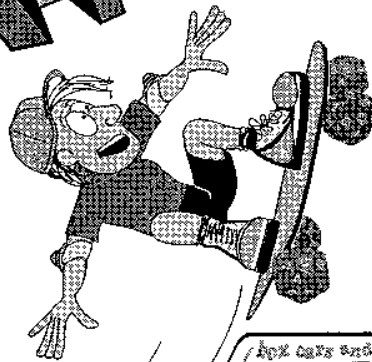


box cars and one-eyed jacks®

Presents

RADICAL MATH



Presented By

John Felling

1-866-342-3386 Toll Free

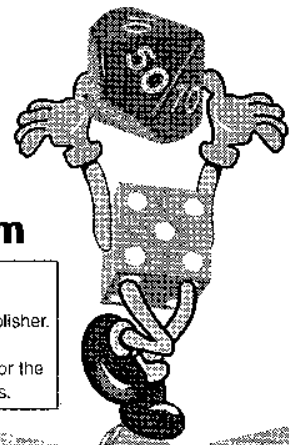
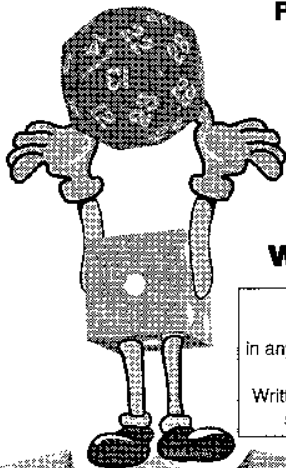
boxcars@telus.net

www.boxcarsandoneeyedjacks.com

All rights reserved.

Except as noted, no part of this publication may be reproduced or transmitted in any form or by any means without the prior written or verbal permission of the publisher.

Written permission must be obtained and a licensing fee issued through Box Cars for the sole purposes of inservicing other professional educators or parent communities.



BIG SUMS



SKILLS: Problem solving, gathering data, recording data, interpreting data

PLAYERS: Students work in groups of 2, 3 or 4

EQUIPMENT: 36 regular dice per group, paper and pencil, chart

ACTIVITY I: The goal of the activity is to find the sum of 36 dice after they have been rolled.

TEACHING TIP: Allow students several rounds to develop their own method of adding the dice. Use **Chart I** to record the methods. Teach the patterns below and show the students how to group the dice.

1	2	6
2	4	7
3	6	8
<u>+4</u>	<u>+8</u>	<u>+9</u>
10	20	30

THOUGHT PROVOKERS:

1. What is the most efficient pattern to start with? Why?
2. In which order should we use the patterns to be most efficient? Why?
3. What is the largest sum we could have? What is the smallest?

ACTIVITY II: The goal is the same but we are trying to determine the range of possible sums. Use **Chart II** to record the sums that are used.

THOUGHT PROVOKERS:

1. What is the estimate for the mean value of the sums?
2. Can anyone give an explanation for the mean?
3. (Challenger) What is the mean sum of 48 dice?

CHART I:

	Prediction	Method Used	Actual Sum	+ / - Difference
1.				
2.				
3.				
4.				
5.				

CHART II:

150+	141-150	131-140	121-130	111-120	101-110	90-100

BETWEENERS

Copyright Box Cars And One-Eyed Jacks Inc.

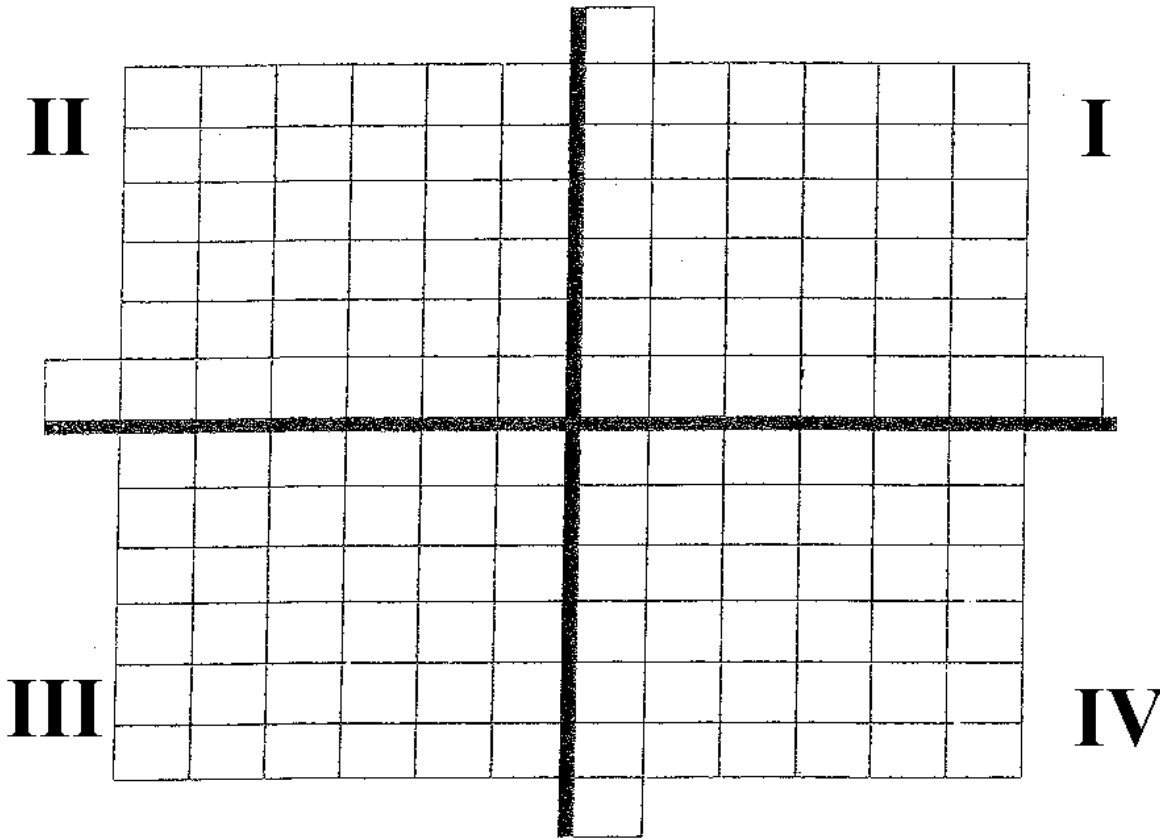
Hit Target

Goal: To get 3 in a row in each quadrant

Directions: Two players on each grid. Players take turns plotting points.

When it's your turn:

- Roll the double die.
- Choose the number or numbers to be negative or positive
- Record the Ordered Pair in the Column for the correct quadrant before you plot the point.



Player 1:				Player 2			
Quadrant I	Quadrant II	Quadrant III	Quadrant IV	Quadrant I	Quadrant II	Quadrant III	Quadrant IV

100 Board Wipe Out

Copyright Box Cars And One-Eyed Jacks Inc.

Roll 1
Roll 2
Roll 3

Roll 4
Roll 5
Roll 6

= 1
= 2
= 3
= 4
= 5
= 6
= 7
= 8
= 9
= 10
= 11
= 12
= 13
= 14
= 15
= 16
= 17
= 18
= 19
= 20
= 21
= 22
= 23
= 24
= 25

= 26
= 27
= 28
= 29
= 30
= 31
= 32
= 33
= 34
= 35
= 36
= 37
= 38
= 39
= 40
= 41
= 42
= 43
= 44
= 45
= 46
= 47
= 48
= 49
= 50

	=	51
	=	52
	=	53
	=	54
	=	55
	=	56
	=	57
	=	58
	=	59
	=	60
	=	61
	=	62
	=	63
	=	64
	=	65
	=	66
	=	67
	=	68
	=	69
	=	70
	=	71
	=	72
	=	73
	=	74
	=	75

	=	76
	=	77
	=	78
	=	79
	=	80
	=	81
	=	82
	=	83
	=	84
	=	85
	=	86
	=	87
	=	88
	=	89
	=	90
	=	91
	=	92
	=	93
	=	94
	=	95
	=	96
	=	97
	=	98
	=	99
	=	100

Copyright Box Cars And One-Eyed Jacks Inc.

Roll 3 to 5 dice, record numbers, create math sentence, mark on 100 Brd at answer or on answer sheet, keep making math sentences with same roll until no longer possible, then re-roll, **RECORD IN WRITING ALL MATH SENTENCES**

COMBO FIVE

LEVEL: Grade 3 and up
SKILLS: Mixed operations (+, -, x, ÷), problem solving
PLAYERS: Teams of 2 vs. 2
EQUIPMENT: One 20-sided die, cards Ace - King (Ace = 1, Jack = 11, Queen = 12, King = 0)

GETTING STARTED: Both teams take five cards and place them face up. The goal of the game is to equal the rolled target number each round. To begin, one team rolls the target number for the round. This number will be used by both teams. Teams now begin finding combinations that equal the target number rolled - all operations may be used. A single card cannot be taken off. Teams may take off two, three, four or five card combinations. Teams may also take off a two card and a separate three card combination or two, two card combinations leaving one card behind for the next round. Each card may only be used once in any combination (ie., in the following example 4 can only be used once and not again in a second combination).

EXAMPLE: Cards drawn are as follows:

Team One	4	9	7	2	11
Team Two	2	3	8	10	5

Target rolled = 11

Team One made the following combinations and removed the cards as follows:

$$9 + 2 = 11 \quad \text{and} \quad 4 + 7 = 11$$

leaving behind the 11 card as it was not used in any combination.

Team Two made the following combinations and removed the cards as follows:

$$(2 \times 3) + 5 = 11$$

leaving behind the 8 and 10 cards.

SWEET 16

"A REAL FAVOURITE"

LEVEL: Grade 4 and up
SKILLS: mixed operations, problem solving
PLAYERS: 1 (solitaire) or whole class in cooperative teams
EQUIPMENT: 1 thirty-sided die, cards (Ace = 1) - K, Jack = 11, Queen = 12, King = 0

GETTING STARTED: All teams build a four x four grid with sixteen random cards, face up.

The goal of the game is for each team to remove all the cards from their grid. All cards remaining at the end of a round equal their face value score AGAINST the team, (ie. 4 and 3 left - score against = 7). The lowest and best possible score per round is zero.

To begin play the teacher rolls a target number for the first round with the die. This number will be used by all cooperative teams. Teams now begin finding combinations that equal the target number rolled - all operations may be used. Players may take off two, three, four or five card combinations.

EXAMPLE: Grid was randomly drawn as follows:

King	4	10	2
Jack	3	9	7
6	Ace (1)	8	6
5	4	10	2

MYSTERY ROLL

You will need to play either 50 or 100 rounds. Play in groups of 3. Every round record L, E and G plus figure out the RANGE between G and L. Use a calculator if you wish. When you are playing you should use your highlight pen to mark any unusual rolls - for example, tie rolls, sequences, unusual winning rolls, etc. Circle the points you score.

Round #	Least	Between	Greatest	Range	Analyze
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					

Once you have completed either 50 or 100 rolls
answer the following questions.

Work Together!

1. What is the average range of the rolls?
2. What percentage of the time does a tie roll happen?
3. What percentage of the time did you score a point? If you kept track of all winners, what percentage of the time did all 3 players score a point?
4. Describe your most unusual round. Try to interpret the probability of that event happening. Remember $\frac{1}{30}$ chance of rolling any number.
5. Write one question for the rest of the group to use with their data.



Name _____

Order In The Court

Date _____

Reject Rolls

Reject Rolls

Reject Rolls

Reject Rolls

Reject Rolls

Reject Rolls

Use Double Sided Dice; 6-Sided Dice; or 1-12 Dice

Goal: To get as many fractions in a row as possible

- Roll one die at a time (Variation: You may roll all the dice at once and race your partner to line them up)
- Write the fraction into the chain or put into the reject boxes
- Points are awarded at the end of 7 rolls. 1 point for each fraction in the chain.
- Use Fraction Circles or Fraction Bars to check accuracy

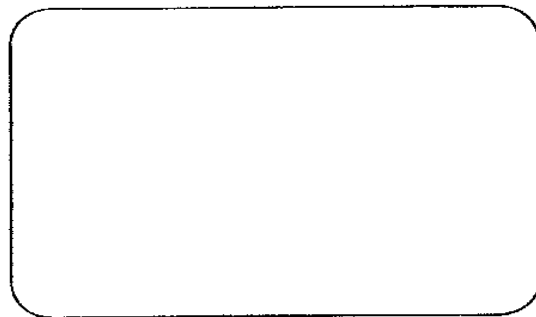
Fractions, Decimals, Percents

1 Whole Number											
		1/1		1.0		100%				2/2	
One Third 1/3 .333 33.3%				2/3				3/3			
One Fourth 1/4 .25 25%		2/4		3/4		4/4		5/5			
One Fifth 1/5 .2 20%		2/5		3/5		4/5		5/5			
One Sixth 1/6 .166 16.6%		2/6		3/6		4/6		5/6		6/6	
One Seventh 1/7 .142 14.2%		2/7		3/7		4/7		5/7		6/7	
One Eighth 1/8 .125 12.5%		2/8		3/8		4/8		5/8		6/8	
One Ninth 1/9 .111 11.1%		2/9		3/9		4/9		5/9		6/9	
One Tenth 1/10 .1 10%		2/10		3/10		4/10		5/10		6/10	
One Eleventh 1/11 .0909 9%		2/11		3/11		4/11		5/11		6/11	
One Twelfth 1/12 .083 8.3%		2/12		3/12		4/12		5/12		6/12	
		7/12		8/12		9/12		10/12		11/12	
		12/12		13/12		14/12		15/12		16/12	

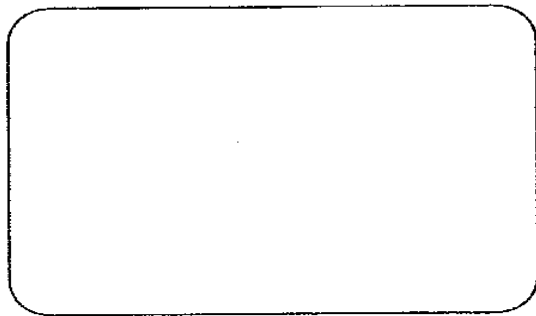
Flippin' Out

00	10	20	30	40	50	60	70	80	90	100
----	----	----	----	----	----	----	----	----	----	-----

Tens

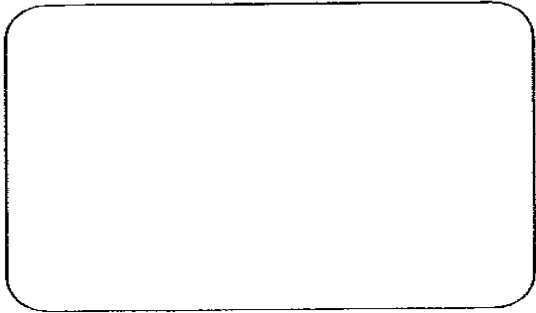


Ones

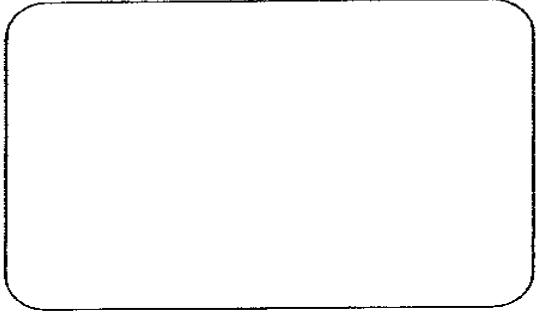


Player One

Tens



Ones



Player Two