

Secondary PLTW Expansion

November 8, 2018

The Raymore-Peculiar School District Strategic Plan process outlines focus areas, strategies and actions steps to follow as a means to achieve overall organizational excellence. Action Step 1.2.1: Expand Project Lead The Way (PLTW) course offerings at all grade levels was listed under Strategy 1.2: Expand STEAM (Science, Technology, Engineering, Arts, Math) opportunities for all students. The draft plan below addresses an expansion opportunity in the area of secondary PLTW.

PLTW has three major pathways within its system: engineering, biomedical, and computer science. At our middle schools, we currently offer full course loads in each of these pathways. At the high school level, there is still room for expansion. New courses can be partially funded through Career Enhancement Grants offered through DESE.

Engineering

In 2016-2017, RPHS started the PLTW journey by first offering a course in the engineering pathway and now currently offers three courses: Introduction to Engineering and Design (IED), Principles of Engineering (POE) and Computer Integrated Manufacturing (CIM). IED and POE are considered foundational in nature and provide what students need to move onto 'capstone' courses. Capstone courses provide students with very detailed instruction in more specialized areas. CIM is considered a capstone course focused on a highly technical manufacturing career path and was first offered in the 2018-2019 school year. For the 2019-2020 school year, RPHS would like to offer the capstone course entitled Engineering Design and Development (EDD). This course focuses on students taking a deeper dive into the designing of engineering solutions. Students will perform research to select, define and justify a problem. They will then select an approach and create and test their solution prototype.

Item	Engineering Design and Development (2019-2020)
PD & Travel	\$5,600
Teacher Stipend	\$1,500
PLTW Participation Fee	\$3,000
Equipment/Supplies	\$4,600
<i>Engineering Pathway Total Cost</i>	<i>\$14,700</i>

Biomedical

The biomedical pathway was first introduced at RPHS in the 2017-2018 school year with a course entitled Principles of Biomedical Science. In the 2018-2019 school year, RPHS offered Human Body Systems as the second tier of the pathway. The third course in this pathway is entitled Medical Interventions (MI); it will be offered in the 2019-2020 school year. In this course, students investigate a variety of interventions involved in the prevention, diagnosis and treatment of disease as they follow the lives of a fictitious family. More specifically, student explore how to prevent and fight infection, how to screen and evaluate the code in DNA, how to prevent, diagnose and treat cancer and how to prevail when the organs of the body begin to fail. Interventions studied include: immunology, surgery, genetics, pharmacology, medical devices and diagnostics. The final capstone course in this pathway is entitled Biomedical Innovations (BI). Students design innovative solutions for health challenges in the 21st century, addressing topics such as clinical medicine, physiology, biomedical engineering and public health. Biomedical Innovations would be offered in the 2020-2021 school year.

Item	Medical Interventions (2019-2020)	Biomedical Innovations (2020-2021)
PD & Travel	\$4,400	\$4,400
Teacher Stipend	\$1,500	\$1,500
PLTW Participation Fee	\$1,000	\$3,000
Equipment/Supplies	\$27,000	\$16,500
Computers	\$28,000	\$0
Total Cost	\$61,900	\$25,400
Biomedical Pathway Combined Total Cost		\$87,300

Computer Science

The final pathway in PLTW is computer science; RPHS offered its first course in this area in the 2018-2019 school year. Computer Science Essentials (CSE) provides the foundational knowledge necessary for a student to further explore the computer science pathway.

Cybersecurity is a fast-growing industry and a course that builds upon the knowledge learned in CSE. In this course, students train and role play as cybersecurity experts. There are four major areas of study: personal security, system security, network security and applied cybersecurity. The curriculum is based in the National Cybersecurity Workforce Framework, which has identified standards from academic, industry and government organizations. Cybersecurity will also be offered in the 2019-2020 school year. Two remaining courses, Computer Science Principles (CSP) and Computer Science A (CSA) are linked courses designed to prepare

students to take the AP Computer Science Principles assessment. Students work in teams to develop computational thinking and solve problems. Specifically, students will develop apps, automate tasks in a variety of computer languages, find patterns in data and interpret simulations. CSP will be offered in the 2020-2021 school year and CSA will be offered in the 2021-2022 school year.

Item	Cybersecurity (2020-2021)	Computer Science Principles (2020- 2021)	Computer Science A (2021-2022)
PD & Travel	\$4,400	\$4,400	\$4,400
Teacher Stipend	\$1,500	\$1,500	\$1,500
PLTW Participation Fee	\$0	\$1,000	\$3,000
Equipment/Supplies	\$550	\$850	\$500
Computers	\$28,000	\$0	\$0
Tablets	\$11,000	\$0	\$0
Total Cost	\$45,450	\$7,750	\$9,400
Computer Science Pathway Combined Total Cost			\$62,600

Total Cost by Implementation Year

2019-2020	2020-2021	2021-2022
\$122,050	\$33,150	\$9,400

Based on enrollment numbers in the future, additional staff may be needed for the Engineering and Biomedical Pathways.