Name(s)_____ Period _____ Date _____

Project Guide - Apps and Problem Solving

Overview

Computer science is an extremely powerful tool for solving real world problems. For this project you will combine what you've learned about the problem solving process and the way computers work in order to propose an app that could help solve a real world problem of your choosing.

You will...

- Work with a partner
- Define a real world problem
- Brainstorm ways an app could be used to help solve that problem
- Identify the inputs / outputs / storage / processing used by your app
- Share your ideas with another group for peer feedback
- Incorporate feedback to create a final version of the app
- Create a poster of your app to share with the class

You will submit...

- This completed Project Guide
- Completed Peer Review
- A poster of your app

Project Steps

Step 1: Find Your Partner

This project will be completed in pairs. List your partner's name here: _____

Step 2: Brainstorm Problems

Brainstorm interesting and personally relevant problems. Nothing is off limits, and don't worry yet about how computer science can help solve the problem. You might think about

- Things you'd like to improve in your school, neighborhood, or community
- A task in your everyday life that you wish could be completed more easily
- A cause that you feel strongly about
- Something that is currently inconvenient or annoying to do

Record your brainstorm of problems in the space below

Boredom - we can make a game.

It takes too long for the police to get to you.

Eating healthy foods (knowing what to eat)

Finding a song/movie/tv show you like.

Step 3: Choose Your Problem

Work with your partner to decide on which problem you would like to work on. As you discuss, make sure you consider the following criteria.

- **Interesting:** Both group members are interested in the problem
- **Well-Defined:** You can specify who specifically the problem affects, what needs to change, and how you'll be able to tell that the problem had been solved
- **CS is Relevant:** Some aspect of the problem could be addressed by computer science

Step 4: Define Your Problem

Large, complex, and poorly-defined problems are much harder to solve. Make sure you have defined your problem clearly by recording responses to the questions below.

1. **Who does the problem affect?** Be as specific as possible. Think about the age, location, life conditions, interests, background, etc. of your audience.

This app will help all ages, from kids to adults. It will solve problems from theft to death.

2. **What is the problem?** Be as specific as possible. What needs to change or improve? Why does the problem exist? You may need to narrow your problem's focus. Making big changes begins with small steps!

The problem that we are trying to solve is the time that the police or aid arrives. The problem is because there is a lot of information that they need to know to make a decision, so it takes too long.

3. **How will you be able to tell that a solution to this problem has worked?** Be as specific as possible. What would you need to measure or observe to know the problem was solved?

People will get their aid faster, so there will be less crime and more people will be saved.

Step 5: Your App

From a high level think about how an app could be used to solve a part of the problem you identified. What features would it need to have? How would someone use it? If you need to update your problem definition above then do so.

Name Your App: ASAP Aid

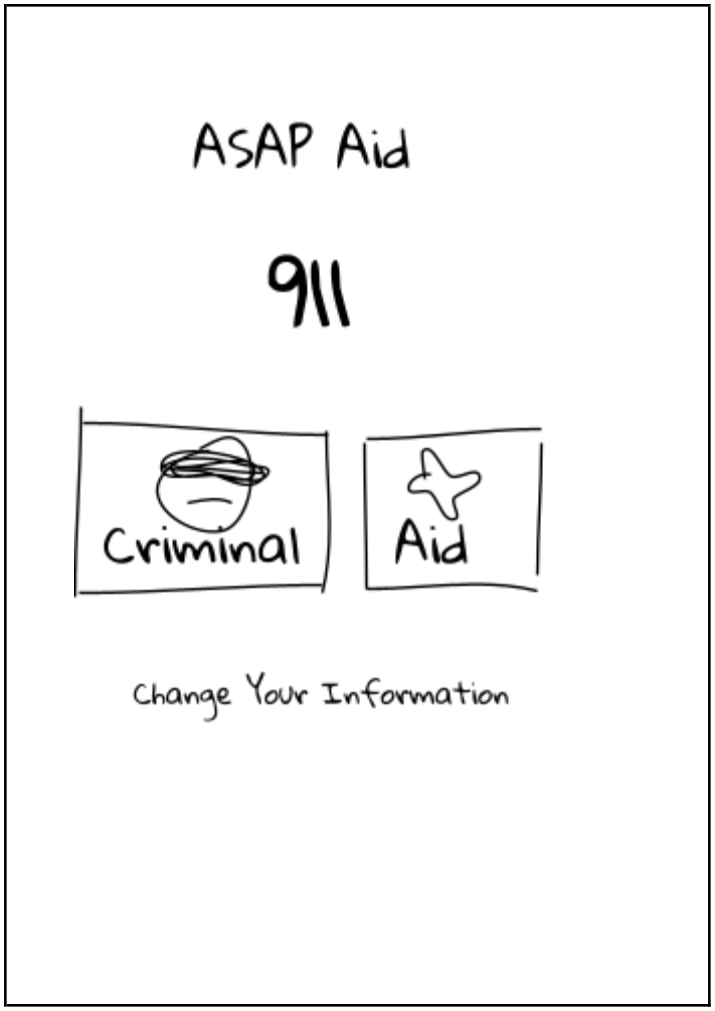
What does your app do? Write a short description of your app as though you were describing it to someone you'd want to use it. What does it do? Why would someone want to use it? How does it help solve the problem?

You will set up the app with your information, and if you have a problem, tell the app, and it will send your information, location, and problem so you get the right help.

Step 6: Input, Output, Store, Process

You will sketch a version of your app and indicate what all the different outputs are. A classmate should be able to tell how the app works based on the sketch and labels.

App Sketch: Sketch what a screen of your app will look like based on your description above.



Output Information: Label the different outputs generated by your app by writing what they are and drawing an arrow to where they are located on the screen. (E.g. “List of nearby parks” or “Days until friends’ birthdays”)

The output of the app is that it will send your problem and information to the right place, and then the officer will respond to you and send help (ambulance or police) to your location.

Inputs: What kind of information does your app need as input to work? Will this input come from the user, phone sensors, or an external source (e.g. a database online)? List every piece of information your app will need to work. Your app may have more or less than 6 inputs. Feel free to add extra sheets of paper if you need them.

Type of Information *Example: User age*	**Source** *User / Sensor / External*	**Example** *Example: 13 years old*
Problem	User	Broken Arm
Location	GPS (phone)	123 Main St.
User Information	User	13 years old, insurance, address, etc.

Process: When computers process information they may do it differently from a human, but everything a computer can do, a human could do as well (just usually much slower!) If you were provided the inputs you've listed, how would YOU need to process it in order to create the outputs of your app.

I would look at the problem and decide whether it is criminal or aid, and then send the information to the right place.

Store: What information will your app store permanently? Think about information that will not change across multiple uses of the app, or information that it would be useful to have recorded and use again later.

The app will store the name, age, address, contact and emergency contact information, medical information, and insurance of the user.

Step 7: Peer Review

Your teacher will provide you with a Peer Review sheet. Trade projects with another group and complete the peer review. As part of this process you should develop new ideas for how you can improve your app.

Step 8: Finalize App and Make Poster

Based on the results of your peer feedback make any additions or changes you need to make to how you defined your problem or how you describe your app. Then make a poster that presents the final version of your app. Your poster needs to include the following information.

- The name of your app
- The target audience
- The problem the app is designed to solve
- The input information the app uses
- A drawing of the output the app produces
- A description of how the app processes and stores information

To create your poster you can and should use your work from this project guide.

Step 9: Present Your App

The last step of this process is to present your app to your classmates. This may be done as a gallery walk or a full-class presentation. As you present your app make sure you're ready to talk to your classmates the following points.

- How you defined the problem your app is designed to solve and why you decided on this specific set of people, problems, and ways of measuring success.
- How your app is designed to work and how it aims to solve the problem.
- An overview of the information your app uses as input and output.
- An overview of how information would need to be stored or processed by your app.
- One change you made to your project based on the feedback you received