

EI-8445

Ages 8+/Grades 3+

# Fraction Pie Puzzles

Making fractions as easy as pie



## CONTENTS

### 65 foam pieces

(1 whole, 6 halves, 9 thirds,  
8 fourths, 5 fifths, 6 sixths,  
8 eighths, 10 tenths,  
and 12 twelfths)

### 50 laminated cards

(leveled from easy to very challenging)

### guide

(with reproducible so students can make their own puzzles)

### game board



## WARNING:

CHOKING HAZARD—Small parts.  
Not for children under three (3) years.

Educational  
Insights®



# Fraction Pie Puzzles

**F**raction Pie Puzzles are a great, kinesthetic way to reinforce basic fraction concepts. As students complete the colorful puzzles, they learn how fractional parts make up one whole and one half and about common denominators, multiples, and equivalencies. The puzzles are self-correcting so they are perfect as a small group or center activity.



## Setting Up the Puzzles

1. Open the storage drawer and remove the fraction pieces. Separate them into like piles on the table.



2. Select a puzzle card. Look at the fraction pieces listed at the bottom of the card. From your piles, take the indicated number of fraction pieces listed on the bottom of card. Those are the pieces that will be used for this puzzle. Set aside the remaining (unselected) fraction pieces—they will not be used for this puzzle.



3. Slide the puzzle card into the slot on the top of the board. (The fraction piece listing is now hidden from view below the slot line.)



## Solving the Puzzles

1. Place the fraction pieces on the board, as indicated on the puzzle card.
2. **The challenge:** Place all the remaining fraction pieces to make complete circles.
- The pieces shown on the card must stay in the circles indicated—they may NOT be moved to another circle.
  - It IS permitted to move the pieces around within a circle.



## Checking Your Answer

One solution is shown on the back of each puzzle card. Most puzzles have multiple solutions. You've found a solution if all the remaining pieces fit—and you have complete circles!



## Small Group or Center Work

**Fraction Pie Puzzles also work well in cooperative groups of two students. One student is the 'Puzzle Master' and the other is the 'Solver'.**

1. The Puzzle Master selects a card and reads aloud the pieces listed on the bottom of the card (e.g., "Take 1 whole, 2 one halves, 1 one third", etc.) while the Solver finds the pieces.
2. The Puzzle Master tells the Solver where to place the pieces (for example, "Put 1 one half in the first circle, put 2 one fourths and 3 one tenths in the second circle," etc.).
3. The Puzzle Master places the card in the slot. The Solver solves the puzzle. The Puzzle Master can time how long it takes the Solver to solve the puzzle with a stopwatch.
4. If necessary, the Solver can ask for help in solving the puzzle. The Puzzle Master may look on the back of the card to provide hints.
5. Once the puzzle is solved, students switch roles as Puzzle Master and Solver.
6. If students are timing each other, they can compete to see who solves puzzles from the same level the fastest.

## Fraction Puzzle Tips

**Here are some strategies for getting the most out of the concepts presented in Fraction Pie Puzzles.**

### Assign cards based on a student's level.

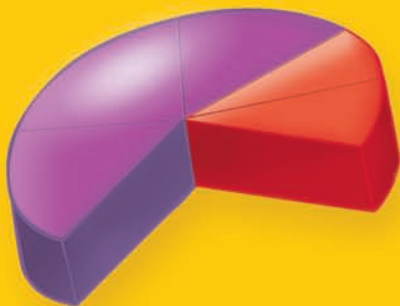
The cards are ordered and coded according to difficulty level. The first ten cards are designed to teach important equivalencies (e.g.,  $\frac{1}{2} = \frac{2}{4}$ ). Students who are beginning to learn about fractions or need to review these equivalencies should begin with the first ten cards. A solid knowledge of these equivalencies will help with solving the more difficult cards later in the set.

Students who already have a solid foundation in fractions can skip ahead to more challenging levels. An explanation of the levels can be found on page 6 of this guide.



## Show students that there is more than one way to make one whole.

Make sure students are familiar with the idea that  $1 = \frac{2}{2} = \frac{3}{3} = \frac{4}{4} = \frac{5}{5}$ , etc. Discuss other ways to make 1 whole, beginning with  $1 = \frac{1}{2} + \frac{1}{4} + \frac{1}{4}$ . The first ten puzzle cards in this set are designed to show students some of these basic equivalencies.

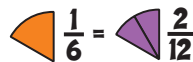
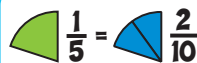
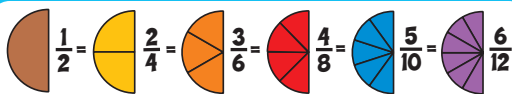


## Review fraction sizes.

Show the various pieces to your class. Ask, "Why is  $\frac{1}{12}$  smaller than  $\frac{1}{2}$  when 12 is a bigger number than 2?" Many students struggle with this concept. By seeing that the same size circle is divided into two pieces, versus twelve pieces, students begin to understand that a larger denominator equals a smaller fraction value.

## Review basic fraction equivalencies.

Familiarize your students with some basic equivalencies. This will help students complete the puzzles. Here are some important equivalencies to know:

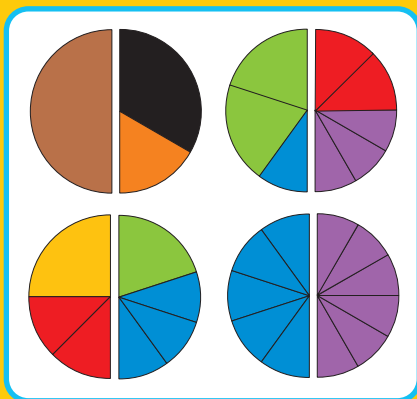


## Make one half.

Show students that you can combine 2 one-fifths with 1 one-tenth to make 1 one half. Now you can put any other half equivalent on the other side of the circle, such as 1 one-third and 1 one-sixth. Ask students to come up with various ways to make one half.

**Tip:** Here's a hands-on way to teach students different ways to make one half. Put a one-half piece in a circle. Ask a student to fit pieces into the other side to make a complete circle. Each time the student completes the circle in a new way, he/she should record the piece combination.

You can do the same thing for  $\frac{1}{3}$  by placing 2 one-third pieces in a circle (or for one fourth by placing 3 one-fourth pieces in a circle, etc).





## Think about multiples.

Help students understand which pieces to place next to each other in a puzzle by explaining that multiples and fractions are related. Show students that fifths are likely to pair with tenths because ten is a multiple of five. Similarly, thirds are likely to go with sixths and twelfths.

## Make your own puzzle card challenges.

Copy the reproducible puzzle card on page 7 of this guide to make additional puzzle challenges for your students. Better yet, ask students to design their own puzzle cards. This is a great exercise to have students think further about which pieces fit together to make one whole.

## Puzzle Card Levels

Level	Card Number	# of Pieces	Description		
1		1-10	varies	Easy	These cards are designed to show basic equivalencies.
2		11-19	maximum of 24	Easy	All cards include the 1 whole piece.
3		20-25	maximum of 32	Easy/ Medium	
4		26-30	maximum of 39	Easy/ Medium	All fractional pieces need to be placed by the student in these puzzles. (Some students may find this level easier than level 3.)
5		31-41	maximum of 41	Medium	These puzzles do not give the student the option to make 1 whole by using all the same pieces in a circle.
6		42-44	maximum of 41	Difficult	
7		45-50	maximum of 44	Very Challenging	25 or more pieces need to be placed by the student to complete the puzzle.

**Tip:** If you want more cards at Level 4, simply have students use the list of fraction pieces at the bottom of any of the cards, and then ignore the initial piece placement on the puzzle card.

Name: \_\_\_\_\_

Date: \_\_\_\_\_

## Make Your Own Puzzle!

Design your own challenge. Be sure to include a solution below. When finished, cut out and glue the card sides together. Trade cards with someone else and see whose card takes the longest to solve!

A puzzle card template consisting of a grey rectangular area with rounded corners, containing six large white circles arranged in two rows of three. Below the circles is a horizontal strip containing nine fraction pieces. The first piece is a circle with the number 1. The remaining eight pieces are sectors of circles with the following fractions:  $\frac{1}{2}$ ,  $\frac{1}{3}$ ,  $\frac{1}{4}$ ,  $\frac{1}{5}$ ,  $\frac{1}{6}$ ,  $\frac{1}{8}$ ,  $\frac{1}{10}$ , and  $\frac{1}{12}$ . A dashed line runs along the bottom edge of the fraction strip.

A second puzzle card template, identical to the first one, featuring six large white circles in a 2x3 grid. Below the circles is a white rectangular area for the solution. On the left side of this area is the text "Name: \_\_\_\_\_" and on the right side is the text "Solution".

 Cut along dotted line

