shown their commitment to increasing the caliber of their workers through their support of the PLTW engineering pipeline.

**Sustainability:** The bulk of the program's investment and capital expenses have already been paid by the school district and by local businesses and industries. Moving forward, upkeep and expansion will be the only financial needs.

As mentioned in the **Industry Partnership Team** section above, local industries have already donated \$185,000 to the PLTW program in the district. These steel mills and chemical plants have a need for engineering talent since they have an aging workforce and are projecting mass retirements in the coming years. Just this year, one of the steel mills performed an on-site visit of the district's PLTW facilities during normal classroom instructional time. The visitors were so impressed that they donated an additional \$50,000 for PLTW instruction and equipment.

Additionally, the school district is committed to ongoing support and expansion of the PLTW engineering pipeline, and the school board has not hesitated to approve the continued expansion of the program. This has involved shifting resources, personnel, and space so that the high school PLTW program is in an optimum technical environment in the same building as a College and Career Readiness Counselor, as mentioned in the **Student Progress** section above.

Furthermore, the middle school is undergoing a renovation, and the PLTW middle school lab has been included in the plans specifically for the purpose of expanding the

opportunities for PLTW in the future. The middle school PLTW space will encompass a two-level section of the building with an adjacent technology café and study lounge. Sliding doors outside the classroom have been designed to give visibility to the program, allowing activities to “spill out” into the corridor so that students who are walking by can see PLTW projects as they happen. Moving forward, PLTW will continue to be a priority in funding and physical plant expansions.

**Evaluation:** The goals for the PLTW program dovetail with the larger goals of the school district, which include increasing the number of graduates who pursue STEM careers and training so that they can eventually work with local industries in engineering roles. To achieve this larger goal, the PLTW program seeks to do the following:

<b>Goal 1 – To teach science and math in a problem-based, engineering environment.</b>	
<b>Objectives for Goal #1</b>	
1	Increase number of students who are taking PLTW engineering courses by 10% each year, determined by enrollment figures.
<b>Outcomes for Goal #1</b>	
1	With more students taking PLTW engineering courses, more students will be exposed to math and science in a problem-based environment, which will increase interest and achievement.
<b>Goal 2 – To encourage more students to pursue STEM careers and technical training after high school graduation.</b>	
<b>Objectives for Goal #2</b>	
2	Increase percentage of students who pursue STEM degrees and training by 5% each year, determined by surveys and data of graduates.
<b>Outcomes for Goal #2</b>	
2	With more of the district’s students pursuing STEM degrees and training, the district will continue to shift its focus toward technical and scientific preparation for students.
<b>Goal 3 – To encourage more female students to enroll in STEM courses.</b>	
<b>Objectives for Goal #3</b>	
3	Increase percentage of female PLTW students by 10% each year until parity is reached, determined by enrollment figures.
<b>Outcomes for Goal #3</b>	
3	Increasing the percentage of female PLTW students in the engineering classes will encourage more of the district’s female students to explore advanced training in STEM fields.

## **Timeline of Pathway to Engineering Activities**

**July 6 – July 18:** Training for Digital Electronics at University of Kentucky

**July 7 – July 11:** Training for Design and Modeling at University of Kentucky

**Summer 2014:** Purchase supplies for the following classes:

- Introduction to Engineering Design
- Principles of Engineering
- Digital Electronics
- Design and Modeling
- Energy and Environment
- Green Architecture

**Summer 2014:** Purchase and Incorporate Makerbot 3d Printer for the Classroom

## Proposed Budget Summary Form

Explanation of Expenditures	Grant Amount	Match (In Kind) Amount
(HS) = High School Expense (MS) = Middle School Expense		
Travel expenses and registration fees for teachers to attend the required PLTW Core Training(s). <ul style="list-style-type: none"> <li>• Teacher attending Digital Electronics Training (HS)</li> <li>• Teacher attending Design and Modeling Training (MS)</li> </ul>	<b>4,380 (HS)</b> <b>2,000 (MS)</b>	<b>8,615</b>
Engineering related instructional materials and equipment. <ul style="list-style-type: none"> <li>• \$1,000 for supplies: <b>Intro to Engineering Design</b> (HS)</li> <li>• \$1,000 for supplies: <b>Principles of Engineering</b> (HS)</li> <li>• \$6,000 for supplies: <b>Digital Electronics</b> (HS)</li> <li>• \$2,000 for supplies: <b>Design and Modeling</b> (MS)</li> <li>• \$4,000 for supplies: <b>Energy and Enviro</b> (MS)</li> <li>• \$7,000 for supplies: <b>Green Architecture</b> (MS)</li> </ul>	<b>8,000 (HS)</b> <b>13,000 (MS)</b>	
Makerbot2 3d Printer, Technical Support (1yr), and Supplies (HS)	<b>2,620 (HS)</b>	
Autodesk Software		<b>3,945</b>
PLTW Mentoring Fee		<b>1,250</b>
Dell Computers – Optiplex 790		<b>4,449</b>
PLTW Participation Fees		<b>2,749</b>
Gateway to Technology Wind Kit and Consumables		<b>4,850</b>
Mileage for PLTW Training and Events		<b>2,345</b>
Ceiling Projector and Principles of Engineering Supplies		<b>3,055</b>
<b>Total Amount Requested</b>	<b>\$ 15,000 (HS)</b> <b>\$ 15,000 (MS)</b>	<b>\$ 31,258</b>

**\*Estimated Costs based on 2013-2014 Purchase Manual attached as a reference for purchases.**

**\*Teacher salaries are not an allowable expense; yet, a stipend for attendance at summer Core Training for Teachers is an allowable expense using the munis code 0113.**

## Budget Narrative

### A. Travel expenses and registration fees for Core Training(s) - \$6,380

Core Training for High School PLTW Engineering Instructor: \$4,380

The core training registration fee is \$2,400 for the two-week Digital Electronics course in Lexington, KY. Lodging costs \$1,400 for the two week period. Board policy dictates \$40 per day for all overnight trips, which comes to \$400. Two round-trips to Lexington comes to \$180.

Core Training for Middle School PLTW Engineering Instructor: \$2,000

The core training fee is \$1,200 for the one-week Design and Modeling course in Lexington, KY. Lodging costs \$700 for the one-week period. Board policy dictates \$40 per day for all overnight trips, which comes to \$200. One round-trip to Lexington comes to \$90. The district will pay \$190 of this (MATCH).

### B. Engineering related instructional materials and equipment. - \$21,000

Supplies for Digital Electronics: \$6,000 – Estimate for class of 20

Supplies for Principles of Engineering: \$1,000 - Resupply

Supplies for Introduction to Engineering Design: \$1,000 - Resupply

Supplies for Green Architecture: \$7,000

PLTW Green Architecture required materials for sixty students. Students will learn about principles of sustainable architecture. Activities will center on constructing three-dimensional structures and generating floor plans.

Supplies for Energy and Environment: \$4,000

PLTW Energy and Environment required materials for sixty students.

Activities will focus on problems/solutions with alternative energy sources.

Supplies for Design and Modeling: \$2,000

PLTW Design and Modeling required materials for sixty students.

Students will use Autodesk software to create a design portfolio.

### C. Makerbot2 3d Printer, Technical Support (1yr), and Supplies (HS) - \$2,620

Makerbot Replicator 2 3d Printer: \$2,200 Technical Support for 1 Year: \$350

Filament: \$70

**NOTE: ALL MATCHING, IN-KIND FUNDS ARE FROM CORPORATE DONATIONS THAT HAVE BEEN USED FOR THE EQUIPMENT LISTED BELOW. THE DISTRICT HAS ENOUGH IN-KIND FUNDS TO COVER THE GRANT AMOUNT FROM TEACHER SALARIES BUT HAS NOT LISTED THEM PER KDE'S INSTRUCTIONS.**

### D. Training, Lodging, and Meals for Core Training: \$8,425 – MATCH

Two PLTW teachers were sent to PLTW training at the University of Kentucky.

### E. Autodesk Software – ADA and Inv - \$3,945 – MATCH

A classroom license was purchased so that PLTW engineering students could explore engineering design with professional-level software.

### F. PLTW Mentoring Fee - \$1,250 – MATCH

### F. Dell Optiplex 790 Computers - \$4,449 – MATCH

24 student computers were purchased for PLTW students.

### G. PLTW Participation Fees - \$2,749 - MATCH

### H. Gateway to Technology Wind Kit and Consumables - \$4,850 - MATCH

### I. Mileage for Teachers to Attend PLTW Trainings and Events - \$2,345 - MATCH

### J. Ceiling Projector & Princ. of Engineering Supplies for PLTW - \$3,055 -MATCH

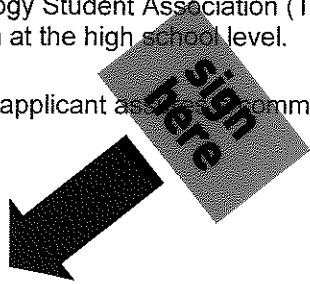


**KENTUCKY DEPARTMENT OF EDUCATION  
BRANCH OF COLLEGE AND CAREER READINESS  
ASSURANCES FOR ENGINEERING PIPELINE  
GRANT AWARD**

The applicant agrees that if funds are made available through the *Engineering* Pipeline Grant Award Program:

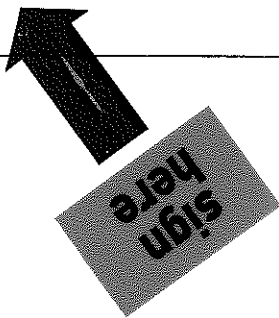
1. Instructional space for the middle school and high school laboratory should be a minimum of 1700 square feet each. However, after the second year of program operation at the high school level, a second laboratory is required and should include a minimum of 1000 sq. ft.
2. Schools will provide annual student information through PLTW's systemic evaluation process.
3. High Schools will use all PLTW End-of Course assessments.
4. Fiscal and property management control, and fund accounting procedures are in place and operational with the Accountability Report to KDE on or before June 30, 2014.
5. Prior to the close of the fiscal year of the grant award, a report will be forwarded to the Department describing the accomplishments made toward the implementation of the plan.
6. All equipment purchases must be physically located in the instructional area approved in the grant application unless explicit approval is obtained under Department regulations regarding equipment disposition.
7. All grant funds must be incurred and expended prior to June 30, 2014.
8. That an affiliated Technology Student Association (TSA) chapter or other related CTSO is made available to students in the program at the high school level.

By submitting this application, the applicant assumes a commitment to implement the improvements described in the attached grant proposal.



\_\_\_\_\_  
Principal

\_\_\_\_\_  
Date



\_\_\_\_\_  
Superintendent

\_\_\_\_\_  
Date