



Strengthening Number Sense in the Intermediate Grades
NCTM Annual Conference, April 2012
presented by Gail Gerdemann

Games from ***Lessons for Strengthening Number Sense***,
Teacher to Teacher, Inc. developer of Supplementary Mathematics Curriculum

Make the Most of It

- Game materials: place value mat for each player, 3 decks of digit cards (0-9) or deck of playing cards, < or > spinner
- Object: To build the largest or smallest multi-digit number
- Rules: Players deal one card at a time to place value mat with one extra card that can replace any of the cards already dealt. Players compare and write numbers on recording sheet; winner (matching spinner) writes correct symbol between numbers and circles his number.
- Math focus: CCSS 4.NBT.2 Place value, expanded form, comparing multi-digit numbers

What's the Difference?

- Game materials: double place value mat for each player, 4 decks of digit cards (0-9) or a deck of playing cards, spinner with 4 choices (largest sum, smallest sum, largest difference, least difference)
- Object: To build two multi-digit numbers when added or subtracted match goal of spinner (e.g., largest sum).
- Rules: Players deal one card at a time to double place value mat with one extra card that can replace any of the cards already dealt. Create two numbers, do calculation, and record results. Winner is player with result that matches spinner.
- Math focus: CCSS 4.NBT.4 Add and subtract multi-digit numbers with algorithm

Factor Design

- Game Materials: Factor-Product gameboard, 2 paperclips, markers or beans in two colors, spinner with grid design choices
- Object: Capture squares on the gameboard to make the design chosen by the spinner. Players work together to make the design with the least number of "off design" squares.
- Rules: Take turns moving ONE paperclip on factors to form products and capture number squares. Must always move one paperclip; two paperclips can be on the same factor.
- Math focus: CCSS 3.OA.7 Fluently multiply and divide within 100. Know all products of one-digit numbers by memory.

Factors and Multiples

- Game Materials: 100 chart for each pair, colored pencils or crayons
- Object: Work together to try to be the team that circles the most numbers.
- Rules: After the first number is circled (any multiple of 2), player must circle a factor or multiple of that number. Next player circles a factor or multiple of last number. Play alternates until no more plays can be made.
- Math focus: CCSS 4.OA.4 Identify factors and multiples in the range 1-100. Determine if numbers are prime or composite.



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Fraction Make-a-Whole Solitaire

- Game Materials: set of fraction cards with same denominator (e.g. eighths $0/8$, $1/8$, $2/8$, $3/8$ etc.)
- Object: To make pairs with fraction cards that equal one whole
- Rules: Deal five cards face up. Make pairs that equal one whole and discard into "win pile." Deal additional cards into empty spaces and continue to make one whole with pairs of fractions. If no play is possible, deal additional cards face up one at a time until it's possible to make a play.
- Math Focus: CCSS 4.NF.3b Decompose a fraction into the sum of fractions with the same denominator in more than one way. Record decomposition with an equation.

Fishing for Fractions

- Game Materials: set of fraction cards with same denominator (e.g. eighths $0/8$, $1/8$, $2/8$, $3/8$ etc.)
- Object: To make pairs with fraction cards that equal one whole. Most pairs wins.
- Rules: Deal five cards to each player. Players make pairs with cards in hand, write on recording as equation, and then take turns asking other players for one card to match one in their own hand. Play ends when a player can no longer make a pair, replenish cards from deck. Played like "Go Fish."
- Math Focus: CCSS 4.NF.3b Decompose a fraction into the sum of fractions with the same denominator in more than one way. Record decomposition with an equation.

Fraction Salute

- Game Materials: deck of fraction cards (all same denominator) including some mixed numerals
- Object: To guess the unseen fraction on your forehead while seeing your opponent's fraction and hearing the sum of the two fractions
- Rules: Captain says "salute," cards go on foreheads, captain gives the sum, players compete to say their own fraction first; cards stay on forehead until BOTH players state their fractions.
- Math focus: CCSS 4.NF.3c Add and subtract mixed numbers with like denominators by using the relationship between addition and subtraction.

Fraction-Decimal Blockage

- Game Materials: 10 x 10 blank grid, colored pencils or crayons, fraction-decimal spinner
- Object: Outline the most area with polygons until play is blocked. 10 x 10 grid represents ONE WHOLE (each small square represents $1/100$ or 0.01)
- Rules: Spin to determine area of polygon to outline. Player #1 starts in one corner, Player #2 must start in opposite corner. Outline a polygon with area matching the fraction or decimal on spinner. Each new polygon must share a side or part of a side with one of the player's own polygons. No overlapping. May touch opponent's polygon. Game ends when a player is unable to fit the polygon spun on the board.
- Math Focus: CCSS 4.NF.5 and 4.NF.6 Express a fraction with denominator 10 as an equivalent fraction with denominator 100. Use decimal notation for fractions with denominators 10 or 100.