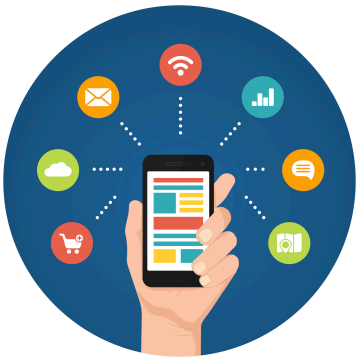
Name(s)_____ Period _____ Date _____

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.

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 explain who specifically the problem affects, what needs to change, and how you'll be able to tell that the problem had been solved
- **Computing is Relevant:** The problem is an "information problem" that can be solved with "thinking work."

Step 4: Define Your Problem

1. **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!

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

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?

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: _____

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?

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")

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*

Process: What sort of processing will your app use?

Store: What information will your app store permanently?

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 class presentation. As you present your app make sure you're ready to talk to your classmates about 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

Peer Review - Apps and Problem Solving Project

Pre-Review

Creator's Name: _____

One thing I want feedback on is…_____

_____

Reviewer Section

Reviewer's Name: _____

Evidence I Found	Types of Evidence	Ideas for More
	The outputs of the app are clearly described and could be used to help the user with the problem.	
	Stored information is listed and makes sense for the what the app does. Information that would change over time is not listed.	
	The problem is well-defined, including a who the app will help, details of the problem, and how to tell it has been solved.	
	The app is clearly described in detail, including what it does and how someone would use it.	
	The way that the inputs are processed to make the output is clearly described in terms of tasks that make sense for computing (e.g. sorting, counting)	

Free Response Feedback

I like… _____

_____

I wish… _____

_____

What if… _____

_____

Creator's Reflection

1. What piece of feedback was most helpful to you? Why?

   _____

   _____

   _____

   _____

2. What piece of feedback surprised you the most? Why?

   _____

   _____

   _____

   _____

3. Based on feedback, what changes will you make to your app proposal?

   _____

   _____

   _____

   _____

Apps and Problem Solving Project Rubric

Key Concept	Extensive Evidence	Convincing Evidence	Limited Evidence	No Evidence
App Output	The outputs of your app are clearly described and could be used to address the problem.	Outputs of your app that could address the problem are listed.	Outputs are listed, but it is not clear that they could be used to fully address the problem.	Outputs are not listed.
Stored Information	Stored information is listed and is appropriate for the functionality. Information that would change from use to use is not listed.	Stored information is listed and is mostly appropriate for the functionality of the app.	Stored information is relevant to the app, but some important information is missing.	Stored information is not listed or does not relate to the app.
Problem Defined	The problem is well-defined, including a target audience, details of the problem, and how to tell it has been solved.	The problem is defined, including how to tell whether it has been solved.	The problem is defined, but it is not clear how to know when it has been solved.	The problem is not defined in enough detail to understand what it is.
App Description	Your app is clearly described in detail, including what it does and how someone would use it.	Your app is described, including what it does and how someone would use it.	Your app is described in vague terms, but it is not clear exactly how it is to be used.	Your app is not described well enough to understand what it does.
Processing Described	The way that the inputs are processed to produce the output is clearly described in terms of tasks appropriate for computing (e.g. sorting, counting)	The way that the inputs are processed to produce the output is clearly described.	Processing is described, but without enough detail to understand how the output could be produced from the given input.	Processing is not mentioned.
Peer Review	The peer review provides useful and constructive feedback, and peer review feedback has clearly been incorporated into the final version of the project.	Peer review provides constructive feedback, and peer review feedback has been responded to.	Some peer feedback was completed.	Peer review was not completed.

Apps and Problem Solving Project Student Checklist

Key Concept	Extensive Evidence
App Output	❒ Your app outputs are clearly described ❒ Your app could be used to address the problem
Stored Information	❒ The stored information is listed ❒ The stored information is appropriate for the functionality ❒ Information that would change from use to use is not listed.
Problem Definition	❒ The problem is well-defined ❒ Your target audience is listed ❒ Details of the problem are listed ❒ You have described how to tell when the problem has been solved.
App Description	❒ Your app is clearly described in detail ❒ You describe what your app does and how someone would use it.
Processing Described	❒ The way that the inputs are processed to produce the output is clearly described in terms of tasks appropriate for computing (e.g. sorting, counting)
Peer Review	❒ The peer review provides useful and constructive feedback ❒ The peer review feedback has clearly been incorporated into the final version of the project.

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Computer Science Practices Reflection

How I've grown	Practice	How I want to grow
	Problem Solving	
	Persistence	
	Creativity	
	Collaboration	
	Communication	