

# Math for the Fun of It!



## A Compendium of Math Games for Kivalliq Schools



Keewatin Math Committee  
Nunavut High School Project



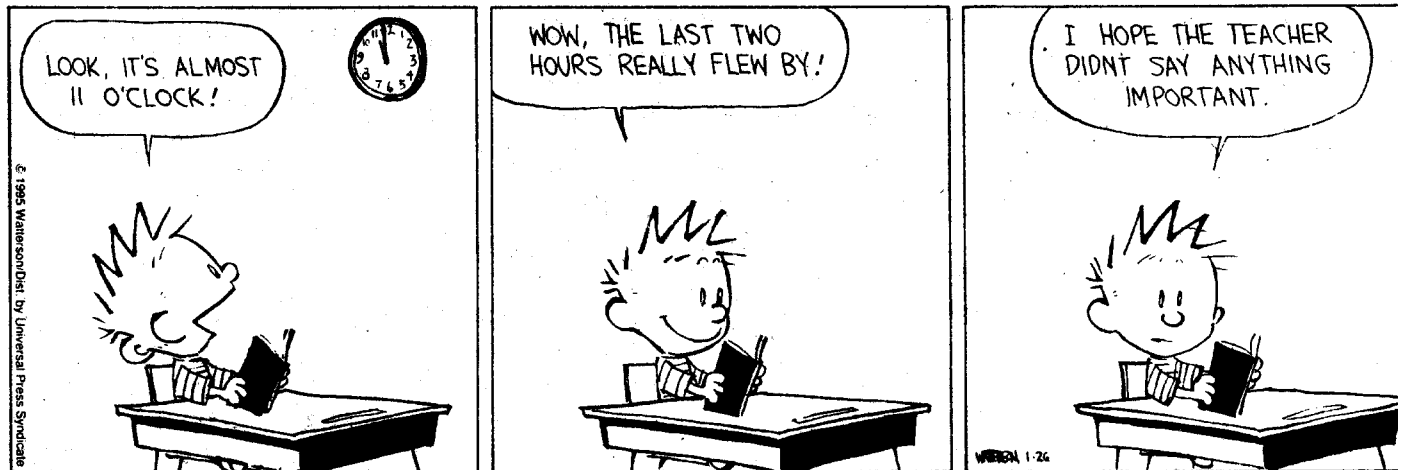
## **Acknowledgements**

These activities and demonstrations were selected, developed and presented at the Kivalliq Teachers' Conference (Rankin Inlet, 1998) by the Kivalliq Math Committee of the Nunavut High School Project.:

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## Preface

November is Numeracy Month and this resource is being reissued to support schools in raising the profile of math and numeracy. This resource was originally created in 1998 for a presentation at the Kivalliq Teachers' conference in Rankin Inlet.



Time flies when your having fun and in most cases a lot of learning can take place as well. Math games give students an opportunity to "play with concepts" and in some cases, the manipulatives help them to achieve a concrete understanding. Most often a math game would be used to reinforce concepts that have already been learned, but sometimes they can be used to introduce concepts.

Math games are not a cure-all. Bellwork, drill, worksheets, centers, board work and homework are all necessary but the appropriate use of math games is sound pedagogy. However, the greatest reason for using math games in your classroom is that they are fun and help students to develop positive attitudes towards math and numeracy. This booklet contains ideas for making math fun and promoting numeracy in November and all year long.

## Table of Contents

1	Making Necklaces.....	3
2.	Sandwiches .....	4
3.	Place Value Comparisons.....	5
4.	Odd or Even .....	6
5.	Place Value Wars .....	7
6.	You Take the High Road .....	8
7.	Hundreds Chart Tic Tac Toe .....	9
8.	What's Your Number .....	10
9.	Decimal Dots .....	11
10.	Addition War .....	12
11.	Subtraction War.....	13
12.	Addition Snap .....	14
13.	Subtraction Snap .....	15
14.	Let it roll.....	16
15.	Family Fact Feud.....	17
16.	It's a Fact Snap.....	18
17.	Doubles Snap .....	19
18.	Double Trouble.....	20
19.	The 18 <sup>th</sup> Hole.....	21
20.	Complimentary Fish.....	22
21.	To Sum it Up.....	23
22.	Count Down.....	24
23.	Rolling Along.....	25
24.	Twenty One .....	26
25.	Road Rally .....	28
26.	Arrange the Blocks .....	29
27.	Broken Squares.....	30
28.	Toilet Paper Math .....	32
29.	Integer Addition War.....	34
30.	Integer Multiplication Snap .....	35
31.	Exponent Snap .....	36
32.	Exponent War.....	37
33.	Battleship.....	38
34.	Fraction Race .....	40
35.	Foiled Again.....	42
36.	Countdown (Easy Nim).....	47
37.	Nim .....	49
38.	Target Practice .....	52
39.	Fox and Geese.....	54
40.	Mancala.....	56

## MAKING NECKLACES

(J. Currah, J. Felling, C. MacDonald (1989). Box Cars and One-Eyed Jacks, Volume 2. J Mac Publishers.)

**Grade Level:** K-1

**Math Skills:** • 1-1 correspondence, adding, subtracting, patterns

**Players:** 1 or 2

**Materials:** • Cereal such as Cheerios or Fruit Loops, string, die

**Procedure:**

1. The goal of this activity is for students to build themselves a "cereal necklace". The student rolls a die and determines the value. If the student rolls a three, the student takes three pieces of cereal and strings them. Players get ten rolls to complete their necklaces (to keep track of rolls we use cubes or tally). After their necklace is complete a helper ties it around their neck.
2. Next comes the subtraction "take away" part that they love. Each student gets ten rolls. They roll the die and determine the value. They can then eat that many pieces off their necklace.
3. Children enjoy this activity! It is interesting to have children compare necklaces and adding/subtracting experiences.

**Teachers' Note:**

Students who have difficulty counting and do not as yet know their numbers from 1 to 6 may still enjoy this activity. Encourage them to make the same pattern with the Cheerios or Fruit Loops that they see on the dice. Once the pattern is completed, they can put the loops onto their necklace.



## PLACE VALUE COMPARISONS

(J. Currah, J. Felling, C. MacDonald (1989). Box Cars and One-Eyed Jacks, Volume 2. J Mac Publishers.)

**Grade Level:** 2-6

**Math Skills:** • Comparing two numbers, odd and even

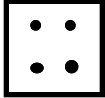
**Players:** 2 or more

**Materials:** • Cards (Ace=1 ) -9, die

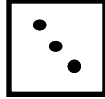
**Procedure:**

1. The deck is placed face down. Each player turns over two cards from the deck and makes a two digit number. The die is rolled by one player. If the roll is even, the bigger number scores. If it is odd, the smaller number scores.

Example:

	Player 1	Player 2
	7 3	5 4

is even and therefore player one scores one point.

	Player 1	Player 2
	5 8	1 9

is odd and therefore player two scores one point.

The first player to score ten points is the winner.

**Variation:**

1. Each player takes three cards and players compare three digit numbers.

## ODD OR EVEN

(J. Currah, J. Felling, C. MacDonald (1989). Box Cars and One-Eyed Jacks, Volume 2. J Mac Publishers.)

**Grade Level:** 1 - 3

**Math Skills:** • Addition to ten, odd and even

**Players:** 2 or more

**Materials:** • Each player cards (Ace =1) -10  
• 2 dice

**Procedure:**

1. Each player arranges their cards as follows

1	3	5	7	9
2	4	6	8	10

2. Before players begin they predict which set of numbers they will eliminate first: either the odd or the even set. Players then take turns rolling one or two dice and begin eliminating sums of their rolls.

Example:                      Roll 2 and 4: remove 6  
                                      Roll 5 and 3: remove 8

3. Players continue to take turns until one player has removed all of their cards. They receive 10 points for doing so. If the player also made a correct prediction (odd or even set first) then they earn an additional 5 points. Play continues to 50 or 100 points.

**Variation:**

1. Encourage players to add or subtract the dice before removing cards. Have players remove up to two cards per roll.



## PLACE VALUE WARS

(J. Currah, J. Felling, C. MacDonald (1989). Box Cars and One-Eyed Jacks, Volume 2. J Mac Publishers.)

**Grade Level:** 2 - 6

**Math Skills:** • Identification of two digit number, comparing and place value

**Players:** 2

**Materials:** • Cards (Ace = 1) - 9

### Procedure:

1. Players divide cards evenly between themselves. Each player turns over two cards. The first number turned over is the tens digit and the second is the ones. Both players call out their numbers (you may have them verbalize "six tens and two ones equals sixty-two"). The player with the largest number gets all cards.
2. In the event of a tie (i.e. each player has the same number) WAR is declared. First, each player places three cards face down. Then, each player turns over two more cards and adds this second number to the first. The player with the largest sum gets all of the cards. Play continues until one player has collected all of the cards.

Example: Player 1: 6,8 becomes 68  
Player 2: 7,2 becomes 72 Player 2 wins & collects the four cards

Player 1		Player 2
4,3 = 43		4,3 = 43
-----	(three cards	-----
-----	face down)	-----
-----		-----
6,2 = 62		1,9 = 19
105		62

Player 1 wins and collects all of the cards.

### Variation:

1. Players turn over three cards and build numbers into the hundreds.
2. Grade 2: have players just compare second number instead of finding sum.

# YOU TAKE THE HIGH ROAD

(J. Currah, J. Felling, C. MacDonald (1989). Box Cars and One-Eyed Jacks, Volume 2. J Mac Publishers.)

**Grade Level:** 3 - 6

**Math Skills:** • Four-digit place value, comparing numbers

**Players:** 2

**Materials:** • Cards (Ace = 1) - 9  
• die  
• paper & pencil

**Procedure:**

1. One player rolls the die to determine if players will build the smallest or largest number.

odd roll = smallest number

even roll = largest number

2. Players then draw four cards each and make their numbers. They then verbalize their numbers to their opponents.

Example:

Even Roll - largest number

Player 1: 2 4 6 1  
makes 6421

Player 2: 3 5 1 9  
makes 9531

3. Players compare numbers. Player two has the largest and scores a point. Players continue to alternate turns until a set number of points is reached. (usually 10 or 20)

**Variation:**

1. Play with larger groups. Challenge players to use six cards each for numbers in the 100 000s.

## HUNDREDS CHART TIC TAC-TOE

(J. Currah, J. Felling, C. MacDonald (1989). Box Cars and One-Eyed Jacks, Volume 2. J Mac Publishers.)

**Grade Level:** 2 - 6

**Math Skills:** • Identification of place value 1- 100

**Players:** 2

**Materials:** • hundreds chart  
• cards (Ace = 1) - 9  
• paper, pencil  
• bingo markers, paper or beans (2 different colours/kinds)

### Procedure:

1. Players select a colour of marker. The goal of the game is for a player to get three or more of their markers in a row either vertically, horizontally or diagonally.
2. Player number one begins by drawing two cards and making a two-digit number. Player number one then verbalised tens number to their partner: i.e. draw 6,3 and says "six tens and three ones equals sixty-three". Player number one then covers this number with their marker Then this player verbally gives the other number that they can make with their two cards (i.e. thirty-six) and covers that number. Player number two then takes a turn, drawing two cards and covering both numbers, remembering to verbalize the tens and ones place value to the other player.
3. Play continues until one player gets three or more of their markers in a row. When this happens, this player scores two points for each marker in a row (i.e. six points for three in a row, eight points for four in a row, and so on).
4. Players can also steal an opponent's space. When a player makes a number already occupied by their opponent, they can replace it with their own marker. For each number stolen, they receive five points.
5. If a player draws two cards that they have already drawn, two new cards may be taken.
6. Players can play until a set time limit is reached or they reach a certain number of points.

# WHAT'S YOUR NUMBER?

(J. Currah, J. Felling, C. MacDonald (1989). Box Cars and One-Eyed Jacks, Volume 2. J Mac Publishers.)

**Grade Level:** 4 - 6

**Math Skills:** • Four-digit place value, decimal place value

**Players:** 3 or more

**Materials:** • Cards (Ace = 1) - 9

**Procedure:**

1. Each player needs to make a chart as follows:

1000	100	10	1	0.1	0.01
				•	

2. The goal is to create the largest number possible. The deck is placed face down. The first player draws a card and places it face up. All players must write this number down on their game board. Players may choose any place value position on their board. Players continue drawing five or more cards and filling in their boards consecutively. The player with the biggest number earns ten points. Play to 100.

Example:

	1000	100	10	1	0.1	0.01
Player 1	7	6	1	8	• 4	2
Player 2	5	9	6	1	• 1	3

Player 1 scores 10 points.

## DECIMAL DOTS

(J. Currah, J. Felling, C. MacDonald (1989). Box Cars and One-Eyed Jacks, Volume 2. J Mac Publishers.)

**Grade Level:** 4 - 7

**Math Skills:** • Identifying and comparing decimals

**Players:** 2 or more

**Materials:** • Cards (Ace = 1) -10 (10=0)

**Procedure:**

1. Each player takes two cards and arranges their cards to make a two digit number. The object is to make the largest number. The black cards represent whole numbers and the red cards represent decimals.
2. For example, if player number one turned over a red six and a black nine the number would be 9.6. If player number two turned over a red seven and a red two the number would be .72.

Player number one would earn one point for having the larger number.

3. The first player to score ten points is the winner.

# ADDITION WAR

(J. Currah, J. Felling, C. MacDonald (1989). Box Cars and One-Eyed Jacks, Volume 2. J Mac Publishers.)

**Grade Level:** 1 - 3

**Math Skills:** • Addition

**Players:** 2

**Materials:** • Grade 1 - 2: cards (Ace = 1) - 5  
 • Grade 2 - 3: cards (Ace = 1) - 9

**Procedure:**

1. Players divide cards evenly between themselves. Each player turns over two cards and adds them together. The highest sum gets all of the cards.
2. In the event of a tie (i.e. each player has the same sum), WAR is declared. Each player deals out three more cards face down and then turns over two more cards. These two cards are added together. The highest sum wins all of the cards. Play continues until one player has collected all of the cards.

Example:	Player 1		Player 2
	2 + 3 = 5		4 + 1 = 5
	-----	War is declared!	-----
	-----	(three cards	-----
	-----	face down)	-----
	4 + 3 = 7		6 + 2 = 8

Player 2 collects all of the cards.

**Variation:**

Vary the number of cards to modify the level of difficulty.

Example:	23		534
	+6	OR	+43
	Three cards/player		Five cards/player

## SUBTRACTION WAR

(J. Currah, J. Felling, C. MacDonald (1989). Box Cars and One-Eyed Jacks, Volume 2. J Mac Publishers.)

**Grade Level:** 1 - 3

**Math Skills:** • Subtraction

**Players:** 2 of equal skill level

**Materials:** • Cards (Ace = 1) -10

**Procedure:**

1. Players divide cards evenly between themselves. Each player turns over two cards and subtracts the smaller number from the larger number. The player with the smallest difference wins all four cards
2. In the event of a tie (i.e.. both players have the same answer), WAR is declared. Each player deals out three more cards face down, and then turns over two more cards. Subtraction is performed. The player with the smallest difference wins all of the cards. Play continues until one player has collected all of the cards.

Example:	Player 1	Player 2
	$9 - 1 = 8$	$7 - 2 = 5$

Player 2 collects all four cards.

Example:	Player 1	Player 2
	$5 - 3 = 2$	$6 - 4 = 2$
	-----	-----
	War is declared!	-----
	(three cards	-----
	face down)	-----
	-----	-----
	$4 - 3 = 1$	$6 - 2 = 4$

Player 1 collects all of the cards.

**Variation:** Vary the number of cards to modify the level of difficulty.

Example:	$27$	OR	$239$
	$- 3$		$- 42$
	Three cards/player		Five cards/player

## **ADDITION SNAP**

(J. Currah, J. Felling, C. MacDonald (1989). Box Cars and One-Eyed Jacks, Volume 2. J Mac Publishers.)

**Grade Level:** 2 - 6

**Math Skills:** • immediate recall of addition facts to 18

**Players:** 2 of equal skill level

**Materials:** • Cards (Ace = 1) -9

**Procedure:**

1. Players divide the cards evenly between themselves. Next, each player turns over a card at the same time. Players add the two together as quickly as possible and say the sum out loud.
2. The player who gives the correct answer first collects both cards. Play continues until one player collects all of the cards.
3. In the event of a tie, players leave their cards down and let the pile build. Play resumes until one player gives a correct sum before the other and takes all of the accumulated cards.





## LET IT ROLL

(J. Currah, J. Felling, C. MacDonald (1989). Box Cars and One-Eyed Jacks, Volume 2. J Mac Publishers.)

**Grade Level:** 3 - 6

**Math Skills:** • Addition

**Players:** 2 or more

**Materials:** • 2 dice  
• paper& pencil  
• Gameboard (as below)

2    3    4    5    6    7    8    9    10    11    12

**Procedure:**

1. Player number one rolls the dice and adds them together. He or she then crosses off the number rolled (i.e.. the sum of the two dice) from his gameboard. Only one number can be crossed off, no combinations are allowed.
2. Player number two then takes a turn. If a player rolls a number already crossed off that player is out. Play continues until all players are out or if one player gets all of their gameboard crossed off.
3. To determine the winner each player adds up the remaining numbers on their gameboard. The player with the lowest sum is the winner.

## FAMILY FACT FEUD

(J. Currah, J. Felling, C. MacDonald (1989). Box Cars and One-Eyed Jacks, Volume 2. J Mac Publishers.)

**Grade Level:** 3 - 6

**Math Skills:** • Addition facts to 18

**Players:** 2

**Materials:** • Cards (Ace=1) - 9

### Procedure:

1. Players decide (or the teacher directs) the particular fact to practice (ie. +3, +4, +9, etc.). Once the constant addend is determined that card is placed between the two players. Players then divide the cards evenly between themselves. Each player turns over one card and adds that card to the constant addend in the middle. The player with the highest sum collects both cards (players must verbalize the math sentence).

Example:

Player 1		Player 2
5	+7	8
"5 plus 7 equals 12"		8 plus 7 equals 15"

Player two would collect both cards.

2. In the event of a tie (ie. both players have the same sum) each player deals out three more cards face down and then turns over a card. The turned over card is then added to the addend. The highest sum wins all of the cards. Play continues until one player has collected all of the cards.

Example:

Player 1		Player 2
6	+7	6
"6 + 7=13"		"6 + 7=13"
____(three cards face down)____		
____		____
____		____
8		4
"8 + 7 = 15"		"4 + 7 = 11"

Player one collects all of the cards.

## IT'S A FACT SNAP

(J. Currah, J. Felling, C. MacDonald (1989). Box Cars and One-Eyed Jacks, Volume 2. J Mac Publishers.)

**Grade Level:** 3 - 6

**Math Skills:** • Immediate recall of addition fact families

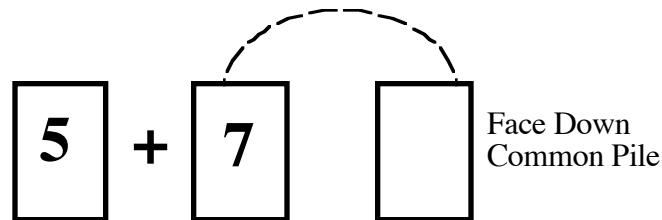
**Players:** 2 of equal skill level

**Materials:** • Cards (Ace=1) - 9

**Procedure:**

1. The object of this game is to practice recall of basic facts. If practice is required for one fact in particular, this game allows for such repetition.
2. Players decide (or teacher directs) the particular fact to practice (example: +12, +15, +9, +7, etc.). Once the constant addend is determined, that card is placed between the two players.
3. One player turns a card over from the common pile and puts it by the constant number. For example working on +5.

Example :



The players add the two cards together. The first player to say the correct sum out loud collects the card. Play continues until one player collects all of the cards.

4. In the event of a tie, players leave the card and let the pile build. Play continues until one player gives a correct answer out loud before the other and takes all of the accumulated cards.

## DOUBLES SNAP

(J. Currah, J. Felling, C. MacDonald (1989). Box Cars and One-Eyed Jacks, Volume 2. J Mac Publishers.)

**Grade Level:** 2 - 6

**Math Skills:** • Addition facts to 18

**Players:** 2 of equal skill level

**Materials:** • Cards (Ace=1) - 9

**Procedure:**

1. A common pile of cards is placed between the two players. A card is turned over and the players double it to find the sum (ie. if a 5 is turned over the correct answer is 10). The first player to say the correct answer out loud collects the card. Play continues until one player collects all of the cards.
2. In the case of a tie (ie. both players give answers at the same time), the card is left on the table and play continues until one player says the correct answer before the other and collects all of the accumulated cards.

**Variation:**

1. To solidify the rule of double plus one, have players double and then add one to find the answer.

Example:

If a 7 is turned over the correct answer is 15  
(7 + 7 + 1 = 15)

**Note:**

Once students have learned the doubles, related families can be learned such as the doubles plus one, doubles take away one, etc.

## DOUBLE TROUBLE

(J. Currah, J. Felling, C. MacDonald (1989). Box Cars and One-Eyed Jacks, Volume 2. J Mac Publishers.)

**Grade Level:** 3 - 6

**Math Skills:** • Adding and subtracting to 18, adding double digits

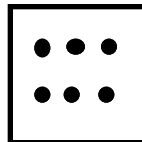
**Players:** 2 of equal skill level

**Materials:** • Cards (Ace=1) - 9  
• die

**Procedure:**

1. A common pile of cards is placed between the two players. A card is turned over and the players double it to find the sum. The die is rolled and the smaller number is subtracted from the larger.

Example:



$$4 + 4 = 8 - 6 = 2$$

2. The first player to say the answer out loud collects the card. Play continues until the common pile is finished. The player with the most cards is the winner.
3. In the event of a tie (ie. players give the same answer at the same time), the card is left down to let the pile build. Play resumes until one player says the correct answer before the other and takes all of the accumulated cards.

## THE 18th HOLE

(J. Currah, J. Felling, C. MacDonald (1989). Box Cars and One-Eyed Jacks, Volume 2. J Mac Publishers.)

**Grade Level:** 3 - 6

**Math Skills:** • Multiple addend addition

**Players:** 2 or teacher vs. whole group

**Materials:** • 3 dice for each player  
• gameboard for each player (see below)

3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18

X X X

### Procedure:

1. Player number one rolls all three dice and adds them together. Player crosses off the number rolled on their gameboard (ie.  $6 + 6 + 3 = 15$ , 15 is crossed off). Only one number can be crossed off and no combinations are allowed.
2. Player number two may then take a turn. If the player rolls a number already crossed off the player receives a strike X. Players continue to alternate turns. The game ends when all players have struck out (three strikes) or when one player gets his entire game board crossed off.
3. Scoring for Grade 3: If both players strike out, the player with the most numbers crossed out wins.
4. Scoring for Grades 4 and up: Players total the numbers left uncrossed. The smallest number wins.

### Variation:

1. To increase the difficulty, players may cross off combinations and use both addition and subtraction.

## COMPLIMENTARY FISH

(J. Currah, J. Felling, C. MacDonald (1989). Box Cars and One-Eyed Jacks, Volume 2. J Mac Publishers.)

**Grade Level:** 2 - 6

**Math Skills:** • Adding and subtracting combinations

**Players:** 3 or more

**Materials:** • Cards (Ace=1) - Q (J=11, Q=12)

**Procedure:**

1. Deal five cards to each player. The remaining cards are placed face down in a deck.
2. Dealer chooses which fact family they will work on in the first round. If the dealer calls out "sevens" then all players are trying to find combinations that total seven.
3. Player number one looks at their cards and looks for combinations or possible combinations for 7. For example, they may ask another player if they have a five to add to their two. If so, the player collects it and lays down these two cards. Two cards are drawn from the deck to replenish their hand. Player may continue their turn until unsuccessful in finding a match.
4. Player number two then takes their turn. For example, they may ask for an eight to combine with an Ace for a difference of seven. If that player does not have an eight then player number two must "Go Fish" and draw another card from the deck.
5. The next player may now proceed.
6. Play continues until all the cards have been used. Players count up their combinations and the player with the most combinations is the winner.



## TO SUM IT UP

(J. Currah, J. Felling, C. MacDonald (1989). Box Cars and One-Eyed Jacks, Volume 2. J Mac Publishers.)

**Grade Level:** 3 - 6

**Math Skills:** • Adding 3 digit numbers

**Players:** 2 or more, or teacher vs. whole group

**Materials:** • Cards (Ace=1) - 10 (10=0)  
• one gameboard for each player

**Procedure:**

- The object of this game is to make the greatest sum. The deck is placed face down. A card is drawn and is placed face up. Each player selects a space on their gameboard and writes the number of this card in it. Eight more cards are drawn and players proceed to fill in their gameboards. Once all spaces are filled in, players complete the addition. The player with the greatest sum is the winner of that round and scores one point. As players have more experience with this game, they will develop strategies to maximize their chances.

Player 1	Player 2	Player 3																											
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**Example:**

First card turned over is a 5. Second card turned over is a 7. Seven more numbers are drawn and completed gameboards could look like this:

Player 1	Player 2	Player 3																											
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+	+	+																											
1 2 1 4	2 3 3 9	2 4 2 0																											

Player 3 has the greatest sum and is the winner for this round.

- In the event of a tie, each player receives one point.
- The winner is the player with the most points after a set number of rounds or a set time limit.

## COUNT DOWN

(J. Currah, J. Felling, C. MacDonald (1989). Box Cars and One-Eyed Jacks, Volume 2. J Mac Publishers.)

**Grade Level:** 3 - 6

**Math Skills:** • Subtraction of two and three-digit numbers

**Players:** 2 or more

**Materials:** • Cards (Ace=1) -10 (10=0),  
• paper, pencil

**Procedure:**

1. Players turn over two cards each to make a two digit number. Players may choose which card is the ten's number and which is the one's. This number is subtracted from the beginning number of one thousand.
2. Players continue alternating turns and subtracting their two digit number from the previous difference.
3. A player may receive an extra turn if their difference ends in a zero or a double figure, ie. 466.
4. The first player to reach zero is the winner.

Player 1

$$\begin{array}{r} 1000 \\ - 63 \\ \hline \end{array}$$

$$\begin{array}{r} 937 \\ - 37 \\ \hline \end{array}$$

$$\begin{array}{r} 900 \\ \hline \end{array}$$

ect.

Player 2

$$\begin{array}{r} 1000 \\ - 21 \\ \hline \end{array}$$

$$\begin{array}{r} 979 \\ - 75 \\ \hline \end{array}$$

$$\begin{array}{r} 904 \\ \hline \end{array}$$

ect.

## ROLLING ALONG

(J. Currah, J. Felling, C. MacDonald (1992). Box Cars and One-Eyed Jacks: Special Games with Special Dice, Volume 3. J Mac Publishers.)

**Grade Level:** K-1

**Math Skills:** • Number recognition, number matching

**Players:** 2 - 4

**Materials:** • 1 twelve-sided die  
• paper & pencil

**Procedure:**

1. Each player makes a game board as follows:

1 2 3 4 5 6 7 8 9 10 11 12

X X X

2. The object is for each player to cross off all their numbers on their game board. Player one rolls the die and crosses off that same number on their game board. Player two then takes a turn. Players continue to alternate turns. If a player rolls a number that has already been crossed off, they earn a strike. Three strikes and a player is out and can not continue rolling.
3. The game ends when all players are out, or one player gets all of their game board crossed off. If all players strike out, the player with the most numbers crossed off is the winner.

**Variation:**

1. Use a 20-sided die and have a game board 1-20.

## Twenty One

**Grade Level:** 9-12

**Math Skills:** • Probability

**Players:** 2

**Materials:** • Cards (complete deck)

**Procedure:**

1. The objective of this game is to get closer to 21 than the dealer. Face cards are worth 10, number cards are worth their face value, aces are worth 1 or 11.
2. Deal each player and dealer one card face down and one card face up. Each player and the dealer may look at their face down card.
3. At this point each player may choose to take another card or hold. If they go over 21 they must declare it and are counted as losing this round. Continue to hand out cards until every one including the dealer is holding.
4. The dealer will take cards until they reach a sum greater than 16 , if they reach a sum 17 or greater they will hold. Make the students aware of this constraints.
5. The dealer wins in the result of a tie.

**Teacher's Note**

Probability or odds: Play enough rounds to demo odds are in favour of the dealer. Keep track of dealer and individuals wins on a tally sheet. After a few rounds demo why the dealer has an advantage. The win as a result of a tie should be the the telling factor. Another factor is early on students will think they have to be really close to 21 in order to win and end up going over 21 frequently.

At this point demo using probability to make decisions. Distribute the counting sheet to half the players. Allow the players enough time to stroke off cards which have been played. Keep track of individuals and dealer wins. Were the counting sheets and lesson on probability helpful

## Twenty One Counting Sheet

A A A A

K K K K

Q Q Q Q

J J J J

10 10 10 10

9 9 9 9

8 8 8 8

7 7 7 7

6 6 6 6

5 5 5 5

4 4 4 4

3 3 3 3

2 2 2 2

## Road Rally

**Grade Level:** 12

**Math Skills:** • Vectors, bearings, trigonometry

**Players:** 2

**Materials:** • Map  
• Trigonometry set

### Procedure:

#### General

1. The objective is to be the first to arrive at the final destination and to identify this point in relation to your starting point.
2. You're given a series of bearings and distances (vectors). You must draw these on the map in order to find your final destination. Now you must name where you now are in relation to where you began, giving the bearing and distance from the start point (resultant vector).
3. Bearings are given in degrees measured clockwise from north.  
Ex: bearing 0 is straight north      bearing 90 is straight east  
bearing 180 is straight south      bearing 270 is straight west

#### Drawing a Bearing (vector)

4. Tape your map down to the table so the lines of longitude (north-south lines) are parallel to your t-square.
5. Draw a north south line through departure point using your t-square
6. Use this line as a base to measure and mark your angle.
7. Draw a line from your point of departure through the angle you measured and measure the distance with your scale.
8. Repeat this process until you have arrived at your final destination.
9. Giving the distance and bearing from your initial starting point. Draw a line from your start point to your end point. Measure the angle clockwise from north and record this measurement. Measure the length of the line with your scale. This is your solution (resultant vector).

#### Teacher's Note

This is an Applied Math activity from grade 12, A6-4,5,6,7,8. Mathematics 12 (Pure) students would be expected to sketch a problem similar to this and use trig functions, laws of sine and cosine to find a solution (C3-3,4,5).

## Arrange the Blocks

**Grade Level:** 7-12

**Math Skills:** • Spatial geometry, problem solving

**Players:** 1-3

**Materials:** • Coloured blocks

### **Procedure:**

Students arrange a set of coloured blocks based on clues.

#### **1. Point of View 1 through 4**

Each clue is a perspective drawing of a structure from a different vantage point. Some blocks are invisible on an individual clue. Challenge your class to build the structure. When the structure is built, each student should indicate where - relative to the structure - his or her clue's "picture" was taken. Encourage different strategies like: placing the clues on the table around the structure, with the position of the clue indicating the position of the "camera."

#### **2. Eternal Flame**

This problem has only word clues, although students still build the structure. While not simple, this one yields to logic.

#### **3. Arrange Six**

Each student gets a view of the six blocks, but each can see only four. Some blocks are hidden behind others. Each clue tells which direction - North, South, East, or West - the person is from the blocks.

#### **4. Lost Labels**

Here students get the views but don't know which side each view is from. Their task is to build the object and then label it.

#### **5. Views 1 and 2**

In these problems, each group member gets a drafting view - with dotted lines for hidden edges. The group builds the structure.

#### **6. Coloured Stairs**

At first, it doesn't look as if there is enough information to solve the puzzle. There are two possible solutions, each a reflection of the other.

## Broken Squares

**Grade Level:** 7-12

**Math Skills:** • Spatial geometry, problem solving, group-work skills

**Players:** 1-3

**Materials:** • 5 cardboard squares 6" x 6" (see template)  
• 5 envelopes

### Preparation:

1. Cut the squares apart on the internal lines and put the pieces into 5 envelopes as follows:

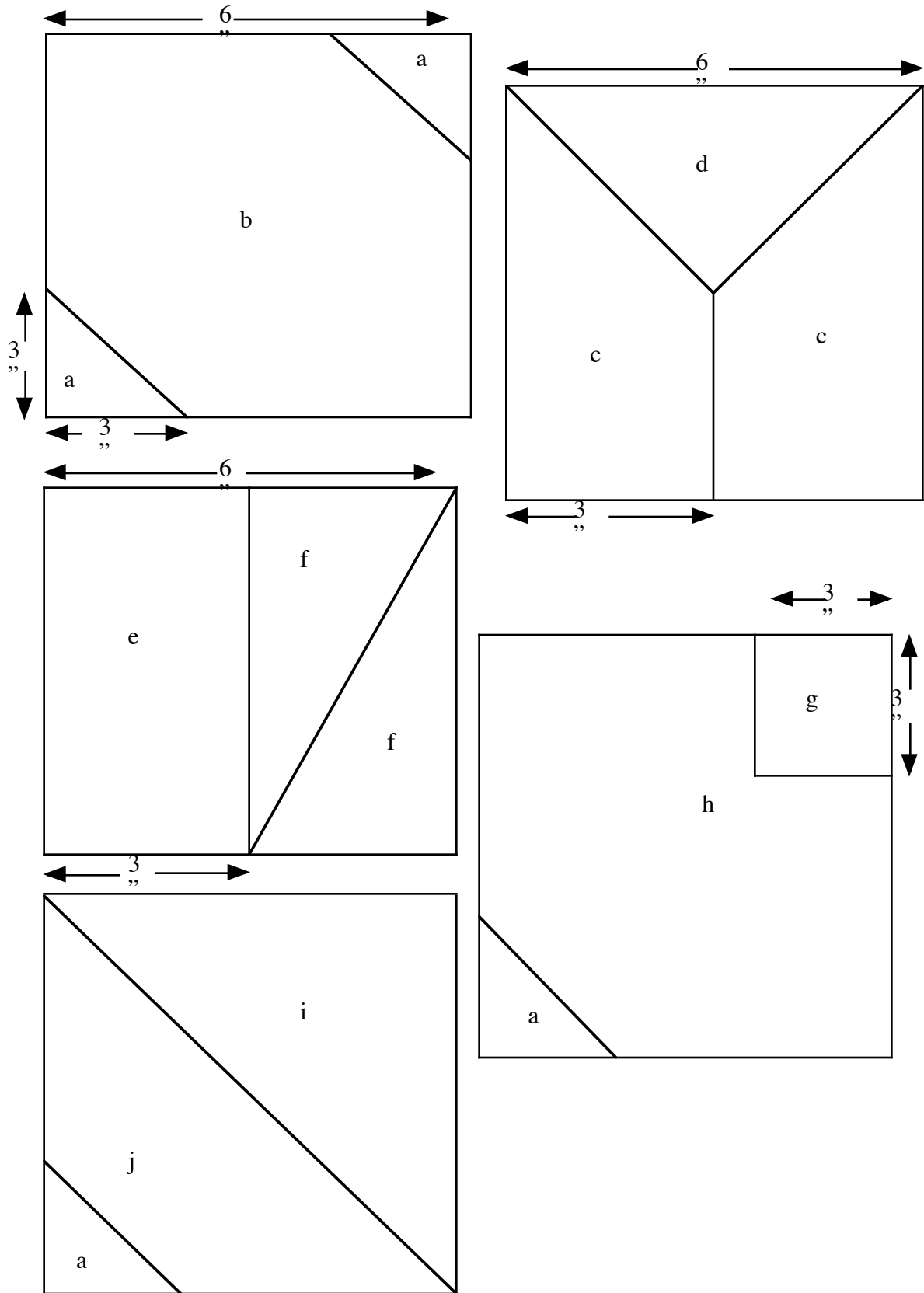
- in envelope 1, put pieces **i**, **h**, and **e**;
- in envelope 2, put pieces **a**, **a**, **a**, and **c**;
- in envelope 3, put pieces **a** and **j**;
- in envelope 4, put pieces **d** and **f**;
- in envelope 5, put pieces **g**, **b**, **f**, and **c**.

2. Erase the letters on each piece and write the number of the envelope in which it is placed. Prepare enough so each small group has a complete set of five puzzles.

### Procedures:

1. Divide the class into groups of 5.
2. The rules are simple but make sure everyone understands them;
  - To finish there must be a completed square in front of each participant.
  - You may not communicate in any way with the members of the group. This means no talking, gesturing, motioning or signaling in any way. The only way for you to get a piece is to have someone give it to you.
  - You may pass any of your pieces to another player at any time.
3. If one group finishes before other groups, mix the pieces, each draw three, and try again. Each person must end up with one square the same size as everyone else.





## Toilet Paper Math

This activity reinforces different skills with geometry. Students work in groups, first estimating the different measurements, then calculating the actual measurements.

Problem solving skills come into play also. When students calculate the perimeter of one sheet they tend to multiply that measurement by how many sheets are in the whole roll to get the perimeter of the whole roll, but because the sheets share edges throughout the roll this calculation would be incorrect.

There are endless extensions to this activity one would be to calculate how many rolls it would take to reach a specific location. The unit price could be calculated (cost for one sheet), then compared with different brands of toilet paper.

## Toilet Paper Math

Name \_\_\_\_\_

Activity	Estimation	Actual Measurement
Total number of Sheets		
Perimeter of one sheet		
Perimeter of the whole roll of paper.		
Area of one sheet.		
Area of the whole roll of paper.		
Perimeter of the tube.		
Area of the tube.		

## Integer Addition War

(J. Currah, J. Felling, C. MacDonald (1989). Box Cars and One-Eyed Jacks, Volume 2. J Mac Publishers.)

**Grade Level:** 6-10

**Math Skills:** • adding positive and negative integers

**Players:** 1-3

**Materials:** • cards (Ace=1) - 10 (black =positive, red = negative)

### Procedure:

1. Players divide the cards evenly between themselves. Players turn over two cards each and add them.

$$\begin{array}{l} \textbf{Player 1} \\ \text{red 5 + red 2 = -7} \end{array}$$

$$\begin{array}{l} \textbf{Player 2} \\ \text{black 3 + red 4 = -1} \end{array}$$

Player 2 wins.

2. The player with the greatest sum collects all of the cards. Play continues until one player has all of the cards.
3. In the event of a tie (ie. both have the same sum), each player deals out three cards face down. Two more cards are turned face up and added. The player with the greatest sum collects all of the cards.

### Variation:

1. Play 3 addend addition with cards still holding positive and negative values.
2. Integer Subtraction War can be played the same way except you subtract the values on the cards.
3. Integer Multiplication War can be played the same way except you multiply the values on the cards. For Integer Multiplication War you use all of the cards except the jokers. (J=11, Q=12, K=13)

## Integer Multiplication Snap

(J. Currah, J. Felling, C. MacDonald (1989). Box Cars and One-Eyed Jacks, Volume 2. J Mac Publishers.)

**Grade Level:** 6-9

**Math Skills:** • multiplying positive and negative integers

**Players:** 2 or more of equal skill level

**Materials:** • full deck of cards (J=11, Q=12, K=O)  
(black = positive, red = negative)

**Procedure:**

1. Players divide the cards evenly between themselves. Players then each turn over a card at the same time.
2. Players must multiply the two numbers. The first player who says the correct product out loud collects both cards. Play continues until one player has collected all of the cards.
3. In the event of a tie, players leave their cards face down and let the pile build.
4. Play continues until one player gives a correct answer before the other and takes all of the accumulated cards.

Example:	<b>Player 1</b>	<b>Player 2</b>	
	red 4	red 6	$-4 \times -6 = 24$
	black 7	red 3	$7 \times -3 = -21$

**Variations:**

1. Addition and subtraction skills can be drilled in the same way.
2. The same skills can be drilled by using two different coloured dice (up to 30-sided dice for addition and subtraction & up to 12-sided for multiplication. Determine which die will be positive and which will be negative. Players roll their dice at the same time. The first person to correctly yell out the sum, difference, or product gets a point. Player with the most points wins.

## Exponent Snap

(J. Currah, J. Felling, C. MacDonald (1989). Box Cars and One-Eyed Jacks, Volume 2. J Mac Publishers.)

**Grade Level:** 6-9

**Math Skills:** • multiplication (exponents)

**Players:** 2

**Materials:** • cards (Ace=1) - 5

### Procedure:

1. Players divide the cards evenly between themselves. Then, each player turns over a card at the same time.
2. One player continuously turns over the base card while the other turns over the exponent card.
3. The first player to say the correct answer out loud collects both cards.
4. Play continues until one player collects all of the cards.
5. In the event of a tie, the two cards are left face down in a pile and two more cards are turned over until one player gives the correct answer before the other and collects all of the cards in the pile and the two face up cards.

Example:	<b>Player 1 (base)</b>	<b>Player 2 (exponent)</b>
	4	3

Correct Answer:  $4^3 = 4 \times 4 \times 4 = 64$

## Exponent War

(J. Currah, J. Felling, C. MacDonald (1989). Box Cars and One-Eyed Jacks, Volume 2. J Mac Publishers.)

**Grade Level:** 6-9

**Math Skills:** • multiplication (exponents)

**Players:** 2

**Materials:** • cards (Ace=1) - 5 or (Ace=1 ) - 9 for advanced players

### Procedure:

1. Players divide cards evenly between themselves. Players turn over two cards each.
2. The first card turned up is the base card and the second card is the exponent (Example: Player 1 turns up a 3 then a 4. His total is  $3 \times 3 \times 3 \times 3 = 81$  ).
3. The player with the highest total wins all four cards.
4. Play continues until one player has all of the cards.
5. In the event of a tie (ie. both players have the same totals), each player deals three cards face down. Two more cards are turned face up in the same manner as above and the higher total wins all of the cards.

Example:	<b>Player 1</b>	<b>Player 2</b>
	2, 4	4, 2
	= $2 \times 2 \times 2 \times 2$	= $4 \times 4$
	= 16	= 16
	----- (three	-----
	----- cards face	-----
	----- down)	-----
	3, 5	1, 4
	= $3 \times 3 \times 3 \times 3 \times 3$	= $1 \times 1 \times 1 \times 1$
	= 243	= 1

Player 1 would collect all of the cards.

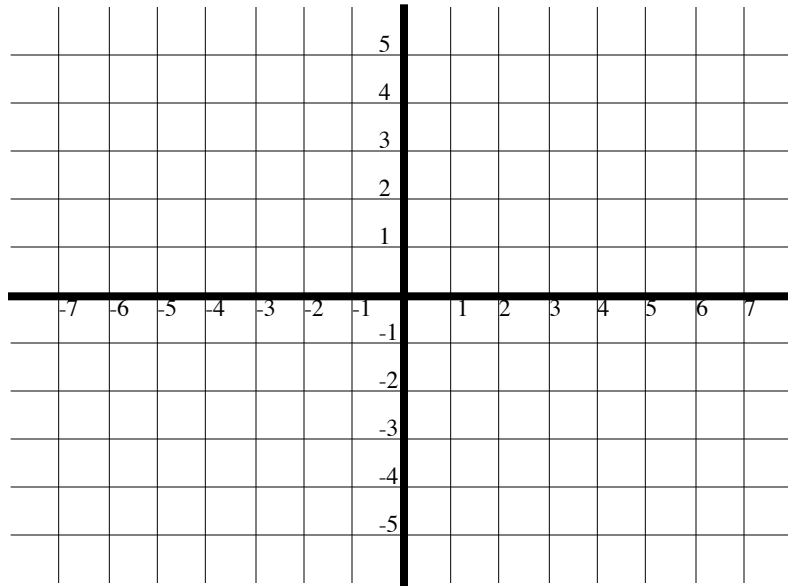
# Battleship

This game is taken directly from the popular kid's game Battleship. The purpose of this game is to help students familiarize themselves with the Cartesian Plane. Students take turns calling out co-ordinates and marking hits and misses on the game board.

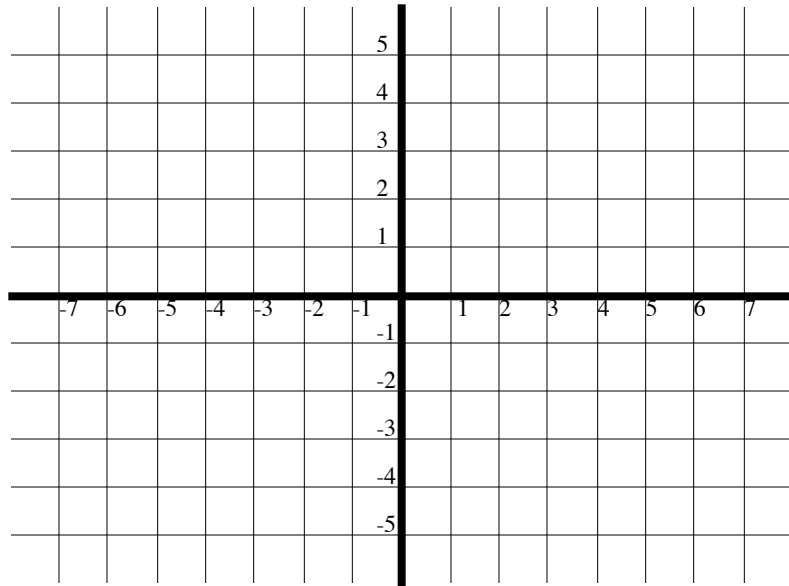
By placing a piece of transparency film over the game board and giving each student an overhead marker, the game boards can be used over and over again.

Place your ships in the grid below. Your ships can go up and down, or side to side.

My Ships



Enemies  
Ships



- Key for Ships
- 1 carrier - cccc
  - 2 subs - sss, sss
  - 3 destroyers - dd, dd, dd
  - 4 torpedo boats - t, t, t, t



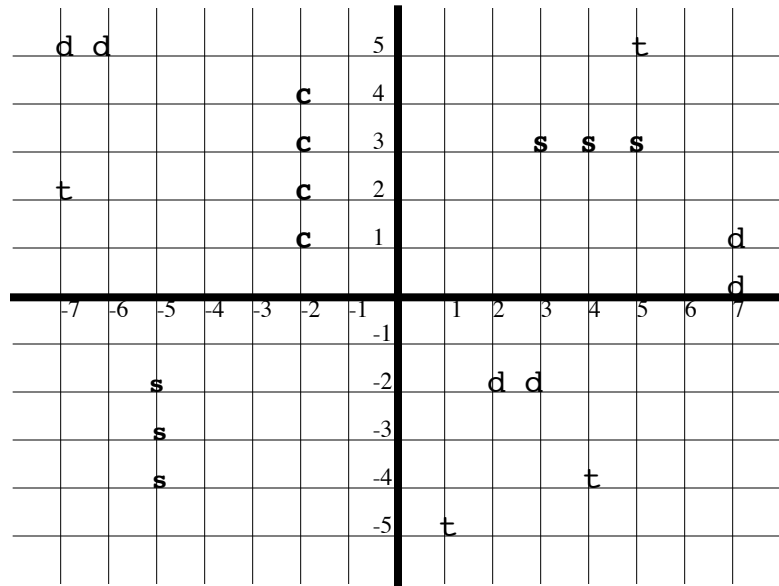
# Battleship

(Continued)

## My Ships

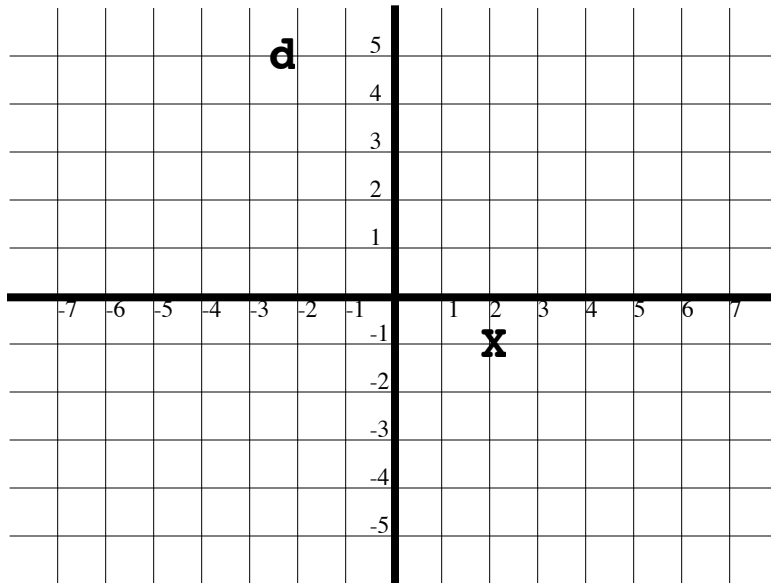
*Ships are placed on the grid as shown.*

*Your opponent calls out (-3, 2). You say miss because you have no ships at that co-ordinate.*



*After your turn your opponent calls out (4, 3), you respond, "You hit a sub." and cross out the "S" at (4, 3). After two more hits your sub has sunk.*

## Enemies Ships



- Ships
- 1 carrier - c c c c
  - 2 subs - s s s , s s s
  - 3 destroyers - d d, d d, d d
  - 4 torpedo boats - t, t, t, t

*On this grid you record you guesses and try to sink your opponents ships. If you guess (2, -1) and your opponent responds miss, put an "X" on that co-ordinate. A guess of (-2, 5) might be a hit on a destroyer, so place a "d" on that co-ordinate.*

## Fraction Race

**Grade Level:** 8

**Math Skills:** • fractions-comparing, addition and subtraction

**Players:** 2

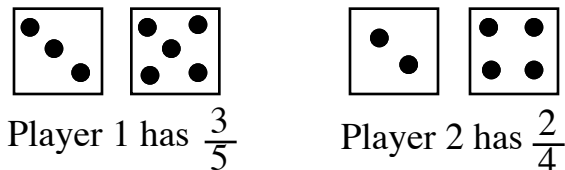
**Materials:**

- 2 pair of dice
- 1 yellow disk and 1 red disk
- 1 game board
- paper & pencil

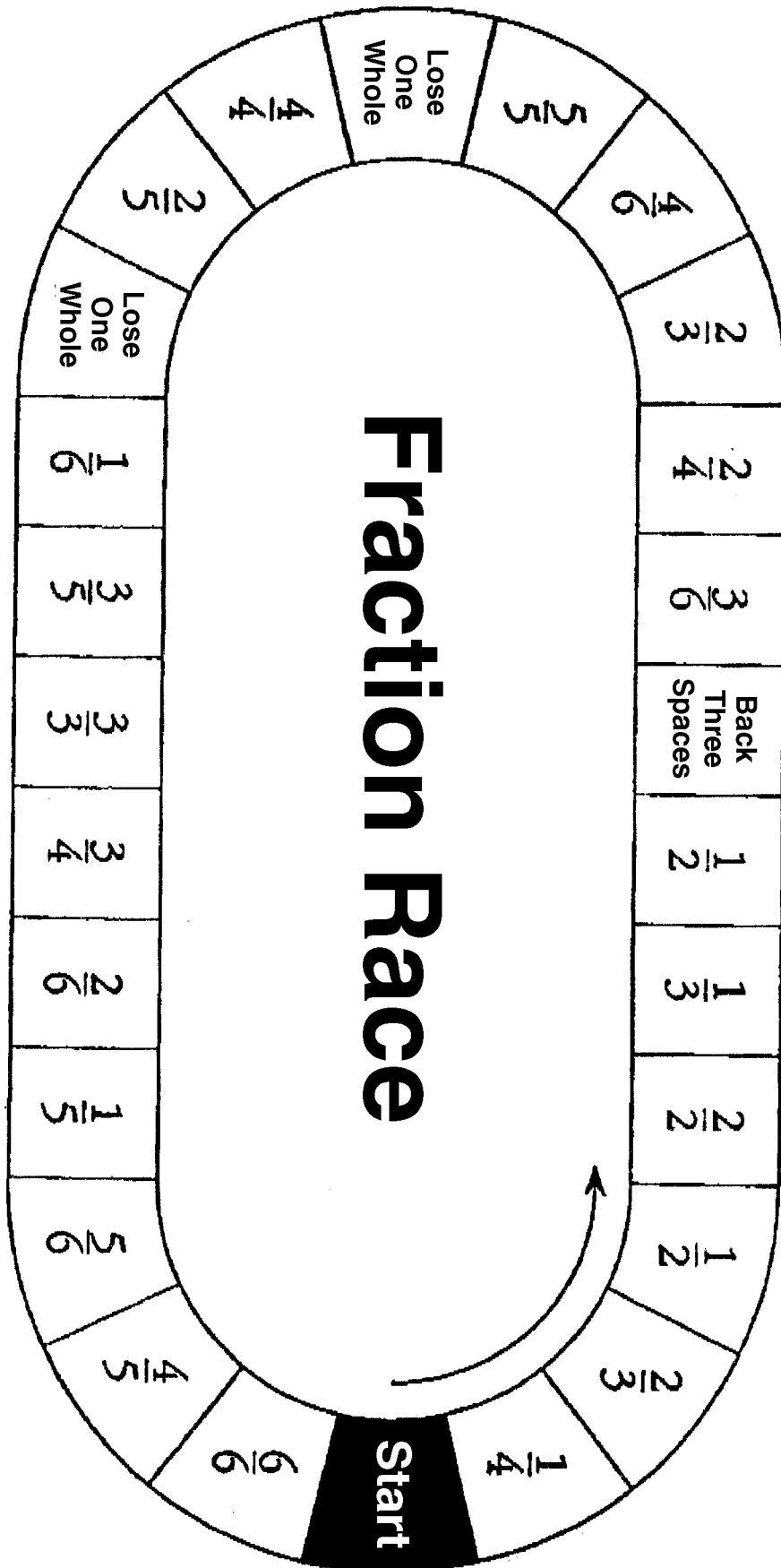
**Procedure:**

1. Each player puts a marker on the “Start” position.
2. Each player rolls a pair of dice at the same time.
3. Each player forms a fraction using the smaller number as the numerator and the larger as the denominator.
4. The player with the larger fraction moves his disk the number of moves in the denominator of the fraction.

Example:



5. Players score the amount of the fraction in the space they move to. Only the player who moves scores during the turn.
6. The game continues around the track, and players keep a running total of their scores.
7. The first player to total 7 or more wins.



## Foiled Again!

**Grade Level:** 8 -10

**Math Skills:**

- Multiplication of two binomial expressions
- using the distributive property

**Players:** 3 - 4

**Materials:**

- five sets of Binomial Expression Cards
- one set of Product Cards

**Preparation:**

1. Make five copies of the Binomial Expression Cards and one copy of the Product Cards for each group. After cutting apart, form one deck for the game. The deck will contain 51 cards.

**Procedure:**

1. The game of foil is played like traditional rummy. The dealer deals six cards to each player. The remaining cards are turned face down, and the top card is turned over to start the discard pile.
2. The first player starts by drawing the top card from the deck or the discard pile. The player may lay down a group of three cards consisting of two binomial expression and their product.

$x + 2$	$x - 3$	$x^2 - x - 6$
---------	---------	---------------

3. The player ends a turn by placing one card in the discard pile.
4. A player wins a hand if he or she succeeds in getting rid of all cards, including a final discard.

**Variations:**

1. Increase the size of the deck by including an additional set of Product Cards. The dealer deals nine cards to each player.
2. Make Product Cards for the Binomial Expression Cards that have a numerical coefficient of 2 for the x term. Make five copies of the Binomial Expression Cards. Form a deck and play Foiled Again!

## Binomial Expansion Cards

$$x + 1$$

$$x - 1$$

$$x + 2$$

$$x - 2$$

$$x + 3$$

$$x - 3$$

**FOIL**

**FOIL**

**Product Cards**

$$x^2 + 2x + 1$$

$$x^2 - x - 2$$

$$x^2 - 1$$

$$x^2 + 4x + 3$$

$$x^2 + 3x + 2$$

$$x^2 - 2x + 3$$

$$x^2 + 2x - 3$$

$$x^2 - 2x + 1$$

### Product Cards

$$x^2 + x - 2$$

$$x^2 - 4x + 3$$

$$x^2 - 3x + 2$$

$$x^2 + 4x + 4$$

$$x^2 - 4$$

$$x^2 + x - 6$$

$$x^2 + 5x + 6$$

$$x^2 - 5x + 6$$

**Product Cards**

$$x^2 - x - 6$$

$$x^2 + 6x + 9$$

$$x^2 - 9$$

$$x^2 - 6x + 9$$

$$x^2 - 4x + 4$$

**FOIL****FOIL****FOIL**



## Countdown (Easy Nim)

**Grade Level:** 2 - 8

**Math Skills:**

- adding and subtracting
- to practice planning ahead with "If . . . , then" thinking.
- problem solving

**Players:** 2 or 3

**Materials:** • 19 to 30 pennies

**Procedure:**

1. Players agree on amount of pennies to be in the starting pile, from 19 to 30.
2. Players alternately remove pennies from the pile.
3. Players must take 1 or 2 or 3, whichever they choose, on each move. They may change the amount they take each time or take the same amount as before. But they must take at least one penny each turn.
4. Each player tries to take the last penny either by itself or together with 1 or 2 other pennies.
5. The player who takes the last penny by itself or together with 1 or 2 other pennies is the winner.

**Example:**

Here's a complete 2-player game played with 19 pennies. Eva won this game. Jerry could have won but made an error on his third move. Can you figure out what Jerry's strategic error is?

1. Eva removes 2, leaving 17  
Jerry removes 1, leaving 16
2. Eva removes 1, leaving 15  
Jerry removes 3, leaving 12
3. Eva removes 1, leaving 11  
Jerry removes 2, leaving 9

4. Eva removes 1, leaving 8  
Jerry removes 3, leaving 5
5. Eva removes 1, leaving 4  
Jerry removes 1, leaving 3
6. Eva removes 3, and wins

**Variations:**

1. Add more pennies to the starting pile.
2. Change the number of pennies that may be taken each time. For example, each player can take 1 or 2 or 3 or 4 pennies.
3. Assign different amounts allowable to different players.
4. Play that the winner in a 2-person game is the one who does not take the last penny.

**Teacher's Note:**

1. This is the simplest of take-away games, yet challenging enough to keep youngsters and adults actively searching for a way to win consistently. The older the players the better it is to have a big pile of pennies to keep them on their mental toes.
2. Talk about the moves the winner made that were crucial in winning; the critical moves made by the loser; what is a strategy for always winning; how to win even with game variations; how to keep track of the amount of pennies removed during the game.

## Nim

**Grade Level:** 3 - 10

**Math Skills:**

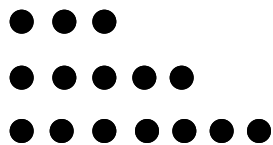
- to learn the powers of 2
- to learn to work in the base 2 (binary)
- to practice planning ahead with "If . . . , then" thinking.
- problem solving

**Players:** 2

**Materials:** • 15 to 30 pennies

**Procedure:**

1. To start a simple, basic game players place 15 pennies in three rows of 3, 5, and 7 pennies like this:



2. Players move alternately; either can go first.
3. Each player may remove as many pennies as he/she wishes—even the whole row—but from only one row each turn.
4. Player must take at least one penny each turn.
5. The object is to take the last penny.
6. The player who removes the last penny (separately or together with others in the same row) is the winner.

**Example:**

A. Here is an example of a complete game of the basic 3-5-7 formation. It will help you to set up 15 pennies and remove them as you read the moves that follow.

1. Joanna removes 2 from top row, leaving: 1 - 5 - 7
2. David removes 3 from middle row, leaving: 1 - 2 - 7
3. Joanna removes 2 from bottom row, leaving: 1- 2 - 5

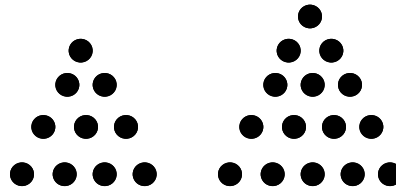
4. David removes 1 from bottom row, leaving: 1- 2 - 4
5. Joanna removes 1 from middle row, leaving 1 - 1 - 4
6. David removes 4 from bottom row, leaving 1 - 1
7. Joanna removes 1 from top row, leaving: 1
8. David removes 1 from middle row and wins.

B. Here is an end-game position. It's your move. If you make the correct move, you can guarantee yourself a win. Work on this to help you get familiar with NIM.



**Variations:**

1. Have 4 or more rows and have a different number of pennies in each row. That is, add pennies and rows. It is possible to play with any number of rows and any number of pennies in any row.
2. Set up a particular formation such as "Bowling Nim" with 4 or 5 rows. For example, "Bowling Nim" may look like this with either 10 or 15 pennies:



3. Allow a player if he/she wishes to remove pennies from a row and then divide that row into two separate rows. For exannple: In the case of 3 rows of 2 - 5 - 7, remove 2 from the bottom row of 7 and divide the 5 remaining pennies into rows of 2 and 3 so that you leave 4 rows of 2 - 5 - 2 - 3.
4. Play "Checkerboard NIM." Place 8 heads and 8 tails on a gamesheet drawn like a checkerboard. (See Fox and Geese gamesheet) Each player has 8 pennies on his/her side, in either the last or the next to last row, with one penny in each column. Thus, there will be one "tail" penny and one "head" penny in each column facing each other. Player plays alternately, advancing any of his/her 8 pennies toward the opponent's penny as many spaces as desired to close the gap between pennies. No jumping, no passing the opposing penny, only closing the gap. Thus, at most there will be only 6 spaces between 2 opposing pennies at the start of the game. When 2 pennies in a column meet, neither can move any more as there are no empty spaces between them. The last player to move a penny wins.

5. Play "Checkerboard NIM" as above but allow a player to move backward as well as forward if desired. Still no jumping. First person unable to move loses.
6. Play regular NIM, but this time the person who takes the last penny loses. That is, the person who forces the other to take the last penny wins.

**Teachers' Note:**

1. NIM is one of the oldest math games in the world
2. The most significant part of the debriefing is talking about the winning strategy. Talk about the players' moves that helped them win, what they can do to improve, how they can plan ahead with "If . . . , then" thinking.

## Target Practice

**Grade Level:** 3 - 10

**Math Skills:** • deductive problem solving

**Players:** 2 individuals or 2 teams

**Materials:** • Pencil and paper

**Procedure:**

1. Each player secretly selects a 3-digit number—each digit a different numeral from 0 to 9.
2. Players write their numbers on their sheets of paper so they can refer to them.
3. Alternately each player asks the other player a 3-digit number in trying to discover the other player's secret number. The player asked responds with MISS, HIT, or BULLSEYE. A MISS means that no numeral asked is in the secret number. A HIT means that a numeral asked is in the secret number but in a different position. A BULLSEYE means that a numeral asked is in the secret number and also in the correct position. The player must tell how many HITS and BULLSEYES if there are some. Thus, the player may, for example, answer 1 HIT or 2 HITS and a BULLSEYE, depending on the secret number. (There are 9 possible combinations of MISS, HIT, and BULLSEYE.)
4. The first player to score 3 BULLSEYES (that is, to detect the other player's secret number) is the winner.

**Example:**

1. Below is an annotated game that shows the process of deducing at each step. Keep in mind that a MISS is a helpful response in deducing the secret number.

Turn	Number Asked	Score	Knowledge Deduced
1.	760	1 Bullseye	There's a 7, 6, or 0 in the secret number in that position.

- |    |     |                  |  |
|----|-----|------------------|--|
| 2. | 743 | Miss             | The number is <u>  6  </u> or <u>  0  </u> ; 7, 4, and 3 aren't in the number.   |
| 3. | 869 | 1 Bullseye/1 Hit | Looks like <u>  6  </u> , but it could be the 8 or 9 giving the Bullseye and the Hit.  |
| 4. | 840 | 2 Bullseyes      | Must be 8 <u>  </u> 0 since we know 4 is not in the number. Also, the Hit in Turn #3 above must be from the 9 as it can't be the <u>  6  </u> referring to Turn #1. Therefore, the number must be 8 9 0. |
| 5. | 890 | 3 Bullseyes      | We were right! It is 890.  |

**Variations:**

1. Use a 4-digit number for a harder game.
2. Allow numerals to be used twice or three times for a very hard game.
3. For an easier game play with teams to have help in deducing.

**Teachers' Note:**

1. Students as young as, 9 and 10, can successfully play this game with some initial help to teach them how to deduce knowledge from the responses they receive. Also, young students need help in strategically choosing the number to ask to test out certain possibilities. After a few short games with help, children can do a powerful job of deductively detecting the secret number via good *Target Practice*.
2. Talk about how the winner deduced the secret number; what was deduced in each turn;- if any errors in deduction were made through omission or commission; why numbers asked were selected; if numbers asked were optimum numbers; how players could have improved their *Target Practice* through better numbers asked and better deductions.

## Fox and Geese

**Grade Level:** 1- 8

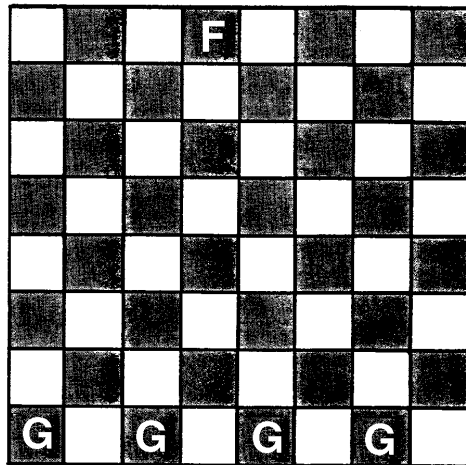
**Math Skills:** • “If then” problem solving

**Players:** 2

**Materials:** • Pencil and paper  
• 5 pennies

**Procedure:**

1. Players prepare an 8" x 8" playing sheet of 64 squares (about 1 " x 1 " each), colouring or shading in every other square, like a checkerboard. (See reduced playing sheet in the figures.)
2. Players decide who will be the Fox and who will be the Geese. The Fox is represented by one penny with the "head" of the coin showing. The Geese is represented by four pennies with the tail sides of the coins showing. The Geese places his/her four pennies on the shaded squares in the first row. The Fox places his/her penny on any shaded square in his first row. (See figure below.)



3. Player moves alternate according to these rules:
  - a. The Fox moves as a king in checkers, from shaded square to shaded square one square at a time backward or forward. The Geese moves like a single checker, from shaded square to shaded square one square at a time forwards only.
  - b. The Geese may move only a single penny in each turn—whichever penny is desired.
  - c. Neither Fox nor Geese may capture or remove an opponent.

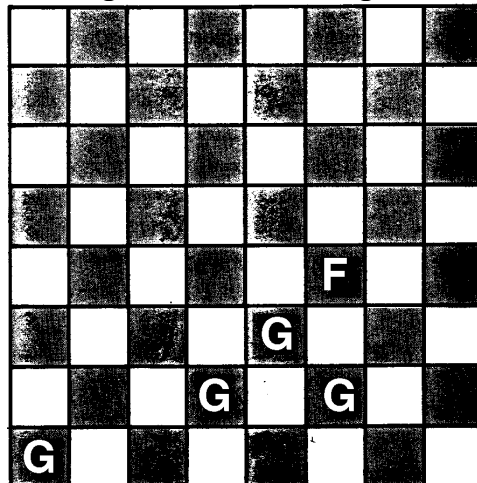


- d. Neither side may jump over any penny.
- e. Fox moves first.
- f. The object for the Fox is to reach the opposite side of the game sheet; the object for the Geese is to block the Fox and hem it in on all sides so that it can no longer move. (See the example for a middle-of-the-game position.)

- 4. Fox wins if he/she reaches opposite side; Geese wins if he/she encircles the Fox.

**Example:**

- 1. Here is a middle-of-the-game position. The Fox and the Geese have each moved 4 times. It is now the Fox's turn to move again. If playing correctly, the Fox will win because there is no way for the Geese to block the Fox from moving forward through the Geese's line.



**Variations:**

- 1. The Geese moves first.
- 2. Set a time limit of 5 seconds for each move to speed up the game.
- 3. Switch roles after a few games.

**Teacher's Note:** In this simple game of encirclement there is much opportunity for planning ahead. The Geese in order to encircle the Fox must try to keep a straight, horizontal line or at least can easily be converted to one.

## Mancala

**Grade Level:** 1- 10

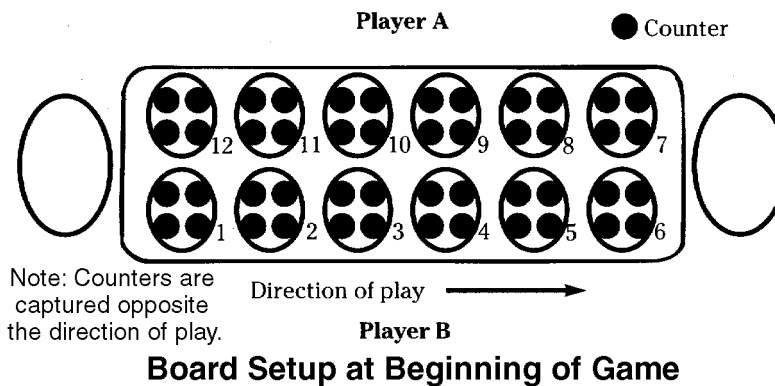
**Math Skills:** • “If then” problem solving

**Players:** 2

**Materials:** • Egg carton  
• 2 dishes  
• 48 counters (chickpeas, beans, and seeds or very small pebbles)

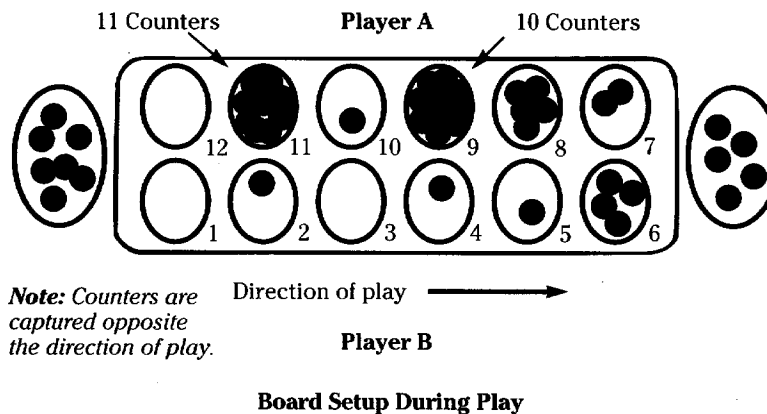
**Procedure:**

1. Place the playing board (egg carton) between the two players so that each player faces 6 of the 12 holes.
2. The players place 4 counters in each of the 12 holes. Player B's cups are numbered 1 through 6. Player A's cups are numbered 7 through 12.
3. Player A picks up the counters from one of the 6 holes on the A side and distributes them, moving in a counterclockwise direction, one by one in neighboring holes. (See the arrow in the diagram.)
4. Player A picks up all the counters from the hole into which the last counter drops. Player A then continues to distribute these counters as before.
5. Player A's turn ends in one of two ways:
  - The last counter falls into a cup with no counters in it.
  - The last counter falls into a cup on the B side of the board that contains only 1 or 2 counters (making a total of 2 or 3).



6. Player A then can capture counters from these cups:

- The last cup into which player A drops a counter
- The cups that immediately precede that last cup and that contain 2 or 3 counters



7. Now it's player B's turn. Player B picks up counters from one of the 6 holes on the B side of the board and, like player A, distributes them in a counterclockwise direction.
8. The object is to capture the counters from the opponent's side of the board. When one player has no more counters, the game ends.
9. In this polite game, a player does not empty all of an opponent's cups, but leaves a counter in one of them. If player A wins, layer B's 6 cups will all be empty. But player B will have emptied them.

AS YOU PRACTICE THE GAME, YOU CAN MOVE FASTER AND FASTER. COUNT QUICKLY, AND LET YOUR FINGERS FLY THEN YOU'LL WIN.