Course Syllabus

Project Lead the Way: App Creators/Flight & Space—Grade 6th, 7th, and 8th Grade

Teacher: Kevin Armstrong
School: Riverside Middle School
Year: 2017-2018

This syllabus includes the following information:

2017-2018 Outline and Project Lead the Way Performance Objectives
Methods of Assessment
Class Procedures and Rules
Grading Scale

Course Rationale

Project Lead the Way is an inquiry-based program that enhances technological literacy and prepares students for life in the 21st century.

Course Prerequisites and Academic Essential Functions

The student must be able to read independently and follow directions.

Resources

Project Lead the Way (PLTW) Curriculum and Resources
Unit: *App Creators*
Flight and Space

PLTW: App Creators Course Outline

App Creators introduces students to the field of computer science and the concepts of computational thinking, through the creation of mobile apps. Students are challenged to be creative and innovative, as they collaboratively design and develop mobile solutions to engaging, authentic problems. Students experience the positive impact of the application of computer science to society as well as other disciplines, particularly biomedical science.

The unit provides students opportunities for self-expression. Teams identify a personal or community problem of interest to them that can be solved with a mobile app solution. The problem can address issues such as health and wellness, the environment, school culture, emergency preparedness, education, community service—the options are endless!

Lesson 1: Let's Create an App!

Students are introduced to the concept of pair programming, app development, and the MIT App Inventor development tool. They learn about the Model-View-Controller (MVC) design pattern, app graphical design, event-driven programming, debugging, and algorithm creation using variables and conditional logic. They create engaging biomedical science apps and fun interactive games that apply these concepts and use basic user interface features, media, and animation.

Lesson 2: Taking It to the Next Level

Students further explore the concepts investigated in Lesson 1 and build upon their skills to use data in mobile applications. They create algorithms using loops to streamline repetition and iterate through lists, and create procedures to abstract the details of a task and reduce redundancy. They learn to organize and store persistent data collected from user input and device sensors.

Lesson 3: The App Challenge

Students apply all of the knowledge and skills they have acquired to design and create a mobile app solution for a personal or community problem. They apply the design process and computational thinking skills to decompose the problem into smaller modules. Following user-centered design principles, they design and create an appropriate user interface and program the app to produce the desired behavior.

PLTW: Flight and Space Course Outline

Lesson 1: History of Flight and Space

The study of aerospace engineering would not be complete without a basic understanding of the history of aerospace. Many students think that the space shuttle can go to the moon. Some even think people have been to Mars. These misconceptions are often the result of watching science fiction movies or television programs that look real to students. In this lesson students will be introduced to the history of flight through hands-on activities, research, and a presentation in the form of an infomercial.

Lesson 2: Aeronautics

Aeronautics is the science and art of flying through the air. It refers to all aspects of flight in the atmosphere, from design and manufacturing to operation and maintenance of aircraft and spacecraft. To design an aircraft or spacecraft, engineers must understand the elements of aerodynamics, propulsion, materials and structures, and stability and control. In this lesson students will be exposed to all of these elements as they discover the science of flying, design and test propulsion systems, use simulations to create airfoils to test in a wind tunnel, and then use their knowledge to design, build, and test an airfoil.

Lesson 3: Traveling and Living in Space

The layer of gases from surface up to about 100 miles above the Earth is known as the atmosphere. Space is the region above the Earth's atmosphere or beyond the solar system. Space travel and living in space is made possible by engineers, from mechanical engineers who design the components for spacecraft to biomedical engineers who design ways to care for astronauts' health while traveling in space. From designing the spacecraft, to getting us to the moon safely, to building tools to help humans someday live on the Moon, engineers play a vital role in space travel, space discovery, and living in space. In this unit students will experience space travel and spacecraft innovation through an interactive simulation.

Suggested Materials:

Earbuds or Headphones and additional materials for the Flight and Space class as needed.

Grading Scale

Percent Range	Letter Grade	GPA
100-90	A	4.0
89-80	B	3.0
79-70	C	2.0
69-60	D	1.0
Below 60	F	0.0

Procedures for Make-up Assignments

Students are encouraged to attend class every day. All work is done in class, project based, when students are absent they miss working in pairs or groups and completing their work. Students can make up work anytime during the 9 weeks before the grade book closes. Students must notify me they have completed the work and ask for regarding. Students are encouraged to come into my class during before or after school to complete their make-up work.

Class Procedures

Students will: Use Google Classroom for assignments and instructions for projects. All safety regulations should be followed with tools and equipment in the workroom. If students cannot handle the responsibility of working with others, with sharp tools, power tools, they will be given an alternate computer/book related assignment.

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