Rules

for

Equate®

THE EQUATION THINKING GAME™

Conceptual™
Math Media

www.ConceptualMathMedia.com

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Mary Kay Beavers

CONTENT

1 INTRODUCTION

Materials

A single game consists of a rules booklet, a game board, 4 racks, and the Original Tile Set of 190 tiles that includes 40 equal symbols, 103 number symbols, 44 operation symbols, and 3 blanks. The symbol distribution chart on the game board indicates the frequency of the various types of number and operation tiles in the Original Tile Set. Class Sets are packaged differently and their contents are listed on the package.

Objective

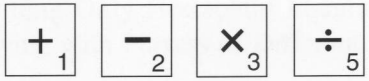
The game *Equate* is a fun and engaging math game for 2 to 4 players or teams that requires computing and thinking strategically, critically, and creatively. A player forms true equality statements, called equations, horizontally across from left to right or vertically from up to down by placing tiles on the board. After beginning at the center of the board, each successive play connects with a previous play. Players strive for a high score by trying to take advantage of both the individual symbol scores as well as the premium board positions. The individual symbol score is located in the lower right-hand corner of the tile, and the legend along the left side of the board indicates how the premium board positions affect either the individual symbol score or the entire equation score.

Defining Terminology

Before reading further in the rules booklet, players should become familiar with the following language.

A **symbol** is a number symbol, an operation symbol, or an equal symbol.

The **operations** are addition, subtraction, multiplication, and division.



The **score** assigned to a symbol is located in the lower right-hand corner of the tile.

The score is 2 points.

The score is 1 point.

A **blank tile** may be used as any one of the symbols in the game. The score for this tile is 0.

A **numerical expression** or **expression** is a combination of numbers and/or operations that makes sense mathematically and has a numerical value. Here are four examples.

56 **or** $3\frac{3}{4}$ **or** $65+8$ **or** $4\times5-8$

An **equation** states that two numerical expressions are equal. Here are five examples.

$6=6$ **or** $15\div3=5$ **or** $2\times3=8-2$

or $3\frac{2}{2}=2\frac{3}{4}+1\frac{1}{4}$ **or** $6\times4+3=9\times4-9$

2 HOW TO PLAY AND SCORE

Getting Started

After reading this chapter on how to play and score, refer to Chapter 5 (pages 20 & 21) for how to make the game easier. Many players are not ready for the highest level at the beginning.

Separate the equal symbols from the other tiles. Keep the number and operation tiles in a nontransparent bag and shuffle. Draw to determine who plays first. The player drawing the largest number plays first. Any number tile drawn wins over drawing an operation tile. Since a blank may be used to represent any symbol in the game, it can be used as the number 9 in the draw that determines who goes first. If all players draw an operation tile, the one with the highest score wins. If two or more players tie in the draw for who goes first they draw again until the tie is broken. Put the exposed tiles back into the draw pile, and re-shuffle. Each player then draws nine tiles that are a combination of numbers and operations and places all nine tiles on the player's rack to hide them from the opponents. An equal symbol is always available when needed. Decide on one player to be the score keeper.

Scoring Five Sample Plays

To understand clearly how to score, players are encouraged to actually place tiles on the board in the designated positions as the following five plays are discussed.

◆ The **first player** uses an equal symbol, and a combination of numbers and operations on each side of the equal symbol, to form a true equation. The player places the tiles on the board with any one of the tiles on the center board position, labeled 2E, that awards 2 times the equation score. Diagonal equations are not permitted. Here is an example of how the first player might begin.

2_1	4_1	$\div_5$	3_1	$=_0$	8_2

Because six tiles are used to make the equation, the player is able to reach the premium board position, labeled 3S, that offers 3 times the individual symbol score. The player is awarded the highest score by positioning the number 2 on the center 2E position and the number 8 on the 3S position.

The player or score keeper computes and records the score for that play. The number in the lower right-hand corner of the tile indicates the individual symbol score. If we assume the number 2 tile is placed on the center 2E position and the number 8 tile is placed on the 3S position, then this play yields 28 points ($1 + 1 + 5 + 1 + 0 + 6 = 14$, then $2 \times 14 = 28$).

The player draws as many number and operation tiles as were played, thus always having nine tiles when beginning a turn. This player draws five new number and operation tiles to replace those played. An equal symbol is available at all times and is the tenth tile in the hand.

◆ Play passes to the left. The **second player** uses a combination of tiles from his hand and perhaps on the board to form a new equation. At least one of the tiles played must be positioned adjacent to a previously played tile, no previously played tiles may be moved, and all tiles played in any one turn must be placed in one equation across or one equation downward. The second player creates the new equation $28 = 4 \times 7$.

						2_1
2_1	4_1	$\div_5$	3_1	$=_0$		8_2
						$=_0$
						4_1
						$\times_3$
						7_2

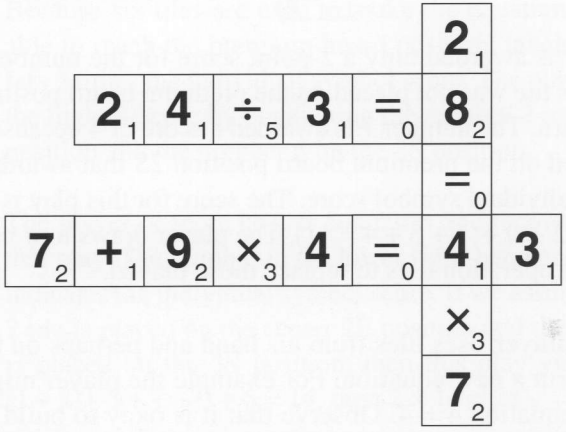
This player is awarded only a 2-point score for the number 8 because this tile was not placed on the premium board position 3S in this turn. The number 7 is awarded a score of 4 because it is positioned on the premium board position 2S that awards 2 times the individual symbol score. The score for this play is 11 points ($1 + 2 + 0 + 1 + 3 + 4 = 11$). The player draws four new number and operation tiles to replace those played.

◆ The **third player** uses tiles from his hand and perhaps on the board to form a new equation. For example the player might create the equation $4 = 4$. Observe that it is okay to build an equation that has no operations.

						2_1
2_1	4_1	$\div_5$	3_1	$=_0$		8_2
						$=_0$
				4_1	$=_0$	4_1
						$\times_3$
						7_2

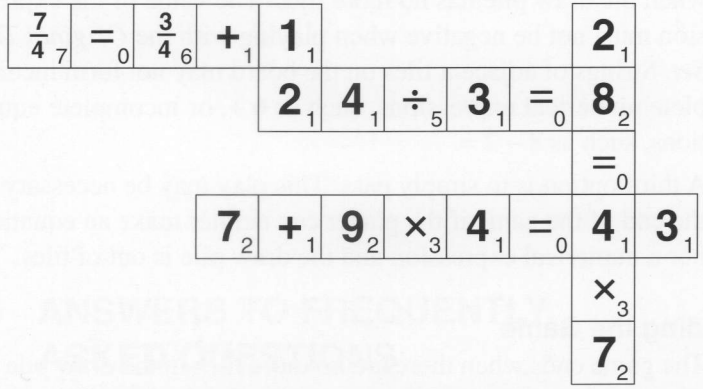
The number 4 on the left is placed on the premium board position 2S that awards 2 times the symbol score. The score for the third play is 3 points (2 + 0 + 1 = 3). The player draws one new tile to replace the one played.

- It is possible to expand an existing equation. The player may place tiles on one or both sides of an equation in a way that does not upset the balance of the equation; however, each equation is allowed only one equal symbol. For example, the **fourth player** might expand the existing equation 4 = 4, creating the new equation 7 + 9 × 4 = 43.



The new equation is valid because each side has the same value 43, and the equation has only one equal symbol. The score for this play is 11 points (2 + 1 + 2 + 3 + 1 + 0 + 1 + 1 = 11). The player draws five new tiles to replace those played.

- Strings of adjacent tiles on the board may form numbers or numerical expressions, as well as true equations; however, no score is earned for numbers or numerical expressions formed. This makes it possible for a player to make an equation using only tiles from the player's own hand. For example, the **fifth player** creates the horizontal equation $\frac{7}{4} = \frac{3}{4} + 1$ and connects this equation to the previously played tiles by positioning the number 1 above the number 2, forming the number 12 vertically. This is a valid play because at least one of the tiles in the equation is adjacent to a previously played tile and the string running perpendicular to the equation forms the number 12.



In the equation $\frac{7}{4} = \frac{3}{4} + 1$, the number $\frac{7}{4}$ is located on a 3S premium board position that yields 3 times the symbol score and the addition symbol is positioned on a 2S premium board position that awards 2 times the symbol score. The player receives no score for forming the number 12. The score for the fifth play is 30 points (21 + 0 + 6 + 2 + 1 = 30). The player draws four new tiles to replace those played.

Using All Nine Tiles in One Turn

If a player uses all nine of the tiles in his or her hand, then the player receives an additional 40 points for that play. All the tiles played must be within one horizontal equation or one vertical equation, and the equation is allowed only one equal symbol.

Alternatives to Making an Equation

A player has three alternatives to creating an equation.

- One option is to use a turn to trade in as many of his nine tiles as he wishes for new ones. After the player draws the new tiles, put the returned tiles in the draw pile and re-shuffle. No score is earned for this turn.
- A second option is to use a turn to form a number or a numerical expression horizontally or vertically on the board. This play will

not earn the player any points but it might be used to set up a possible future play, to get rid of tiles without putting them back into the draw, or to help the player go out at the end of the game when the draw pile has no more tiles. The value of the expression must not be negative when playing with the *Original Tile Set*. Strings of adjacent tiles on the board may not form incomplete numerical expressions, such as 6 +, or incomplete equations, such as 8 – 2 =.

- A third option is to simply pass. This play may be necessary at the end of the game if the player can neither make an equation nor a numerical expression and the draw pile is out of tiles.

Ending the Game

The game ends when there are no more tiles in the draw pile of numbers and operations and one player uses the last of his tiles. The player that goes out adds to his score the total of all the individual scores that the other players are left holding. Also, each player left with tiles must subtract from his score the total of the tile scores he is left holding.

After there are no more tiles in the draw pile, it can be impossible for any player to go out. In this case the game ends when each player passes once, successively. Each player subtracts from his score the total of the individual scores he is left holding.

If time is a factor, the game can end at a specified time but be sure that all players have had the same number of turns. The player with the highest score at that time wins.

3 ANSWERS TO FREQUENTLY ASKED QUESTIONS

Can Equations Be Formed Diagonally?

No, all equations must be formed horizontally across from left to right or vertically from up to down.

What If a Player Cannot Make an Equation?

A player has three alternatives to creating an equation. One option is to use a turn to trade in as many of his nine tiles as he wishes for new ones. After the player draws the new tiles, put the returned tiles in the draw pile and re-shuffle. The player receives no score for this turn.

A second option is to use a turn to form a number or a numerical expression horizontally or vertically on the board. This play will not earn the player any points but it might be used to set up a possible future play, to get rid of tiles without putting them back into the draw, or to help the player go out at the end of the game when the draw pile has no more tiles. The value of the expression must not be negative when playing with the *Original Tile Set*. Strings of adjacent tiles on the board may not form incomplete numerical expressions, such as 6 +, or incomplete equations, such as 8 – 2 =.

A third option is to simply pass. This play may be necessary at the end of the game if the player can neither make an equation nor a numerical expression and the draw pile is out of tiles.

Can Equations Contain More Than One Equal Symbol?

No, in the game *Equate*, an equation cannot be extended to contain more than one equal symbol. For example, a player cannot extend the equation $5 \times 6 = 30$ to be $5 \times 6 = 30 = 25 + 5$.

Can a Player Alter an Existing Equation?

Yes, a player can play on one or both ends of an existing equation to form a new equation as long as the player does not move any of the previously played tiles. Each side of the new equation must have the same numerical value and the equation is allowed only one equal symbol. Here are some examples.

Original Equation	*New Equation*
$54 = 9 \times 6$	$2 \times 54 = 9 \times 6 \times 2$
$16 + 4 = 20$	$16 + 4 = 20 - 3 + 3$
$2 + 5 = 7$	$72 + 5 = 77$
$24 \div 6 = 4$	$24 \div 6 = 4 + 0 \times 567$

The player receives all of the individual symbol scores for the entire equation. The board position affects the score only in the turn that the tile was placed on that position.

How Can a Blank Tile Be Used?

There are three blank tiles. A blank can be used to represent any one of the operation or number tiles in the game. The blank cannot be used to represent the number 20 or the fraction 3/8 because these are not number tiles in the game. Once a player uses a blank to represent a number or operation, it must remain that symbol for the remainder of the game. In case the blank is assigned a number that has more than one form in the game, the player indicates the specific form it represents. For example, if the blank tile is a number one, is it a numeral 1 or one of the fractions like 2/2?

What If All Nine Tiles Are Played in One Turn?

If a player forms an equation using all nine operation and number tiles in one play, the player adds an extra 40 points to the score for that play. All tiles played must be within one horizontal or vertical equation, and the equation is allowed only one equal symbol.

How Do the Board Positions Affect the Score?

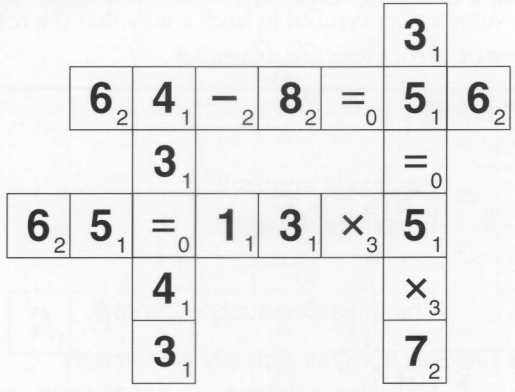
The legend along the left side of the board specifies how the premium board positions affect the score. There are two types of board positions that affect the individual symbol score. These are labeled 2S and 3S, respectively. There are two more types of board positions that affect the entire equation score. These are labeled 2E and 3E, respectively. The individual symbol score awards are computed before the entire equation awards. If a player places tiles on two 2E or 3E board positions in one turn then the multiplication is applied twice. That is, hitting two 3E positions in one turn will multiply the sum of the indiviual tile scores by 9. The 40-point bonus for playing all the tiles in one turn is added at the end after applying the awards of the premium board positions.

Can Players Trade Tiles with Other Players?

No, a player cannot trade tiles with another player. However, a player may use a turn to trade in as many of the nine tiles as he wishes with the draw pile. The score for that turn is 0.

Are Larger Numbers Allowed?

Yes, a player may form numbers with any number of digits by simply placing the single digits adjacent to one another. Here are some sample plays that utilize two-digit numbers.



Are Unnecessary Zero Digits Allowed?

Players are not allowed to represent a number like 5 as 05 nor a fraction $\frac{1}{4}$ as $0\frac{1}{4}$. Unnecessary zero digits are not allowed.

Are Mixed Numbers Allowed?

Yes, mixed number notation, such as $3\frac{2}{3}$ or $4\frac{2}{2}$ or $2\frac{7}{4}$ is allowed in this game. The expression $3\frac{2}{3}$ means $3+\frac{2}{3}$ or $\frac{11}{3}$, the expression $4\frac{2}{2}$ means $4+\frac{2}{2}$ or 5 (not 41), and the expression $2\frac{7}{4}$ means $2+\frac{7}{4}$ or $3\frac{3}{4}$. In mathematics, when a fraction follows a nonzero whole number and no grouping symbols are present, we assume the operation of addition is between the numbers. For example, a player may create the following valid equation.

2_1	$\frac{2}{4}_5$	$=_0$	5_1	$\div_5$	2_1

Are Negative Numbers Allowed?

Negative numbers are not allowed when using the *Original Tile Set*. (See the back cover of this booklet for information about the *Advanced Tile Set*.) The minus symbol – in *Equate* is a subtraction symbol, not a negative symbol. Therefore this symbol is always placed between two numbers, not simply in front of a number.

Because the subtraction result is not allowed to be a negative number when using the *Original Tile Set*, players must position numbers about the subtraction symbol in such a way that the result is a positive number or zero. Here are examples.

ORIGINAL TILE SET RULES

Valid Equations

15 – 12 = 3	Each side equals 3.
7 – 7 = 2 × 3 – 6	Each side equals 0.

Invalid Equation

3 – 5 = 2	The left side equals – 2, not 2.

Invalid for Original Tile Set, *but True Equality Statements*

–5 = –5	Negative numbers are not allowed.
4 – 6 + 7 = 5	Both sides equal 5, a positive number; however, when computing the left side one encounters the negative number –2.

Can an Addition Symbol Be Used as a Positive Symbol?

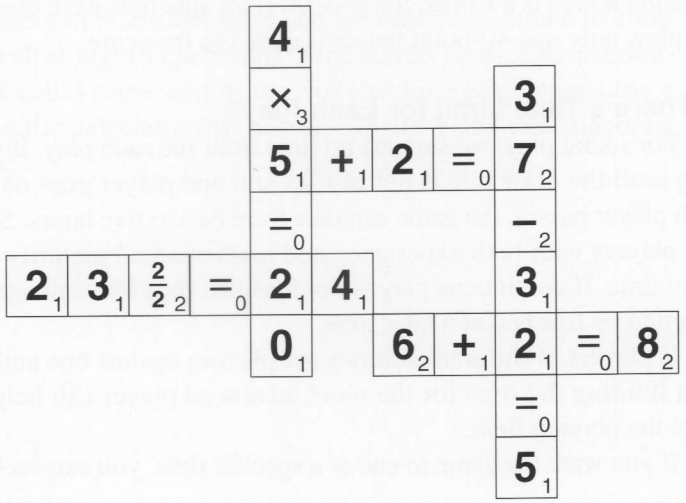
A player may not represent a number such as 32 as +32. The symbol + in the game *Equate* is an addition symbol and is always placed between two numbers to indicate the operation of addition.

What If a Play Is Incorrect?

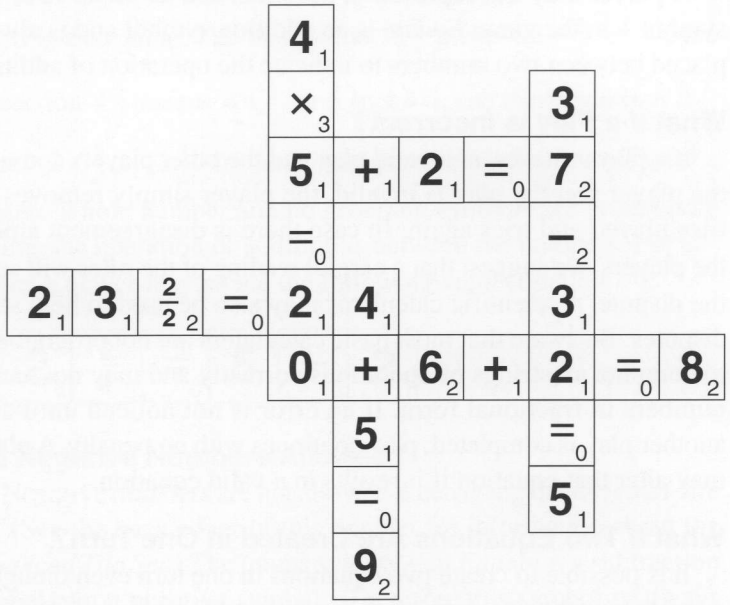
If a player makes an invalid play and the other players convince the player that the play is invalid, the player simply removes the tiles played and tries again. In case there is disagreement among the players, we suggest that a careful reading of the rules will settle the dispute. A scientific calculator may also be used to help settle disputes. Be aware that most basic calculators are not programmed to compute all strings of operations correctly and may not handle numbers in fractional form. If an error is not noticed until after another play is completed, play continues with no penalty. A player may alter that equation if it results in a valid equation.

What If Two Equations Are Created in One Turn?

It is possible to create two equations in one turn even though in a single turn the player must place all the tiles within one horizontal or vertical equation and must use no more than one equal symbol. For example, assume a player is faced with the situation shown in the diagram below. The player can make a play that creates two



equations. In forming the vertical equation 4 + 5 = 9, the player has also created the new horizontal equation 0 + 6 + 2 = 8.



In case a player does this, the player gets the full score for each of the equations formed. If the tile that is common to both equations is positioned on a premium board position then each of the equation scores is awarded the benefit. If all nine tiles were used in the play, only one 40-point bonus is added to the score.

Is There a Time Limit for Each Play?

For social play, we suggest no time limit for each play. If you play until the draw pile is out of tiles and one player goes out or each player passes, the game can take from two to five hours. Serious players with both experience and mathematical maturity use more time. If continuous play is not feasible, then leave the game set up to be finished at a later time.

If players of different abilities are playing against one anther, then limiting the time for the more advanced player can help to level the playing field.

If you want the game to end at a specific time, you can declare

the player with the highest score at that time to be the winner. Make certain that each player has had the same number of turns before ending. If the game is terminated in this way, you may want to put a time limit on each play so that the person who is ahead will not be able to monopolize the time left in the game. A reasonable time limit for each play, in this case, is from 5 to 10 minutes. Do not rush a player too much. You want to reward the thinker who is checking out many possible plays carefully before deciding on a play. This game is not about speed; it's about thinking.

For tournament play there will need to be time limitations, but serious players should definitely not be rushed. A serious, experienced player that is advanced mathematically needs more time for he or she sees not only more possibilities but also more complex plays, and therefore has more to think about.

Using a time clock that keeps track of the total time for each player is a possibility. To encourage players not to waste time, there could be a loss of points for using more than a designated amount of total time and/or bonus points for the player who uses the least amount of total time.

Are Calculators Allowed?

Players are not allowed to use a calculator while making a play except to help settle disputes; however, players may use paper and pencil. Since many basic calculators do not handle numbers in fractional form and are not programmed to compute all strings of operations in the correct order, a basic calculator could cause confusion. For checking calculations use a scientific calculator that handles fractions and uses algebraic logic.

4 IMPORTANT MATH RULES

Positioning Numbers Correctly About an Operation

When adding or multiplying two numbers, it does not matter in what order the numbers are positioned; however, when subtracting or dividing two numbers it does matter in what order the numbers are positioned. For example, $4 + 1$ and $1 + 4$ both equal 5, and 4×1 and 1×4 both equal 4. However, $4 - 1$ does not equal $1 - 4$. The expression $4 - 1$ is equal to 3, while the expression $1 - 4$ is equal to the negative number -3 and is not allowed in the game *Equate* when using the *Original Tile Set*. This game does not allow any numerical expressions that involve negative numbers.

Also, the expression $4 \div 1$ does not equal $1 \div 4$. The expression $4 \div 1$ is equal to the number 4, while the expression $1 \div 4$ is equal to the fraction $\frac{1}{4}$. The numbers 4 and $\frac{1}{4}$ are not equal. The number 4 is more than 1 while the fraction $\frac{1}{4}$ is less than 1. In mathematics we say that addition and multiplication are commutative while subtraction and division are not commutative.

Be careful when using the number 0 in a division expression. Although $0 \div 8 = 0$ is true, the expressions $8 \div 0$ and $0 \div 0$ are not defined mathematically, thus are not allowed in the game *Equate*. Zero divided by a nonzero number equals 0, but division by 0 is meaningless.

Performing Operations in the Correct Order

Numerical expressions containing more than one operation are allowed in the game *Equate*. Because the game has no grouping symbols to clarify the order to perform the operations, players must use the mathematical rules for the order to operate. These rules are as follows.

Rules for the Order to Operate

Rule 1 *Repeated addition can be done in any order.*

Rule 2 *Repeated multiplication can be done in any order.*

Rule 3 *Repeated subtraction, or a mixture of addition and subtraction, is computed from left to right for horizontal expressions (or downward for vertical expressions).*

$8 - 2 + 4 = 10$ $\quad$ $12 - 4 - 3 = 5$

Rule 4 *Repeated division, or a mixture of multiplication and division, is computed from left to right for horizontal expressions (or downward for vertical expressions).*

$24 \div 6 \div 2 = 2$ $\quad$ $8 \div 2 \times 2 = 8$

Rule 5 *When multiplication and division are in the same expression with addition and subtraction, perform all of the multiplication and division first, moving left to right (or downward); then perform the addition and subtraction, from left to right (or downward).*

$9 - 6 \div 3 = 7$ $\quad$ $8 + 4 \times 2 = 16$

$6 \times 5 - 2 \times 4 = 22$ $\quad$ $3 \div 4 + 1 \div 4 = 1$

Reviewing Fractions

Here are some basic rules of fractions that players need to know to become a good *Equate* player.

Fraction Rules

Rule 1 *The fraction bar means to divide.*

$\frac{4}{4} = 4 \div 4 = 1$

$\frac{3}{4} = 3 \div 4$

Rule 2 *Multiplying or dividing the numerator and denominator of a fraction by the same nonzero number does not change the value of the fraction.*

$$\frac{1}{2} = \frac{1 \times 2}{2 \times 2} = \frac{2}{4}$$

$$\frac{4}{6} = \frac{\cancel{2} \times 2}{\cancel{2} \times 3} = \frac{2}{3}$$

In simplifying the fraction $\frac{4}{6}$, canceling the common factor 2 from the numerator and denominator is equivalent to dividing the numerator and denominator by 2. Canceling a factor of 2 undoes the multiplication by 2 which is the same as dividing by 2.

Rule 3 *To add or subtract fractions, convert each to an equivalent fraction with a common denominator, then add or subtract the numerators and put the result over the common denominator.*

$$\frac{1}{2} + \frac{1}{6} = \frac{1 \times 3}{2 \times 3} + \frac{1}{6} = \frac{3}{6} + \frac{1}{6} = \frac{4}{6} = \frac{2}{3}$$

Rule 4 *To multiply fractions, multiply the numerators to obtain the numerator of the answer and multiply the denominators to obtain the denominator of the answer.*

$$\frac{1}{2} \times \frac{1}{3} = \frac{1 \times 1}{2 \times 3} = \frac{1}{6}$$

If there is a common factor in the numerator and denominator, you can cancel this before multiplying. Taking advantage of this allows one to work with smaller numbers. Here is a problem done in two ways.

METHOD 1 $\frac{3}{4} \times 24 = \frac{3}{4} \times \frac{24}{1} = \frac{3}{\cancel{4}} \times \frac{\cancel{4} \times 6}{1} = 18$

METHOD 2 $\frac{3}{4} \times 24 = \frac{3}{4} \times \frac{24}{1} = \frac{72}{4} = 18$

Using Method 1 makes it easier to do the problem mentally.

Rule 5 *Dividing by a fraction is the same as multiplying by its reciprocal.*

$$\frac{3}{4} \div \frac{1}{2} = \frac{3}{4} \times \frac{2}{1} = \frac{6}{4} = \frac{3}{2} \text{ or } 1\frac{1}{2}$$

$$2 \div \frac{1}{4} = \frac{2}{1} \times \frac{4}{1} = \frac{8}{1} = 8$$

The expression $2 \div \frac{1}{4}$ can also be computed by thinking, how many $\frac{1}{4}$s make 2? The answer is 8 because four $\frac{1}{4}$s make 1 whole, and two 1 wholes make 2.

5 HOW TO MAKE THE GAME EASIER

The game *Equate* can be simplified in several ways. Using these alternative rules helps players reach higher ability levels more quickly.

Separate the Draw Pile into Two Piles

Players that are new to the game *Equate* or are just starting to play with more challenging tiles, should play with two separate draw piles, one containing numbers and the other operations. This ensures that players have a balanced hand. A player may draw from either pile to obtain a hand of nine tiles. A suggested balance of symbols is two or three operation tiles and the rest numbers. An equal symbol is available at any time. A hand has ten tiles counting the equal symbol. Players use this drawing procedure until they are skilled at forming a variety of equations and are ready for the additional challenge of playing with an unfriendly hand.

Playing with Selected Tiles

Players that are not comfortable with fractions should take them out when first learning to play. If all of the fractions are taken out, then six division symbol tiles should be removed also.

The fractions can be brought in gradually. First bring in the halves, then the fourths, then finally the thirds and sixths. For each additional four fractions that are included, bring in another division symbol.

Very young players can begin by playing without any division tiles and without any multiplication, if desired. If a player is playing with only addition and subtraction, we suggest that he form only horizontal equations as explained in the next paragraph.

Forming Only Horizontal Equations

Players who are at the elementary algebra level or below should play at least once or twice by forming only horizontal equations. Each play is made anywhere on the board. At this lowest level players do not play on existing equations and no two equations have adjacent tiles. No fractions are used. Take out at least six division symbols and any other operations that the player is not ready for.

Avoiding vertical equations, the connecting of equations, and fractions in the beginning helps players to learn to create a variety of equations more quickly. Here we give examples of what is meant by a variety of equations.

4 + 5 = 9	Beginners often form only simple equations.
9 = 5 + 4	The answer can be on the left side.
8 = 8	The equation does not need an operation.
42 = 7 x 6	Two-digit numbers are allowed.
2 + 4 = 2 x 3	Operations can appear on both sides.
7 – 2 + 3 = 8	Expressions may have more than one operation.

Playing with Players of Different Abilities

If the players in a game are of different levels of math ability and/or *Equate* playing ability, the game is more fun if something is done so that the disadvantaged player is allowed to get into the competitive spirit.

Using handicap scoring is one possible solution. Give the disadvantaged player some extra points at the beginning of the game.

A parent or teacher who wants to encourage a player to use the fraction tiles can offer the player twice or triple the score for each fraction used.

Adjusting the time allowed to make a play is another way to even the playing field. For example, the more advanced player might be given only 2 to 5 minutes to make a play, while the disadvantaged player has no time limit.

6 IDEAS FOR USING *EQUATE*

Team Play

Equate is a great game for team play. Divide a group of any number into two to four teams. Team members work together to create brilliant plays. More advanced players teach less advanced players not only how to play the game but also relevant math skills.

One way to manage team play is to set up a game to continue over several hours or days. Team members study the board in small groups plotting their next play.

To facilitate a large group playing a game at the same time, Conceptual Math Media has developed an *Equate Transparency* that allows the equations to be recorded on the overhead as the game progresses. Captains help facilitate this activity.

Classroom Use

There are many ways to use *Equate* in the classroom. One is to divide the class into teams and use either one of the procedures explained in the previous paragraph that explains team play.

After the students have learned to play, pass out an *Equate* game for each four to six players. The small groups play in pairs or individually. Arrange the students in a semi-circle facing the front or sides of the board.

If a class has only one *Equate* game, then the class can have an activity time where students that are not playing *Equate* are engaged in other activities. The different activities can be rotated throughout the year.

If the school has a Math Lab or Activity Lab, students can be required to play *Equate* in the lab a specified amount of hours throughout the term. A time card can be used to track the time.

Conceptual Math Media has also developed a series of *Equate Boardless Activities* where all students are given the same Equate hand in strips of paper tiles that they tear apart themselves. Using only these symbols, individuals or groups list as many different

equations as they can and the corresponding scores. Players are aiming for a high total score as well as indiviual high-scoring equations. An inclusive, engaging activity. No one finishes early!

School/Family Connection

Attention teachers!! Introduce *Equate* to the parents of your students at a school Family Night. Recommend that they purchase a game and play at home. In fact you can require that they play a specified amount of time each month and have the parent to sign a time card verifying the time played.

Equate Club

Start an Equate Club or include *Equate* in your already existing Math Club. This encourages players to become better at the game and gives the experts some challenging competition.

Tournament Play

Have a tournament that is advertised well in advance to motivate students to practice with friends and family. The competition can be between individuals or teams.

Conceptual Math Media has developed *Equate Board Situations* that are great for contests. The board design and some sample play is laid out on paper and a hand is given. Participants make only one play. Highest score wins. Watch for this type of competition coming soon on our website, www.PlayEquate.com.

The Single Player

The single player can either strive for a high total score or strive for a high average score per turn. A very good single player can accumulate 1000 to 1200 total points and can average over 30 points per turn.

When computing the average score per turn, if the single player uses a turn to trade in tiles for new tiles, he must count this as a turn with 0 score. For example, suppose that the first three turns produce scores of 10, 20, and 6, and the fourth turn is used to trade in tiles, thus has 0 score. The average score for these four turns is $36 \div 4 = 9$, not $36 \div 3 = 12$. Because there were four turns, we must divide by 4.

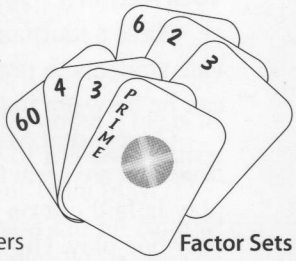
OTHER PRODUCTS

Conceptual Math Media, Inc. is dedicated to the development of math educational products that promote thinking. We want to make math fun for the classroom and family. Our mission is to change the negative attitudes about math that are so prevalent in our society.

Equate Extra Tile Sets - Play the *Equate* game with any one of three different tile sets. The *Original Tile Set* that contains whole numbers and a variety of fractions is the set that comes with the single *Equate* game. Take the game to a higher math level by playing with the *Advanced Tile Set* that has negative numbers and exponents. The *Junior Tile Set* offers a friendlier game that has more addition and subtraction than multiplication and division, and the fractions all have denominators of 2. This offers an excellent introduction to fractions for young children. Each of these three tile sets may be purchased separately without a board.

Equate Instructional Materials - We sell materials that help teachers use *Equate* as a major part of their learning program. *Equate Class Sets* are available to make the game more affordable for schools. Each class set contains 8 boards, 8 tile sets (either Junior or Original), 32 racks, a rule booklet and a plastic tote bag for convenient transporting and storage. To help teachers play *Equate* with the whole class in a managable amount of time we have the *Equate Activity Notebooks*. These 3-ringed binders are filled with three types of reproducible hands-on paper activities, two types of transparencies, and worksheets. Teachers may choose among three levels.

PrimePak Card Game - Master multiplication, division, and factoring skills while having fun playing four different card games with this unique deck of 171 cards. Players form factor sets. Because 6 = 2 x 3, the numbers 6, 2, and 3 form a factor set. Factor sets can have more than 3 cards. Prime wild cards can be used for prime numbers only. Adapts to many levels with six deck levels defined in the rules booklet. For 1 to 6 players or teams, ages 7 years to adult.



Factor Sets

Also Available! *The PrimePak Transparency Deck* allows teachers to play with the whole class using an overhead projector.

Conceptual Bingo - We are pleased to announce our new *Conceptual Bingo* series. These bingo games are unique because the caller chooses one of six options when calling a value and the questions cover concepts and language as well as computation. Seven games are available at this time.
What Time Is It? • *Whole Numbers* • *Fractions* • *Decimals* • *Convert: Fraction-Decimal-Percent* • *Integers* • *Rational Numbers: Algebra Focus*
Each game includes 36 playing cards, 360 plastic markers, over 50 calling cards, and two reproducible masters for customizing and assessment.

1. Four fifths
2. Count by fifths: $\frac{1}{5}$, $\frac{2}{5}$, $\frac{3}{5}$, ___?___
3. Simplify: $\frac{36}{45}$
4. Separate 16 into 20 equal parts. What is the size of each part?
5. $\frac{1}{10} \div \frac{1}{8}$
6. $\frac{4}{15} + \frac{1}{3} + \frac{1}{5}$

$\frac{4}{5}$

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A sample calling card from the Fraction Bingo

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