

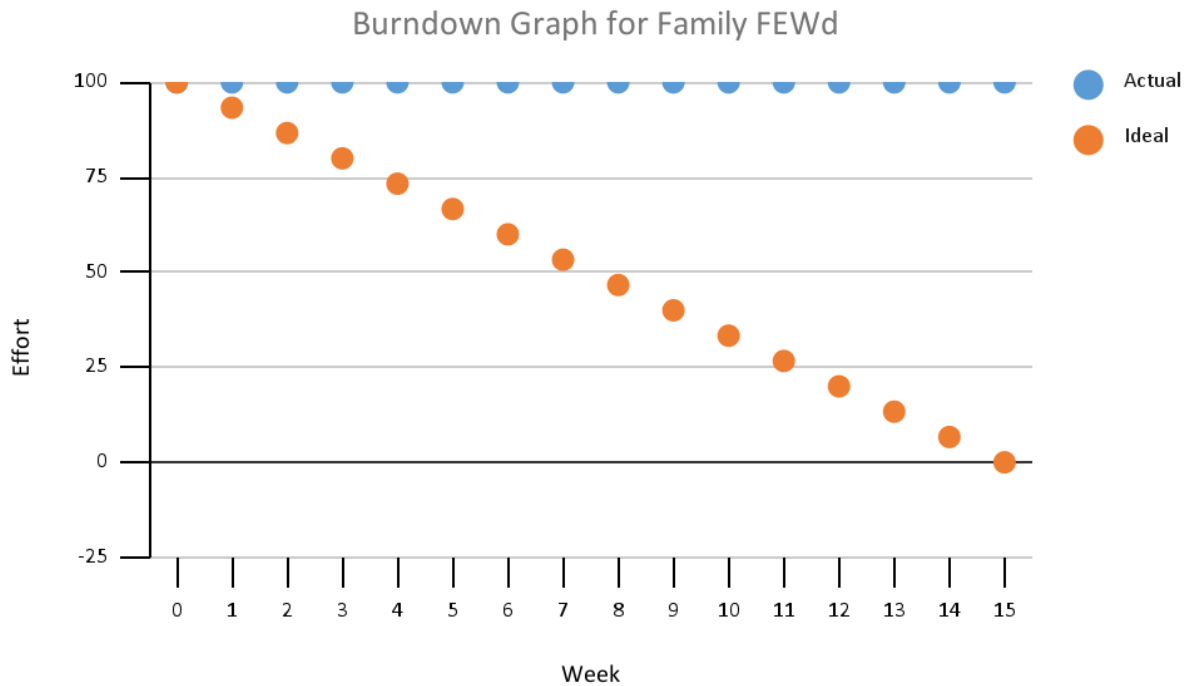
Family FEW App Description 1

The main purpose of this app is to teach middle school students to look at the complex relationship between food, water, and energy consumption. This relationship is known as FEW in research, which is where the app name, Family FEW, comes from. This app will help teach students about this relationship in the form of a game that consists of buying food for a family while balancing costs and keeping consumption costs between some pre-set limits.

There will be two types of users, middle schoolers and teachers/parents. We expect the middle schoolers to be around 10 - 14 years old and to have a good amount of experience with technology, but nothing too advanced. We expect that parents and teachers will have a broad range of skill levels due to differences in age or background.

Middle school students use this game to simulate shopping for grocery items and add them to their cart. While items are being added, a receipt is made to calculate the cost of items, as well as an environmental impact cost based on each item in the cart. Levels could be implemented to give limits to the environmental impact cost to reduce it. Parents and teachers will interact with the game by viewing the results of their children/students.

Any required data will be provided as a spreadsheet by the team of scientists that will include the energy and water consumption details, nutrition, and impacts. The app will be responsible for collecting usage related data and gameplay statistics for reporting, analytical purposes, and educational statistics for teachers. This data will likely be utilized for in-game level-ups or any similar comparable features.



Family FEW App Description 2

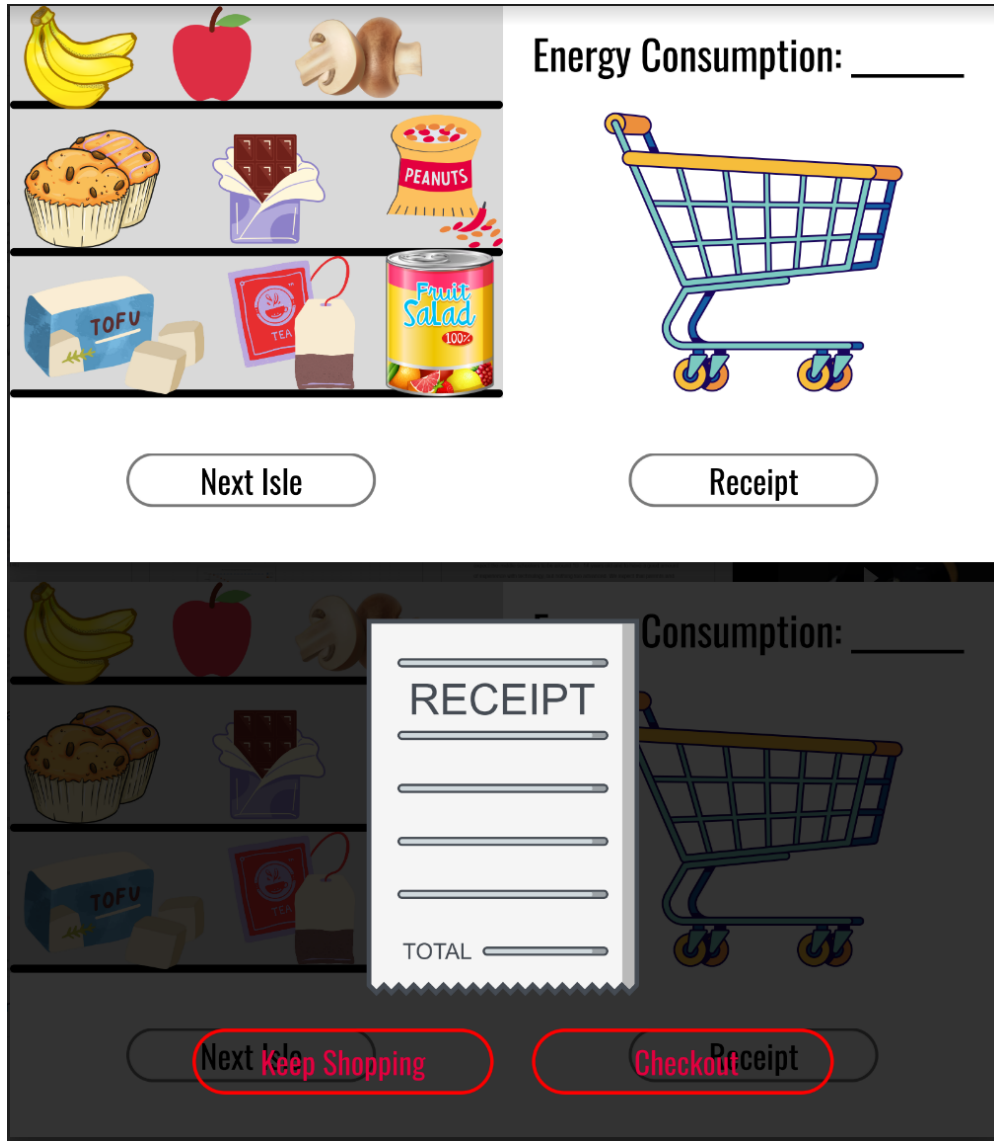
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The flow of gameplay goes as follows: The student opens the game, new players will be given a tutorial about the gameplay before starting the first level. As they progress through the levels, their score and the time spent playing will be recorded. The basic idea will be to select items from the aisles to place into their shopping carts. Upon selecting any item, a summary of that item's nutritional information and environmental impacts will be displayed. Students will then be expected to make decisions based on this information to meet the requirements set for that level. Once they finish, they will see the results screen with their score and playtime, as well as a button to download the data to send the results to the teacher. The game can be replayed and the students can continue to send their results to their teacher, showing their improvement.

The major views that our app will have are the start page, a tutorial, levels, and a results screen. The start page is the main menu, which would include the title, play button, a way to log in, and a brief description of the game. Next would be a tutorial section, which could just be a simple page that explains the rules to students with screenshots to demonstrate. The main page that students will see as they play the game is the level view, which will show aisles for students to shop from. The results screen will be displayed at the end of the level, displaying the student's score and time spent playing for the teachers or parents to view. There will also be a simplified version of this view that will appear when a student selects an item to allow them to track their progress during gameplay.



Any required data will be provided as a spreadsheet by the team of scientists that will include the energy and water consumption details, nutrition, and impacts. The app will be responsible for temporarily collecting usage related data and gameplay statistics for reporting, analytical purposes, and educational statistics for teachers. This data will likely be utilized for in-game level-ups or any similar comparable features. However, we will not be storing any in-game statistics permanently in a database for the time being. It will be displayed as a summary at the end of the game and then discarded. We are

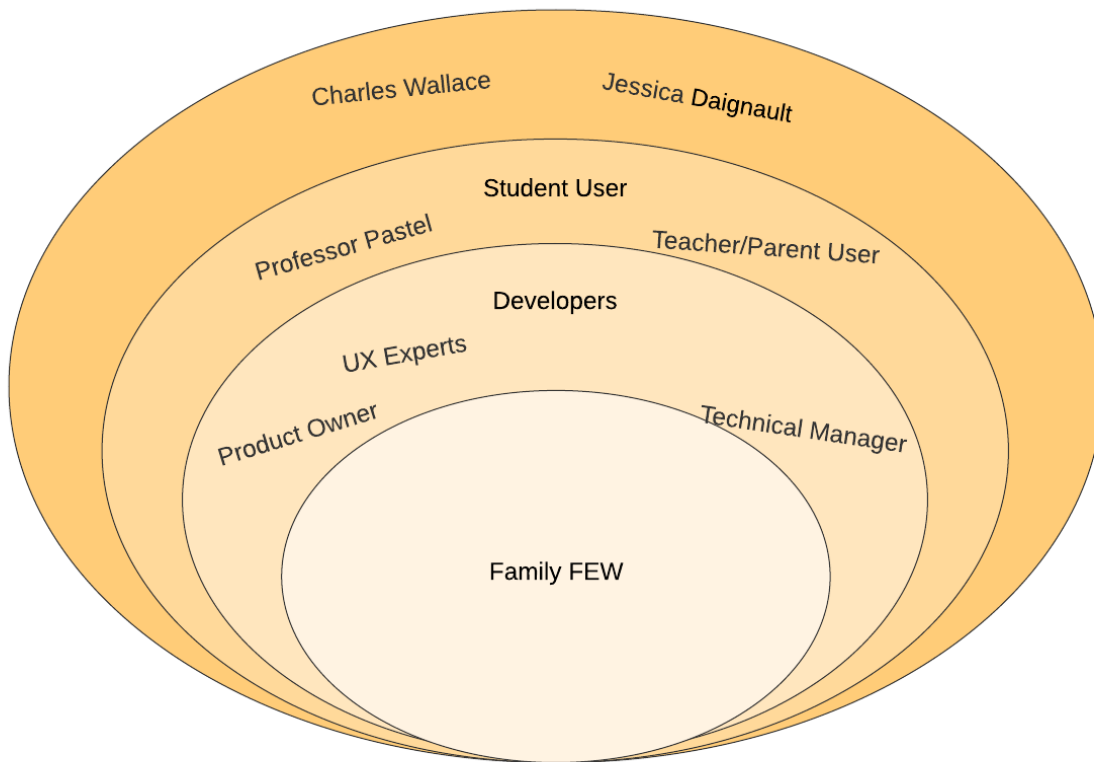
considering collecting some basic data such as the time spent playing the game for reporting purposes to the teachers/parents.

We have identified a few implementation challenges such as level design, integrating the spreadsheet data with the USSEIO Model, and possibly implementing a login system as a stretch goal. Level design is a challenge as we need to figure out difficulty scaling and calculate the correct answers ourselves. We plan to have a dynamic integration of the spreadsheet data so that the spreadsheet can be updated and the game can be easily updated with it. We have also identified the following usability challenges that include the students forgetting to screenshot the end screen summary, not knowing what an item is even with detailed descriptions, and issues with closing the game before you have finished.

Brief overview of the system

Our game will be built in the Unity game engine using the Unity 2D game libraries and C# for scripting. We will be converting the data from the USSEIO model, given to us by our stakeholder, into the database for our game. This database will contain all of the information about each individual grocery item that the players will interact with. The game will then be exported to HTML 5 to be playable in a browser and easily accessible for our target audience.

Stakeholders



- Charles Wallace
 - Level 3: External Stakeholder
 - Client the application is being created for
- Jessica Daignault
 - Level 3: External Stakeholder
 - Client the application is being created for
 - Understands the data being used very well
- Professor Pastel
 - Level 2 : Sponsor / Executive ??
 - Helps guide and keep team in scope
- Student Users
 - Level 2: End user
 - Primary User
 - Most likely going to be an “expert” user
- Teacher / Parent Users
 - Level 2: End User
 - Secondary User

- There is variability in the expertise level of this user
- Product Owners
 - Level 1: Closely involved with creating Family FEW
 - Responsible for clients and users' requirement concerns
- UX Experts
 - Level 1: More closely involved with creating Family FEW than users
 - Advise the team
- Developers
 - Level 1: Closely involved with creating Family FEW
 - Design and Develop the application
- Technical Manager
 - Level 1: Closely involved with creating Family FEW
 - Responsible for any implementation concerns

Four user personas

Middle School Student

Rebecca Smith

Age: 12

Height: 5'2"

Weight: 102 pounds

Rebecca is uninterested in school and doesn't care much about her grades beyond whether she passes. She sees funner activities such as games as a chance to slack off and will use her time in the computer lab to surf the web when the teacher isn't looking at her screen. She doesn't play video games much in general so she is unfamiliar with them, she would rather play outside or hang out with her friends.

Middle School Student

Christopher Williams

Age: 10

Height: 4'6"

Weight: 71 pounds

Christopher is attentive and eager to get a good grade. He is used to playing video games on his computer at home, so he is familiar with technology. Since he enjoys video games, it is easier for him to grasp what the game wants him to do without too much explanation. He is competitive and tries to get the highest score on the game out of his group of friends.

Middle School Science Teacher

Doug Hamilton

Age: 60

Height: 5'7"

Weight: 159 pounds

Doug is easygoing with a sense of humor. He has been teaching at the same school for many years. He enjoys providing his students with fun activities to do to keep them engaged in learning and get them interested in science. He does not use technology too often and only uses his computer for checking emails and Facebook. Sometimes his fellow teachers may email him links to games that he can show his students. If he can set up the game easily for his class he considers it worthwhile, but if it takes too much effort he is quick to give up and move on to something else to not waste class time. His kids are grown up and have moved out, leaving only him and his wife at home so he has plenty of time outside of class to experiment with the game.

Middle School Social Studies Teacher

Maria Garcia

Age: 26

Height: 5'4"

Weight: 170 pounds

Maria is earnest and strict. She hasn't been teaching too long and is worried that her students won't take her seriously as an authority figure due to her age. She is strict with her students to ensure that they take her seriously. Her skill level with technology is about average for someone her age, she knows how to use computers well enough outside of technical issues. She is passionate about the environment and wants to make students aware of how they can keep their environmental impact low, so she tries to work that angle in if any of her teaching material is tangentially related. She is married with a young child at home, so she doesn't have much time outside of class to try to fiddle with the game.

Descriptions of the environment

The environment that students and teachers are most likely to be in while using this app is a school computer lab, with a computer for each student to use and a teacher supervising. There is a projector that the teacher can use while explaining how the program works, as well as showing supplemental material to explain the topic that the app relates to. After the teacher is done explaining, students will start using the app

and the teacher will walk around to see if any students are having trouble getting it going.

The second most likely environment that users will be in is at home, with their own personal computer. The primary user is the student, who is likely either homeschooled, learning remotely, or was sick the day that the rest of the class went to the computer lab. The student has a list of instructions on how to use the app and submit their score to follow on their own. They may have an adult trying to help them figure out the app, whether it is a teacher who is teaching remotely or a parent trying to understand the instructions.

Scanned or transcribed notes

See meeting minutes and scientist meeting notes sections on the [home page](#).

2 scenarios describing the nominal use of the application

Doug Hamilton was sent the Family FEW game by one of his coworkers, Maria Garcia. Maria told him that the game helped her class and that he should try incorporating it into his class. Doug looked through the game and found it easy to understand and get results from, thanking Maria for the resource. On the next day of class, Doug brought up how his class would be having time on the computer to play a game. The class was excited to be playing a game, as they know many of the games they've been given from the teacher have been entertaining and insightful. Doug helps some of the students get to the game, using his own experience setting it up as his only guide. He tells the students that they should leave the game open once they are done, and he will have them email their results to him. Many students complete the game and the email process goes fairly smoothly, with only a few hiccups in between. Once everyone has completed the game, Doug lets them continue playing while he works on grading the results, offering extra credit to those who increase their score by a large margin.

Christopher Williams is a student in Doug Hamilton's class. He has been doing very well in the class and has enjoyed every activity that he has been given. One morning, Mr. Hamilton tells the class about a new game he was sent by fellow teachers and wants the class to try it out. Christopher has no issues setting this game up and begins right away. Christopher has heard very little about FEW, but the information that is presented throughout the game makes sense to him. A few nearby students ask him questions, since he is so far ahead, and he gives them the help that he can. After being helpful, he realized that the time was part of his score, which disheartened him a bit. Mr. Hamilton then offered extra credit to any student that greatly improved their score, which Christopher took as a challenge. Only a few students kept working to try to get that improvement. By the end of class, Mr. Hamilton congratulated Christopher and

awarded him five points of extra credit. Christopher showed this game to his parents and siblings, competing to get a higher score with each of them.

1 scenario describing user making an error using the app and the app behavior

Rebecca Smith is a student in Maria Garcia's class. She has been keeping her grade at a passing level but nothing too spectacular. When Mrs. Garcia told the class that they would be playing a game in class, she was ecstatic. Computer time in the class meant more time to slack off, and with Mrs. Garcia it was very rare. While Mrs. Garcia wasn't looking, she tended to swap tabs and look at videos or play on another game website. She got so involved in one of her game sessions that she almost didn't notice Mrs. Garcia returning. In her attempt to swap back to the game tab, she accidentally closed the tab instead. When Mrs. Garcia asked her about her progress thus far, she mentioned that she had accidentally closed the tab. Mrs. Garcia really wants Rebecca to understand why FEW is so important, knowing that Rebecca abused her time prior, she gave her another chance. Mrs. Garcia reminded Rebecca that she needed to email a screenshot of her results at the end of the game, so she started opening the game back up. She knew on other websites that the game progress was saved when accidentally closing the tab. Upon opening the Family FEW app, she was upset to find out that she had to restart the game. While she replayed, she did notice a few similar questions and improved her score, granting her a passing grade and making Mrs. Garcia happy that she gave it a chance.

Simplified hierarchical task interaction design

Family FEW App Simplified HTA

Upper Level Views:

- Homepage view

- Rules/tutorial View

 - *Confirm understanding / Navigate to gameplay

Lower Level Views:

- Gameplay View

 - *Next aisle (level)

 - *View receipt

 - *Checkout

- Receipt View

 - *Keep Shopping / resume shopping

 - *Checkout

- Checkout View

 - *Resume shopping / go back

 - *Finish & get results

- Results View

*Save / Download results

A description of your database schema

List of Domain Classes:

- Grocery_Options (MyPlate): A list of food items as suggested by MyPlate's daily requirements
- Environmental_Impact: All environmental impact details listed by USSEIO categories based on per dollar

Domain Class: Grocery_Options

- **Food_Item**: names of the food items (primary key)
- **Amount**: quantity based on units
- **Unit**: unit of measurement
- **MyPlate_Daily_Requirement**: the suggested daily consumption quantity with units
- **MyPlate_Category**: categories such as fruits, vegetables, grains, proteins, dairy
- **USSEIO_Category**: category names based on USSEIO conventions (foreign key)

Domain Class: Environmental_Impact (all units are by per dollar)

- **USSEIO_Category**: category names based on USSEIO conventions (primary key)
- **kg/co2_eq**: kilogram of carbon dioxide equivalent per kilogram
- **m3**: cubic meters of water
- **gal**: gallons
- **mj**: megajoules of energy
- **kwh**: kilowatt-hour

These two domain classes will hold all the spreadsheet information that was provided by the scientists/stakeholders beforehand. The USSEIO_Category will be a foreign key referencing the Environmental_Impact table that contains all category-related information.

Stretch Goal:

Domain Class: UserDetails

- **Email**: (primary key)
- **Name**: first and last name of the user
- **Username**: a unique username/display name
- **Password**: *alphanumeric if possible*
- **Score**: the saved intermediate/final score
- **Last_Played_Level**: a saved level from which the user can continue playing

As we have decided with the scientists/stakeholders, integrating a fully functional and secure login system with a password will be a stretch goal for this project. That being said, if we manage to reach that stage within the given time frame, it may be possible to include other stretch goal features such as the user's score and the last played level. Both of these columns can contain values even when the game has been completed by the user.