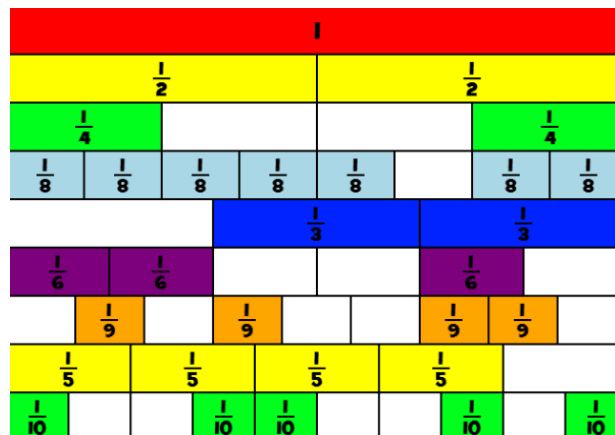


PBL Project: Fraction Builder (ages 9-12)

Mission: To understand fractions by visually manipulating colored rows that add up to one. To connect fractions with their equivalent decimals and percentages.



Step 1: Getting to Know the Tool

The game board is divided into rows, and each row is divided into equal parts of different sizes. Can you figure out how these correspond to fractions? Experiment using the settings options to change what appears at the end of each column. What does the number at the end of the row mean? Why can we express it as fractions, decimals, and percentages? Play around freely to get to know the tool and understand its full meaning.

Step 2: Represent fractions

Using the blank grid game mode, and leaving the last column blank, find a way to represent the following fractions by coloring bars in any of the rows:

$\frac{5}{6}$, $\frac{7}{9}$, $\frac{2}{3}$, $\frac{4}{5}$, $\frac{1}{2}$.

Visually represent the sums that result in these fractions.

Step 3: Representing Percentages

Play in “Observe” mode, looking at the percentages in the last column, and find:

- 3 ways to visually represent 33%.
- 5 ways to visually represent 50%.

Phase 4: Represent Decimals

Activate Decimal mode in the settings wheel and find which fraction and which percentage the decimal number 0.56 is equivalent to. And the number 0.75.

Phase 5: Reflections

Write down your new ideas about fractions, adding fractions, representations, percentages, and decimals. Does the game help you visualize any of these numbers better? Can you connect this representation to another one you have in your head? Share these ideas with your classmates and listen to others' to explore fractions and the math behind them more deeply.