PLTW APP CREATORS	
CURRICULUM/CONTENT AREA	**COURSE LENGTH**
IT/ENTREPRENEURSHIP	*Semester, Alternating Days (45 days)*
GRADE LEVEL	**DATE LAST REVIEWED**
7-8	*2022*
PREREQUISITE(s) ***if applicable***	**BOARD APPROVAL DATE**
	11/15/2022
PRIMARY RESOURCE ***if applicable***	
PLTW App Creators	

DESIRED RESULTS

COURSE DESCRIPTION AND PURPOSE

Businesses and individuals alike are making millions of dollars by developing apps that entertain, solve problems, and make life better. This class will get you well on your way to makingyour very own apps regardless of how much or how little previous coding experience you have had. Limited only by your imagination, you will have fun customizing your experience by developing apps that interest you while learning software engineering concepts. App Creators (AC) 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.

ENDURING UNDERSTANDINGS *Students will understand that...*	**ESSENTIAL QUESTIONS** *Students will keep considering...*
Creativity, innovation, and critical thinking are essential for success in a technologically advanced world.	Why is creativity and innovation important? How is creativity and innovation used in the STEM career pathways?
	How do teams efficiently and effectively solve problems in an increasingly complex world?
	What strategies and processes can I use to become a more effective creator, thinker and problem solver?
The ability to communicate and collaborate with people with diverse backgrounds and perspectives is key to participation in a global economic society.	Why is communication and collaboration important? How do positive work behaviors and personal qualities impact communication and collaboration?
	What is effective teamwork? What strategies can I use/teams use to work better together? How can perspectives and experiences of a diverse group develop innovative solutions to a given problem?
Career and technical education provides pathways to high-demand, high-wage career opportunities, and personal fulfillment.	Why is career and life readiness important? What jobs and careers are available to meet individual and societal needs locally, regionally, and nationally?
	How might technical knowledge and skills influence one's employability and advancement opportunities within various work settings?
	What are employability skills? How do I prepare myself for a career that is in demand now and in 5, 10, or 20 years from now?

PRIORITY CAREER & TECHNICAL STANDARDS
Students will be skilled at...

Creativity, Critical Thinking, Communication and Collaboration
4C2: Students will formulate and defend judgments and decisions by employing critical thinking skills.
a: I develop effective resolutions for a given problem, decision or opportunity using available information.
b: I develop and implement a resolution for a new situation using personal knowledge and experience.

Career Development
CD4: Students will identify and apply employability skills.
a: I identify and demonstrate positive work behaviors and personal qualities needed to be employable.
b: I demonstrate skills related to seeking and applying for employment to find and obtain a desired job.
c: I identify and exhibit traits for retaining employment.
d: I develop positive relationships with others.

Information, Media, Technology

IMT1: Students will access, interpret and evaluate information from a variety of sources in order to inform and support premises, arguments, decisions, ideas and initiatives.

a: I choose appropriate sources of data and information for a given purpose.
b: I determine the relevance, validity and timeliness of data and information.
c: I select relevant information necessary for making decisions and solving problems
d: I apply data and information to communicate ideas and create new opportunities.

PRIORITY CONTENT STANDARDS

Students will know...

Standard AP2: Students will create computational artifacts using algorithms and programming

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.

STAGE 1: Desired Unit Results What will students understand as a result of the unit?		**STAGE 2: Assessment Evidence** By what criteria will performances of understanding be assessed? Through what authentic performance tasks will students demonstrate the desired unit results?
ESSENTIAL QUESTION (s) What thought-provoking questions will foster inquiry, understanding, and transfer of learning?		**Success Criteria with Standards** The criteria for evaluating performance on standards is constant.
Why is creativity and innovation important? How is creativity and innovation used in the STEM career pathways?		CTE standards-based Rubric: Throughout the course, students and teachers use the rubric for communication of success criteria, reflection, goal setting, and feedback.
What strategies and processes can I use to become a more effective creator, thinker and problem solver?		In their portfolio/evidence journal, students will reflect on the essential questions through a quick write, constructed response.
PRIORITY CAREER & TECHNICAL STANDARDS & Learning Targets		**Performance Tasks Options/ Assessment Strategies by Standard** Students may be given options to show their learning in varied ways.
Creativity, Critical Thinking, Communication and Collaboration **4C2: Students will formulate and defend judgments and decisions by employing critical thinking skills.**		
b: I develop and implement a resolution for a new situation using personal knowledge and experience.	4C2.b.3.m: I can analyze problems to determine what past experiences might be related and relevant.	KWL Chart Pair Share 30 Second Expert
Career Development **CD4: Students will identify and apply employability skills.**		
d: I develop positive relationships with others.	CD4.d.4.m: I can use cooperative behavior in helping peers accomplish goals and tasks.	Group Goal Setting Team Huddles
Information, Media, Technology **IMT1: Students will access, interpret and evaluate information from a variety of sources in order to inform and support premises, arguments, decisions, ideas and initiatives.**		
c: I select relevant information necessary for making decisions and solving problems	IMT1.c.3.m: I can evaluate the relevance and reliability of various sources of information.	KWL Chart Launch Cycle
PRIORITY CONTENT STANDARDS & Learning Targets		**Performance Tasks Options/ Assessment Strategies by Standard** Students may be given options to show their learning in varied ways.
Standard AP2: Students will create computational artifacts using algorithms and programming	I can produce computational artifacts with broad accessibility and usability through careful consideration of diverse needs and wants of the community I can design, develop, and implement a computing artifact that responds to an event (e.g., robot that responds to a sensor, mobile app that responds to a text message, sprite that responds to a broadcast).	Given a unique problem, students will design and develop an app. Students will reflect on the design process and evaluate the solutions of others.

Stage 3: Learning Activities

A brief summary of the key learning activities- How will students build knowledge & develop skills? How will learning be relevant, accessible, and engaging? How will the learning unforld in a natural flow?

GUIDING UNIT QUESTIONS Using Costas Level of Thinking, what questions will hook and hold students so that they develop a deep understanding of the desired results? The guiding questions are more topic-specific to the particular unit. They guide the exploration of the essential questions and rigor of the standards. This may include questions that guide project based/ problem based learning	**STRATEGIES/ACTIVITIES** What learning strategies and experiences will authentically engage students so that they gain understanding the desired results? This includes strategies and activities that help learners acquire targeted knowledge and skills, make meaning of important ideas, and transfer their learning to new situations. Consider how the learning will be tailored and flexible to address the interests and learning styles of all students.	**RESOURCES/MATERIALS** This includes an applicable textbooks, software, industry recognized certification software/tools, subcriptions (such asPLTW), etc.
Why is a flowchart needed before the design process?	Online flowcharting with partners (Lucidchart)	PLTW website - App Creator Digital Emulator
What are the basic design features for creating an app?	Hide and Seek Activity	PLTW website - App Creator Digital Emulator
Why are naming conventions important when creating an app?	Germ Guide Project	PLTW website - App Creator Digital Emulator
Why is it important to test, debug, and retest often when creating an app?	Conditional Statements activity	PLTW website - App Creator Digital Emulator
In what ways does technology affect peoples lives?	Explicit instruction in the L.A.U.N.C.H. & other Design Processes	Defined Learning/Defined Careers
How do computer scientists design mobile apps to meet societal needs?		
What does effective teamwork look like?		
How do diverse perspectives of team members impact a solution?		
How do you express yourself and your creativity through computer science?		

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.

STAGE 1: Desired Unit Results What will students understand as a result of the unit?		**STAGE 2: Assessment Evidence** By what criteria will performances of understanding be assessed? Through what authentic performance tasks will students demonstrate the desired unit results?
ESSENTIAL QUESTION (s) What thought-provoking questions will foster inquiry, understanding, and transfer of learning?		**Success Criteria with Standards** The criteria for evaluating performance on standards is constant.
Why is creativity and innovation important? How is creativity and innovation used in the STEM career pathways?		CTE standards-based Rubric: Throughout the course, students and teachers use the rubric for communication of success criteria, reflection, goal setting, and feedback.
How do teams efficiently and effectively solve problems in an increasingly complex world?		In their portfolio/evidence journal, students will reflect on the essential questions through a quick write, constructed response.
PRIORITY CAREER & TECHNICAL STANDARDS & Learning Targets		**Performance Tasks Options/ Assessment Strategies by Standard** Students may be given options to show their learning in varied ways.
Creativity, Critical Thinking, Communication and Collaboration **4C2: Students will formulate and defend judgments and decisions by employing critical thinking skills.**		
b: I develop and implement a resolution for a new situation using personal knowledge and experience.	4C2.b.3.m: I can analyze problems to determine what past experiences might be related and relevant.	Pair Share Socratic Seminar / circle
Career Development **CD4: Students will identify and apply employability skills.**		
a: I identify and demonstrate positive work behaviors and personal qualities needed to be employable.	CD4.a.4.m: I can demonstrate flexibility and willingness to learn new knowledge and skills.	Jigsaw Cornell Notes LAUNCH
d: I develop positive relationships with others.	CD4.d.4.m: I can use cooperative behavior in helping peers accomplish goals and tasks.	30 second expert
Information, Media, Technology **IMT1: Students will access, interpret and evaluate information from a variety of sources in order to inform and support premises, arguments, decisions, ideas and initiatives.**		
c: I select relevant information necessary for making decisions and solving problems	IMT1.c.3.m: I can evaluate the relevance and reliability of various sources of information.	Cornell Notes
PRIORITY CONTENT STANDARDS & Learning Targets		**Performance Tasks Options/ Assessment Strategies by Standard** Students may be given options to show their learning in varied ways.
Standard AP2: Students will create computational artifacts using algorithms and programming	I can produce computational artifacts with broad accessibility and usability through careful consideration of diverse needs and wants of the community I can design, develop, and implement a computing artifact that responds to an event (e.g., robot that responds to a sensor, mobile app that responds to a text message, sprite that responds to a broadcast).	Students create algorithms using loops to streamline repetition and iterate through lists, and create procedures to abstract the details of a task and reduce redundancy. Students will reflect on the elements of the design process, specifically Build and Test (C: Create a Prototype, H: Highlight & Fix)

Stage 3: Learning Activities

A brief summary of the key learning activities- How will students build knowledge & develop skills? How will learning be relevant, accessible, and engaging? How will the learning unforld in a natural flow?

GUIDING UNIT QUESTIONS Using Costas Level of Thinking, what questions will hook and hold students so that they develop a deep understanding of the desired results? The guiding questions are more topic-specific to the particular unit. They guide the exploration of the essential questions and rigor of the standards. This may include questions that guide project based/ problem based learning	**STRATEGIES/ACTIVITIES** What learning strategies and experiences will authentically engage students so that they gain understanding the desired results? This includes strategies and activities that help learners acquire targeted knowledge and skills, make meaning of important ideas, and transfer their learning to new situations. Consider how the learning will be tailored and flexible to address the interests and learning styles of all students.	**RESOURCES/MATERIALS** This includes an applicable textbooks, software, industry recognized certification software/tools, subcriptions (such asPLTW), etc.
Why is a flowchart needed before the design process?	Repeating tasks activity	PLTW Website - App Creator
What are the basic design features for creating an app?	Algorithm activity	Digital Emulator
Why are naming conventions important when creating an app?	Charades Game	PLTW Website - App Creator
Why is it important to test, debug, and retest often when creating an app?	Understanding Lists activity	PLTW Website - App Creator
How can loops be used appriately to reduce coding redundancy?	Disease Tracker	PLTW Website - App Creator
What do programming best practices look like?	Explicit instruction in the L.A.U.N.C.H. & other Design Processes	Defined Learning/Defined Careers
How do diverse perspectives of team members impact a solution?		

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.

STAGE 1: Desired Unit Results What will students understand as a result of the unit?		**STAGE 2: Assessment Evidence** By what criteria will performances of understanding be assessed? Through what authentic performance tasks will students demonstrate the desired unit results?
ESSENTIAL QUESTION (s) What thought-provoking questions will foster inquiry, understanding, and transfer of learning?		**Success Criteria with Standards** The criteria for evaluating performance on standards is constant.
Why is creativity and innovation important? How is creativity and innovation used in the STEM career pathways?		CTE standards-based Rubric: Throughout the course, students and teachers use the rubric for communication of success criteria, reflection, goal setting, and feedback.
How do teams efficiently and effectively solve problems in an increasingly complex world?		In their portfolio/evidence journal, students will reflect on the essential questions through a quick write, constructed response.
PRIORITY CAREER & TECHNICAL STANDARDS & Learning Targets		**Performance Tasks Options/ Assessment Strategies by Standard** Students may be given options to show their learning in varied ways.
Creativity, Critical Thinking, Communication and Collaboration **4C2: Students will formulate and defend judgments and decisions by employing critical thinking skills.**		
b: I develop and implement a resolution for a new situation using personal knowledge and experience.	4C2.b.3.m: I can analyze problems to determine what past experiences might be related and relevant.	KWL
Career Development **CD4: Students will identify and apply employability skills.**		
a: I identify and demonstrate positive work behaviors and personal qualities needed to be employable.	CD4.a.4.m: I can demonstrate flexibility and willingness to learn new knowledge and skills.	Give one - Get one LAUNCH
d: I develop positive relationships with others.		
	CD4.d.4.m: I can use cooperative behavior in helping peers accomplish goals and tasks.	Team Huddles
Information, Media, Technology **IMT1: Students will access, interpret and evaluate information from a variety of sources in order to inform and support premises, arguments, decisions, ideas and initiatives.**		
c: I select relevant information necessary for making decisions and solving problems	IMT1.c.3.m: I can evaluate the relevance and reliability of various sources of information.	Focused Notetaking
PRIORITY CONTENT STANDARDS & Learning Targets		**Performance Tasks Options/ Assessment Strategies by Standard** Students may be given options to show their learning in varied ways.
Standard AP2: Students will create computational artifacts using algorithms and programming	I can produce computational artifacts with broad accessibility and usability through careful consideration of diverse needs and wants of the community I can design, develop, and implement a computing artifact that responds to an event (e.g., robot that responds to a sensor, mobile app that responds to a text message, sprite that responds to a broadcast).	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. Students will reflect on the elements of the design process.

Stage 3: Learning Activities

A brief summary of the key learning activities- How will students build knowledge & develop skills? How will learning be relevant, accessible, and engaging? How will the learning unforld in a natural flow?

GUIDING UNIT QUESTIONS Using Costas Level of Thinking, what questions will hook and hold students so that they develop a deep understanding of the desired results? The guiding questions are more topic-specific to the particular unit. They guide the exploration of the essential questions and rigor of the standards. This may include questions that guide project based/ problem based learning	**STRATEGIES/ACTIVITIES** What learning strategies and experiences will authentically engage students so that they gain understanding the desired results? This includes strategies and activities that help learners acquire targeted knowledge and skills, make meaning of important ideas, and transfer their learning to new situations. Consider how the learning will be tailored and flexible to address the interests and learning styles of all students.	**RESOURCES/MATERIALS** This includes an applicable textbooks, software, industry recognized certification software/tools, subcriptions (such asPLTW), etc.
What category/problem is the team going to address? Justify your answer.	The Great App Challenge	PLTW Website - App Creator
Why is a flowchart needed before the design process?	User Centered Design	PLTW Website - App Creator
What are the basic design features for creating an app?	Review Rubric	Digital Emulator
Why are naming conventions important when creating an app?	The Great App Challenge	PLTW Website - App Creator
Why is it important to test, debug, and retest often when creating an app?	The Great App Challenge	PLTW Website - App Creator
How can loops be used appropriately to reduce coding redundancy?		PLTW Website - App Creator
In what ways does technology apply peoples lives?	Explicit instruction in the L.A.U.N.C.H. & other Design Processes	Defined Learning/Defined Careers
How do you express yourself in computer science?		
How do diverse perspectives impact a solution?		

Priority Standards	Unit 1	Unit 2	Unit 3
Creativity, Critical Thinking, Communication and Collaboration **4C2: Students will formulate and defend judgments and decisions by employing critical thinking skills.** a: I develop effective resolutions for a given problem, decision or opportunity using available information. b: I develop and implement a resolution for a new situation using personal knowledge and experience.	x	x	x
Career Development **CD4: Students will identify and apply employability skills.** a: I identify and demonstrate positive work behaviors and personal qualities needed to be employable. b: I demonstrate skills related to seeking and applying for employment to find and obtain a desired job. c: I identify and exhibit traits for retaining employment. d: I develop positive relationships with others.	x	x	x
Information, Media, Technology **IMT1: Students will access, interpret and evaluate information from a variety of sources in order to inform and support premises, arguments, decisions, ideas and initiatives.** a: I choose appropriate sources of data and information for a given purpose. b: I determine the relevance, validity and timeliness of data and information. c: I select relevant information necessary for making decisions and solving problems d: I apply data and information to communicate ideas and create new opportunities.	x	x	x
Standard AP2: Students will create computational artifacts using algorithms and programming	x	x	x