TCSJ PBL Overview

Title:	**Building an App for the Community**	**Est. Start Date:** **March 2017**	**Duration:** 4 weeks
Teacher:	**Kellene Ditler, Dae Dyer, Maria Ramirez**	**Grade Level:** High School, 9 - 12	
Content Focus:	Technology	**Other subject areas to be included:** Math, ELA	
Overall Idea: Summary of the issue, challenge, investigation, scenario, or problem	How can creating a virtual reality App impact your local community?		
The Project: What will students design, build, and/or present at the end of the PBL to demonstrate their expertise and solution/answer to the Driving Question?	Students will utilize technology to create an augmented reality application to share with elementary school students that utilizes students' ideas of "important" places/things in their communities and surrounding areas, and they will present their project process and product to teachers and classmates.		
Essential Question:	In what ways can the use or technology help us learn about, appreciate, and experience our community and surrounding areas?	**Driving Question:**	If you could create an App for elementary students, what would it be?
Content and Skills Standards to be addressed: (CCCSS, NGSS, Calif.)	Writing Standards for Literacy in History/Social Studies, Science, and Technical Subjects for grades 11 and 12: Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes. Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the strengths and limitations of each source in terms of the specific task, purpose, and audience; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and overreliance on any one source and following a standard format for citation. CCSS.ELA-LITERACY.W.9-10.2.D		

	Use precise language and domain-specific vocabulary to manage the complexity of the topic. CCSS - Speaking & Listening 5. Make strategic use of digital media (e.g., textual, graphical, audio, visual, and interactive elements) in presentations to enhance understanding of findings, reasoning, and evidence and to add interest. 6. Adapt speech to a variety of contexts and tasks, demonstrating command of formal English when indicated or appropriate. (See grades 9–10 Language standards 1 and 3 on page 54 for specific expectations.) 21st C. Skills: Students in the 21st century must be aware of the global nature of our world and be able to select, organize, and design information to be shared, understood, and distributed beyond their classrooms. Math: Using data they have collected, and analyzing it, will help students start to become familiar with the data literacy skills of data processing, data manipulation, data presentation and data analysis CCSS Mathematics Standards A-SSE Seeing Structure in Expressions F-IF Interpreting Functions S-ID Interpreting Categorical and Quantitative Data C-21.0 Students understand the algorithms involved in Simpson's rule and Newton's method. Technology: CCSS SMP 3, SL 5 Create presentations for a variety of audiences and purposes with use of appropriate transitions and animations to adnd interest. Identify and use a variety of storage media (e.g., CDs, DVDs, flash drives, school servers, and online storage spaces), and provide a rationale for using a certain medium for a specific purpose.

		T+A	E		T+A	E
21st Century Skills and MPS to be explicitly taught and assessed **(T+A)** or that will be encouraged **(E)** by Project work but not taught or assessed:	**Analytical Thinking**	**X**		**Make sense of problems and persevere in solving them.**	**X**	
	Collaborating		**X**	**Reason abstractly and quantitatively.**	**X**	
	Communicating	**X**		**Model with mathematics.**	**X**	
	Creating & Innovating	**X**		**Attend to precision.**	**X**	
	Finding & Evaluating Information	**X**		**Look for and make sense of structure.**	**X**	
	Problem Solving	**X**		**Look for and express regularity**	**X**	

<table>
<tr><td></td><td></td><td></td><td></td><td colspan="3">in repeated reasoning.</td><td></td></tr>
<tr><td colspan="8">Presentation Audience</td></tr>
<tr><td rowspan="4">Culminating Products and Performances</td><td rowspan="3">Group:</td><td colspan="2" rowspan="3">Create an App of local important places and Present to an elementary school</td><td colspan="2">Class</td><td>X</td></tr>
<tr><td colspan="2">School</td><td>X</td></tr>
<tr><td colspan="2">Community</td><td>X</td></tr>
<tr><td rowspan="3">Individual:</td><td colspan="2" rowspan="3">Research and design of storyboard ideas and app “pokestops concept”</td><td colspan="2">Experts</td><td></td></tr>
<tr><td colspan="2">Web</td><td></td></tr>
<tr><td colspan="3">Other:</td></tr>
<tr><td colspan="8">Project Overview</td></tr>
<tr><td></td><td colspan="7">*(Pre-assessment) KWL Chart: What do you know about the use of technology tools to learn about and navigate a particular region or location?

I. Students will demonstrate data literacy.
A. Students will understand, explain, and document the utility and limitations of data. v
B. Students will find meaning in data, and take action based on data.
C. Students will collect, evaluate, and present data.
D. Students will analyze and interpret data to identify trends.
*Exit Questions

II. Students will be able to implement the research process.
A. Students will use key terms to search a topic.
B. Students will check potential sources for credibility by considering purpose, domain, author, timeliness, sources cited, and sponsorships; and cross-checking facts gathered.
C. Students will avoid plagiarism by crediting sources appropriately and by using in-text citations and creating a bibliography.
*Site critique assessment (exit ticket)

III. Students will create a digital storyboard of their app.
A. Students will utilize appropriate elements and principles of design such as asymmetrical balance, one-point perspective, texture, rhythm, radial balance, form, repetition, symmetry,value, depth, variation, two-point perspective, movement, shape, and line.
B. Students will utilize a variety of graphical, textual, visual, and</td></tr>
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	interactive digital media elements. ***Mini-presentation of storyboard** **IV. Students will program and Code an app.** **A. Students will learn program design and development.** **1. Students will describe and analyze a sequence of instructions being followed (e.g., describe a character's behavior in a video game as driven by rules and algorithms).** **B. Students design algorithms and create programming solutions to a variety of computational problems using an iterative development process in Scratch.** **1. Programming problems include mathematical and logical concepts and a variety of programming constructs.** *** Assessment** **V. Students will explore computing and data analysis.** **A. Students explore how computing has facilitated new methods of managing and interpreting data. Students will use computers to translate, process and visualize data in order to find patterns and test hypotheses.** **B. Students will work with a variety of large data sets that illustrate how widespread access to data and information facilitates identification of problems.** **C. Students will collect and generate their own data related to local community issues and discuss appropriate methods for data collection and aggregation of data necessary to support making a case or facilitating a discovery.** ***Assessment: Data table analysis/aggregation** **VI. Students will give an oral presentation of their app and their creation process.** **A. Students will demonstrate a command of formal English** **B. Students will utilize precise language and domain-specific vocabulary.** ***Presentations (scored on Rubric)**				
Assessments	**Formative Assessments** (During Project)	Quizzes/Tests (Exit Ticket)	**X**		
		Journaling/Learning Log	**X**		
		Preliminary Plans/Outlines			
		Rough Drafts (Peer/teacher Edits)	**X**		

		Other Oral/Powerpoint of Digital Storyboard to classmates	**X**		
	Summative Assessments (End of Project, identify content areas to be covered) ***NOTE:*** *The end of PBL Summative Assessments do NOT replace The Project.*	Written Product(s), with rubric		Other Products (App)	X
		Oral Presentation, with rubric	**X**	Peer Evaluation	X
		Multiple Choice/Short Answer Test		Self-Evaluation	
		Essay Test		Other (Presentation of App to Elementary Students)	X

Resources Needed	**On-site people, facilities**	Computer Lab
	Equipment	iPads or Chromebooks or Computers, Video equipment, some student smartphones (not mandatory)
	Materials	“Scratch” code.org tutorials
	Community resources	Visitors’ Bureau, City Hall, County/City Museums, County Library, National Parks, Forest Service

Reflection Methods	(Individual, Group, and/or Whole Class)	Journal/Learning Log	**X**	Focus Group	
		Whole-class Discussion	**X**	Fishbowl Discussion	
		Survey		Other	X

Project Teaching and Learning Guide

Knowledge and Skills Needed by Students

(to successfully complete culminating projects and to do well on summative assessments)	
Student needs to be able to: **Use creative development processes to create computational artifacts for creative expression or to solve a problem.**	**Student needs to be able to:** **Use multiple levels of abstraction to write programs or create other computational artifacts**
Student needs to be able to: **Write algorithms that are precise sequences of instructions for processes that can be executed by a computer and are implemented using programming languages.**	**Student needs to be able to:** **Develop programs for creative expression, to satisfy personal curiosity, to create new knowledge, or to solve problems (to help people, organizations, or society).**
Student needs to be able to: **Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.**	**Student needs to be able to:** **Research each site and be able to determine site credibility.**
Questions to be Provided by the Project Teacher **(to successfully complete culminating products and to do well on summative assessments)**	
Teacher asks questions to recall facts, make observations, or demonstrate understanding: **What is AR (augmented reality)?** **What does it mean to be a "creative" programmer?**	**Teacher asks questions to summarize, analyze, organize, or evaluate:** **How is designing an algorithm to solve a problem different from other kinds of problem solving?** **How can we determine whether a source is credible?**
Teacher asks questions to apply or relate:	**Teacher asks questions to predict, design, or create:**

Can you find any other games or apps that use AR? **How could you use algorithms?** **How do programmers collaborate?**	**Could you design and plan your own AR game?** **How do you design a solution for a problem so that is programmable?**
Teacher Reflection: **How did the unit flow? What worked well? What needs to be changed for next time? What did the students learn? What evidence do you have to support student's learning?**	

http://blog.discoveryeducation.com/blog/2016/07/13/pokemongo/

http://blog.wizitup.com/2016/07/19/pokemon-go-can-create-meaningful-learning-opportunities-here-is-how/

https://ideafm.org/2016/07/08/14-reasons-why-pokemon-go-is-the-future-of-learning/

http://www.teachingideas.co.uk/computing/ways-to-use-pokemon-go-in-the-classroom

http://www.usatoday.com/story/tech/gaming/2016/07/16/educators-gold-pokemon-go/87101090/

Daily PBL Plans **Kellene Ditler, Dae Dyer, Maria Ramirez** **CURR343**

Week #1

Monday (Day 1)	Tuesday (Day 2)	Wednesday (Day 3)	Thursday (Day 4)	Friday (Day 5)
Quickwrite/ Freewrite/Journal: Do you play PokemonGo? Why or Why not? What Pokestops would you wish to see if you could add to the app? Pass out and Read "Excerpted" USA Today article, **http://www.usatoday.com/story/tech/gaming/2016/07/16/educators-gold-pokemon-go/87101090/** Post Class Discussion Entry Event: Pokemon Go QR Scan (Questions would change for students in App class): Game template that uses QR Codes as students answer questions and move around the classroom to catch Pokémon. https://www.teacherspayteachers.com/Product/Pokemon-Go-Game-Template-with-optional-QR-Codes-2645289 **Assess: KWL** - Think-Pair-Share...What	Brainstorm: Programming Projects and Concepts So Far **Activity** ● Students identify target App and major components that must be programmed. ● Students individually program major components. ● Work with classmates to give and receive feedback. ● Students complete project reflection questions and create digital storyboard. **Wrap-up** ● Submit and potentially present submissions. **EL Strategies:** Strategic group tasks, visual aiding for EL students. Provide examples with visuals to aid understanding, pair shair **Intervention Lesson:** Teacher or peer assistance.	Review the project guidelines and the rubric. Assign students to collaborative partners. ● Select "site" strand: historic, civic, or natural Have students brainstorm and complete App Design Guide guide in Practice PT Planning Guide - Improve Your App. Improve Your App Rubric: Improve Your App Rubric **EL Strategies:** Partner/group task Provide visual aides (for steps) **Intervention Lesson:** Reteach /extra time/guided practice with teacher or peer assistance	Introduction to research process: Search engines and tools ● key terms ● source credibility ● Source citing (Students have individual ipads) Teacher places students in pairs. Each pair given a site (some credible, some not, etc…) Activity 1: Students practice searching using engines and tools. Select 3. Activity 2: Students practice checking for credibility. Findings shared out with class including criteria used to check. Wrap-up Review steps for researching and source credibility checking *Assessment Exit Ticket: 3 websites projected. Students check each for credibility independently. Identify each as credible or not. Exit Ticket: Source Credibility **EL Strategies:**	Student work day: Groups researching the 10 sites to be included in app. Teacher checking for on-task activity, reinforcing research techniques. Students gather facts to include in app and create a reference page. **EL Strategies:** Partner/group task **Intervention Lesson:** reteach small group as guided exercise.

"PokemonGo "App" would you create? - KWL chart to record student responses **Application:** - What is the relevance and importance of PokemonGo? **EL Strategies:** Group tasks, visual aides and examples, teacher modeling **Intervention Lesson:** Guided practice with teacher or peer assistance	Differentiated rubric/ expectations for students with IEPs.		Partner EL students with appropriate classmate for support **Intervention Lesson:** Modify activity to be a whole class guided exercise or reteach small group as guided exercise.	

Daily PBL Plans **Week # 2** **Dates** _____

Monday (Day 6)	Tuesday (Day 7)	Wednesday (Day 8)	Thursday (Day 9)	Friday (Day 10)
Student work day: #2 Groups continue researching the 10 sites to be included in app. Teacher checking for on-task activity, reinforcing research techniques. Students gather facts to include in	Students will be reviewing the mathematics needed to work on the creation of their app. *Solving, evaluating, comparing and function notation. Students will be reminded of the multiple representations of a	Math continued Algorithms & Computer Science (2nd day) *The coding need it to create their app. * Students will add their answers to the exit questions from the previous class in a google slide shared with the whole class. Students will need present their	Students begin work on programming projects. Students add at least one or two new features/components to the app. **EL Strategies:** Partner/group task	Students give and receive feedback with collaborative partner. Students pick two pieces of feedback to act on and improve in their program. Continue working on program.

app and create a reference page. **EL Strategies:** Partner/group task **Intervention Lesson:** reteach small group as guided exercise.	linear function as they form study teams for the unit. Students will be challenged to work together as a team as they consider the output of various composite relations. *Solving word problems Students will define variables and write equations to solve word problems. They will review the connections between a graph, table, and the equations of a system of equations and how to write equations to solve word problems. They will solve a simple system of equations. *Statistics Students will review drawing a line of best fit by hand. They will make predictions based on their linear model and will interpret slope and y-intercept in context. Students will understand, explain, and document the utility and limitations of data, take action based on data. Students will collect, evaluate, and present data after they have	finding in a video 2-3minutes video explaining their findings. Example of a video **EL Strategies:** *TPR (total physical response) *word wall *peers and teachers support **Intervention Lesson:** Have them present after other team has presented and provide extra support	**Intervention Lesson:** Reteach/support small groups as necessary	**EL Strategies:** Partner/group task **Intervention Lesson:** reteach/support small group as necessary

	analyze and interpret data to identify trends. *Code: Student's will review all the coding they have learned from last unit and think about the ones they will be using to create their app. Questions: that will need to be research and present answered to next class (Exit Questions) 1) What is an algorithm? 2) How exactly is mathematics related to computer science? 3) How can mathematics help advance computer science? 4) Do all branches of computer sciences require the same degree of difficulty of mathematics? **EL Strategies:** Pair Share, Realia, Visuals, Videos **Intervention Lesson:** Team working time with often teacher check ups for understanding and clarity.			

Daily PBL Plans **Week # 3** **Dates** _____

Monday (day 11)	Tuesday (day 12)	Wednesday (day 13)	Thursday (day 14)	Friday (day 15)
Students finalize their first implementation of the program. Students begin their reflection questions and/or video. **Teaching Tips** **Reflection Questions:** Students will complete the reflection questions included in Practice PT Overview and Rubric - Improve Your App. **Video Creation:** Students will create a video to demonstrate the functionality of their program. The video should not be longer than 1 minute. It does not need sound. Video Creation: Suggested Tools: Many of the short program clips of	Students complete their reflection questions and/or video. Students submit their projects. Assessment: **Rubric:** Use the Improve Your App Rubric already provided **EL Strategies:** Group tasks, visual aides and examples **Intervention Lesson:** reteach /extra time/guided practice with teacher or peer assistance	**Trend analysis lesson** **EL Strategies:** Group tasks, visual aides and examples **Intervention Lesson:** reteach /extra time/guided practice with teacher or peer assistance	**Presentation rehearsal** Students will rehearse their presentations to elementary classes. Teacher and peers will provide suggestions/ Feedback on the following: • Clarity • Pace • Eye contact • Organization **EL Strategies:** Group task **Intervention Lesson:** Extra rehearsal opportunity if necessary	**Field trip to present apps.** Each team will present their app to a 6th, 7th, or 8th grade class at neighboring elementary school. Analytic Rubric used to assess presentation. Oral Presentation Rubric **EL Strategies:** Group task **Intervention Lesson:** N/A

programs running throughout the curriculum were created using LiceCap, which is an easy way to create gifs of things happening on your computer - http://www.cockos.com/licecap/ QuickTime - You can do a screen recording. **EL Strategies:** Group tasks, visual aides and examples **Intervention Lesson:** Reteach /extra time/guided practice with teacher or peer assistance				

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https://ideafm.org/2016/07/08/14-reasons-why-pokemon-go-is-the-future-of-learning/

http://www.teachingideas.co.uk/computing/ways-to-use-pokemon-go-in-the-classroom

http://www.usatoday.com/story/tech/gaming/2016/07/16/educators-gold-pokemon-go/87101090/