



Lil' Math Chef

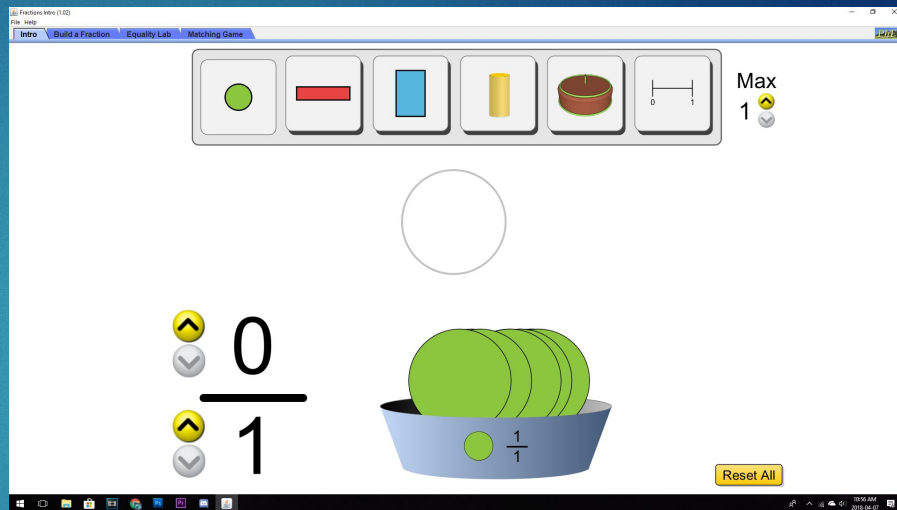
BY: DUFF, EVAN, JAMEEL, PEDRO, USANT, YASMEEN

Goals

- ▶ To create a game that can effectively teach kids fractions
- ▶ Optimize already established application
- ▶ Implement design principles throughout our app
- ▶ Evaluate and improve our design

Previous Design

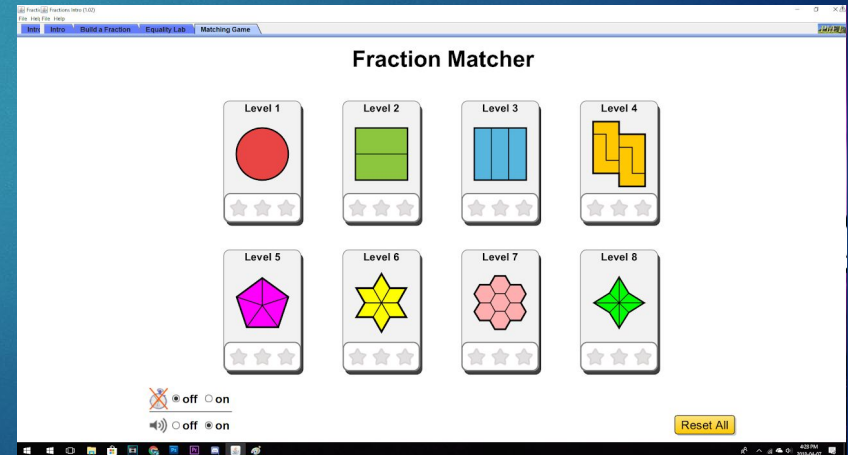
- Click and drag based
- Interaction with shapes
- Multiple modes
- Simple design
- Implication of forgiveness
- Positive reinforcement via sounds
- Sizable number of levels



<https://phet.colorado.edu/en/simulation/fractions-intro>

Design shortcomings

- No clear instructions, trial and error learning
- Incorrect naming for some modes (intro, equality lab)
- No negative reinforcement for mistakes made
- No clear separation of game modes
- Seeming lack of user able control
- White background, overexposure eye sore



Predecesor demo

The screenshot shows the 'Build a Fraction' game interface. At the top, there is a toolbar with icons for a circle, a rectangle, a cylinder, a cone, and a number line. Below the toolbar, a number line is displayed with a yellow marker at the 2/8 position. To the right of the number line, the fraction $\frac{2}{8}$ is shown. The numerator '2' has two yellow checkmark icons above it, and the denominator '8' has two yellow checkmark icons below it. A 'Reset All' button is located at the bottom right.

The screenshot shows the 'Build a Fraction' game interface. The title 'Build a Fraction' is at the top. Below the title, there is a grid of 10 level cards arranged in two rows of five. Each card has a level number (1-5) and a corresponding geometric shape. The shapes are: Level 1 (red circle), Level 2 (blue square), Level 3 (green triangle), Level 4 (yellow square), Level 5 (purple pentagon). Below the grid, there are navigation buttons: a left arrow, a '1-5' button, a '6-10' button, and a right arrow. A 'Reset All' button is located at the bottom right.

Our Design

- Took into account previous design and flaws
- More hands-on work
- Contains 3 modes with various levels of difficulty
- Utilizing a cooking theme for friendly demeanor
- Includes 3 game modes:
 - Matching
 - Are we equal
 - Practice



Design principles included

- ▶ Accessibility
- ▶ Advanced Organizer
- ▶ Aesthetic-Usability Effect
- ▶ Affordances
- ▶ Alignment
- ▶ Chunking
- ▶ Classical Conditioning
- ▶ Color
- ▶ Comparison
- ▶ Consistency
- ▶ Constraint
- ▶ Depth of Processing
- ▶ Entry point
- ▶ Garbage In-Garbage Out
- ▶ Gutenberg Diagram
- ▶ Hick's Law
- ▶ Highlighting
- ▶ Hierarchy

Design principles Cont.

- ▶ Iconic Representation
- ▶ Immersion
- ▶ Inattentional Blindness
- ▶ Layering
- ▶ Legibility
- ▶ Mental Model
- ▶ Picture Superiority Effect
- ▶ Performance Load
- ▶ Performance Load
- ▶ Progressive disclosure
- ▶ Readability
- ▶ Recognition Over Recall
- ▶ Signal-to-Noise Ratio
- ▶ Visibility
- ▶ Wayfinding

App demo



Areas of improvement



- ▶ More game modes
- ▶ Formative testing
- ▶ Online leaderboards
- ▶ Alternative tutorials

The End

- ▶ Any questions?