Math Games for the Classroom: Grades PreK–5

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- Concentration
- Game of Nim
- Product Game
- Number Mastermind
- Make 10
- Arithmetic Four
- Spin to Win!

Concentration

Rules

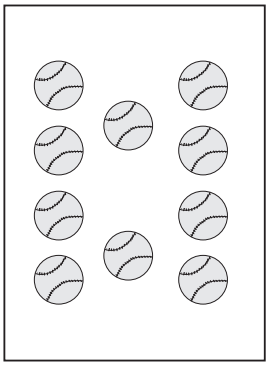
Turn all cards face down. Player one turns over two cards. If the two cards are equivalent, he/she takes the cards and goes again. If the cards are not equivalent, he/she turns them back over and it is the next player's turn. The player who collects the most matches wins!

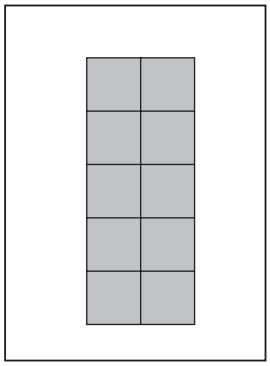
Object: To be the person to collect the most matched pairs.

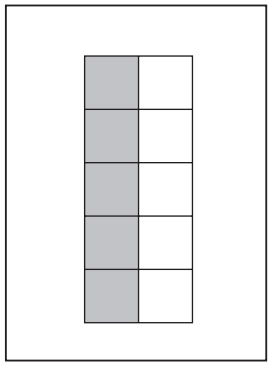
NCTM Standard: Number & Operations

Grade level: Grades K–5
Number of players: 2–3 players
Materials: 12 playing cards with pairs of equivalent numbers represented using pictures, words and numerals. See following examples.

Concentration
Counting Numbers







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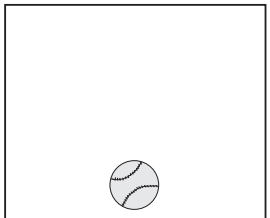

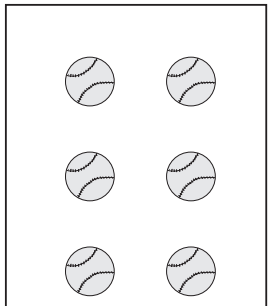

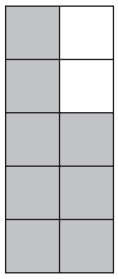

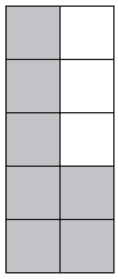

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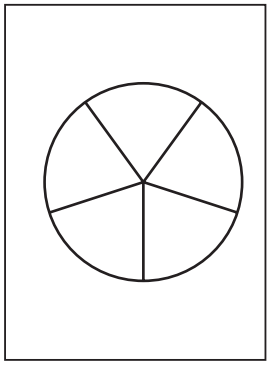
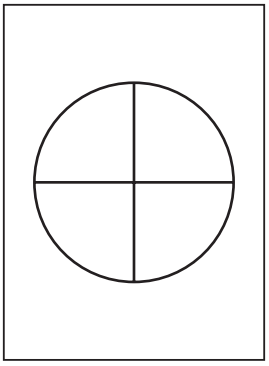
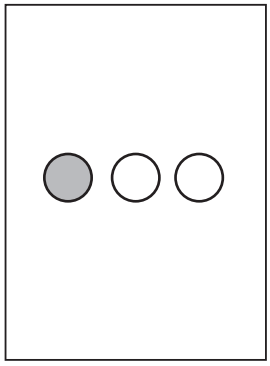
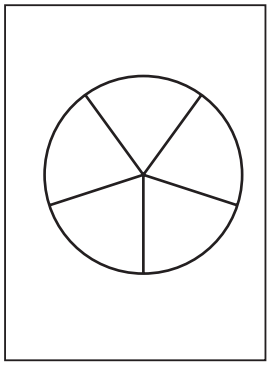
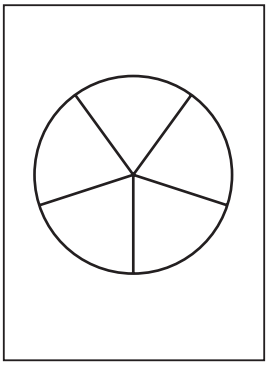
Concentration
Fractions

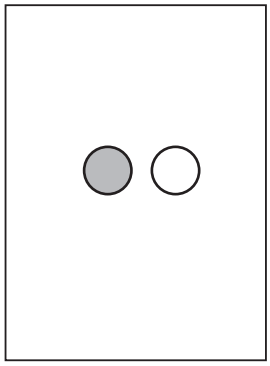


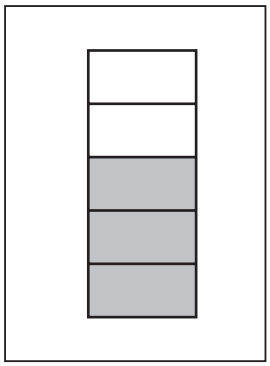


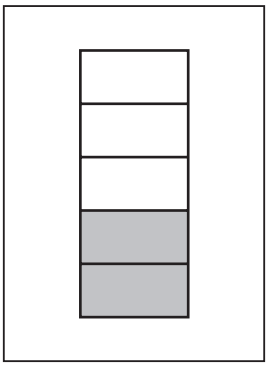


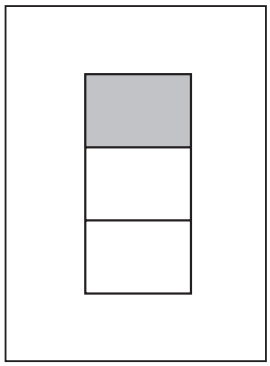


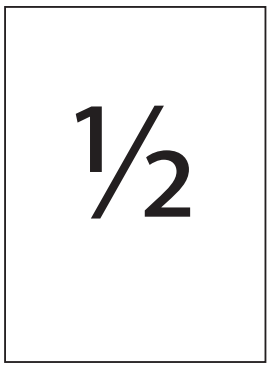


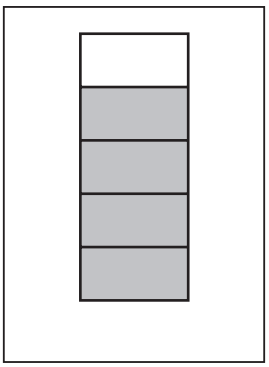


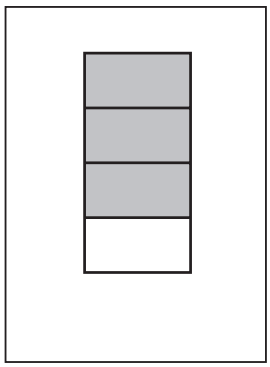












Game of Nim

Rules

Nim is a two-player game of logic and strategy. The goal of Nim is to be the player who marks the last of ten circles on the gameboard. A player must mark one or two circles during their turn. The player who marks the last circle wins!

Questions for Students:

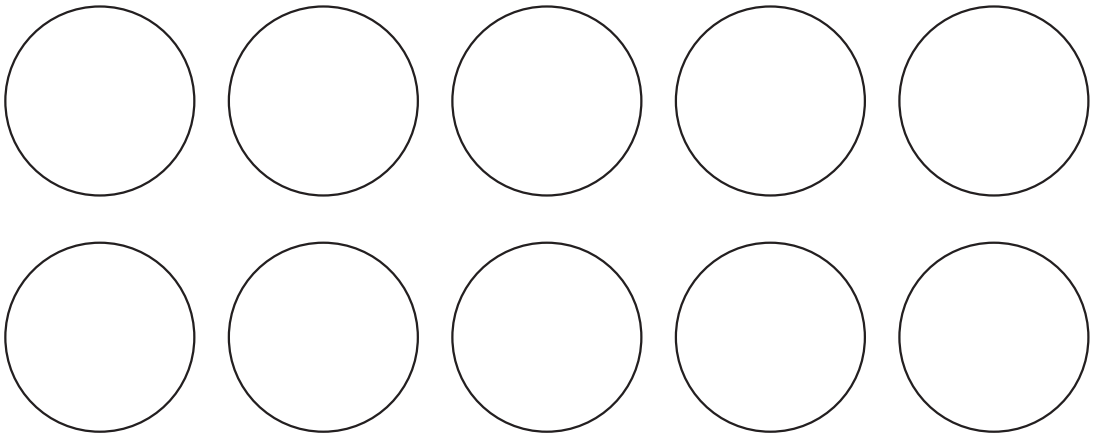
- Is this game fair regardless of who goes first or second?
- How many circles do you need your opponent to leave you to ensure that you'll win?
- What is your strategy?
- How would your strategy change if you could pick 1, 2, or 3 circles?

NCTM Standard: Problem Solving

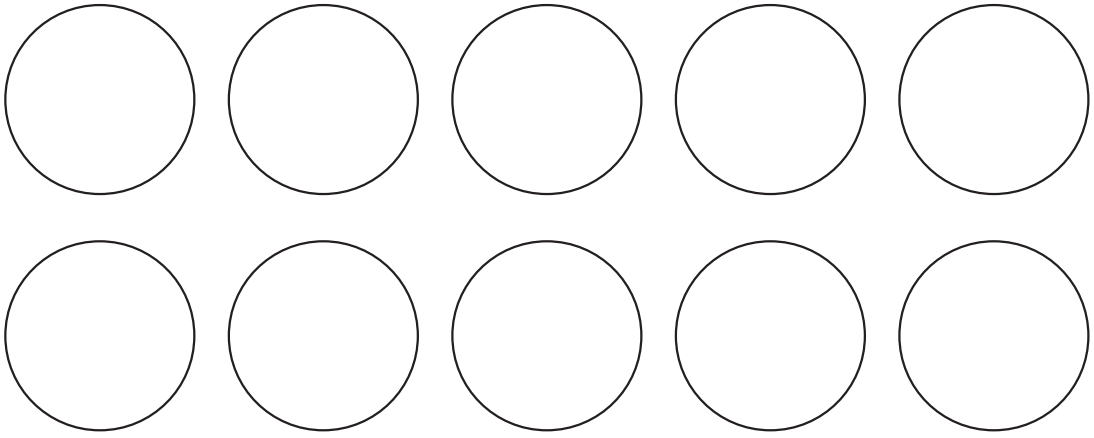
Grade level: Grades 3–5
Number of players: 2
Materials: pencil, gameboard

Game of Nim
Gameboards

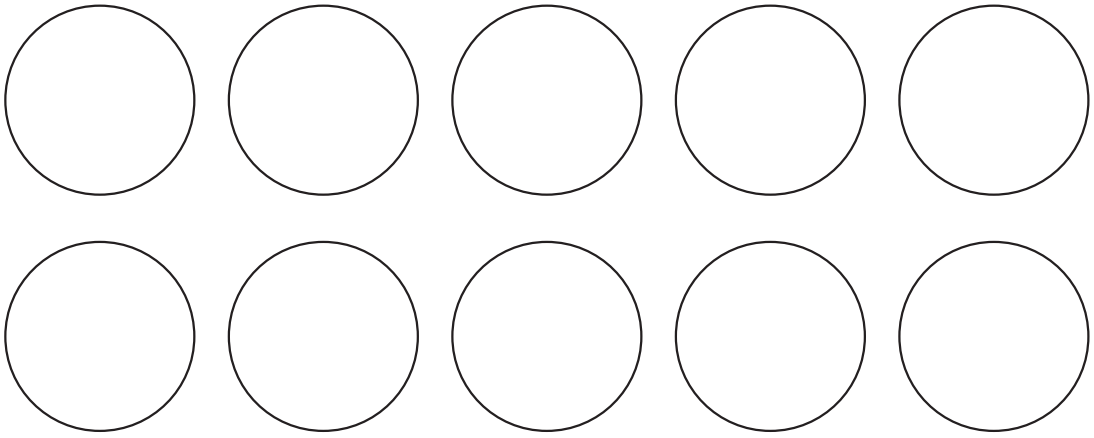
Game 1



Game 2



Game 3



The Product Game

Rules

1. Player A puts a paper clip on a number in the factor list. Player A does not mark a square on the product grid because only one factor has been marked: it takes two factors to mark a product.

2. Player B puts the other paper clip on any number in the factor list (including the same number marked by Player A) and then shadesor covers the product of the two factors on the product grid.

3. Player A moves either one of the paper clips to another number and then shades or covers the new product.

4. Each player in turn moves a paper clip and marks a product. If a product is already marked, the player does not get a mark for that turn. The winner is the first player to mark four squares in a row—up and down, across, or diagonally.

Suggestions for Teacher:
Allow your students to play the Product Game several times with their partners.
Instruct them to look for interesting patterns and winning strategies.

Give them 10 minutes to free-write on their experience, asking them to reflect on strategies that worked or failed.

After they turn in their free-writes, facilitate a whole class discussion.

NCTM Standard: Number & Operations, Problem Solving

Grade level: Grades 3–5
Number of players: 2
Materials: Gameboard (1 for each game), 2 paper clips, 2 different colored markers

The Product Game
Gameboard

0	1	2	3
4	5	6	8
9	10	Free	12
15	16	18	20
24	25	30	36

Factors:

0 1 2 3 4 5 6

Source: Olsen, Jo Clay. Developing Students' Mathematical Reasoning through Games. *Teaching Children Mathematics*, May 2007

Number Mastermind

Rules

Player one composes a secret 3-digit number which his/her opponent must figure out within ten tries. Player one guesses the digits and player two responds with hints using dots and x's to let player one know how accurate the guess was. A dot indicates that one digit is correct. An x indicates that one digit is correct, but placed in the wrong spot. Player two gives player one these hints after each guess. If player one can crack the code within ten tries, he/she wins. If not, player two wins!

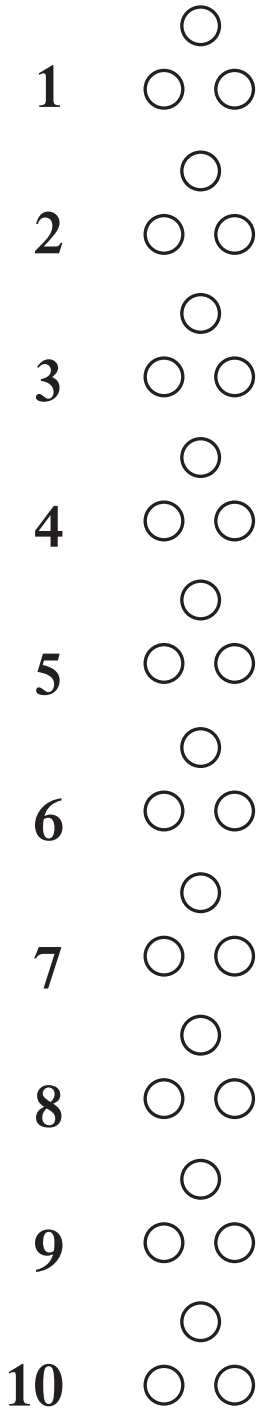
Object: To crack the code within 10 tries

NCTM Standard: Problem Solving

Grade Level: Grades 3-5
Number of Players: 2 players
Materials: Game template and a pencil

This activity was adapted from Mastermind found at http://nlvm.usu.edu/.

Number Mastermind
Gameboard



Make 10

Rules

1. Shuffle the deck of cards (36 cards – 4 of each number 1 through 9).
2. Deal 5 cards to each player. Place the remaining cards face down on the table.
3. Player 1 asks one of the other players for a card to add to one of his or her cards to make a sum of ten. The requested card is then placed with a second card from player 1's hand, and the other players check the sum. If the player does not have the requested card, player 1 draws one card from the face-down stack. If player 1 can make a sum of 10 with the two cards, the pair is placed on the table.
4. The players draw additional cards from the face-down stack until they each have five cards. If player 1 cannot make a sum of 10 with the cards in her or his hand, player 1 keeps the six cards and does not draw additional cards until her or she has fewer than five cards.
5. The game is over when the face-down cards have been used up. The students count the number of pairs that they made, ant the student with the largest number wins. (Note: Because the game should result in every group finding the same number of pairs, everyone should win.)

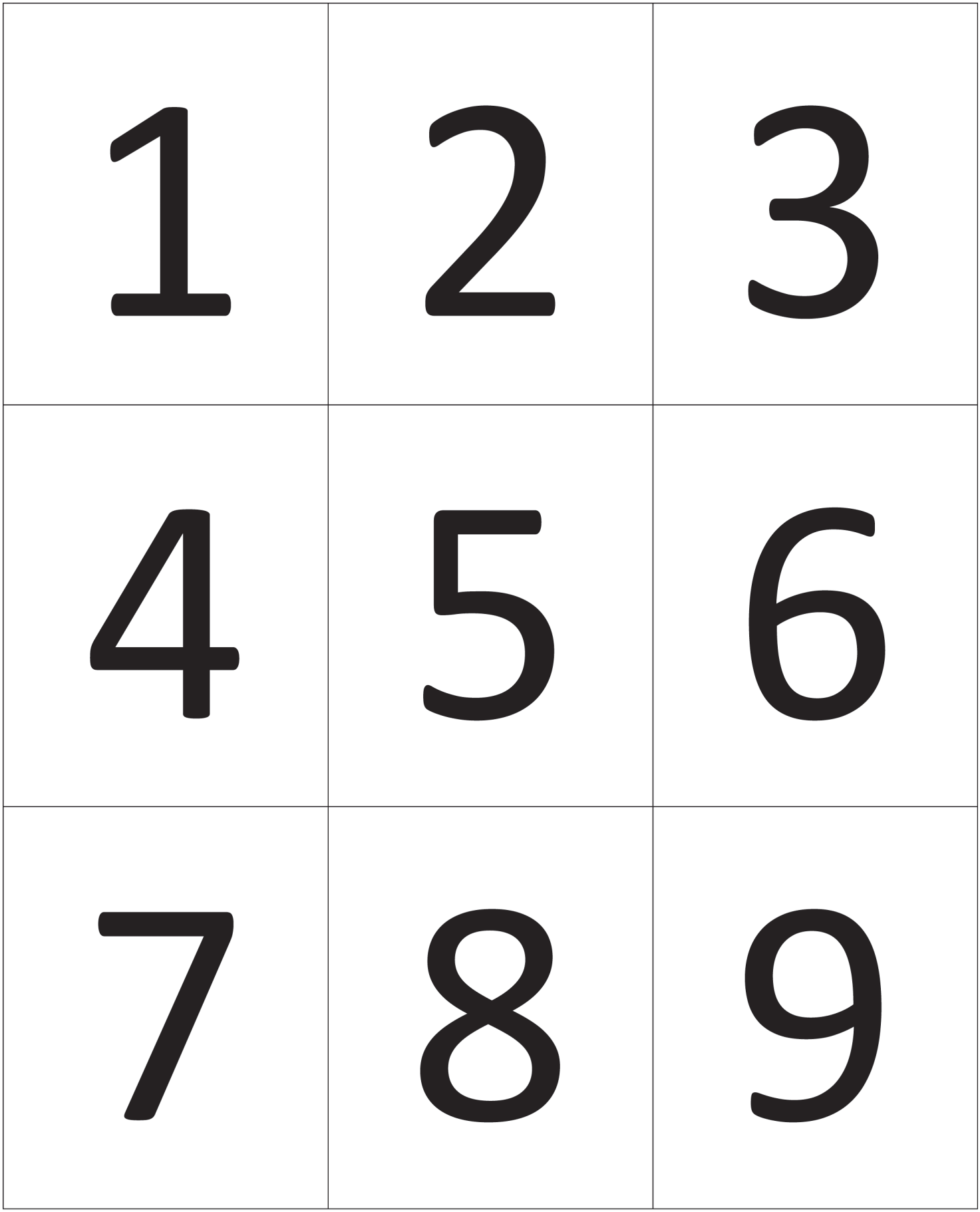
Modification: Allow students to use two or MORE cards to make a sum of 10.

Questions for Students:
Can we explain why it seems we always end up in a 'tie'?
Does everyone win if you are allowed to make sums of 10 with more than two cards? Why or why not?
Did you develop a strategy for playing?

NCTM Standard: Number & Operations

Grade level: Grades 2-4
Players: 2 or more players (4 should be max or students get bored because they have to wait too long for a turn)
Materials: Cards (4 copies of the following sheets, cut apart ahead of time)

*Thicker paper is better so that the students cannot see the numbers through the paper.



* Print 4 of these pages for each group of students.

Arithmetic Four

Rules

The players alternate turns answering questions and placing chips in the Connect Four game board. The student may only place their chip if they have answered the question correctly. If the player does not answer the question correctly, the turn goes to the next player. The first person to get four chips in a row wins!

Object: To get 4 of your pieces in a row horizontally, vertically or diagonally.

NCTM Standard: Number & Operations

Grade level: Grades 1–5
Number of players: 2
Materials: Computer (online applet) or Milton Bradley Connect Four game set with flash cards of math problems

Spin to Win!

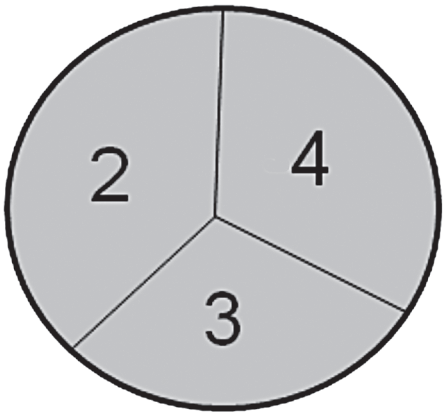
Rules

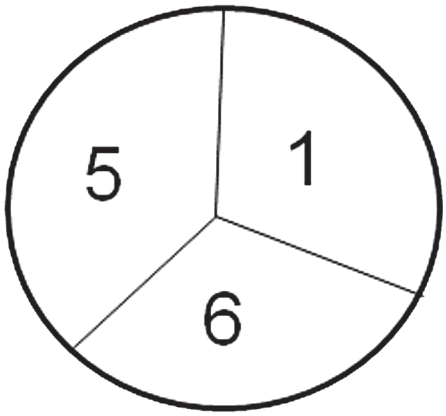
Students will fill in the 3 sections on each spinner with numbers 0 to 6. The first player spins each spinner and records the sum of the two numbers. The players alternate turns ten times. The player to get the highest cumulative score wins!

Modifications:

- The player must use subtraction and record the difference of the two numbers. The highest cumulative score after ten rounds wins!
- The player must use multiplication and record the product of the two numbers. The highest cumulative score after ten rounds wins!

Example spinners:





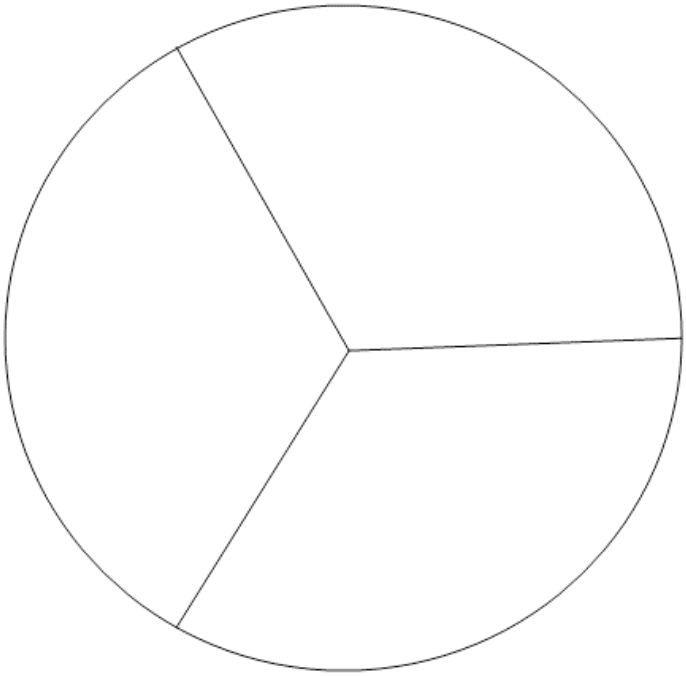
Questions for Students:

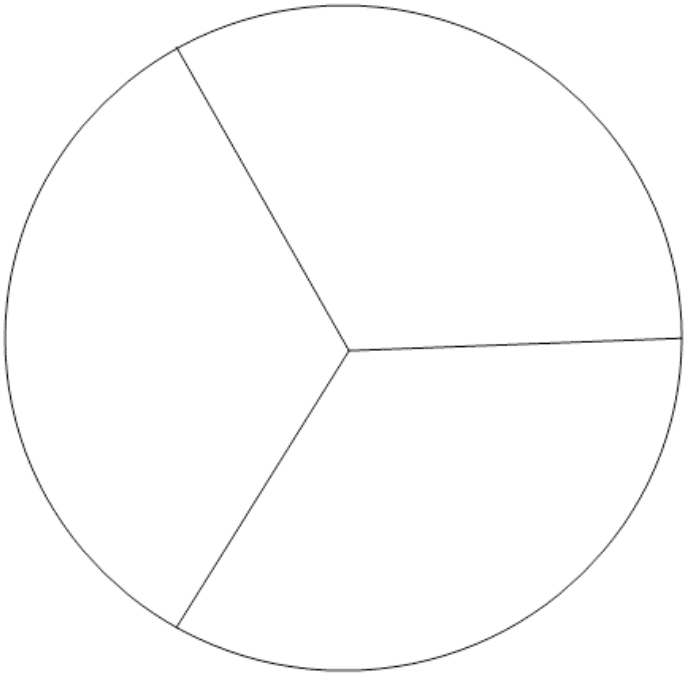
- What is the maximum amount of points you could get for one round?
- Find a combination (if possible) to end up with a score of 50 after 10 rounds.

NCTM Standard: Number & Operations

Grade level: Grades K–5
Number of players: 2
Materials: Two spinners split in 3 sections for each group or pair of students, pad of paper, pencil and paperclip (to spin)

Spin to Win!
Blank Spinners for Students





Spin to Win!
Worksheet

	Player 1	Player 2
Round 1		
Round 2		
Round 3		
Round 4		
Round 5		
Round 6		
Round 7		
Round 8		
Round 9		
Round 10		
Sum		