

CS 147: Assignment #9

CA: Makiko Fujimoto

Med-fi Prototyping

Project Title: Math Outside the Box

Team:

- Ashlee Reynolds
- Brad Huang
- Charlie Yu
- David Young

## **Problem and solution overview**

The problem is that in school, young children learn how to solve math problems rather than learning the real-life applicability of these math problems. Not understanding the real-life applicability of math leads to a lack of passion for math, and ultimately to poor math grades. We want to teach kids that math is cool, math is real and math is an adventure, and in so doing, we aim to foster kids' passion for math. We do this through a math adventure game called 'Math outside the Box'. 'Math outside the box' challenges students to practical activities (such as running or building a house of cards), and these activities are used to teach math. In so doing, the kids enjoy learning math and also learn the practical applications of the math they learn.

## **Tasks**

Our three representative tasks are:

- **Parent Portal – simple task.**  
On the landing page of the app, the user is given an option – they must choose to continue as a kid or as a parent. If they choose to continue as a parent, they are sent to the parent portal. Within this portal, the task is simple as it only involves the parent viewing and interpreting charts showing how their child is doing.
- **Social aspect – medium task.**  
If from the landing page, the user chooses to continue as a kid, the kid can do a math challenge or visit friends. If the user chooses to visit friends, they then begin the social task. This task allows the user to allow kids to do challenges together and compare their performance of completed challenges.
- **Math challenge –complex task**  
If from the landing page, the user chooses to continue as a kid, then to do a math challenge, they begin the challenge. During this challenge they are first given a practical / physical challenge such as running followed by a math challenge such as calculating their speed.

Note that last week we had different tasks. Last week our tasks were:

- Parent Feedback – simple task
- Physical/Practical challenge – medium task
- Math challenge – complex task

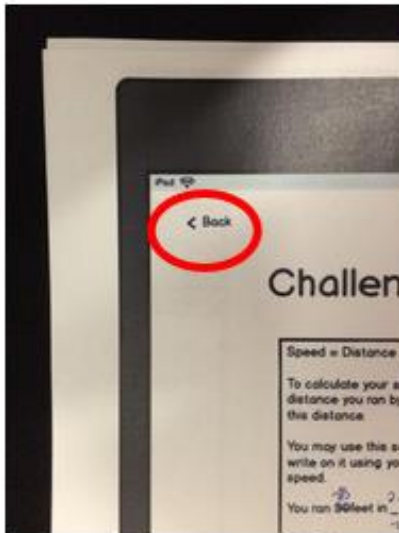
We changed our tasks after being advised that the Physical/Practical challenge and the Math challenge were dependent on each other and therefore count as one task. Also, upon reviewing results from last week's testing, we recognized that the kids who were tested were quite excited about the social aspect of the game, and so we decided to make that more complete and a task of its own.

## **Revised interface design**

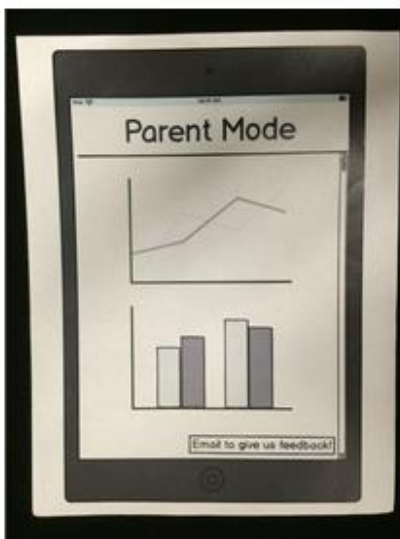
We made four major revisions to our interface:

- Buttons – During testing, the kids did not use the back button and had problems figuring out how to go back. So, we made the button bigger and more obvious. The revised version

is on the left below.



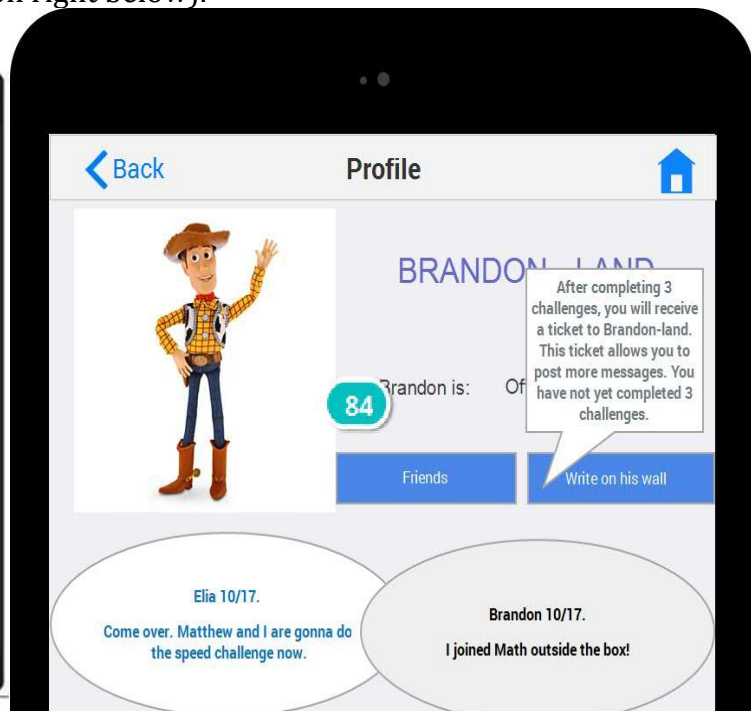
- Parent Control – The Parent Portal last week had a few graphs that were not very informative (See picture below on the left). However, the main realization from testing was that most parents have multiple children that would use an app like this. We made improvements so that each parent can access feedback on multiple children and this feedback is much more informative (See picture below on the right).



- Menu – Previously, the menu was a list of options that appeared on the side of the pages (as shown on the left below). The kids during testing mentioned that it was boring, and 'didn't do anything'. We also noticed that it was a bit hard for the kids to find the menu. So we made the menu bigger, brighter and with more shapes and interesting figures (as shown on the right below).



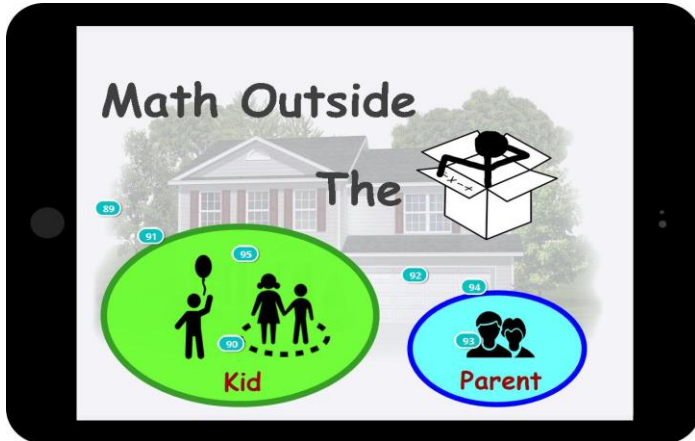
- Social Aspect – Previously, the social aspect was a small part of the application and not considered a task of its own. During testing, we noticed that the kids were very excited about the social aspect, and one child repeatedly asked for ‘a ticket to Matthewland’. We recognized that the social aspect could become an interesting task of its own and these ‘tickets’ to the social part of the application could be used to motivate children. Therefore where there were previously only profile pages (seen on left below), the social aspect of the application now includes the ability to post on friends’ walls and add friends. However kids can only do so after completing a certain number of challenges, and receiving the ‘ticket’ to the land of their friends (seen on right below).



[insert pictures]

## Scenarios of Three Tasks

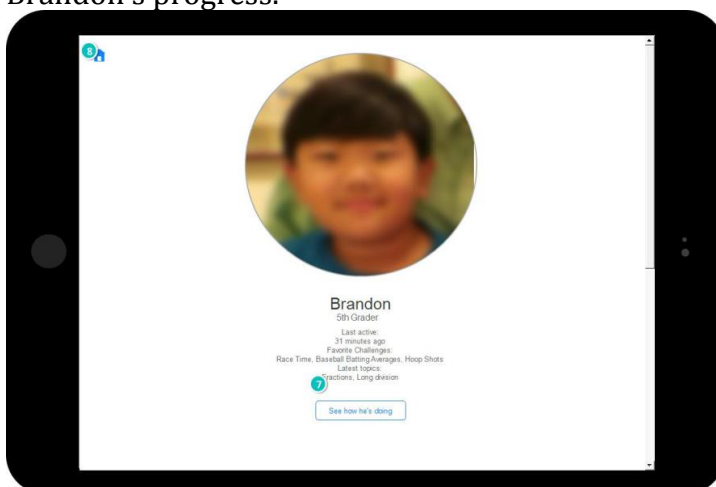
**Scenario 1: Parent Portal Scenario:** Parents check on the progress of their children



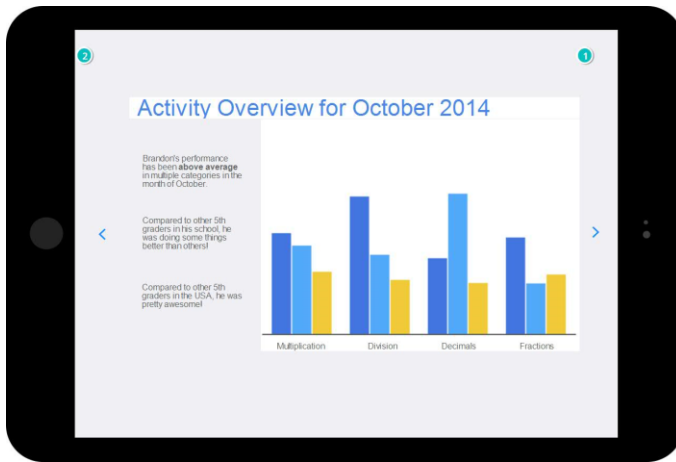
1. User visits landing page and chooses to log in as parent.



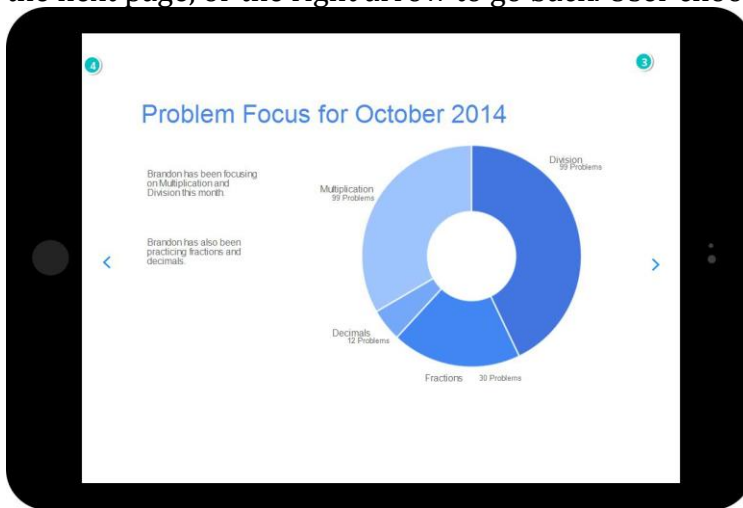
2. User sees the option to view either Saarah or Brandon's progress and chooses to view Brandon's progress.



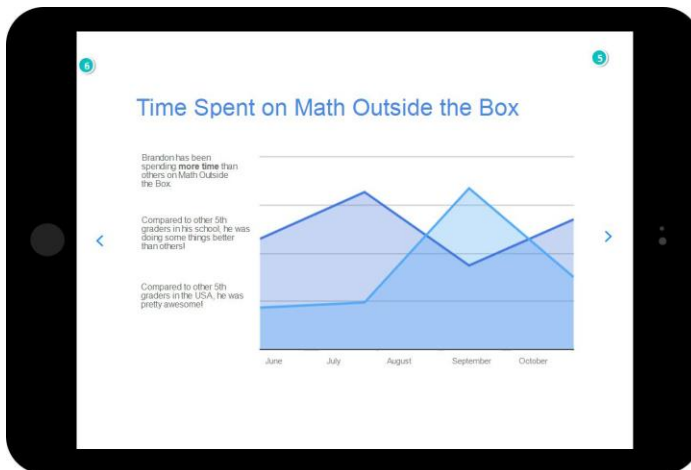
3. User sees some stats such as Brandon's last login then clicks to see Brandon's progress.



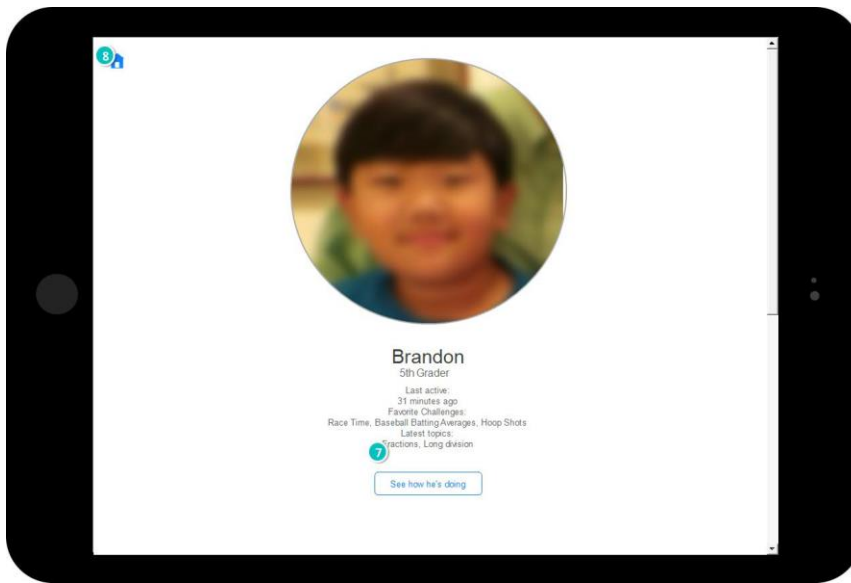
4. The user is first shown Brandon's activity overview. User may click the left arrow to go to the next page, or the right arrow to go back. User chooses to click the left arrow.



5. The user is then shown Brandon's problem focus for the month. User may click the left arrow to go to the next page, or the right arrow to go back. User chooses to click the left arrow.

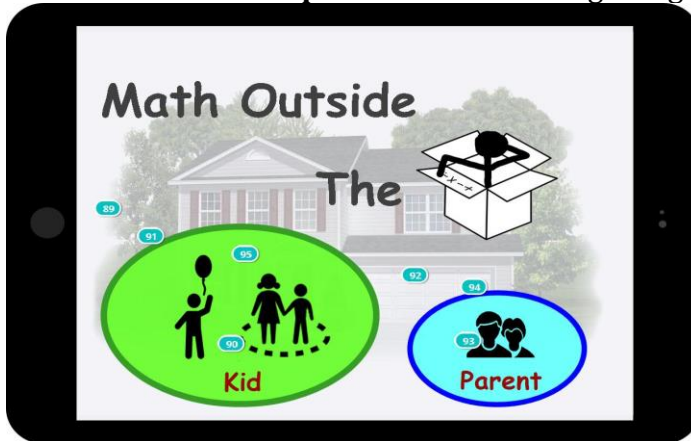


6. The user is then shown Brandon's time spent on Math outside the Box. User may click the left arrow to go to the next page, or the right arrow to go back. User chooses to click the left arrow.

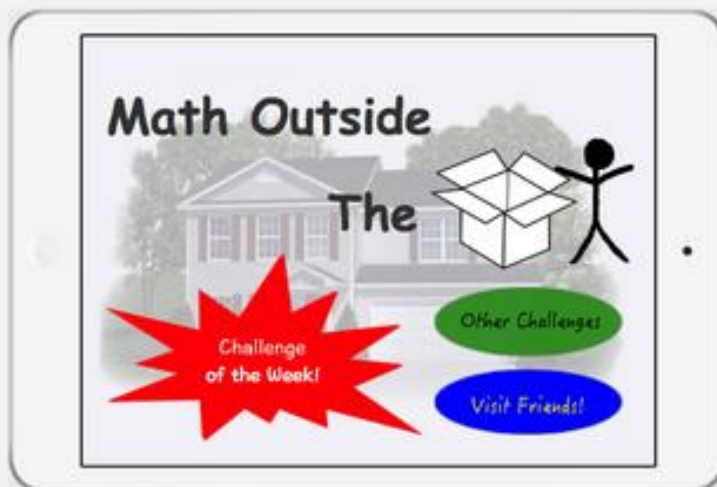


User is brought back to first page about Brandon.

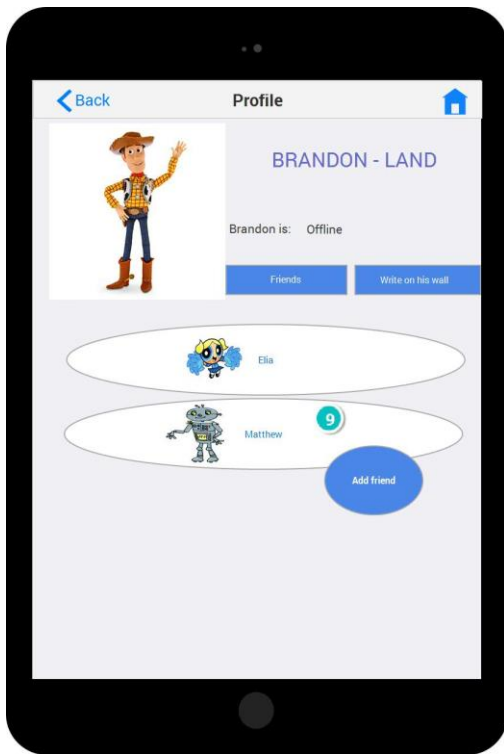
**Scenario 2: Social aspect:** Kids do challenges together



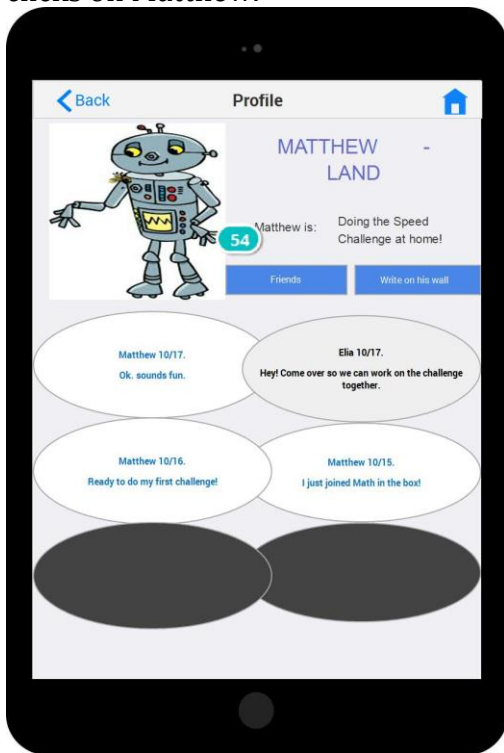
1. User visits landing page and chooses to log in as a kid.



2. Kid (Brandon) is brought to this page and chooses to visit Friends.

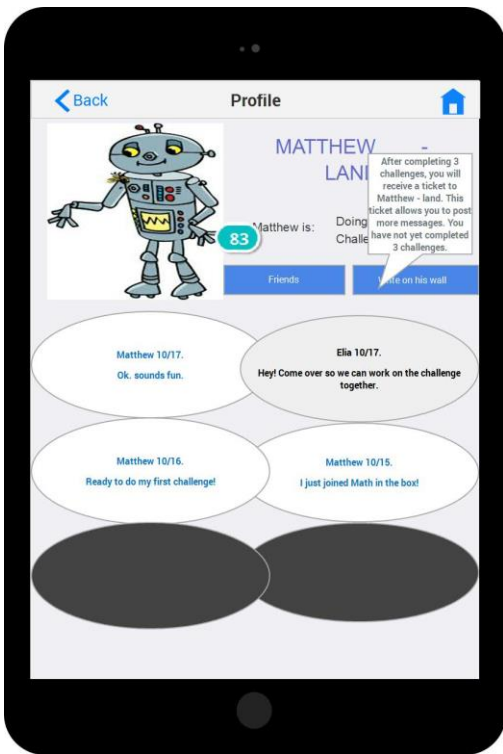


3. Brandon sees the list of his friends. He wants to do the challenge with Matthew so he clicks on Matthew.



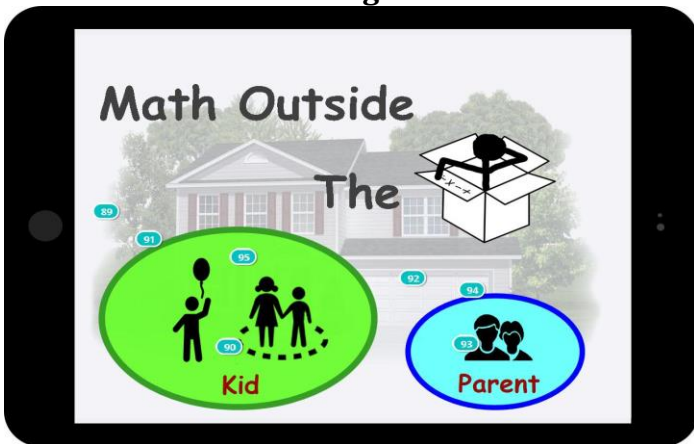
4. He is brought to Matthew's profile page. He can see here that Matthew and Elia are planning to do the challenge together. He clicks 'Write on his wall' to write on Matthew's wall.



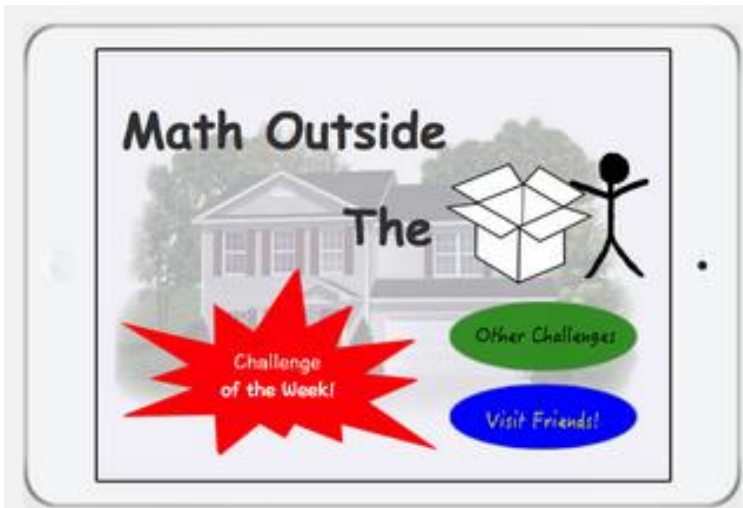


5. He is told from the chat bubble that unfortunately he cannot post on Matthew's wall until he has a ticket to 'Matthew-land'. To get this ticket, he must compete three challenges. He goes off to complete his first challenge.

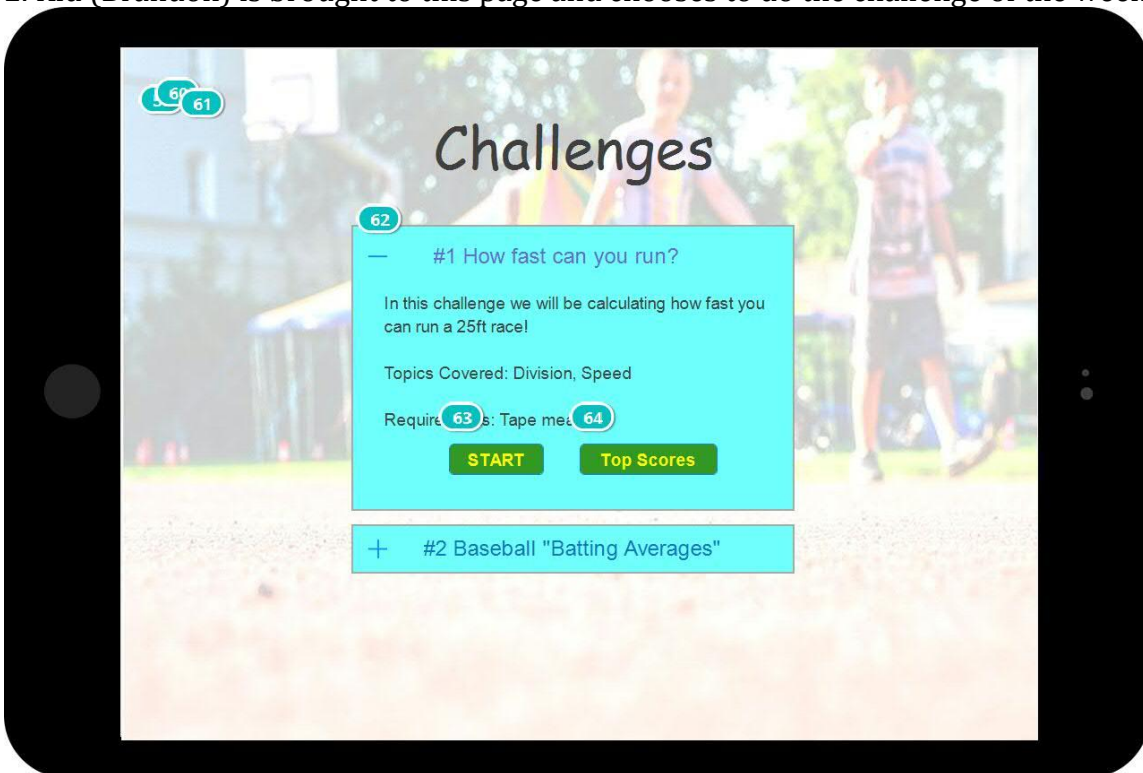
**Scenario 3: Math challenge:** Kids time their run and find their speed



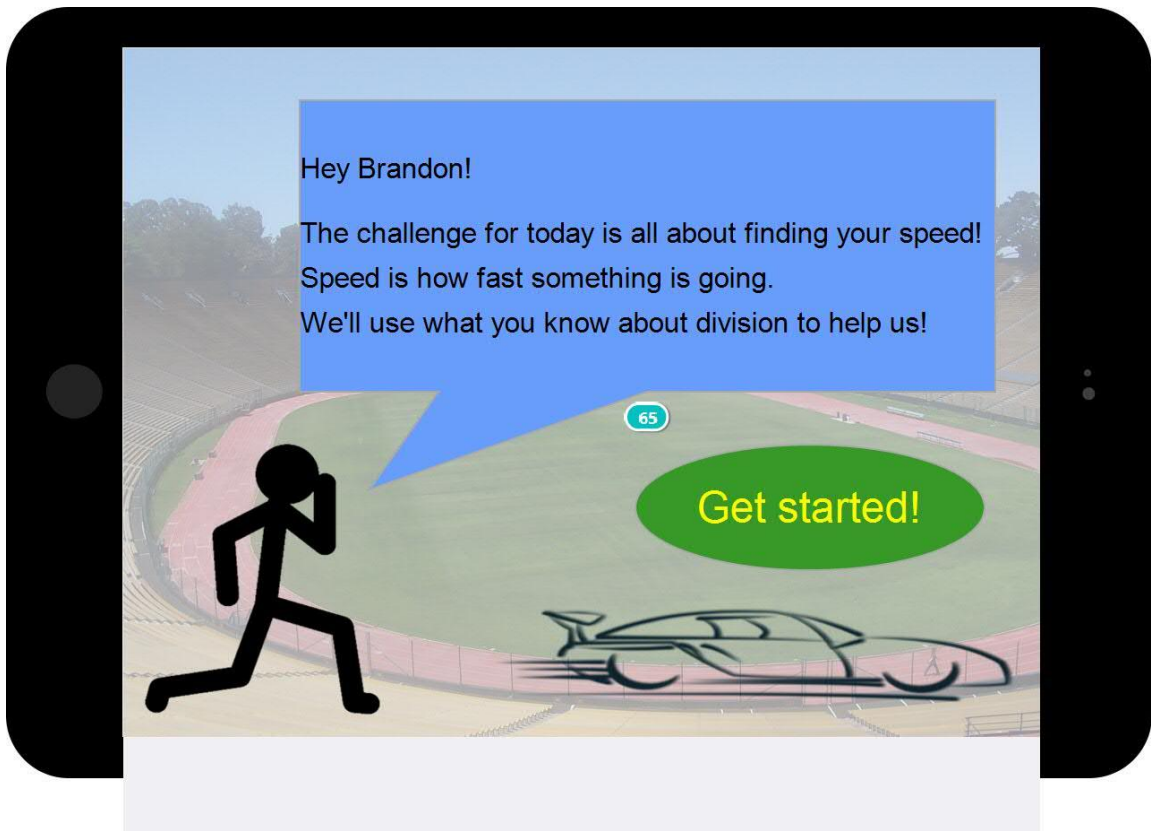
1. User visits landing page and chooses to log in as a kid.



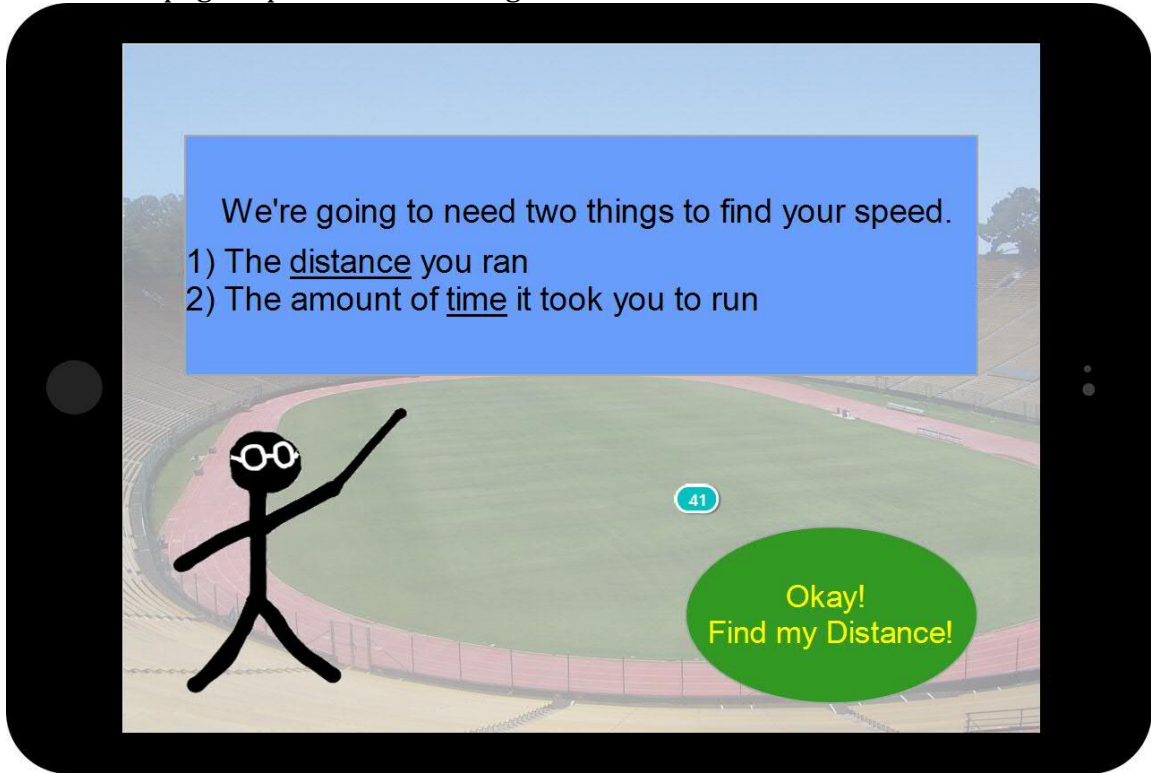
2. Kid (Brandon) is brought to this page and chooses to do the challenge of the week.



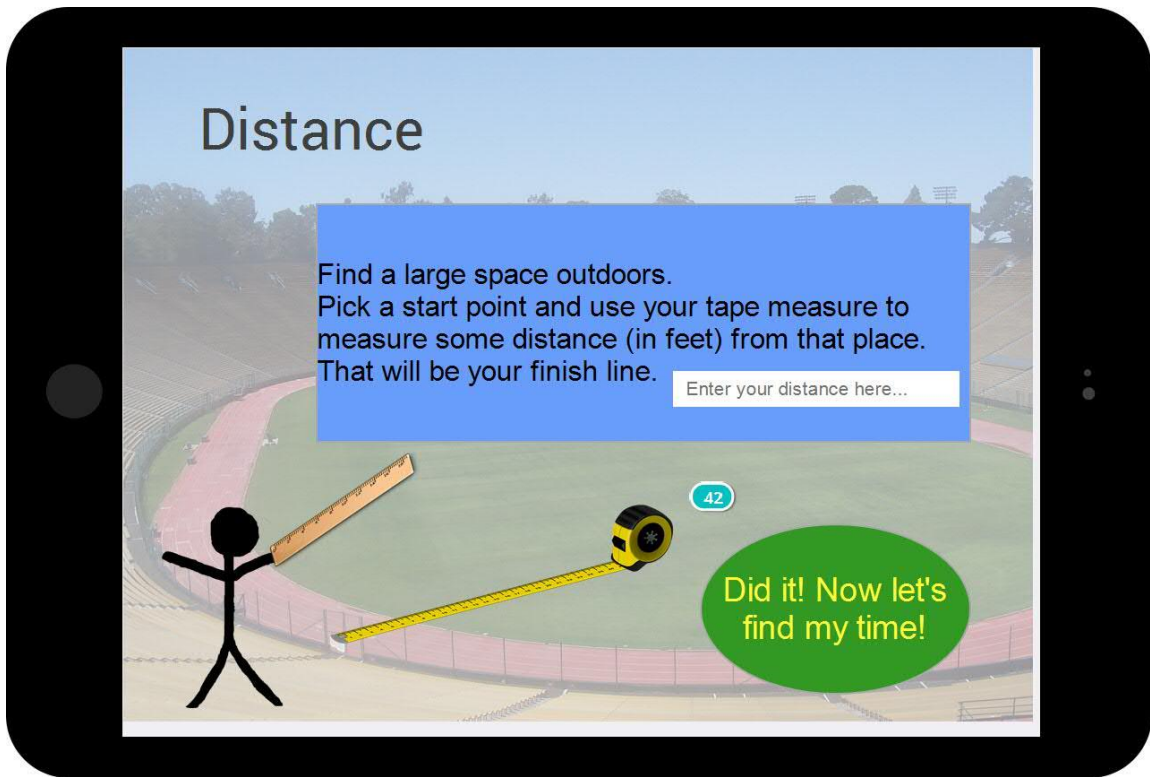
3. He is brought to this page that introduces the challenge. He clicks 'Start' to begin the challenge.



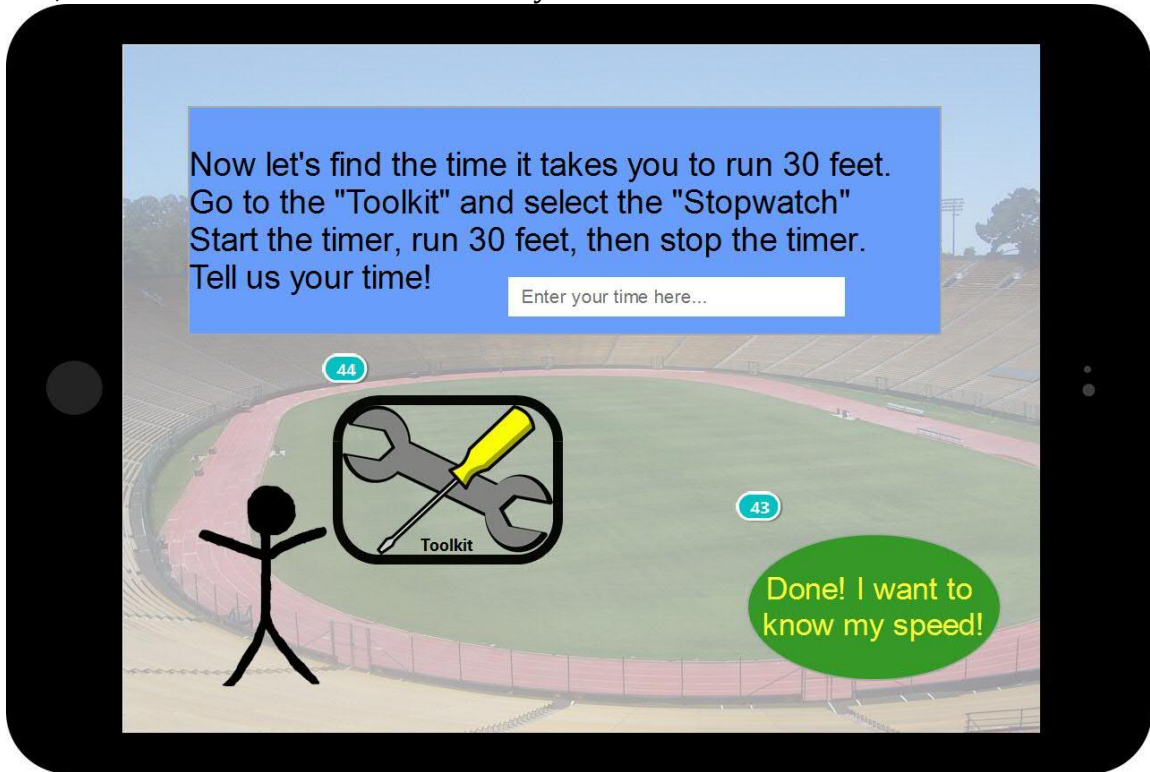
4. The next page explains the challenge a bit more. Brandon clicks Get Started!



5. He is brought to a page which tells him what he will need to complete the challenge. He click 'Okay, find my distance' to do the first activity.

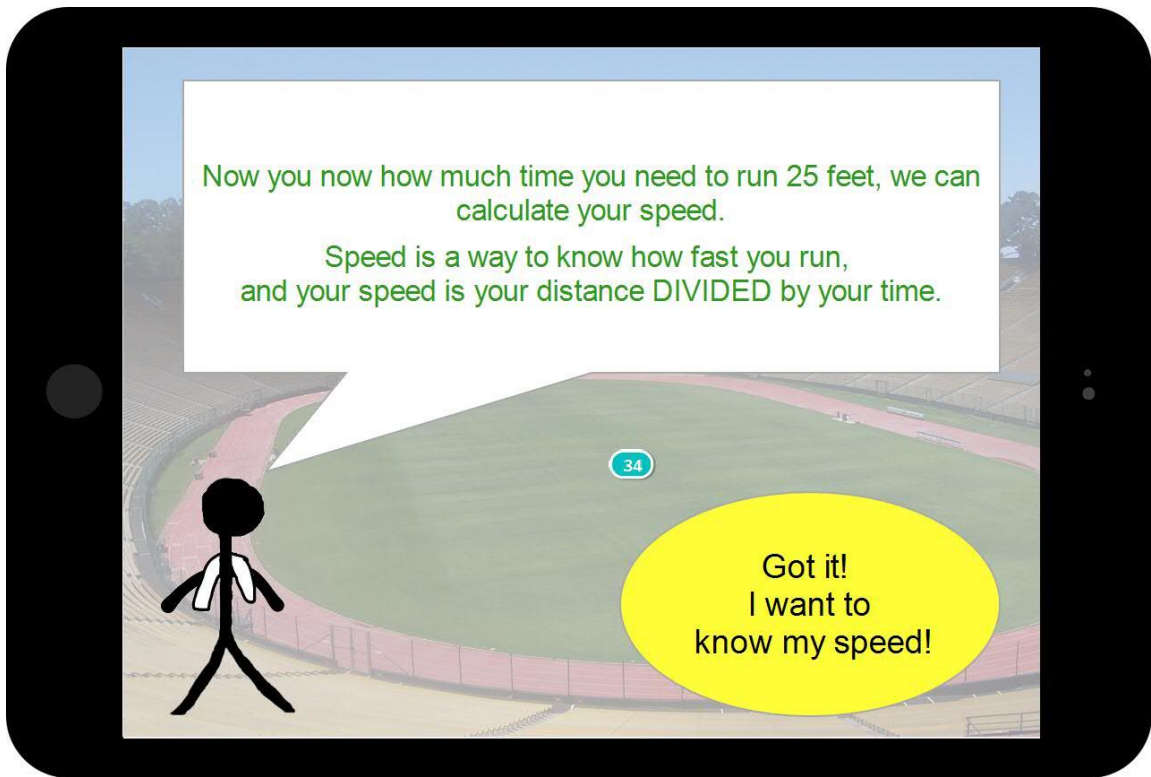


6. He is given instructions as to how to complete that activity. He enters his distance in the box, then clicks 'Did it! Now lets find my time!'

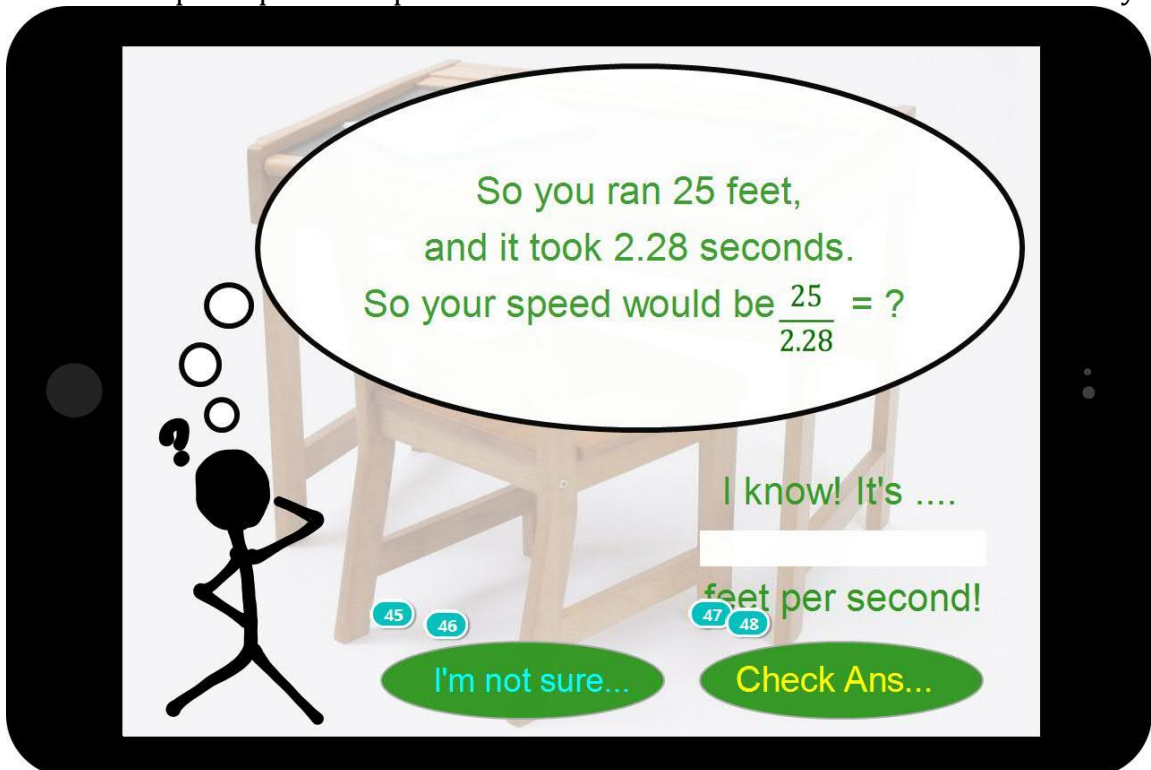


7. He is given instructions as to how to complete that activity. He enters his time in the box, then clicks 'Done! I want to know my speed!'

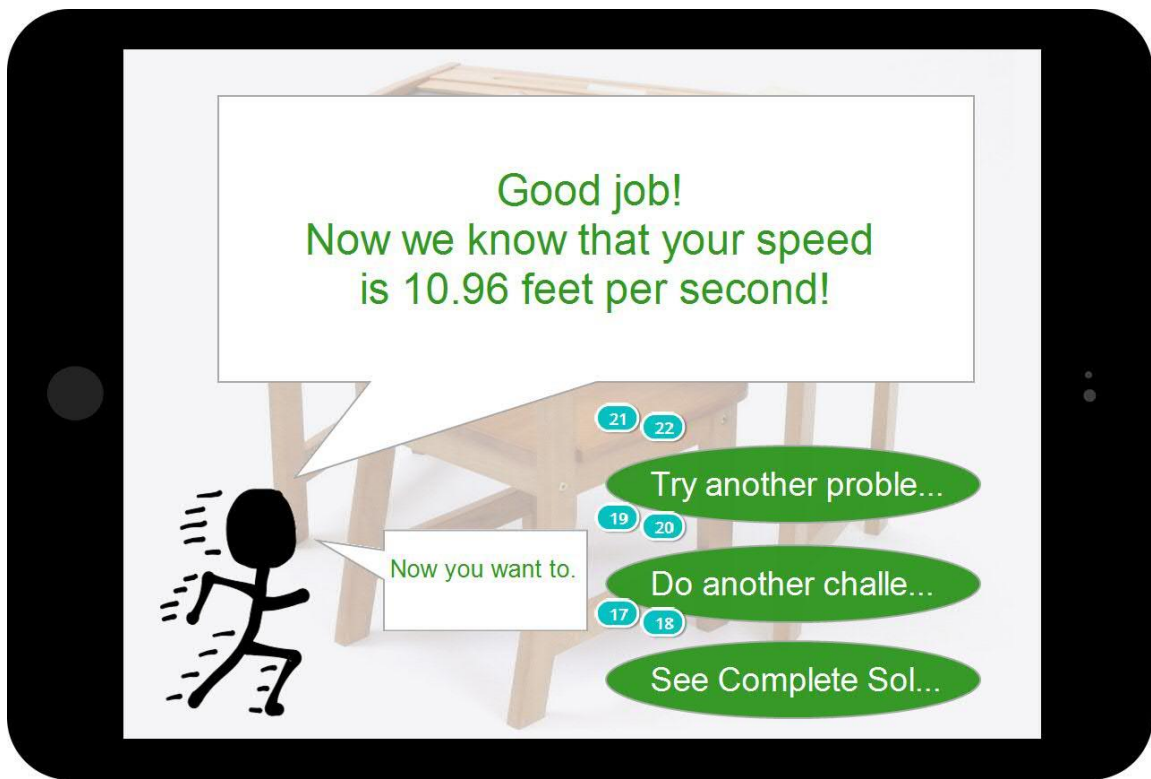




8. The concept of speed is explained a bit. Brandon clicks 'Got it! I want to know my speed!'



9. Brandon calculates his speeds, enters his speed and clicks 'Check Answer'.



10. He is brought to this page that congratulates him on his correct answer.

### Prototype overview

#### Tools

We used the justinmind prototyping tool. This tool helped us to make similar pages very quickly by creating and editing templates. It was also designed for collaboration by allowing multiple users to work on the same prototypes and to see each other's updates. This tool allowed us to collaboratively create an interactive prototype without coding.

#### Limitations

Justinmind had to be downloaded to our computers - every time a change was made, we had to update (which was time consuming), and the update crashed a few computers. There were also not enough drawing tools; for example, there was no paintbrush, and the fonts would change from computer to computer and did not export to simulation on devices, leaving us with boring, varying font, that was difficult to change.

#### Wizard of Oz techniques

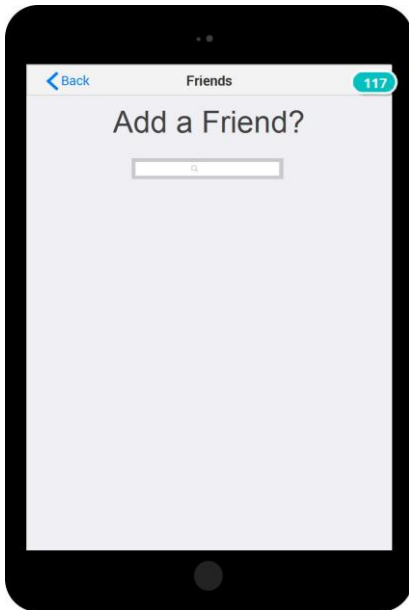
In calculating speed, when a user is asked to enter their distance and time, they may do so. However, currently, the application is only able to calculate the speed for one particular distance and time. We have entered this speed in response to a particular distance and time. The application responds by saying whether or not it is correct, and the application can also show the solution. It might seem like these calculations are being done by the computer, but in fact, currently, the application has been provided (by us) with the answer to one particular question. So it does not actually do the calculation.

## Hand coded features

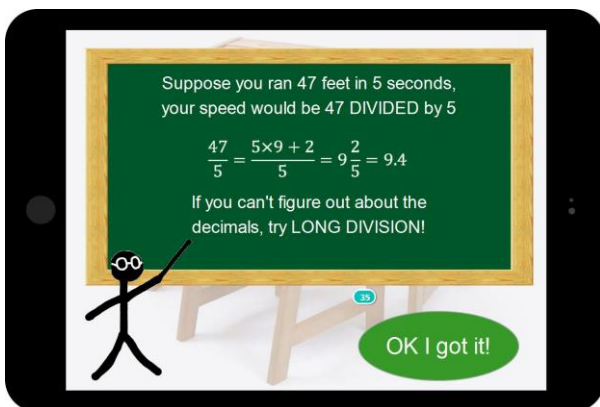
When the user logs in as a kid, he is logged in as Brandon who has 2 friends and has posted on some friends' wall. We hard coded these features since adding friends, sending messages, and creating profiles were things we could not do / found very difficult to do using our prototyping tool. In addition, when the user logs in as a parent, they can see graphs as to how their children are doing. We also hard coded these graphs for the same reason we did the friends, messages and profiles.

## Prototype Screenshots

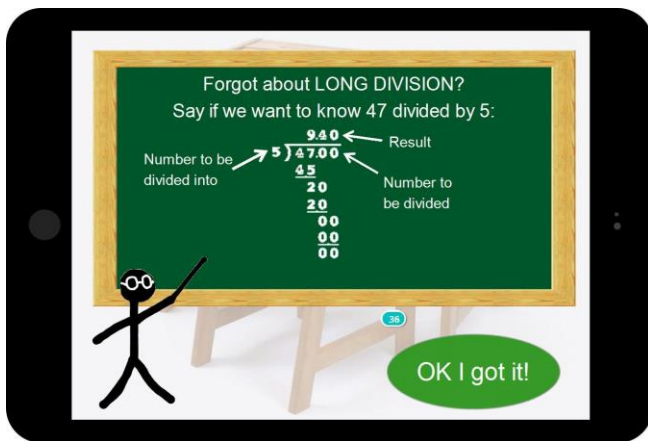
Below are screenshots of the pages of the prototype that have not yet been shown.



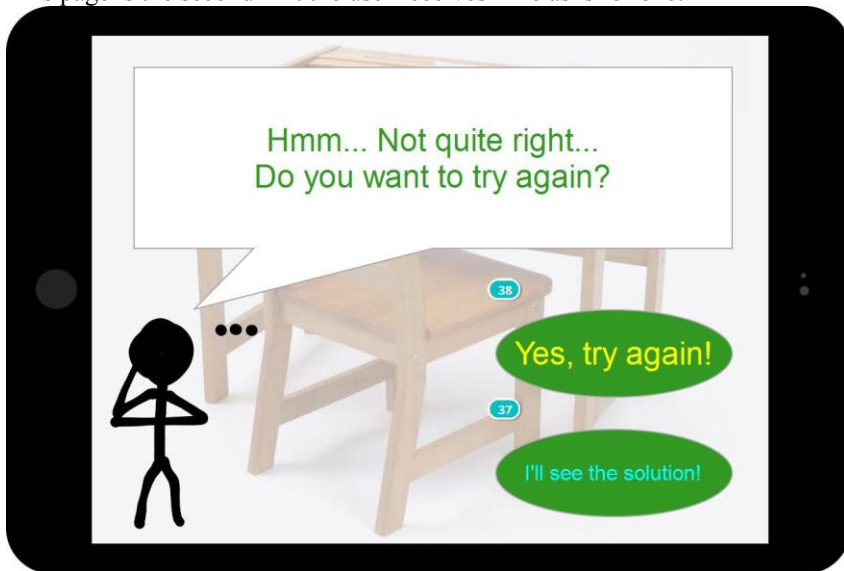
This page allows the user to add a Friend by searching for their name.



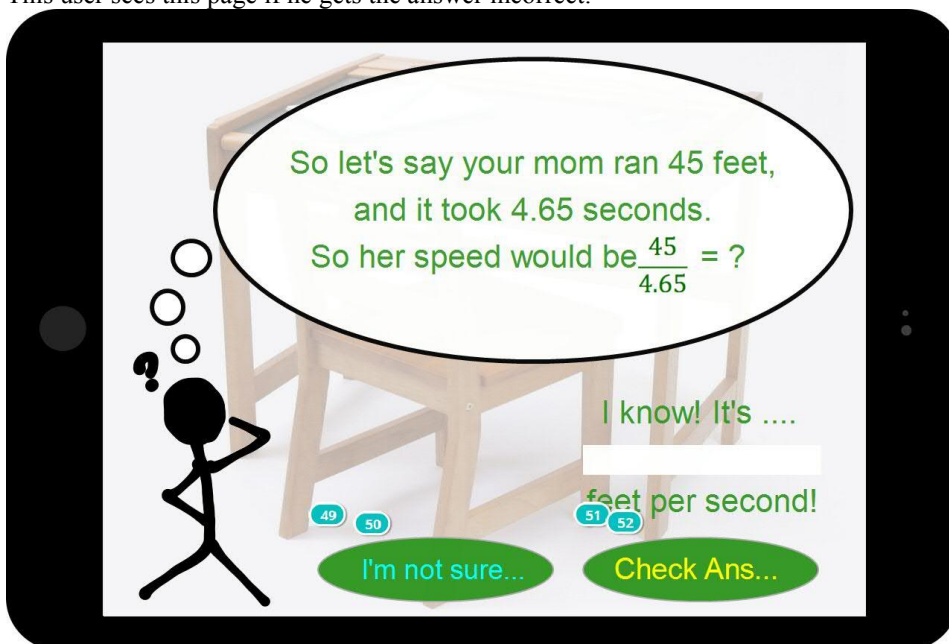
This page is the first hint the user receives if he asks for one.



This page is the second hint the user receives if he asks for one.

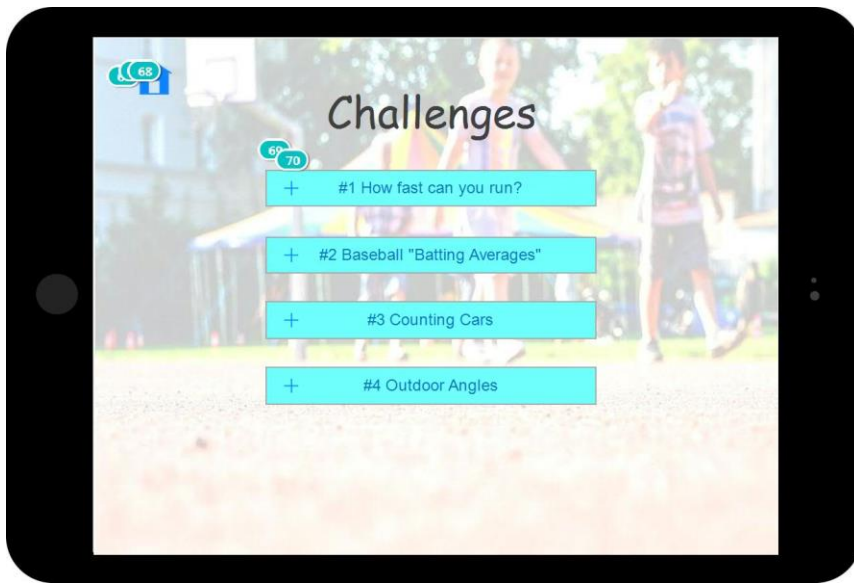


This user sees this page if he gets the answer incorrect.

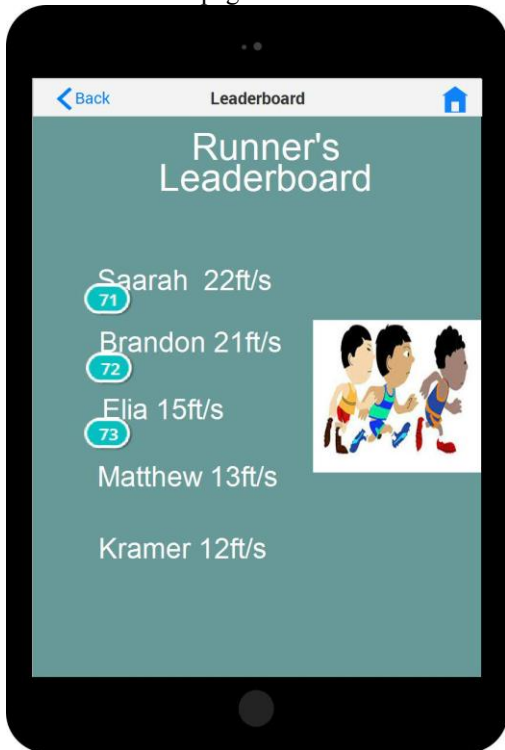


The user sees this page if she asks for another question after getting the previous one correct.

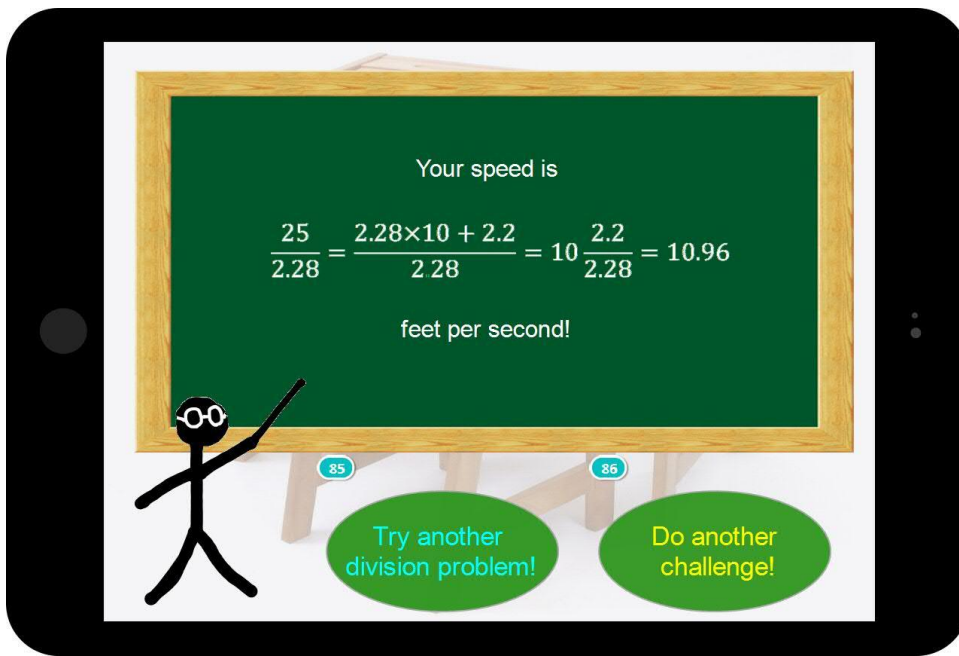




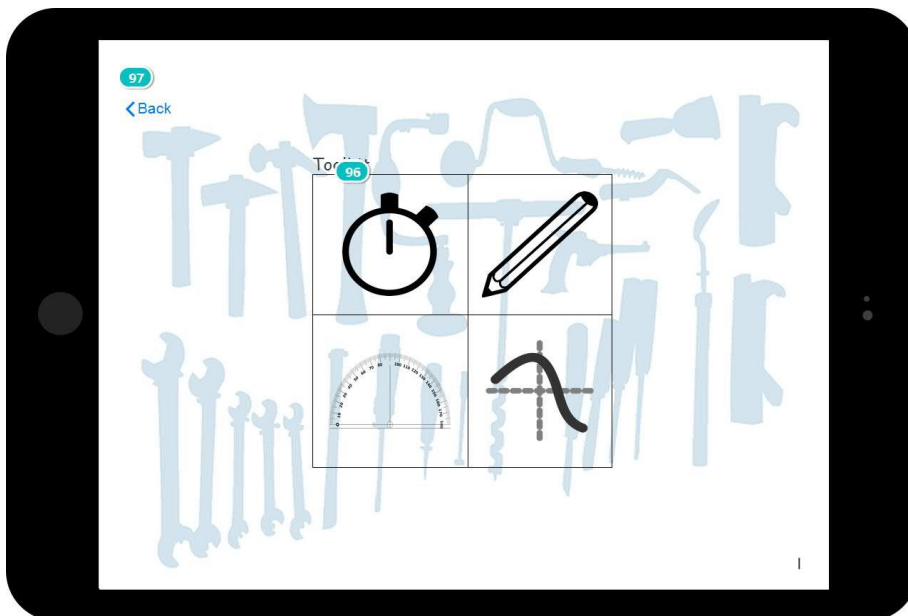
The user sees this page if he chooses 'Other challenges' from the menu page.



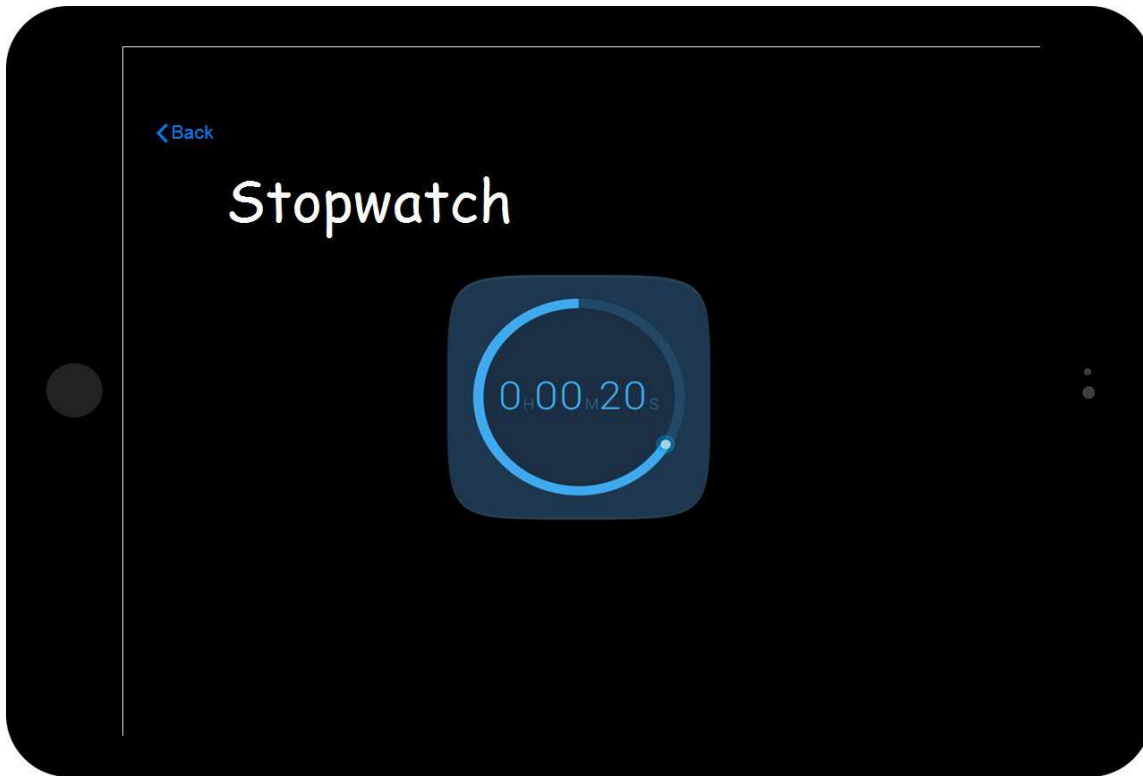
The user sees this page if she clicks 'top score' from the main page of a challenge.



The user sees this page is she asks for the solution



The user sees this page is he clicks toolkit



The user sees this page if he clicks stopwatch from the toolkit.