



HANDBOOK

EDITOR'S NOTE

Slice Fractions: School Edition is designed to introduce children to the concept of fractions by solving puzzles. This guide reveals the underlying conceptual learning of the game and gives you the key content for all accessible levels.

We strive to help children discover the principles of fractions on their own, rather than assume that they have already learned them. Therefore, the first levels are designed to familiarize children with the game and teach basic concepts such as splitting groups into equal shares, slicing shapes into equal shares, comparing shapes to a common whole, etc. The game also uses symbolic representations to gradually give meaning to the numbers used as a numerator or denominator. Even without seeing numbers, students achieve significant knowledge gains on which they will build a strong conceptual understanding of fractions.

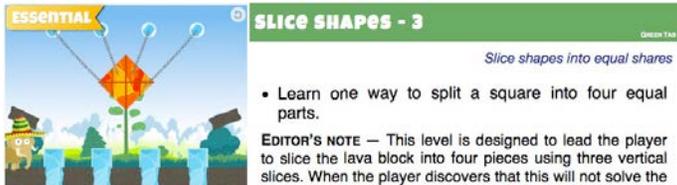
HOW TO USE THE LEVEL DESCRIPTION SECTIONS

Each level has been described and analyzed to help you grasp the content of the game as you flip through the pages.

The game is designed to challenge the players on different aspects:

- **Math:** The player has to use their mathematical reasoning skills to solve the puzzle.
- **Planning:** The player has to plan his moves in a specific order to solve the puzzle.

Both aspects are associated with a difficulty scale from 0 to 3.

	Flagged level	Level's ID	Tab color in the menu	
	↓	↓	↓	
Screenshot	→			←
Difficulty scale	→	<p style="text-align: center;"><i>Slice shapes into equal shares</i></p> <ul style="list-style-type: none"> • Learn one way to split a square into four equal parts. <p>EDITOR'S NOTE — This level is designed to lead the player to slice the lava block into four pieces using three vertical slices. When the player discovers that this will not solve the puzzle, he or she will likely begin to question why it didn't work. This "cognitive conflict" will allow the player to find a different, less obvious way to slice the block into four equal parts.</p>		←
				←

LEVELS SECTIONS

TAB	CONCEPT	DESCRIPTION	COMMON CORE MATH CONTENT
GREEN	How to play	Learn the gameplay	
	Split groups	Split groups into equal shares	2.G.A.2
	Slice shapes	Slice shapes into equal shares	2.G.A.3
	Common whole	Compare shapes to common whole	
BLUE	Symbolic numerator	Understand that a numerator counts equal parts	
	Fractions reading	Compare symbolic to numerical fractions	
	Denominator	Use the denominator	3.NF.A.1
	Numerator	Use the numerator	3.NF.A.1
ORANGE	Pie charts	Use pie charts to represent fraction values	3.NF.A.1
	Size comparison	Know that one fraction is X times bigger than 1	3.NF.A.3
	Equivalent Fractions (A)	Understand equivalent fractions	3.NF.A.3
	Equivalent Fractions (B)	Master equivalent fractions	3.NF.A.3
GREY	Fractions ordering	Compare fractions successfully	3.NF.A.3
	Question marks	Solving fraction values based on the information at hand	3.NF.A.1
	Subtraction	Subtract fractions from 1	4.NF.B.3.A

LEARNING OBJECTIVES

By the end of this demo version of **Slice Fractions: School Edition**, the students will be able to:

- Describe fractions as equal parts of a whole;
- Describe the meaning of the denominator;
- Describe the meaning of the numerator.



LEVEL DESCRIPTION SECTION



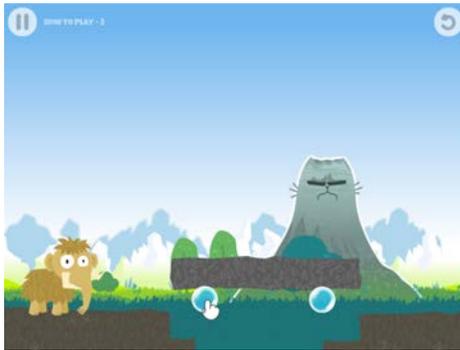
Math ○○○ Planning ○○○

HOW TO PLAY - 1

GREEN TAB

Learn the gameplay

- Learn how to use the bubbles.
- Get to know the main character.



Math ○○○ Planning ○○○

HOW TO PLAY - 2

GREEN TAB

Learn the gameplay

- Discover that the main goal of the game is to clear the mammoth's path.



Math ○○○ Planning ○○○

HOW TO PLAY - 3

GREEN TAB

Learn the gameplay

- Discover that lava cancels ice.



Math ○○○ Planning ●○○

HOW TO PLAY - 4

GREEN TAB

Learn the gameplay

- Learn that one ice block cancels a lava block of the same size.

EDITOR'S NOTE — Here, the player could fail for the first time in the game by dropping too much ice. It will encourage him or her to analyse the puzzle before executing. For example, he or she cannot start popping bubbles without a strategy.



Math ○○○ Planning ●○○

HOW TO PLAY - BADGE

GREEN TAB

Learn the gameplay

- Discover that order of operation is important to drop blocks on the right spot.
- Get the first hat as a reward!



Math ○○○ Planning ●●○

SPLIT GROUPS - 1

GREEN TAB

Split groups into equal shares

- Figure out how to get columns to the ground level by dropping the same amount of lava on each of them.
- Learn how to equally share six blocks in two groups.



Math ○○○ Planning ●●○

SPLIT GROUPS - 2

GREEN TAB

Split groups into equal shares

- Perfect getting the columns down to the ground by dropping the same amount of lava on each of them.



Math ○○○ Planning ●●○

SPLIT GROUPS - 3

GREEN TAB

Split groups into equal shares

- Learn how to equally share six blocks in three groups.



Math ○○○ Planning ●●○

SPLIT GROUPS - 4

GREEN TAB

Split groups into equal shares

- Learn that it's the amount of lava that is dropped on columns that matters, not the number of blocks.



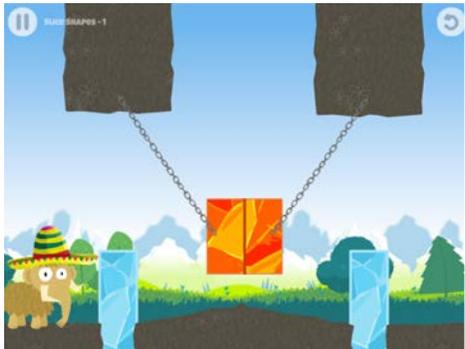
SPLIT GROUPS - BADGE

GREEN TAB

Split groups into equal shares



BADGE OF EQUAL SHARING!



Math ○○○ Planning ○○○

SLICE SHAPES - 1

GREEN TAB

Slice shapes into equal shares

- Discover how to slice shapes.



Math ○○○ Planning ●○○

SLICE SHAPES - 2

GREEN TAB

Slice shapes into equal shares

- Discover that you must slice shapes and pop bubbles in a specific order to solve the puzzle.



Math ●●● Planning ●●●

SLICE SHAPES - 3

GREEN TAB

Slice shapes into equal shares

- Learn one way to split a square into four equal parts.

EDITOR'S NOTE — This level is designed to lead the player to slice the lava block into four pieces using three vertical slices. When the player discovers that this will not solve the puzzle, he or she will likely begin to question why it didn't work. This “cognitive conflict” will allow the player to find a different, less obvious way to slice the block into four equal parts.



Math ●●● Planning ●●●

SLICE SHAPES - 4

GREEN TAB

Slice shapes into equal shares

- Learn another way to slice a square into four equal parts.

EDITOR'S NOTE — This unusual slicing will likely cause a “cognitive conflict” that should encourage the player to begin finding new and unintuitive ways to slice a square into four equal parts.



Math ●●● Planning ●●●

SLICE SHAPES - 5

GREEN TAB

Slice shapes into equal shares

- Learn to slice a hexagon into the equivalent of thirds.

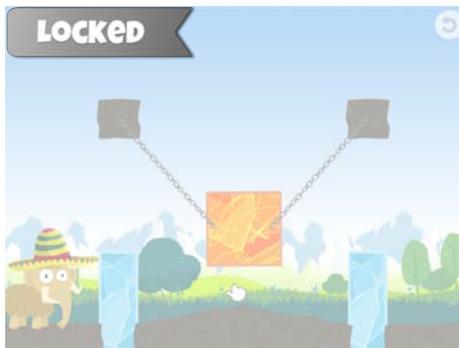


Math ○○○ Planning ○○○

SLICE SHAPES - 6

GREEN TAB

- Solve the puzzle for fun!



Math ●○○ Planning ●○○

SLICE SHAPES - 7

GREEN TAB

Slice shapes into equal shares

- Discover that a lava block can be sliced freely when it's covered with a scissors pattern.
- Discover that a slice can be adjusted by holding the finger on the screen and moving around the preview line.

EDITOR'S NOTE — With the scissors pattern, the player must pay attention to the precision of his slicing to make sure he or she is splitting the block in half.



Math ●○○ Planning ●○○

SLICE SHAPES - 8

GREEN TAB

Slice shapes into equal shares

- Learn to slice a square into quarters without any guides.

EDITOR'S NOTE — This level allows four ways to slice the lava block into quarters.



Math ●●● Planning ●●●

SLICE SHAPES - 9

GREEN TAB

Slice shapes into equal shares

- Learn to slice a shape into thirds without any guides.

EDITOR'S NOTE — This level allows four ways to slice the lava block into thirds.



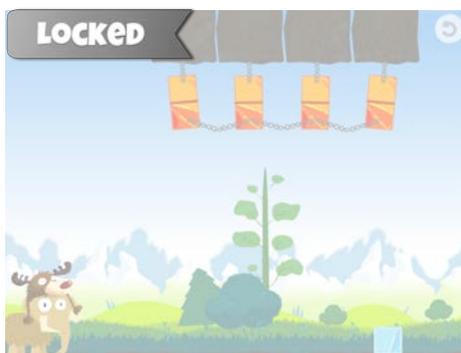
SLICE SHAPES - BADGE

GREEN TAB

Slice shapes into equal shares



BADGE OF SLICING!



Math ○○○ Planning ●○○

SLICE SHAPES - 10

GREEN TAB

- Solve the puzzle for fun!



Math ●○○ Planning ●○○

common WHOLE - 1

GREEN TAB

Compare shapes to a common whole

- Discover that white lines in the background can be used to compare blocks.

Editor's note — White lines in the background are equivalent to a whole.



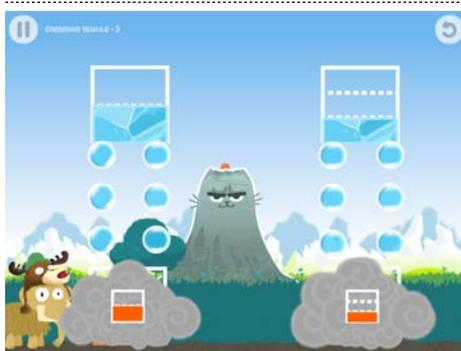
Math ●○○ Planning ●○○

common WHOLE - 2

GREEN TAB

Compare shapes to a common whole

- Discover that ghost wholes can be used to compare blocks.



Math ●○○ Planning ●○○

common WHOLE - 3

GREEN TAB

Compare shapes to a common whole

- Learn that smoke hides a lava block.
- Discover that symbols in front of smoke represent what's behind the smoke.

EDITOR'S NOTE — This level introduces clouds of smoke that are used in the game to prevent the player from visually assessing the value of a lava block.



Math ●○○ Planning ●○○

COMMON WHOLE - 4

GREEN TAB

Compare shapes to a common whole

- Learn to associate the symbol in front of the smoke with its equivalent block of ice.



Badge of Common Whole!

COMMON WHOLE - BADGE

GREEN TAB

Compare shapes to a common whole



BADGE OF COMMON WHOLE



ESSENTIAL

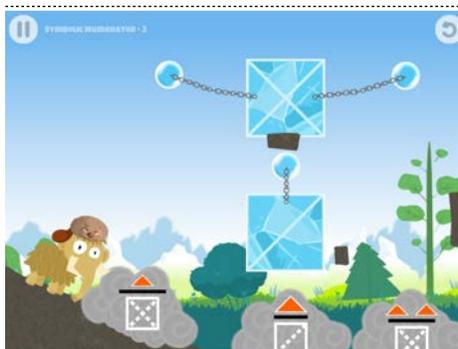
Math ●○○ Planning ●●●

SYMBOLIC NUMERATOR - 1

BLUE TAB

Understand that a numerator counts equal parts

- Discover that the red upper symbols count equal parts of the whole represented underneath.



Math ●○○ Planning ●●●

SYMBOLIC NUMERATOR - 2

BLUE TAB

Understand that a numerator counts equal parts

- Discover that the red upper symbols must be compared to the whole represented underneath to understand its value.



Math ○○○ Planning ○○○

SYMBOLIC NUMERATOR - 3

BLUE TAB

- Solve the puzzle for fun!



Math ●○○ Planning ●○○

SYMBOLIC NUMERATOR - 4

BLUE TAB

Understand that a numerator counts equal parts

- Learn to slice the right amount of ice according to the symbolic representation.



Math ●○○ Planning ●○○

SYMBOLIC NUMERATOR - 5

BLUE TAB

Understand that a numerator counts equal parts

- Perfect the ability to slice the right amount of ice according to the symbolic representation.



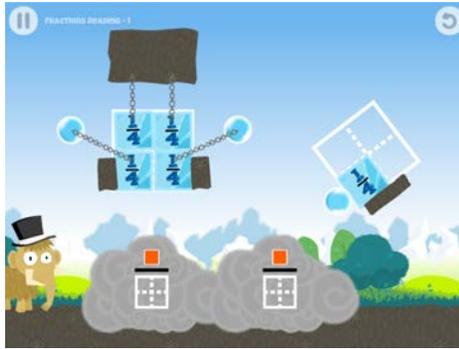
SYMBOLIC NUMERATOR - BADGE

BLUE TAB

Understand that a numerator counts equal parts



**BADGE OF THE SYMBOLIC
NUMERATOR**



Math ●○○ Planning ○○○

FRACTIONS READING - 1

BLUE TAB

Compare symbolic and numerical fractions

- Discover that a symbol could be associated with a numerical representation of a fraction.



Math ●○○ Planning ●○○

FRACTIONS READING - 2

BLUE TAB

Compare symbolic and numerical fractions

- Perfect the ability to associate the right fraction to its corresponding symbol.



Math ●○○ Planning ●●○

FRACTIONS READING - 3

BLUE TAB

Compare symbolic and numerical fractions

- Learn to use either the symbolic or the numerical fractions to deduce the amount of ice to slice.



Math ●○○ Planning ●●○

FRACTIONS READING - 4

BLUE TAB

Compare symbolic and numerical fractions

- Learn to associate the right fraction to its corresponding symbol with a numerator greater than 1



FRACTIONS READING - BADGE

BLUE TAB

Compare symbolic and numerical fractions



BADGE OF FRACTIONS READING



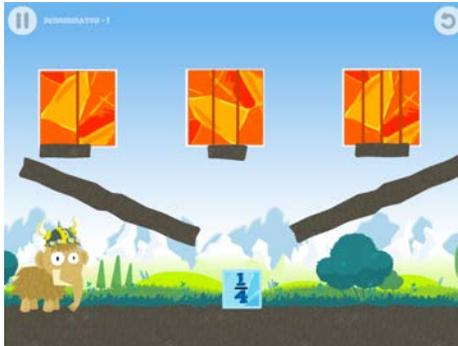
Math ○○○ Planning ●○○

FRACTIONS READING - 5

BLUE TAB

Compare symbolic and numerical fractions

- Solve the puzzle for fun!



Math ●○○ Planning ○○○

DENOMINATOR - 1

BLUE TAB

Use the denominator

- Understand that the denominator represents the number of equal parts of a common whole.
- Discover a way of splitting a square in fourths.

EDITOR'S NOTE — This level is designed to make the player interpret the denominator without the help of a symbolic representation.



Math ●○○ Planning ●○○

DENOMINATOR - 2

BLUE TAB

Use the denominator

- Perfect the ability to split a square into four equal parts.
- Discover a different way to split a square in fourths.



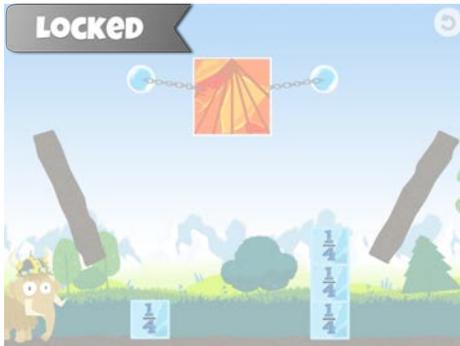
Math ●○○ Planning ●●●

DENOMINATOR - 3

BLUE TAB

Use the denominator

- Discover a different way to split a square in fourths.



Math ●●● Planning ●●●

DENOMINATOR - 4

BLUE TAB

Use the denominator

- Discover a different way to split a square in fourths.
- Learn that a single block of lava can contain $1/4$ multiple times.

EDITOR'S NOTE — This level requires the player to think outside of the box to find the solution.



Math ●○○ Planning ○○○

DENOMINATOR - BADGE

BLUE TAB

Use the denominator



BADGE OF THE DENOMINATOR

GET THE FULL GAME