

# Equivalent Fractions LI\*

Grade 4

Fractions - Equivalence and Ordering

4 levels

## Probing Questions

- What do you need to do to allow JiJi to cross?
- How are you deciding which denominator to choose?

## Something to Think About

Students must focus first on the denominator and then choose the appropriate numerator. Since many algorithms have students start at the top and work down, this may not be immediately apparent to them.

## Something to Think About

The word half comes from a very old word meaning to cut or one of two sides. It predates the invention of the fraction notation that uses a numerator, denominator, and fraction bar or vinculum.

\*LI: Language Integration - Refers to the transition from a visual representation in ST Math to a gradual inclusion of words, mathematical symbols, and operators in higher levels of games.

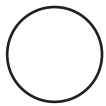
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All levels require finding equivalent fractions.

Levels 3 and 4 require that the denominator be different.

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# Fraction Trap

Grade 4

Fractions - Equivalence and Ordering

5 levels

## Probing Questions

- How do you know where to place the glue?
- What do the tick marks on the number line mean?

## Research is Clear

The use of unit fractions (numerator of 1) and the number line have been shown to have a positive impact on students' understanding of fractions. Unit fractions are "foundational to fractions understanding" and number line models "have longevity across grades, mathematical number systems, and contexts." [http://www.edugains.ca/resources/Math/CE/LessonsSupports/Fractions/FractionsLearningPathways\\_ResearchSummary\\_Nov2015.pdf](http://www.edugains.ca/resources/Math/CE/LessonsSupports/Fractions/FractionsLearningPathways_ResearchSummary_Nov2015.pdf)

## Supporting Struggling Students

For puzzles with mixed numbers, help students locate the whole number on the number line and then discuss the relationship between the ticks on the number line and unit fractions.

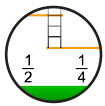
Levels 1 and 2 have a number line from 0 to 1.  
Levels 3,4 and 5 have a number line from 0 to 3.

The glue trap is smaller in Levels 3-5 so students must be more precise.

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# Fraction More or Less

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## Probing Questions

- How do you think about solving this problem when the denominators are the same?
- How do you think about solving this problem when the numerators are the same?

## Classroom Connection

This would be a great game to present to students for 5-10 minutes each day. Have students discuss strategies used when they're comparing fractions with the same numerator/denominator.

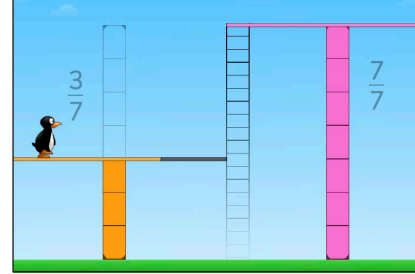
## Emphasize the Connection

Ask students which of the numbers would be closer to zero (or half or one) on a number line and have them justify their reasoning.

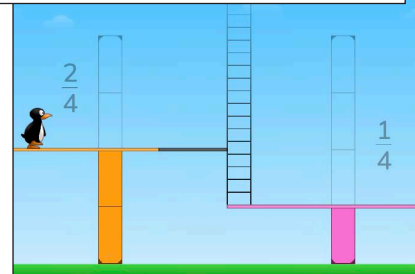
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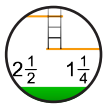
If the second fraction is larger than the first, the ladder will need to come up from the first.



If the second fraction is smaller than the first, the ladder will need to come down.



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# Mixed More or Less

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4 levels

## Probing Questions

- How did you determine how to get JiJi across?

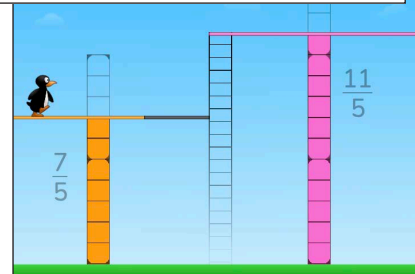
## Classroom Connection

This would be a great game to present to students for 5-10 minutes each day. Have students discuss strategies used when they're comparing fractions with the same numerator/denominator.

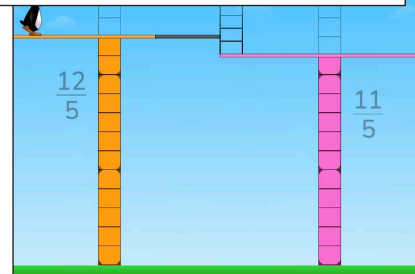
## The Bigger Picture

Rather than have students follow a set series of steps, encourage them to use what they know about fractions and mixed numbers to solve the problem. For example,  $1\frac{1}{2}$  is always greater than any proper fraction.

If the second number is larger than the first, the ladder will need to come up from the first.



If the second number is smaller than the first, the ladder will need to come down.



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# Fraction Order Fill

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## Probing Questions

- How do you determine which fraction is the smallest?
- How do you determine which fraction is the largest?

## Classroom Connection

This would be a great game to present to students for 5-10 minutes each day. Have students discuss strategies used when they're comparing fractions with different numerators/denominators.

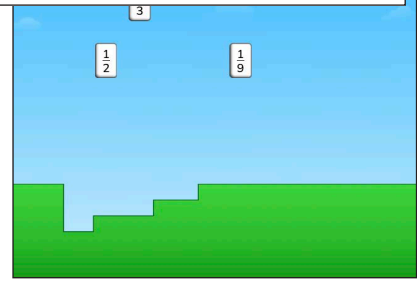
## Uncover the Thinking

This game provides an excellent opportunity to discuss what students know about the relationships found in fractions. For example, what effect does changing the denominator have when the numerator remains the same? How can you identify fractions that are greater or less than one? How can you identify fractions that are closer to one or closer to zero?

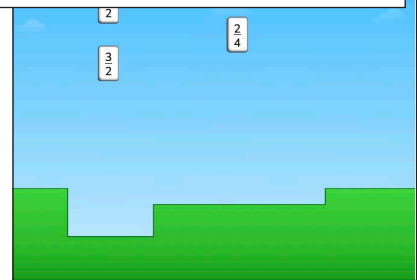
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Level 1 shows bars labeled with the fraction and Level 2 uses unit fractions.



Level 3 puzzles always include 1 and Level 4 is a mix of puzzles and includes equivalent fractions.



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