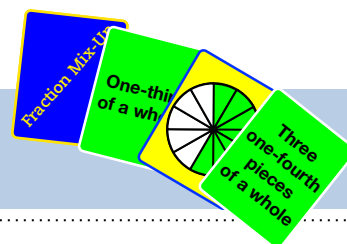


Fraction Mix-Up



Strands:

Number & Quantity	X
Algebra	
Functions	
Geometry	
Statistics & Probability	

Materials Needed:

- Fraction Mix-Up cards
- One 6-sided die
- Fraction manipulatives
- Pie graph paper, 1 sheet per team
- Page protector, 1 per team
- Dry erase marker and eraser, 1 per player
- Sheet of paper to make card holder, 1 per player
- Scrap paper

Where:

Outside	
Inside	X
On-line	
On-site	

Mix fractions together using informal addition and subtraction in this collaborative game for players in 3rd through 6th grades.

Set-Up:

- Fold a sheet of paper to make a card holder for a set of four cards. (See directions and picture on next page.)
- The player with the shortest hair goes first.

Object of the Game: Create a number sentence with fractions, using addition and subtraction, to reach a randomly generated goal.

Pre-Game Play: Become familiar with the *Fraction Mix-Up* cards:

- Give each player one of each type of card. Players model each card with fraction pieces or draw each fraction on the pie graph paper provided.
- For the fractions already modeled as circle fractions, state which 2 fractions the card can represent and explain how you know.
- Think of each fraction representation in terms of your favorite type of pie cut into the number of pieces shown on each card.

Playing the Game:

For each round, the dealer deals 4 cards to each player. The player to the left of the dealer goes first.

As you play, think about your favorite pie cut into the number of pieces shown on each card. Also think about how many pieces of the pie each card represents.

Round 1: Place your cards face-up in front of you so everyone can see them.

On your turn:

1. Play a card from your hand.
2. Create the fraction with fraction pieces or color in the fraction on the pie graph paper. Say what part of the pie you have.
3. Find another player's card to combine with yours to make 1 whole pie.
4. If no player has a card that works with yours to make 1 whole pie, choose 2 cards that, when combined with your card, make 1 whole pie.
5. Play moves to the left. Repeat Steps 1 through 4 until no more whole pies can be made.
6. Once there are no more whole pies to be made, switch dealers. Play Round 2.

Round 2:

Place your cards in a card holder facing away from you. Other players can see your cards, but you cannot. On your turn:

1. Play a card. Model it with fraction pieces or color in part of a pie on the pie graph sheet. Say what part of the pie you have.
2. Give 1 player a hint about 1 of the player's cards. You can tell a player either
 - a. The number of pieces of pie a card has on it, or
 - b. The number of parts the whole pie has been broken into.
 For example, if a card reads, "five one-sixth pieces," a player can point to the card and say, "This card has 5 pieces of pie." A different player could say, "This whole pie is cut into sixths."
3. Play moves to the left. The goal is to make as many whole pies as possible, as in Round 1.
4. Once no more whole pies can be made, switch dealers. Play Round 3.

Round 3

As in Round 2, use the card holder so other players can see your cards, but you cannot. Play this round in Teams of 3 or 4 players each.

1. Dealer:
 - a. Roll a 6-sided die. The die shows the number of whole pies your team needs to make.
 - b. Flip over one *Fraction Mix-Up* card. The card shows what additional part of a pie you also need.
 - c. Your team needs to play cards to achieve a target mixed number equal to the sum of the whole pies and the fractional part of a pie. You may use both addition and subtraction in this round.
3. On your turn, you have four things to do:
 - a. Play a card.
 - b. Create a fraction model of the card either with materials or on paper. Say what part of the pie you have.
 - c. Give another player a hint about one of the cards in the player's card holder. See Round 2, Step 2 for the kinds of hints you can give.
 - d. Replace the card you used so you end your turn with 4 cards. Don't look at the new card!
4. Play moves to the left. Repeat Step 3 until your team has found enough cards to equal the target for the round.

To Win: Your team wins if you create a number sentence using addition or subtraction that equals the target mixed number of pies.

Think About It:

1. There are *Fraction Mix-Up* cards that show halves, thirds, fourths, sixths, eighths, and twelfths. Suppose a player plays a card equivalent to $\frac{7}{12}$ and there are no $\frac{5}{12}$ cards on the table. What can you do to make a whole pie in this case?
2.
 - a. What fractions in the *Fraction Mix-Up* cards are equivalent (show the same amount of pie)? Sort them.
 - b. How does it help you play knowing which fractions are equivalent?
4. In Round 3, your goal is to make a mixed number of pies. Is it necessary to make each whole pie separately in order to make the goal whole number of pies? Why or why not?

Variations:

Restrict the Types of Fractions:

- For players who need more experience with equivalent fractions, use only cards representing halves, thirds, sixths, and twelfths. Use the pie graph paper showing only these fractions.
- As players become more adept, also include the fourths. Use the pie graph paper showing all of the types of fractions for *Fraction Mix-Up*.
- Alternatively, play with halves, fourths, and eighths first. Use the pie graph paper showing only these fractions.

Use Subtraction: Allow players to use subtraction of fractions to reach a goal exactly.

Write Number Sentences: As players make whole pies, they must record the fractions they are adding or subtracting.

Helpful Hints:

- Is there another name for the fraction you're working with? Is it equivalent to any others?
- If you're having trouble, try to make one whole pie at a time.



To make a card holder:

1. Fold a sheet of 8.5 by 11 paper in half so the fold is parallel to the short side of the paper.
2. Fold the folded edge up about an inch.
3. Flip the paper over so the folded section is facing away from you.
4. Fold the holder in half again.
5. All folds are parallel to each other. Your holder should look like the holder in the pictures below.

