## Six for 600

Materials: One set of cards, 1-9, per player or a set of playing cards using A-9. The cards can be made from index cards or scraps of paper.

Purpose: Reinforce place value and addition number sense.

## Number

of Players: Any
Directions:

1. Each player shuffles his/her cards and places them face down. Each player makes a recording chart (see example below)
2. Player 1 turns over the top card. This card is not returned to the deck.
3. Player 1 decides how to use his/her card by making that card hundreds, tens, or ones.

$$
\begin{array}{ll}
\text { For example: } & \text { If } 3 \text { is turned over, a player can choose from these } \\
& \text { options for his/her first turn: } 300
\end{array}
$$

4. Each player, in turn, turns over a card from his/her own deck and does the same.
5. Continue for six rounds.
6. The player whose total for the six rounds is closest to 600 is the winner.

## Scoring Example:

| Turn | Number Formed |
| :---: | :---: |
| 1 | 20 |
| 2 | 300 |
| 3 | 90 |
| 4 | 100 |
| 5 | 80 |
| 6 | 7 |
| Total | 597 |

## Variations:

a) For younger children, use only cards digits $1-5$ and aim for 30 with 4 turns.
b) Before each game, choose a new target number.
c) After each draw, return the digit card to the deck and reshuffle the cards.


## Children's Work on 28 + 29

Make 4-6 copies and cut strategies numbers 2-7 into individual strips.

1. Two children counted in ones, using fingers.
2. $30+30=60 ; 30-29=1 ; 30-28=2$; $1+2=3$; $60-3=57$.
3. $8+9=17 ; 20+20=40 ; 40+17=57$.
4. $4 \times 10=40 ; 40+9=49 ; 49+1=50$; $50+7=57$.
5. $25+25=50 ; 4+3=7 ; 50+7=57$.
6. $20+20=40 ; 40+10=50 ; 8-1=7$;
$50+7=57$.
7. $29+10=39 ; 39+10=49 ; 49+8=57$.

NCTM, Computational Alternatives for the Twenty-first Century
Shard, Hillary B. One Year of Can. Cambridge, England: Homerton College 1987

## Children's Work and Strategies

## Children's Work on $28+29$

1. Two children counted in ones, using fingers.
2. $30+30=60 ; 30-29=1 ; 30-28=2 ; 1+2=3 ; 60-3=57$.
3. $8+9=17 ; 20+20=40 ; 40+17=57$.
4. $4 \times 10=40 ; 40+9=49 ; 49+1=50 ; 50+7=57$.
5. $25+25=50 ; 4+3=7 ; 50+7=57$.
6. $20+20=40 ; 40+10=50 ; 8-1=7 ; 50+7=57$.
7. $29+10=39 ; 39+10=49 ; 49+8=57$.

| Strategies |  |  |
| :---: | :---: | :---: |
| Name of Strategy | Examples | Problem Number |
| Using doubles | $\begin{aligned} & 20+20 \\ & 25+25 \\ & 30+30 \end{aligned}$ | $\begin{aligned} & \# 2 \\ & \# 5 \\ & \# 6 \end{aligned}$ |
| Breaking apart numbers | $28=20+8$ | \#3 |
| Putting numbers back together | $\begin{aligned} 28+29 & =(20+20)+ \\ (8+9) & =40+17=57 \end{aligned}$ | \#3 |
| Using combinations | $10=9+1$ | \#4 |
| Using friendly or benchmark numbers | $\begin{aligned} & 28 \rightarrow 30 ; 29 \rightarrow 30 \\ & 28 \rightarrow 25 ; 29 \rightarrow 25 \end{aligned}$ | $\begin{aligned} & \text { \#2 } \\ & \# 5 \end{aligned}$ |
| Using place value of 10 s | $\begin{aligned} & 29+10=39 \\ & 39+10=49 \\ & 49+8=57 \end{aligned}$ | \#7 |
| Making 9s into 10s | $8+9=7+10$ | \#6 |

## NCTM Number and Operations Standard

Instructional programs from prekindergarten through grade 12 should enable all students to--

- Understand numbers, ways of representing numbers, relationships among numbers, and number systems
- Understand meanings of operations and how they relate to one another
- Compute fluently and make reasonable estimates

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## Learning the Addition Facts

Adding 1's and 2's: $(1+1$ to $1+10$ and $2+1$ to $2+10)$ are the first facts learned.
The Doubles: $(2+2$ to $10+10)$ Children learn the doubles quite easily. They can count by 2 s , so they can use the ones they know to figure out the ones that they do not know. For instance: $6+6$ is 2 higher than $5+5.5+5$ is 10 and 2 more is 12 .

The Near Doubles: $(2+3,5+6,8+9)$ These sums are 1 more than the doubles. Children can build on their knowledge of doubles to figure them out. $5+5$ is 10 , so $5+6$ is one more, or 11. When they are give $7+6$, or one less than a double, they can think of it as $6+6+1$, which is usually easier for them than counting down.

Combinations That Make 10: $(1+9,2+8,3+7,4+6,5+5,6+4,7+3,8+2,9+1)$ Children need lots of practice with these combinations. They are the basis for many facts and mental mathematics problems. Play games with them like: How close to 10 am I? (Hold out 6 blocks - or beans - and ask that question playfully. Also, start with 10 items and take some away and ask how many are missing.

The $10+$ Combinations: $(10+2$ to $10+10)$ Children can practice this concept by using beans. Have them decide how many beans are in all when you start with a pile of 10 and a pile of 3. At first your child will count all the beans. Be patient and let them do this. The next step you will see is for your child to start at 10 and count up from there. The last process is for them to recognize that $10+3$ is 13 . Though these facts are not included in the single digit addition facts, the skill is used in learning the $9+$ combinations and the last eight facts.

The $9+$ Combinations: $(9+2$ to $9+10)$ These are fun once your child has mastered the 10 + combinations. Some children think of these as one less than the $10+$ combinations. Others take the numbers apart and think of $9+6$ as $9+1+5$. They subtract 1 from the 6 to use to make the 9 a 10. Now they can do $10+5=15$.

The Last Eight: $(5+3,6+3,7+4,7+5,8+3,8+4,8+5$, and $8+6)$ After children have learned the facts above, only eight more facts remain: the ones listed. The idea of taking apart numbers (from tonight's workshop) is very helpful here. If a child knows his/ her doubles, then $5+3$ is the same as $4+4$, taking 1 from the 5 and giving it to the $3.7+4$ is $7+3+1$, so it is 1 more than 10 , or 11 .

Counting On: (8 + 3 is done by counting up from eight: 9-10-11) One Method to use with some of "The Last Eight" is "Counting On". Counting on seems like a simple method used by young children. It is actually a very effective method for adding and is used by most adults in combination with other strategies. When children first start counting on, they will start with the first number and count on with the second number: $3+5$ : counting up from 3: 4-5 - 6-7-8. Later they learn to start with the largest of the two numbers and count on from it. This would be taking $3+5$, realizing that 5 is the larger number, and counting on from 5: 6-7-8. Counting on can be used with other strategies like the 9+ combinations.

| 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 |
| 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 |
| 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 |
| 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
| 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
| 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 |
| 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 |
| 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
| + | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |

## Five Pieces in a Row

Materials: 2 colors of beans or counters, game board, deck of cards - use only five cards with this first game board (use the ace as 1).

Purpose: To practice combinations of numbers.
Number of Players: 2 Ages: 5+

## Directions:



1. Draw cards to see who goes first. The highest card goes first.
2. Mix the cards and then turn them upside down to form a draw pile.
3. Player \#1 draws three cards and lays them face up in front of him.
4. Player \#1 chooses two cards to add so that the sum of the two cards will match a number that he wants to claim .
```
Example: He draws 3,2 and 4
    He can make 3+2=5 and claim a five on the gameboard.
    He can make 2+4=6 and claim a six on the gameboard.
    He can make 3+4=7 to claim the seven on the gameboard.
```

Player \#1 places a chip, counter, or bean on the number that he is claiming on the gameboard.
5. Player \#2 then draws three cards and lays them face up in front of him. He decides which two cards to add and claims his number on the gameboard by placing a counter on the number. Place the cards in a discard pile.
6. Play continues in this fashion until one player has five numbers in a row, vertically, horizontally or diagonally.

Variation: Use cards numbered 1-10, 4 of each, and create a new board with the numbers from 2 to 20 , repeating the numbers $8,9,11$, and 12, and put in a total of three 10's. The game now becomes a fun way to practice the addition facts, but don't tell anyone!

Note to parents: It is fun to play this game as a team also with you and your child playing together to get one group of five numbers in a row, keeping track of how many turns you take together to accomplish the task. Children may use the symbols on the cards in order to add.

## Game Board

Five Pieces in a Row!

| 2 | 9 | 4 | 5 | 6 |
| :--- | :--- | :--- | :--- | :--- |
| 3 | 5 | 5 | 7 | 7 |
| 4 | 4 | 6 | 6 | 8 |
| 5 | 8 | 7 | 6 | 7 |
| 6 | 9 | 8 | 3 | 10 |

## Advanced Game Board

Five Pieces in a Row!

| 2 | 9 | 14 | 11 | 10 |
| :---: | :---: | :---: | :---: | :---: |
| 13 | 5 | 15 | 17 | 10 |
| 4 | 12 | 20 | 6 | 18 |
| 10 | 8 | 7 | 16 | 11 |
| 10 | 19 | 9 | 3 | 10 |

## The Sum to Game

## Mathematics Focus: Number Sense

Materials: Cards numbered from 2 to 12, face down (These can be made with index cards) 1-10 Game Board for each player (This can be drawn on paper) 10 Game markers for each player (can be beans, buttons, coins, etc.)

Players: 2 or more
Ages: 7+
Directions: The object of the game is to be the first to cover the 1-10 game board or have the most numbers covered on the board.


1. Each player draws a card and has two options for placing his/her game markers on the game board. If a 9 is drawn, a player could do one of the following:
a) Place a marker on the 9
b) Place markers on a combination of numbers whose sum is 9 ( 5 and 4,3 and 6 , or even 5,3 , and 1, for example)
c) The used cards are discarded to the side.
d) See sample plays.


| Player 1 |  |
| :---: | :--- |
| Draw | Covered |
| 9 | $5,3,1$ |
| 6 | 2,4 |
| 3 | No play <br> available |

2. The game is over when one player completely covers his/her board or the number cards are all used.
3. A player may pass if he/she sees no move.

The game can also be played using different variations based on the age and/or skill level of the players. The variations may require the use of different materials.

Variation 1: (Develops number sense and fluency with numbers 1-18). This game should be played using 1 - 20 on the game board. Use 22 number cards ( 2 of each number from 2 to 12). Players draw 2 number cards at a time and use the sum of their numbers to fill their game boards. Otherwise the rules are the same.

Variation 2: This game should be played on a shared game board. Using 2 colors of markers, each of the players draws a card and covers as many numbers as he/she would like as long as they equal the sum drawn.


## Aim for Fifty

Materials: One set of digit cards*. 0-9, for each player. These can be made from index cards or scraps paper.

Purpose: Reinforce number sense for addition and subtraction of two-digit numbers.

Number of Players: Any Ages: 8+

## Directions:



1. Each player shuffles his/her digit cards then turns over four cards.
2. Each player arranges his/her four cards to form two two-digit numbers whose sum or difference is as close to fifty as possible.

Example: If a player turns over 4, 6, 3, 2 they might consider the following arrangements:

| 46 | 64 | 36 | 63 |
| :--- | ---: | ---: | ---: |
| +23 |  |  |  |
| 69 | $\frac{-23}{41}$ | +24 | -24 |
| 60 | 39 |  |  |
| closest this player can get to 50 is 41 (off by 9 ). |  |  |  |

3. The player whose sum or difference is closest to fifty (50) wins that round.
4. The winner is the first player to win 6 rounds.

## Variations:

a) Before players choose their cards for each round, choose a new target number for that round. Change target numbers for each round.
b) Give each player a set of 20 digit cards: two cards each of 0-9.
c) Play the game with three cards and form a two-digit by one-digit multiplication problem. Aim for 150 (or another three digit number).
*Note: Playing cards A-9 and $Q$ can be used as digit cards if $A=1$ and $Q=0$. (All other cards stand for their face value.)

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## Game Reflection



What do you think will be hard for your child with this game? What will be easy?

# What would your children learn by playing this game? 

## What strategies do you think they would use?

## Tic-tac-toe

Materials: Paper and pencil
Purpose: Practice finding sums mentally.
Number of Players: Two Ages: 7+

## Directions:

1. Draw a regular Tic-tac-toe grid.
2. Write the even and odd number 1-10 under the grid as show below.
3. One player uses even numbers, the other uses odd numbers.
4. Player 1 writes a number of his/her type (even or odd) in the grid. Player 1 crosses off the number used.
5. Player 2 does the same.
6. The winner is the player who completes a Tic-tac-toe (three in a row, vertically, horizontally or diagonally) with a sum of 15 .
7. Sample play in series:


Even wins because even placed the winning 10 in the row.
Written by Linda Griffin, 12/20/00

## Tic-tac-toe Game Board



## Find the Bean

Materials: 10 paper cups numbered one to ten and 1 bean


Purpose: To develop sense of relationships of numbers, to develop logic.

Number of Players: 2 or more Ages: 5+

## Directions:

1. One person hides a bean under a cup.
2. The other person guesses which numbered cup covers and the bean.
3. If a player guesses the wrong number (for instance 7), the hider states, "The bean is found under a number that is higher (lower) then 7."
4. The player(s) then guesses another number.
5. The round continues until someone guesses the location of the bean.
6. The next round, someone else hides the bean.

Note to parents: Take this opportunity to discover your child's thinking. Resist the temptation to teach strategies, just enjoy the fun of the game. It takes several times of playing the game before children think about strategy, so wait several rounds before you ask your child to talk about their strategy. Too many questions can take away the fun of the game. As you play the game more, watch your child's strategy become more advanced.

## What's in My Hand

Materials: 5 counters or beans
Purpose: To practice combinations of numbers
Number of Players: 2 Ages: 5+


## Directions:

1. The first person takes the 5 beans and splits them so that some are in one hand and some are in the other (for instance, 3 in one hand and 2 in the other).
2. The first person closes both hands and puts them in front of him with his knuckles up.
3. The second player chooses a hand, and the first person opens that hand revealing how many beans are in it.
4. The second player then guesses how many beans are in the other hand.
5. The next time the second player hides the beans in their hands.

Note to parents: Keep everything lighthearted in this game. The first combinations to work with are combinations that make 5. When this becomes too easy for your child, increase the number of beans to $6,7,8$, etc. One of the benchmarks that is very useful for children is to know the combinations that make 10.


[^0]:    Written by Linda Griffin, 12/20/00

