

Equal Areas

Grade 3

Fraction Concepts

3 levels

Probing Questions

- How do you decide which one to choose?
- How does the feedback prove they are equal/unequal?

What's Important Here?

An understanding of fair sharing is critical to building the concept of a fraction.

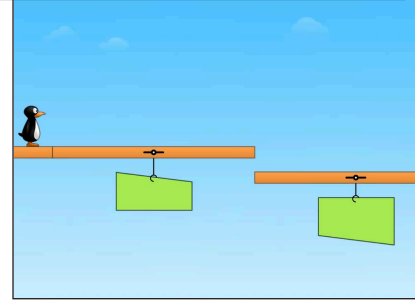
Pause the Animation

Show a wrong answer and discuss how the balance compares the partitioned pieces by comparing the weight.

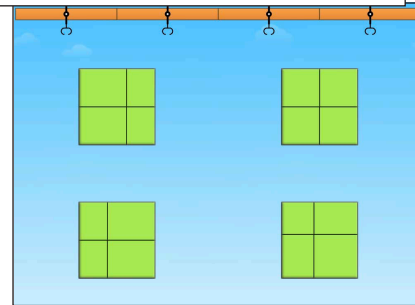
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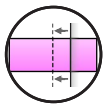
Unequally divided pieces don't balance.



Levels 2 and 3 present more choices and different shapes.



Fraction Concepts - 1



Equal Division

Grade 3

Fraction Concepts

2 levels

Probing Questions

- How do you know which line needs to be moved?
- How do you know in which direction to move it?
- How does the game prove that they are equally divided?

Something to Think About

By using a bar model and comparing the size of the segments, this game builds a foundation for fractions on a number line.

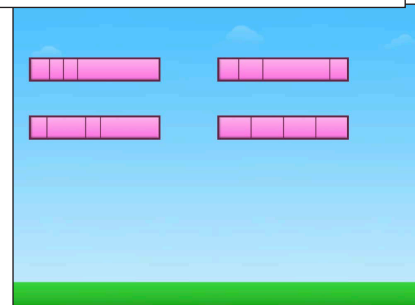
What do the Standards Say?

Level 2 requires students to *Attend to precision*.

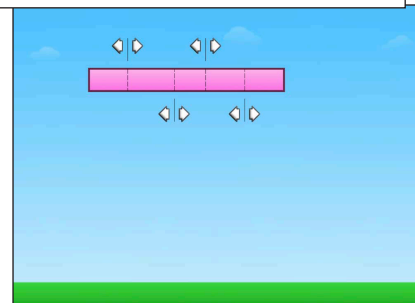
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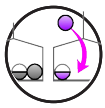
Level 1 teaches the gameplay so students can do the real work in Level 2.



Level 2 requires choosing the arrow and direction.



Fraction Concepts - 2



Balance Pies

Grade 3

Fraction Concepts

5 levels

Probing Questions

- How do you know it's going to balance if the pieces aren't exactly the same?

Pause the Animation

The animation shows how smaller pieces are combined to make bigger pieces and wholes.

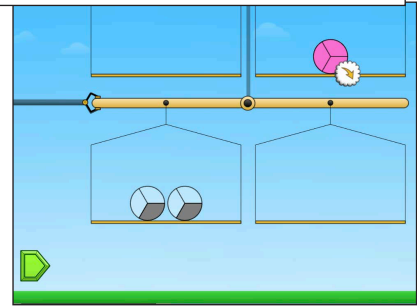
Classroom Connection

Allowing students to discuss what will and won't work with classmates can strengthen problem solving skills.

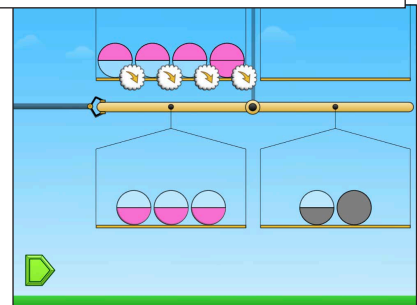
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Return pink pieces to the top by clicking on them.



In some puzzles there is more than one solution.



Fraction Concepts - 3



Pie Monster

Grade 3

Fraction Concepts

3 levels

Probing Question

- How do you know how many pies to feed the monster(s)?

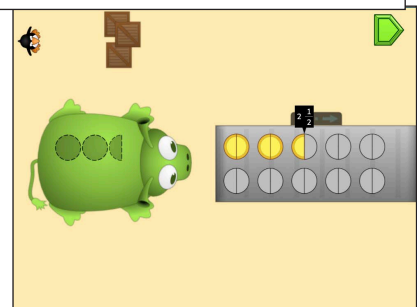
What Concepts Are Being Developed?

In Level 3, students begin to build understanding of adding fractions.

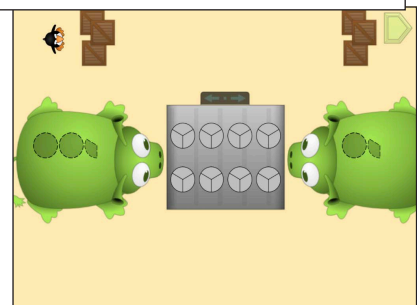
Uncover the Thinking

How are students seeing the fractional pies on the monster's back since they're not divided into pieces?

Note the different representations for the same amount.



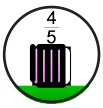
Ask students how they are combining the pies.



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Fraction Concepts - 4



Match Fraction

Grade 3

Fraction Concepts

2 levels

Probing Questions

- How do you know how many parts you'll need?
- How do you know how many pieces you'll need? Why do all of the puzzles say one whole at the bottom?

Pause the Animation

Use Pause and question the student about how the numerator and denominator connect to the model.

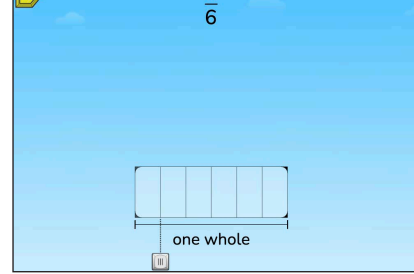
What's Important Here?

The denominator indicates how many sections to divide the whole. The numerator indicates how many of those pieces to select.

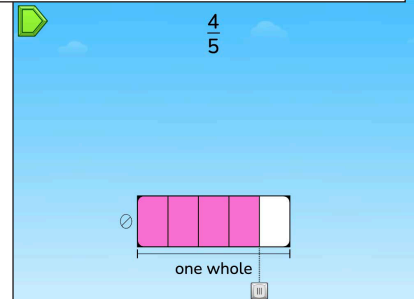
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Moving the slider to the left increases the number of divisions.



The animation clearly shows how each part of the fraction is modeled.



Fraction Concepts - 5



Fraction of Shape

Grade 3

Fraction Concepts

3 levels

Probing Questions

- How do you decide which number to choose?

What's Important Here?

Shapes other than circles and rectangles can be divided into fractional parts.

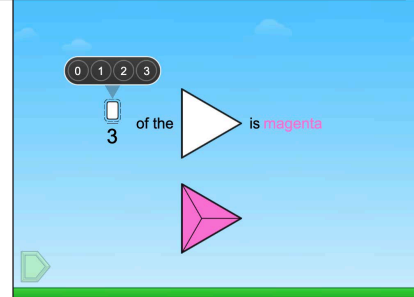
Classroom Connection

Show puzzles with novel shapes and arrangements. Ask students to create multiple arrangements for the same fraction.

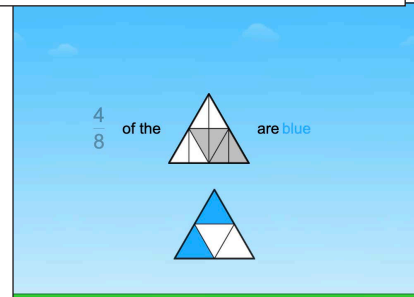
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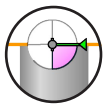
Help students read the sentence shown.



Different arrangements create equivalent areas.



Fraction Concepts - 6



Crank Pies

Grade 3

Fraction Concepts

4 levels

Probing Questions

- How do you know what to choose?
- How would you say that fraction?
- How do you know if a fraction will be a whole number?

Pause the Animation

Use puzzles from Level 3 and ask students to share different ways to notate the fractions equal to or larger than 1. Connect mixed numbers to the improper fraction notation.

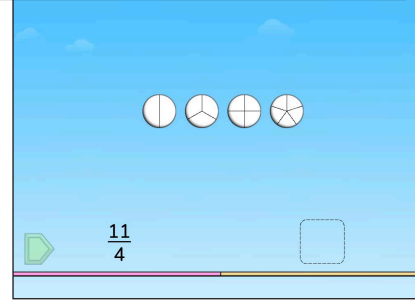
What do the Standards Say?

Recognize that a fraction can be shown as the iteration of a unit fraction.

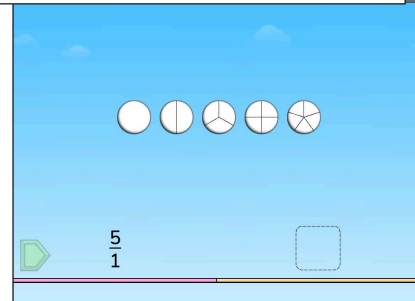
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Level 3 introduces fractions greater than one.



Explore different ways to represent a whole number using different denominators.



Fraction Concepts - 7



Alien Bridge

Grade 3

Fraction Concepts

5 levels

Probing Questions

- How are you choosing the numerator?
- How are you choosing the denominator?

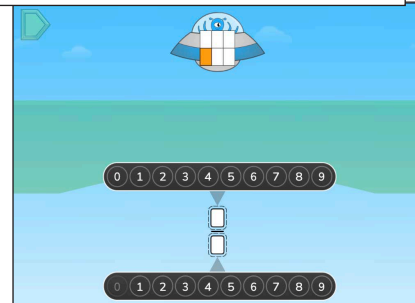
Research is Clear

An understanding of fractions is vital to a student's success with higher-level mathematics.

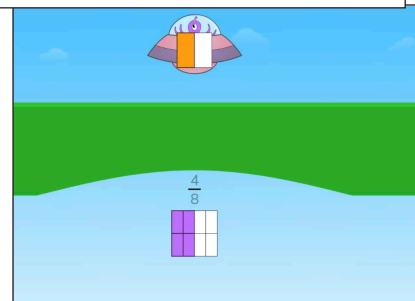
The Bigger Picture

Though the natural tendency is to move from top to bottom, it will help later to have students focus on the denominator first.

Levels go from creating the model from a fraction to the other way around.



Sometimes multiple solutions are possible.



Fraction Concepts - 8

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