

Zero AD

Augmented Reality Action Adventure Game

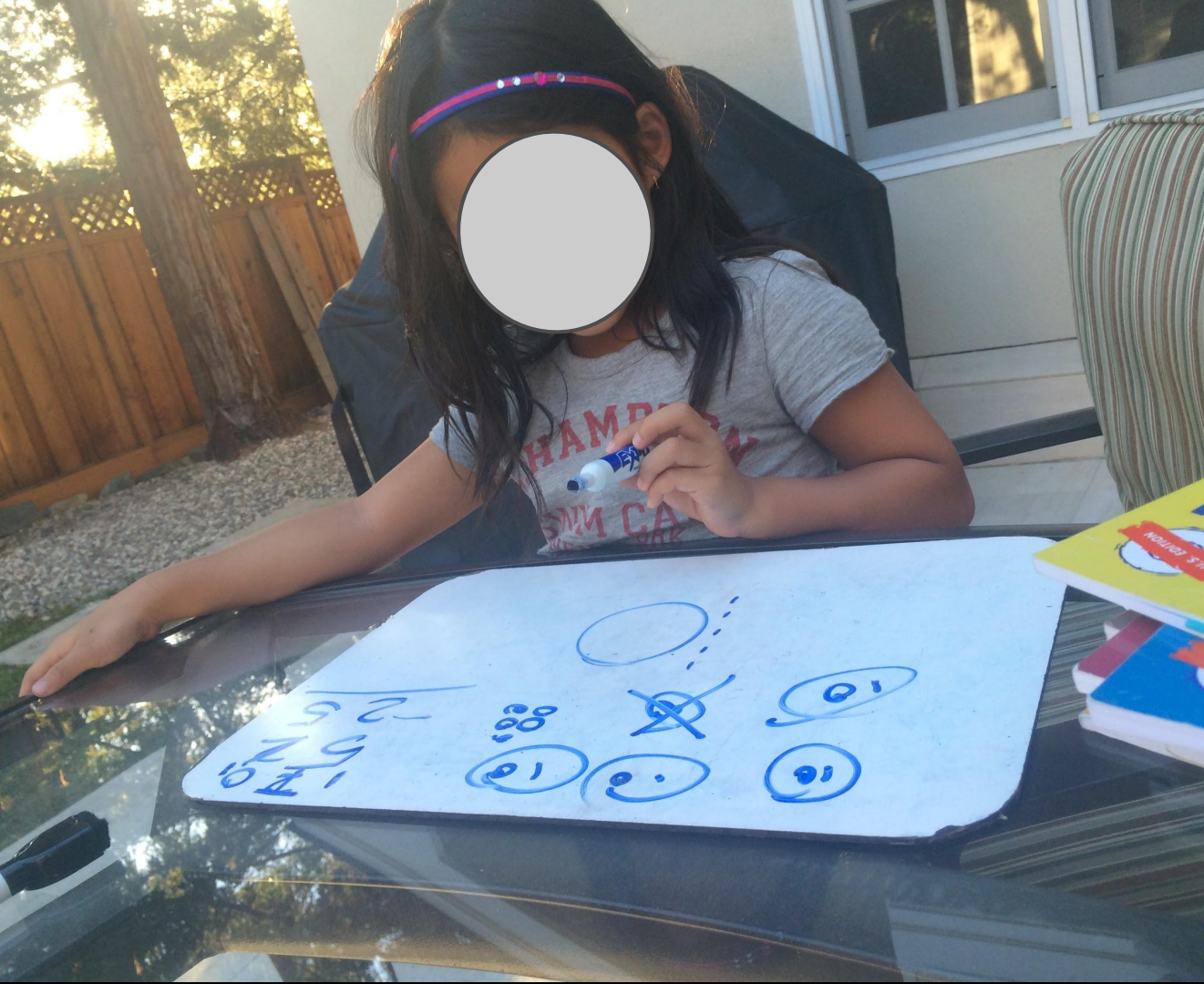
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Overview

- Problem & Solution
- Contextual Inquiry & Interview
- Task Analysis Results
- 3 Representative Tasks
- 3 Application Ideas
- Early Design Sketches

Problem & Solution

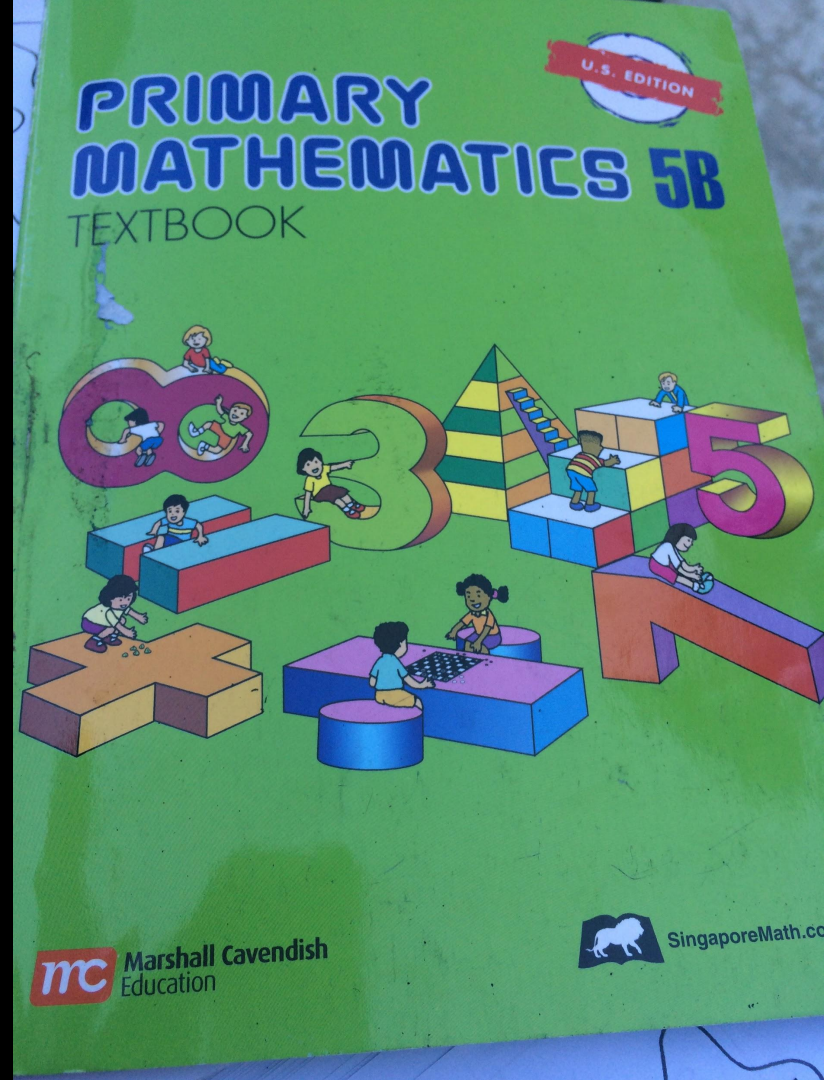




Contextual Inquiry

Observations

- School is not a challenge, homework is
- Like drawing
- Like doing things together



What we learned about children

- Rewards
- Gender Differences
- Social Dimension

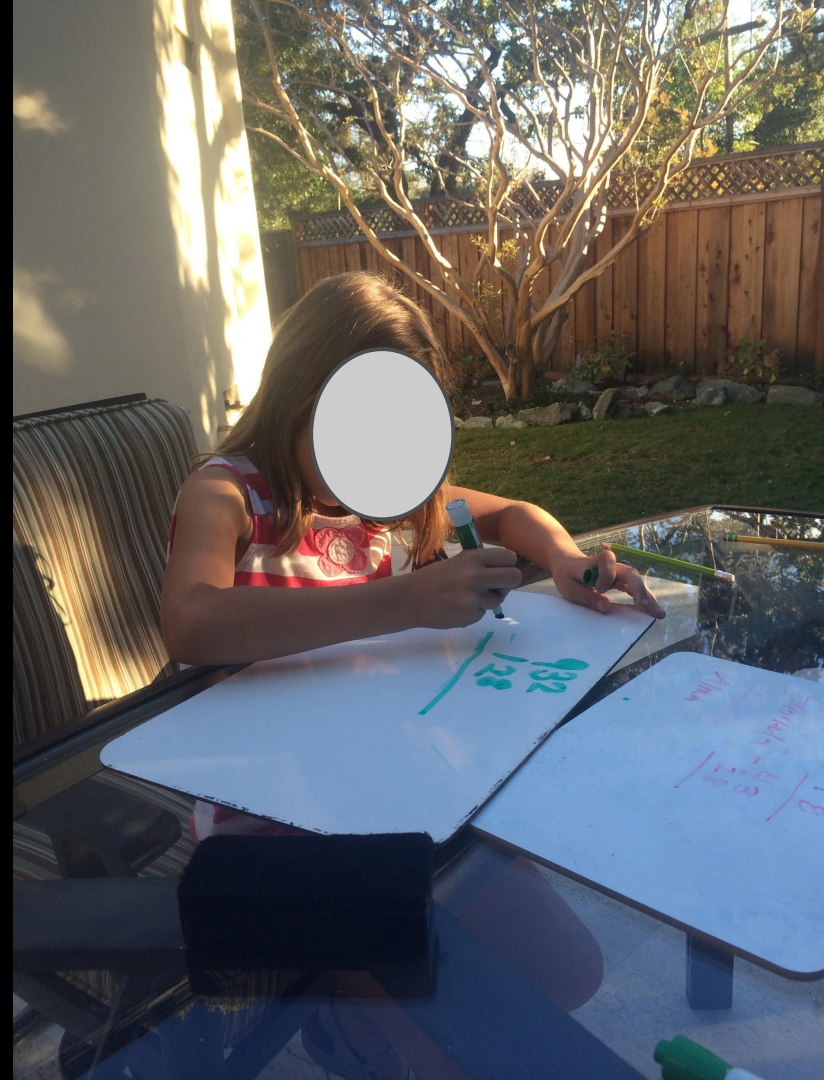


What we learned about parents

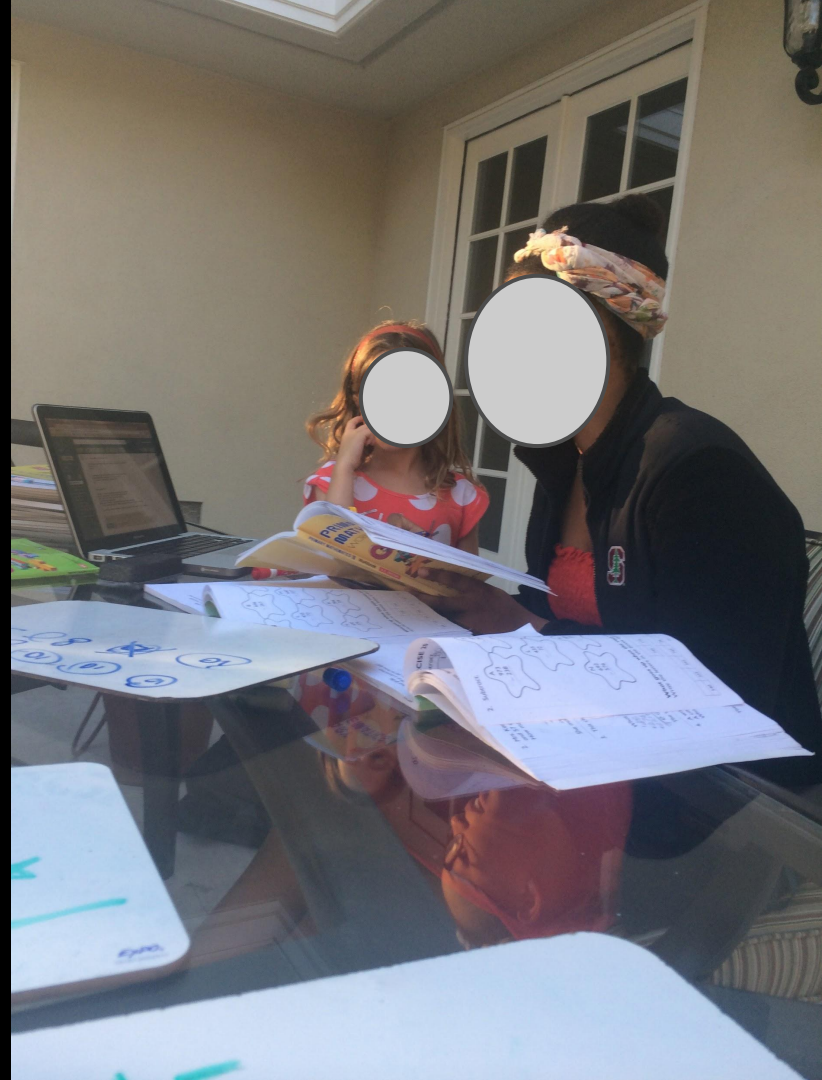
- Value: Effort > Talent
- Don't want to be *too* involved in the process
- Want progress reports
- Adaptive Learning
- \$\$\$



Task Analysis Results



Task Analysis Results



- Round off each of the following to 2 decimal places.
 (a) 0.119 (b) 7.508 (c) 40.082 (d) 81.143
 (e) 0.725 (f) 3.123 (g) 59.005 (h) 18.607
- Round off each of the following to 2 decimal places.
 (a) 6.265 km (b) 4.083 kg (c) 0.189 ℓ (d) 20.245 ℓ
- Express each fraction as a decimal correct to 2 decimal places.
 (a) $\frac{1}{8}$ (b) $\frac{4}{7}$ (c) $2\frac{5}{9}$ (d) $5\frac{2}{3}$

Find the value of each of the following:

- (a) 10×5.7 (b) 100×1.508 (c) 7.25×1000
- 30×0.002 400×3.29 6.8×3000
- 84×0.13 56×2.07 1.29×29
- $39 \div 10$ $34.2 \div 100$ $9 \div 1000$
- $99 \div 30$ $648 \div 600$ $60 \div 2000$

Find the equivalent measures.

- (a) $0.285 \ell = \blacksquare \text{ ml}$ (b) $0.75 \text{ gal} = \blacksquare \text{ qt}$
 (c) $0.085 \text{ km} = \blacksquare \text{ m}$ (d) $0.25 \text{ ft} = \blacksquare \text{ in.}$
 (e) $0.706 \text{ kg} = \blacksquare \text{ g}$ (f) $0.5 \text{ lb} = \blacksquare \text{ oz}$
- (a) $670 \text{ ml} = \blacksquare \ell$ (b) $12 \text{ oz} = \blacksquare \text{ lb}$
 (c) $105 \text{ m} = \blacksquare \text{ km}$ (d) $3 \text{ c} = \blacksquare \text{ qt}$
 (e) $69 \text{ g} = \blacksquare \text{ kg}$ (f) $6 \text{ in.} = \blacksquare \text{ ft}$
- (a) $20.08 \text{ km} = \blacksquare \text{ km } \blacksquare \text{ m}$ (b) $3.75 \text{ qt} = \blacksquare \text{ qt } \blacksquare \text{ c}$
 (c) $16.5 \ell = \blacksquare \ell \blacksquare \text{ ml}$ (d) $18.5 \text{ ft} = \blacksquare \text{ ft } \blacksquare \text{ in.}$
 (e) $2.08 \text{ kg} = \blacksquare \text{ kg } \blacksquare \text{ g}$ (f) $4.75 \text{ lb} = \blacksquare \text{ lb } \blacksquare \text{ oz}$
- (a) $9 \text{ m } 60 \text{ cm} = \blacksquare \text{ m}$ (b) $6 \text{ gal } 3 \text{ qt} = \blacksquare \text{ qt}$
 (c) $4 \ell 705 \text{ ml} = \blacksquare \ell$ (d) $2 \text{ lb } 5 \text{ oz} = \blacksquare \text{ oz}$
 (e) $25 \text{ km } 6 \text{ m} = \blacksquare \text{ km}$ (f) $3 \text{ ft } 7 \text{ in.} = \blacksquare \text{ in.}$

- Juliana is 1.64 m tall. Her sister is 6 cm shorter. Find her sister's height in meters. *1.58*
- Rachel had 3.54 kg of flour. She used 250 g to make cookies and 1.25 kg to bake cakes. How many kilograms of flour did she have left? *2 cakes 7 cookie 0.040*

Task Analysis Results



Representative tasks (i)

- Children learn Math concepts in school



Representative tasks (ii)

- Children do homework

pineapple tarts
er?

EXERCISE 20

1. Subtract

$\begin{array}{r} 120 \\ - 37 \\ \hline 15 \end{array}$ ✓	$\begin{array}{r} 74 \\ - 36 \\ \hline 38 \end{array}$ ✓	$\begin{array}{r} 74 \\ - 36 \\ \hline 38 \end{array}$ ✓
$\begin{array}{r} 96 \\ - 57 \\ \hline 39 \end{array}$ ✓	$\begin{array}{r} 62 \\ - 58 \\ \hline 4 \end{array}$ ✓	$\begin{array}{r} 45 \\ - 39 \\ \hline 6 \end{array}$ ✓
$\begin{array}{r} 50 \\ - 4 \\ \hline 46 \end{array}$	$\begin{array}{r} 87 \\ - 59 \\ \hline 28 \end{array}$ ✓	$\begin{array}{r} 80 \\ - 64 \\ \hline 16 \end{array}$ ✓

library.
ry?

Why do you go to bed?
Write the letters in the boxes below to find the reason.

<input type="checkbox"/> T	<input type="checkbox"/> D	<input type="checkbox"/> O	<input type="checkbox"/> E	<input type="checkbox"/> S	<input type="checkbox"/> N	<input type="checkbox"/> O	<input type="checkbox"/> T
39 26	38 46	37 28	6 46	26			
<input type="checkbox"/> C	<input type="checkbox"/> O	<input type="checkbox"/> M	<input type="checkbox"/> E	<input type="checkbox"/> T	<input type="checkbox"/> O	<input type="checkbox"/> M	<input type="checkbox"/> E
15 46	4 37	26 46	4 37				

51

Representative tasks (iii)

- Consume some math games



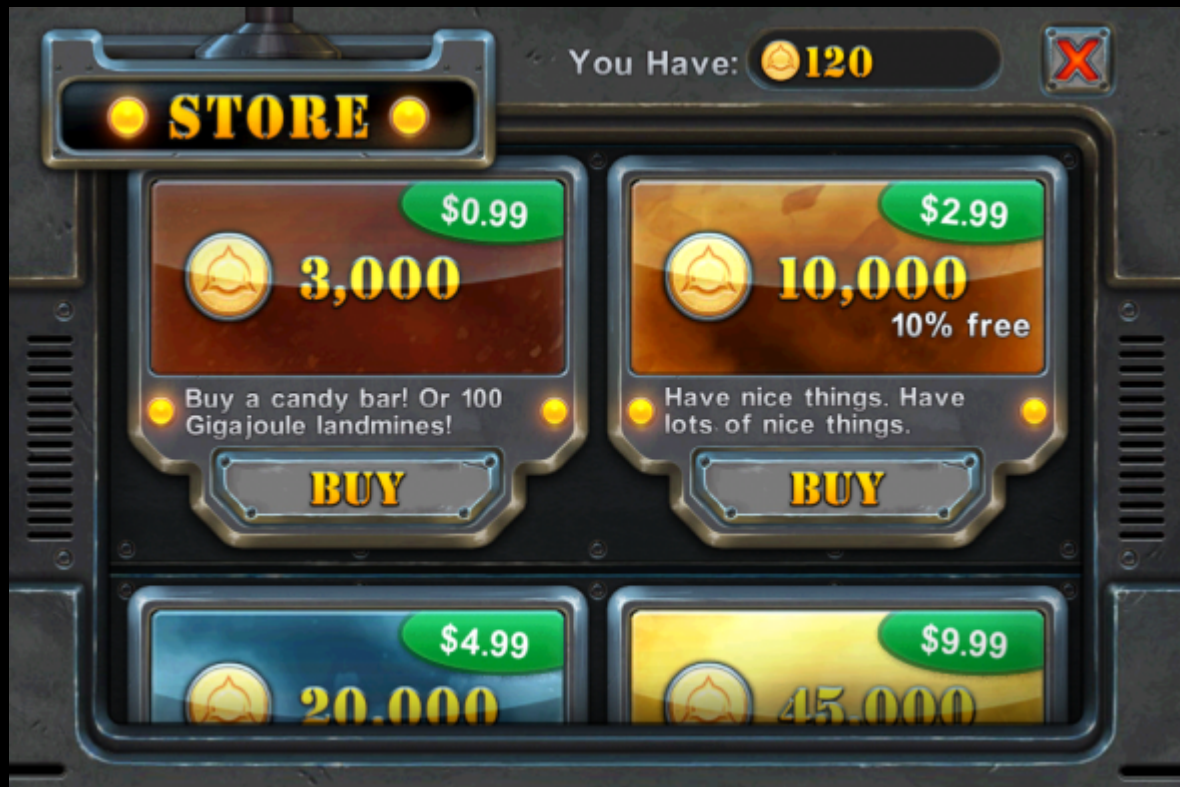
3 Application Ideas (i)

- History + Math



3 Application Ideas (ii)

- Math Portal

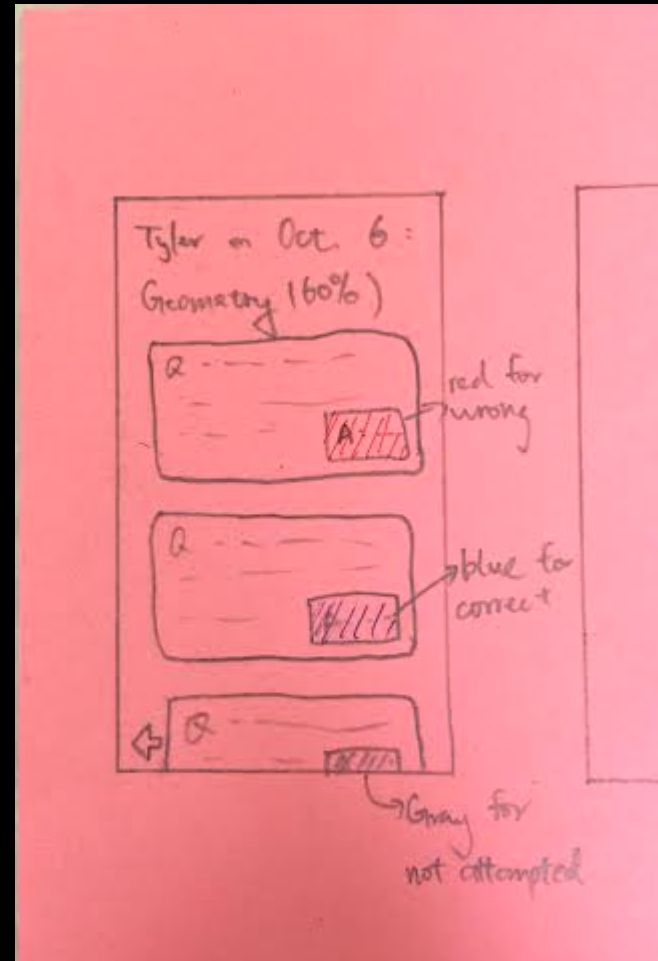
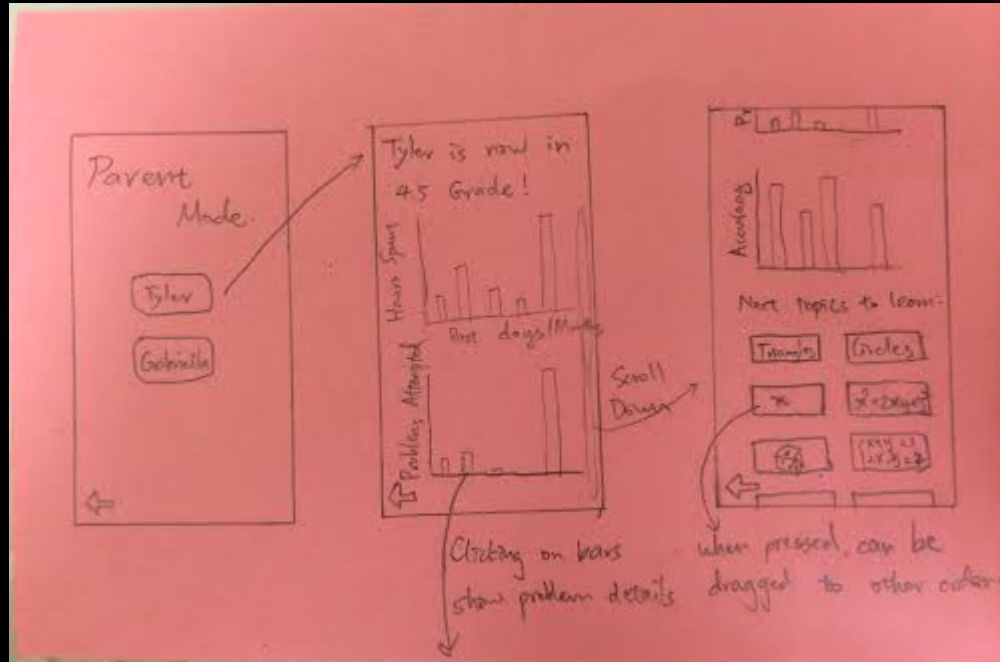


3 application ideas (iii)

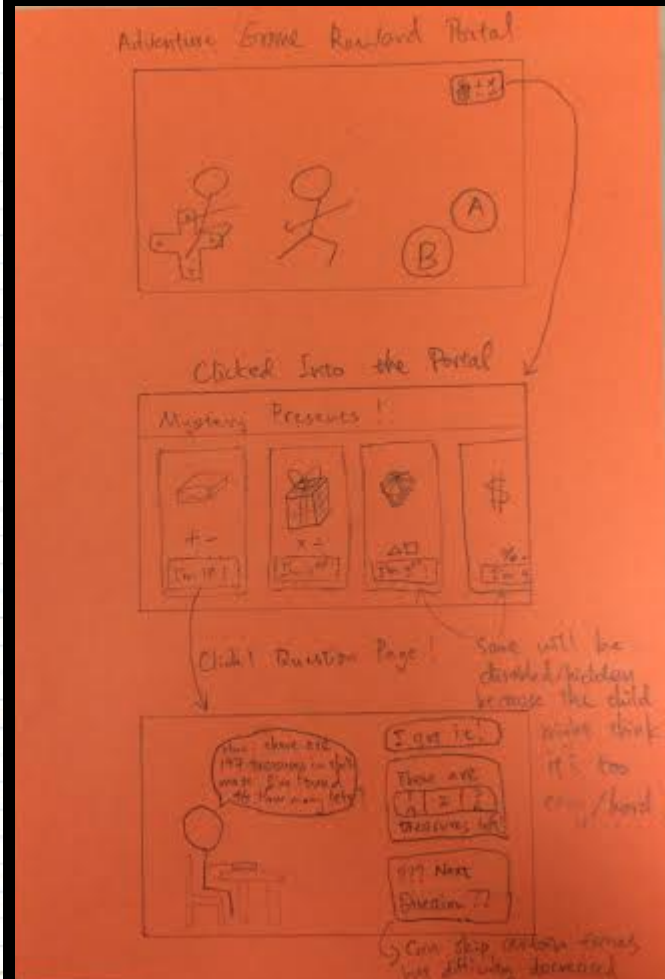
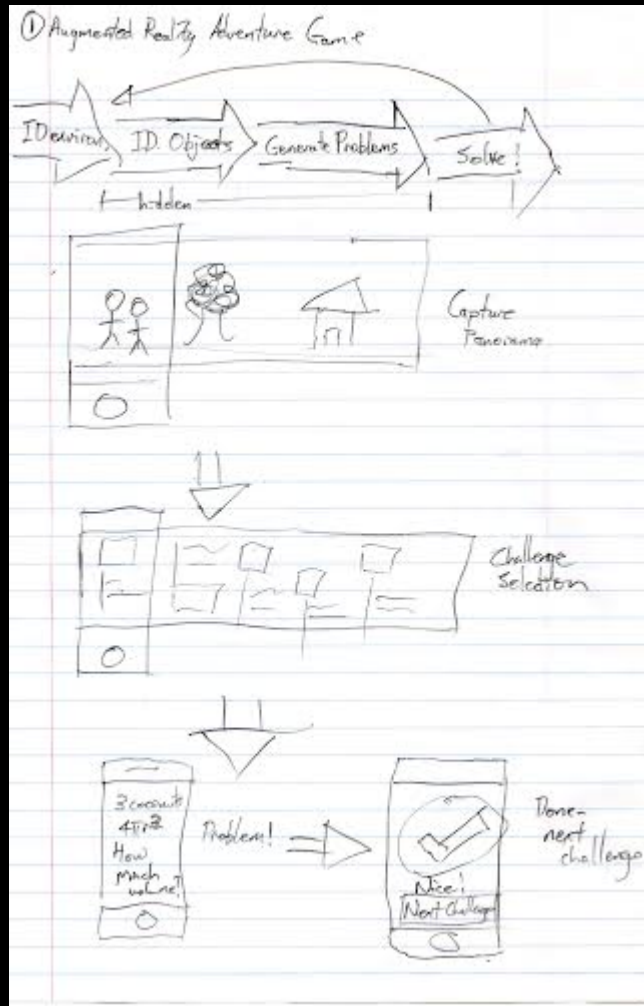
- Augmented Reality



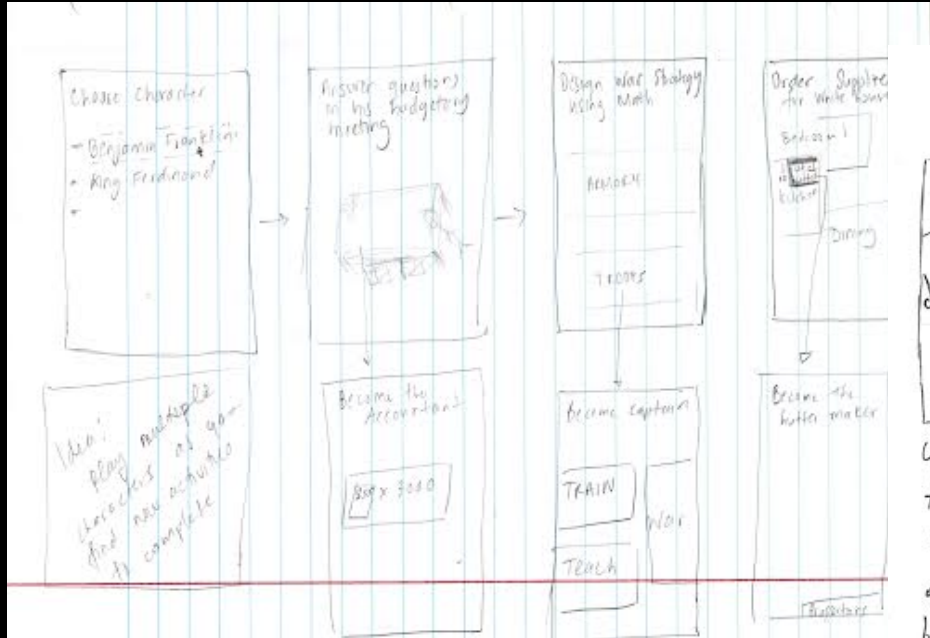
Early design sketches



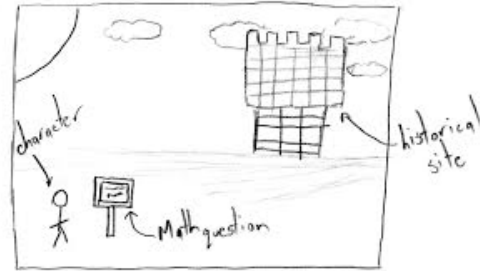
Early design sketches



Early design sketches



In-game examples



User moves avatar to the sign post and taps it to be prompted with a question about the building.

ACHIEVEMENTS

BADGES

- 🏆 100 problems solved
- 🏆 50 problems solved
- 📖 125 questions attempted

RIBBONS

- 🏆 - Algebra Champion
- 🏆 - Geometry Beginner

List of achievements

Summary

- Opportunity to engage kids
- Math *can* be fun and engaging
 - Spontaneous
 - Dynamic
- Solution:

Augmented Reality Adventure Game

Works Cited

- Jason Pratt - Boy and Girl - <https://www.flickr.com/photos/jasonpratt/2347428960>
- William Warby - Coins - <https://www.flickr.com/photos/wwarby/4860328951>
- Brittany Randolph - Time Check - <https://www.flickr.com/photos/celinesphotographer/440842293>
- Tim Patterson - Kids -