# Well Played: Unleashing the Power of Games and Puzzles

Linda Dacey and Jayne Bamford Lynch
NCTM Conference
April 2016

## *Which Number Is Closest?* Game Board

Name(s): _____   Date: _____

| Goal Number | Number Created |
|:-----------:|:--------------:|
| **100** | ⬜⬜⬜ |
| **1,000** | ⬜⬜⬜⬜ |
| **500** | ⬜⬜⬜ |
| **1,000** | ⬜⬜⬜ |
| **10,000** | ⬜⬜⬜⬜⬜ |

Score: _____

## *Which Number Is Closest?* Directions

## Materials Needed

› 1 *Which Number Is Closest?* Game Board per team (page A-4)
› 1 deck of *Which Number Is Closest?* Cards (made from *two* copies of page A-5) per group of players
› Optional: 1 *Which Number Is Closest?* Directions per group

## Directions

Goal: Place digits in the spaces to form numbers as close in value as possible to the goal numbers.

› Shuffle the cards and place them facedown. Choose a player to be the game leader.
› The game leader turns over one card and announces the number. Each team writes the digit in one of the spaces (boxes) in the "Number Created" column of the game board.
› All teams must record the digit before the next number is announced, and once written, its placement may not be changed.
› The leader continues turning over cards until eighteen digits have been placed. (Note that the last two cards will not be used.)
› Compare how close each of the teams' numbers is to each goal number. The team with the closest number wins a point. Each team adds its points to find its score. The team with the most points wins the game.

## *Equal Values* Recording Sheet

Name(s): _____ Date: _____

| Card #1 | Card #2 | How do you know the cards make a pack? |
|---------|---------|----------------------------------------|
|         |         |                                        |
|         |         |                                        |
|         |         |                                        |
|         |         |                                        |
|         |         |                                        |
|         |         |                                        |
|         |         |                                        |
|         |         |                                        |
|         |         |                                        |
|         |         |                                        |
|         |         |                                        |

## *Equal Values* Cards

| = | = |
|---|---|
| $3 \times 8$ | $8 \times 3$ |
| $8 \times 7$ | $5 \times 7 + 3 \times 7$ |
| $6 \times 2 \times 5$ | $6 \times 10$ |
| $4 \times 3 + 4 \times 3$ | $8 \times 3$ |
| $9 \times 6$ | $10 \times 6 - 6$ |
| $9 \times 8$ | $8 \times 9$ |
| $2 \times 7 + 3 \times 7$ | $5 \times 7$ |

## *Equal Values* Cards (continued)

| | |
|---|---|
| $34 \times 6$ | $6 \times 34$ |
| $23 \times 4$ | $20 \times 4 + 3 \times 4$ |
| $20 \times 7 \times 5$ | $7 \times 100$ |
| $50 \times 18 \times 2$ | $100 \times 18$ |
| $578 \times 5$ | $5 \times 578$ |
| $40 \times 9 \times 5$ | $200 \times 9$ |
| $395 \times 5$ | $400 \times 5 - 5 \times 5$ |
| $2 \times 250 \times 5$ | $250 \times 10$ |

## *Equal Values* Cards (continued)

| | |
|---|---|
| $540 \times 6$ | $500 \times 6 + 40 \times 6$ |
| $699 \times 4$ | $700 \times 4 - 4$ |
| $17 \times 5 \times 2$ | $17 \times 10$ |
| $2 \times 18 + 2 \times 18$ | $18 \times 4$ |
| $98 \times 5$ | $100 \times 5 - 2 \times 5$ |
| $20 \times 6 \times 5$ | $6 \times 100$ |
| $23 \times 4$ | $20 \times 4 + 3 \times 4$ |
| $17 \times 5 \times 2$ | $17 \times 10$ |

## *Equal Values* Directions

## Materials Needed
> 1 deck of *Equal Values* Cards per group of four students (pages A-40–A-42)
> 1 *Equal Values* Recording Sheet per group (page A-43)
> Optional: 1 *Equal Values* Directions per group
> Optional: 1 calculator

## Directions
Goal: Get more pairs of cards that have equal values.

> Give each team a card with the equal sign.
> Shuffle the cards. Deal each team four cards faceup for all to see. Put the other cards facedown in a pile.
> On each turn you can do one of three things:
  1. Find two of your cards that have an equal value. Set this pack beside you. Replace them with two cards from the top of the pile.
  2. Trade one of your cards with one of the other team's cards when you are able to make a pack. Set this pack beside you. Replace your card with a card from the top of the pile.
  3. Draw a card from the top of the pile and add it to your cards.

> When a pack is made, both teams must agree on the product and then one player records their thinking.
> If no cards are left in the deck, you can still have a turn, but you don't take a card.
> The game ends when no team can make another pack.
> The team with more packs wins.

# *The Number Is/What Number Is?* Cards

| | | | |
|---|---|---|---|
| The number is 236,427.<br><br>What number is 250 tens and 3 ones? | The number is 2,503.<br><br>What number is 50,000 + 700 + 3? | The number is 50,703.<br><br>What number is rounded to 2,500 when rounded to the nearest hundred? | The number is 2,489.<br><br>What number is greater than 350 thousands? |
| The number is 405,786.<br><br>What number is 2,000 more than 10,000? | The number is 12,000.<br><br>What number is 17 hundreds and 15 tens? | The number is 1,850.<br><br>What number is less than 2,000? | The number is 1,715.<br><br>What number is one more than 15,699? |
| The number is fifteen thousand seven hundred.<br><br>What number is between 10,000 and 14,000? | The number is 13,700.<br><br>What number is rounded to 25,000 when rounded to the nearest thousand? | The number is 25,499.<br><br>What number is 200,000 + 40,000 + 7? | The number is two hundred forty thousand seven.<br><br>What number is 10,000 + 400 + 30 + 6? |
| The number is ten thousand four hundred thirty-six.<br><br>What number is 72 hundreds? | The number is 7,200.<br><br>What number is 2,000 + 500 + 60 + 3? | The number is 2,563.<br><br>What number is between 70 tens and 80 tens? | The number is 742.<br><br>What number is less than 800? |
| The number is 450.<br><br>What number is 63 thousands, 25 hundreds, 18 ones? | The number is 65,518.<br><br>What number is greater than half a million? | The number is 827,345.<br><br>What number rounds to 20,000 when rounded to the nearest ten thousand? | The number is 18,239.<br><br>What number is rounded to 200,000 when rounded to the nearest hundred thousand? |

## *The Number Is/What Number Is?* Directions

## Materials Needed

> 1 deck of *The Number Is/What Number Is?* Cards per group of two to four students (page A-7)
> Optional: 1 set of *The Number Is/What Number Is?* Cards to Make Your Own Puzzle per pair of students (page A-8)
> Optional: 1 *The Number Is/What Number Is?* Directions per group

## Directions

Goal: Place cards so that the number identified on each card answers the question on the card before it.

> Spread out the cards faceup on a table or the floor.
> Choose a card and read its question.
> Find a card with a matching answer, place this card next to the first card, and read the question on this second card.
> Continue to read questions and find answers. Organize the cards in a circle so that each question is followed with a correct answer.
> Each card must be included in the circle.

## *Think Remainder* Game Board

| | | | |
|---|---|---|---|
| 11 | 12 | 13 | 15 |
| 17 | 18 | 19 | 20 |
| 21 | 23 | 24 | 27 |
| 29 | 31 | 32 | 35 |
| 42 | 44 | 47 | 49 |

## *Think Remainder* Recording Sheet

Name(s): _____   Date: _____

| I/We Rolled | Number Crossed Out | Related Fact | Remainder |
|---|---|---|---|
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
| **Total score:** |  |  |  |

## *Think Remainder* Directions

## Materials Needed

> 1 die per group of players
> 1 *Think Remainder* Game Board per group (page A-45)
> 1 *Think Remainder* Recording Sheet per team (page A-46)
> Optional: 1 *Think Remainder* Directions per group

## Directions

Goal: Have the greater sum when adding the remainders of ten division examples.

> Take turns. When it's your team's turn, your team is known as the "rolling team."
> A member of the rolling team rolls the die.
> A member of the opposing team crosses out a number on the game board.
> Players on the rolling team divide the number crossed out by the number rolled. The remainder is the rolling team's score for this turn. A member of the team records the numbers for this turn on the team's recording sheet.
> Teams take turns rolling, crossing out numbers, dividing, and recording the work for this turn. (Crossed-out numbers cannot be used again.)
> When every number on the board has been crossed out, teams compare their total scores by adding all the remainders from their turns.
> The team with the greater score wins.

# Etiquette Expert Cards

| | |
|---|---|
| Dear Etiquette Expert,<br>Yesterday my good friend wanted to play a math game with me, but I knew it wouldn't help me learn. I didn't want to hurt her feelings, so I just played it. How could I have turned her down without hurting our friendship? | Dear Etiquette Expert,<br>Whenever W.D. is on my team, he takes over. We are supposed to work together, but he never gives me a chance. He basically solves the puzzle all by himself. How can I keep him from doing this without looking like I am just whining? |
| Dear Etiquette Expert,<br>Sometimes my partner gets really upset when we lose. She throws down the cards or dice and stomps off. Or sometimes she calls the other team names and says the game is boring. How can I help her to not be a sore loser? | Dear Etiquette Expert,<br>I am a very shy person and get nervous when we have to form partners. I go sharpen a pencil or something. So usually I just end up with whoever is left. I don't even know how to get a partner. How can you help me? |
| Dear Etiquette Expert,<br>My partner and I were working on a puzzle, but she just gave up. She said it was too hard and we shouldn't even bother to solve it. I thought we could solve it if we worked together. How can I convince her to work longer and that the effort is worth it? | Dear Etiquette Expert, My team doesn't clean up right. They just throw things in the box without sorting them. Sometimes important game pieces are left on the floor. I am getting tired of being the one to always put everything away correctly. What should I do? |
| Dear Etiquette Expert,<br>Sometimes I really need to solve a puzzle alone. I get too distracted in the group and can't think about the math. I think my teacher might let me if I asked, but I'm worried about looking so different from everyone else. What do you think? | Dear Etiquette Expert,<br>Yesterday my partner took a really long time. He had some good ideas, but it took forever for us to finish our turn because he wanted to check every possibility. How can we get the other team to be more patient and get my partner willing to stop? |
| Dear Etiquette Expert,<br>The team we were playing against today made an error. I mentioned it and my partner said they should lose their turn. They got mad at me and said I wasn't the teacher and should just let it go. What do you suggest? | Dear Etiquette Expert,<br>My team won today, but I was embarrassed by the big deal my partner made when we scored the final point. He kept telling the other team that we were much better than they were. What can I do if this happens again? |
| Dear Etiquette Expert,<br>I'm not sure how to disagree with my partner when I think she is wrong, so sometimes I just agree with her. I don't want her to think I don't like her, but I want to talk more about our different ideas. What should I do? | Dear Etiquette Expert,<br>My partner and I had a lot of questions about the puzzle today. We read the directions again, but it didn't help and everyone else looked busy. We finally just filled in some numbers and said we were done. What do you think we should have done instead? |