Box Cars and One-Eyed Jacks

MATH GAMES THAT SUPPORT SINGAPORE MATH

GRADES 3-5

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Let The Games Begin

All the Box Cars games are written using the same format. As a sample, we've chosen one of our basic games to familiarize you with our style.

LEVEL: Grade 1 - 7
SKILLS: addition facts 1 - 10, 1 - 18 combinations
PLAYERS: 2
EQUIPMENT: Cards (Ace = 1) - 5, or (Ace = 1) - 9
GETTING STARTED: Players divide cards evenly between themselves.   Each player turns over two cards and adds them together. The highest sum gets all the cards. In the event of a tie; (ie: 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 cars. Play continues until one player has collected all of the cards.

Cards 1 - 5   Grade 1 - 2   Sums to 10
Cards 1 - 9   Grade 2 - 3   Sums to 18

Player 1	Player 2
2 + 3	4 + 1
War is declared	
2 + 3	4 + 1

3 cards are turned upside down.

4 + 3	6 + 2

Player 2 collects all of the cards Try

These Variations Place

Value War
Subtraction War
3 Addend War
Multiplication War
Integer War Fraction
War
Mixed Operations

Remember: War is a traditional game. However, due to the negative connotation you may want to change the term "war" to one of your own choice.
We often call these our Buzz Games (ie. Three Card Buzz).

Salute
Box Cars "All Hands On Deck" Mystery Number (adapted)

Concepts: Missing Addend, Factor
Equipment: Cards 0-12 (J=11 Q=12 K=0)
Goal/Object: Figure Out value of the card on your head

Usually 3 players with one player taking the role of "General". The General says "salute". The other two players take the card from the top of their deck and WITHOUT LOOKING AT IT place it on their forehead so everyone else can see what the card on their forehead is. The General Adds the two cards together and says "The sum of your two cards is...." The two players then use the sum and the card they can see on their opponent's forehead to try and figure out their own card.

Variations: (1) Multiplication (take out 0s)
(2) 4 Players (one General, 3 soldiers)
(3) Red = neg integers / Black = pos integers

Multiplication Board

	1	2	3	4	5	6	7	8	9	10	11	12
1	1	2	3	4	5	6	7	8	9	10	11	12
2	2	4	6	8	10	12	14	16	18	20	22	24
3	3	6	9	12	15	18	21	24	27	30	33	36
4	4	8	12	16	20	24	28	32	36	40	44	48
5	5	10	15	20	25	30	35	40	45	50	55	60
6	6	12	18	24	30	36	42	48	54	60	66	72
7	7	14	21	28	35	42	49	56	63	70	77	84
8	8	16	24	32	40	48	56	64	72	80	88	96
9	9	18	27	36	45	54	63	72	81	90	99	108
10	10	20	30	40	50	60	70	80	90	100	110	120
11	11	22	33	44	55	66	77	88	99	110	121	132
12	12	24	36	48	60	72	84	96	108	120	132	144

Box Cars & One-Eyed Jacks inc

Multiplication Tic Tac Toe
- Player one rolls 2 x 0-9 or 2 x 1-12 dice and finds the product (eg 4x6=24; 6x4=24)
- Cover spaces with bingo chips (one space only would be covered if doubles are rolled)
- Player Two takes their turn. Players continue to alternate turns
- Build Tic Tac Toe, three or more in a row horizontally, vertically or diagonally
- One point per chip and remove from board so spaces are open again
- Roll your partner's space and capture for 2 points per chip
- Play for a set period of time

BIG SUMS

SKILLS: Gathering, recording and interpreting data, problem solving.

PLAYERS: Cooperative groups of2, 3 or 4.

EQUIPMENT: 36 regular dice, paper and pencil.

TO BEGIN: The group rolls their dice, then works together to find the sum of all 36 die. Allow them to develop their own methods for adding the dice and use the chart below to record their results.

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

Use these patterns to demonstrate how to group dice tbr faster addition:
- 1 + 2 + 3 + 4 = 10
- 2 + 4 + 6 + 8 = 20
- 6 + 7 + 8 + 9 = 30

Thought Provokers:
1. What is the most efficient pattern to start with and why?
2. In which order should we use the patterns to be the most efficient? Why ?
3. What are the largest and smallest sums we could have?

VARIATION: Instead, have students try to determine the range of possible sums. Use the chart below to record the sums that are used.

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

BIG SUMS

COUNTING SHEET

30	20	10
30	20	10
30	20	10

BIG SUMS

RECORDING SHEET

CLASS SUMS

150+	150-141	140-131	130-121	120-111	110-101	100-91

STEM	LEAF

100 Board Wipe Out

Level: Grade 3 and up

Skills: Multi-operations (+ - x ÷ √ X^2), Order of Operations

Players: 2-3 players working together as a team

Equipment: Dice Tray, pencil, recording sheet per player/team

Objective/Goal: To make equations for 1-100 in fewest rolls

Getting Started: Team One decides whether to roll 3, 4 or 5 dice and records the roll in the Roll 1 space on the recording sheet. Team One then creates math sentences using the numbers rolled that have the numbers 1-100 as answers. They record each math sentence on the recording sheet in the space for the answer. Each math sentence must use each number rolled. For example, if 4, 4, 2 and 6 are rolled then each math sentence must contain 4, another 4, 2 and 6. Once the team has exhausted all the possibilities for Roll 1, they can take Roll 2. At the beginning of each roll, the team can decide to roll 3, 4 or 5 dice. In other words, they don't always have to roll the same number of dice for every roll.

Example: The team rolled 4, 4, 2 and 6 and made the following math sentences, (utilizing the rules for Order of Operations where necessary - see examples with answers = 10 and = 12):

$4 \times 4 \times 2 + 6 = 38$ $\qquad$ $(6 - 4 + 4) \times 2 = 12$ $\qquad$ $6 - 4 + 4 \times 2 = 10$ $\qquad$ $4^2 \times 4 + 6 = 70$ $\quad$ etc

In the examples, the team first rolled 4 dice and using those numbers, made equations for 30 answers before rolling a second time. For the second and third rolls, they rolled 5 dice and had written math sentences for 61 answer before the math period ended (they said they could have kept going).

Variation: (1) Teams can use dice other than regular spotted dice, such as 10-sided 0-9, 12-sided 1-12, 20-sided 1-20 or 30-sided 1-30 dice.
$\qquad$ (2) Teachers may place restrictions on equations to make it more challenging such as "Every math sentence must include at least one multiplication component".

100 Board Wipe Out – Recording Sheet

Team Members _____   _____   _____   Date: _____

Roll One: _____   Roll Two: _____   Roll Three: _____   Roll Four: _____

Roll Five: _____   Roll Six: _____   Roll Seven: _____   Roll Eight: _____

= 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

GOT IT / CLOSEST TO!

TARGET	NUMBER	EVALUATE
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		

GOT IT / CLOSEST TO!

LEVEL: Grade 4 - 8

SKILLS: Mixed operations (+, -, ×, ÷), order of operations, exponents

PLAYERS: Teams of 2 vs. 2, equal skill level

EQUIPMENT: One decadie, two ten-sided (0-9) dice, two regular dice, gameboard (see reproducibles), pencil

GETTING STARTED: All five dice are rolled and set before the two teams. Players are not allowed to touch the dice once they are rolled. The goal of the teams is to target the number on the decadice using the four remaining dice. All remaining dice must be used once.

EXAMPLE: The dice are rolled: ← Target Decadie

Dice for targeting → the decadie

Team One says "Got It" as they calculated an exact bullseye: (5 + 5) x (4 - 3) = 10. Team One now records their math.

There will be roll combinations that cannot be calculated to a bullseye. In this case, a team may call "Closest To", verbalize their sentence and record their math.

EXAMPLE: The dice are rolled: ← Target Decadie

Dice for targeting → the decadie

Team Two says "Closest To".

$8^2 - 1 - 1 = 62$

ROCK AND ROLL

LEVEL: 3 - 6

SKILLS: comparing place value, expanding numbers

PLAYERS: 2 – 4 (1 player as referee)

EQUIPMENT: 2 – 6 dice per player (# of dice determines size of number), recording sheet

GOAL: to be the first player to order their dice and to create the greatest number possible

GETTING STARTED:

The referee calls players to "Rock and Roll". All players shake their dice and hide the roll with their hands until the referee calls "Reveal". Players then begin arranging their dice to make the largest number possible. The first player to finish calls out "Rock and Roll". All other players must immediately freeze their work in their current order and pull their hands off their dice. The first player verbalizes their number to the other players.

If the first player to finish has correctly ordered and read their number, they earn 5 points. If they are also the largest number of the group they earn another 5 points for a total of 10 points. All other players earn zero. If any player in the group has a number greater than the first to call "Rock and Roll" they earn 5 points for the round as well.
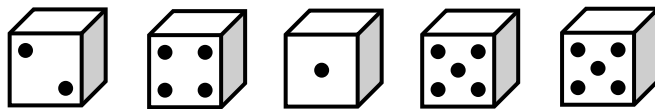
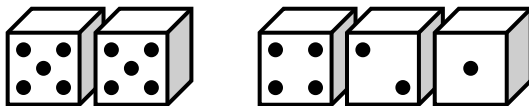| MATH TALK | Don't let students use AND when reading their numbers. AND is the decimal.

EXAMPLE:
Playing to ten thousands

ROLL:

ARRANGE:

5 5 , 4 2 1

READ: **Fifty-five thousand, four hundred twenty-one**

ROCK AND ROLL

VARIATIONS:

1. Students play for the least possible number.

2. Students play on the decimal game sheet.

3. Arrange and write all your numbers in ascending order.

MATH JOURNAL WORK AND EXTENSIONS:

1. Why is it important to see place value represented in many different ways?

2. What is the largest possible number that can be rolled? The least? How close were you on any roll to either of these possibilities?

3. What strategy did you use to tell which number is greatest in the round? Do you use the same strategy when the numbers are very close?

4. This game is excellent for teaching expanded notation. After each round have players slot their dice into the black tray on top of the Stratedice place value chart. This provides the language for the students.

   After the dice are slotted in, have players expand them out as follows:

   <<SAMPLE>>

   The blank spaces in the trays represent zeroes. Students can put their fingers right into the empty slots. From this physical expanding of the number we then have students record on their math journal recording sheet.

Roll dice, arrange for greatest possible number

First to call ROCK & ROLL scores 5 POINTS

All other players must freeze their dice when ROCK & ROLL is called

If a player's number is greater than the player who called ROCK & ROLL, they also get 5 POINTS

ROLL	NUMBER	EXPANDED NUMBER
1.	6 6 5 2	6000 + 600 + 50 + 2
2.	6 6 5 1	6000 + 600 + 50 + 1
3.	6 5 2 2	6000 + 500 + 20 + 2
4.	3 3 2 2	3000 + 300 + 20 + 2
5.	5 3 3 3	5000 + 300 + 30 + 3
6.	6 4 4 3	6000 + 400 + 40 + 3
7.	5 4 4 3	5000 + 400 + 40 + 3
8.	6 4 4 4	6000 + 400 + 40 + 4
9.	4 4 3 1	4000 + 400 + 30 + 1
10.	5 4 2 1	5000 + 400 + 20 + 1

ROCK AND ROLL

RECORDING SHEET

ROLL	NUMBER	EXPANDED NUMBER
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		

ROLL ON PLACE VALUE

	HUNDRED THOUSANDS	TEN THOUSANDS	THOUSANDS	HUNDREDS	TENS	ONES
ROUND ONE — PLAYER ONE						
PLAYER TWO						
ROUND TWO — PLAYER ONE						
PLAYER TWO						
ROUND THREE — PLAYER ONE						
PLAYER TWO						

The goal of the game is to create the largest number. Players take turns rolling a die, placing it into the tray and announcing it's place value for that roll. After 6 rolls, players compare numbers. A point is earned by the player with the largest number. A Place Value Systems die is rolled to identify a specific place value (for example 100's) . A second point is earned by the player with the highest place value in that place. A third "upside down bonus point" is awarded to the player with the biggest number when the tray is rotated 180 degrees and the numbers are compared.

ROLL ON PLACE VALUE RECORDING SHEET
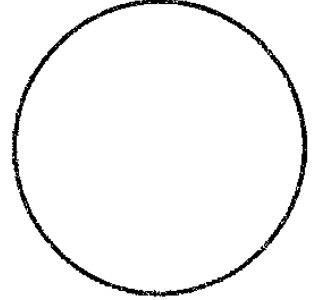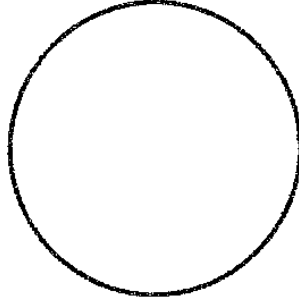
My Name _____   My Partner's Name _____

ROUND #	MY NUMBER	> = <	MY PARTNER'S NUMBER
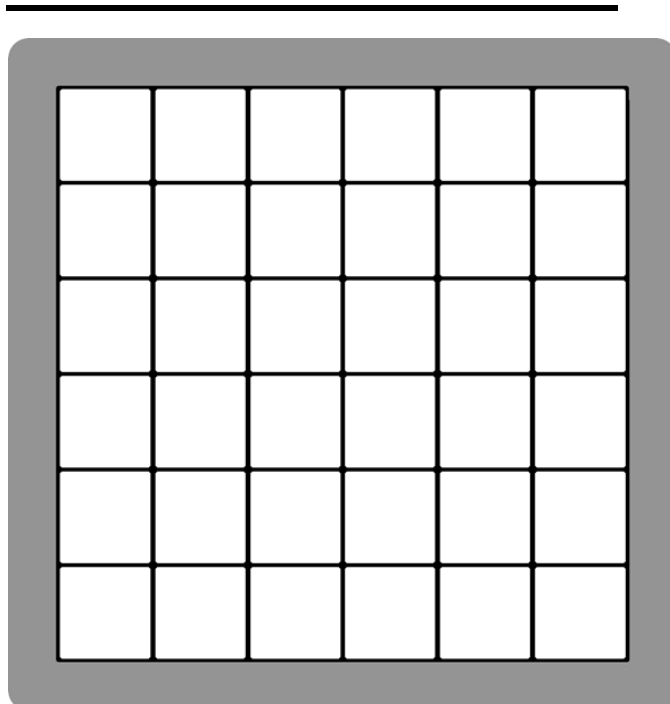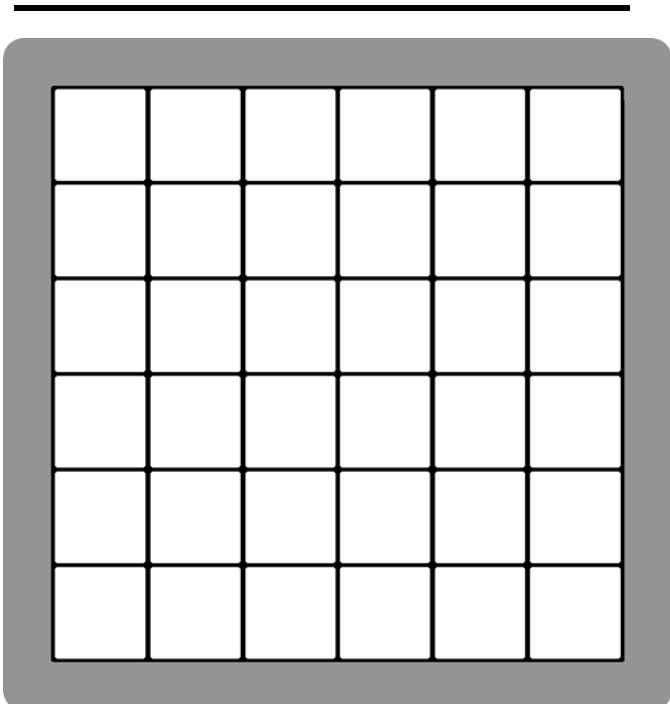
Rounding Recording Sheet

Turn	Rolled	Standard	Rounded To 10's	Rounded to 100's	Notes
example	400 , 20 , 7	427	430	400	
1					
2					
3					
4					
5					
6					
7					
8					
9					
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20					
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22					

The Solution
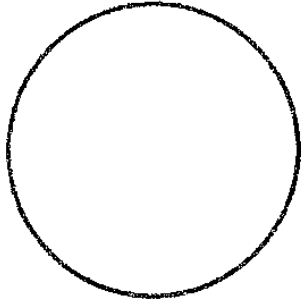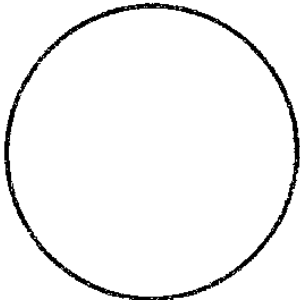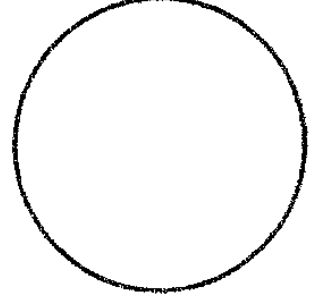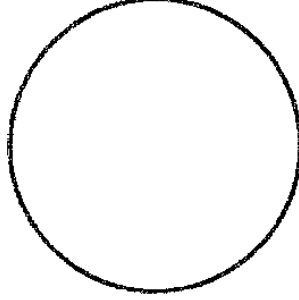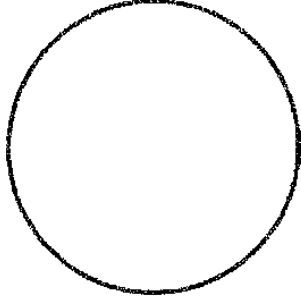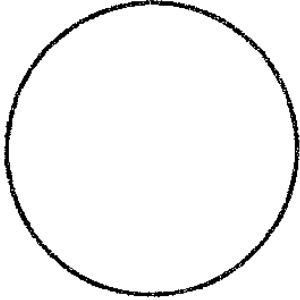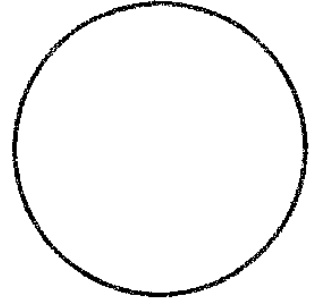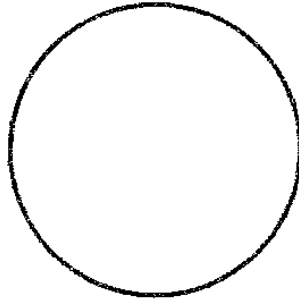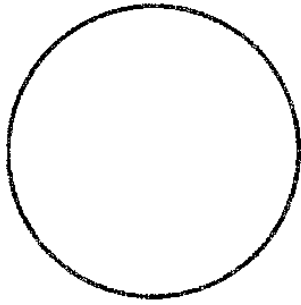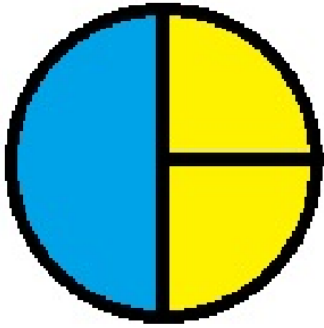
Fraction Estimator
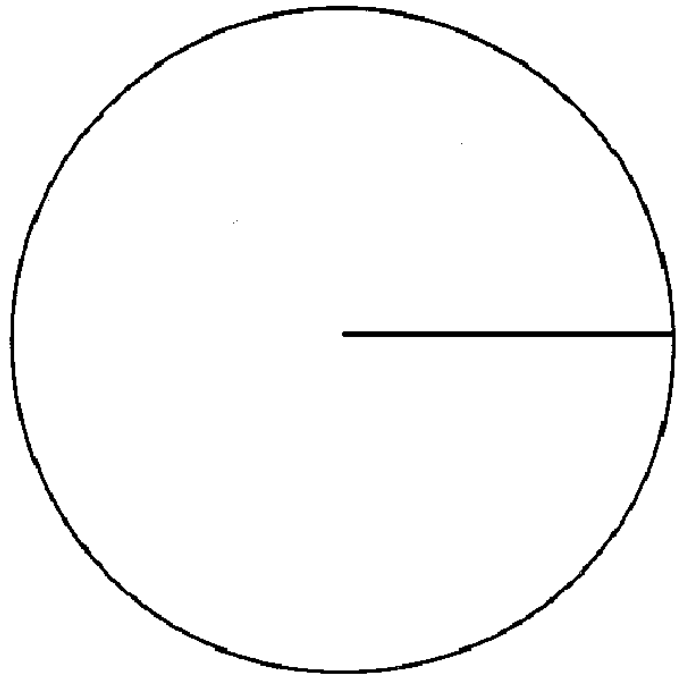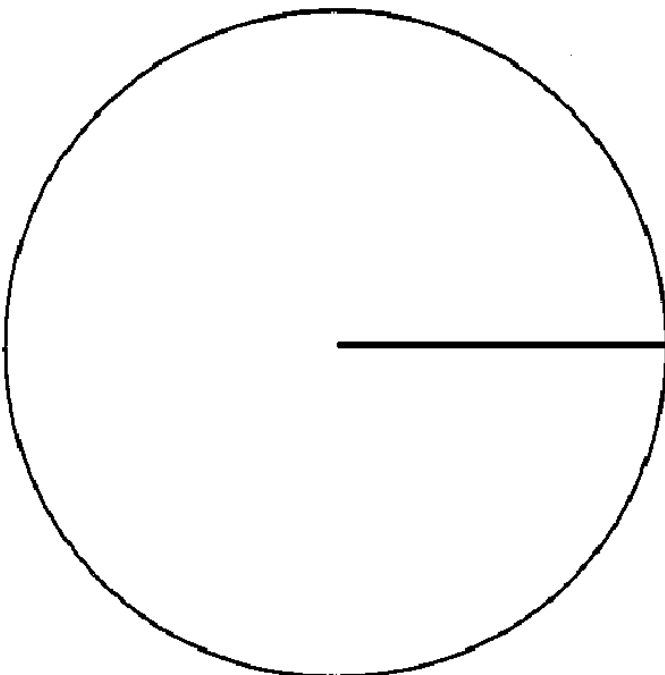
Fractions Decimals Percents

Name	Fraction	Decimal	Percent
One Whole	1/1	1.00	100%
One Half	1/2	0.50	50%
Two Halves	2/2	1.00	100%
One Third	1/3	0.333	33%
Two Thirds	2/3	0.666	67%
Three Thirds	3/3	1.00	100%
One Fourth	1/4	0.25	25%
Two Fourths	2/4	0.50	50%
Three Fourths	3/4	0.75	75%
Four Fourths	4/4	1.00	100%
One Fifth	1/5	0.20	20%
Two Fifths	2/5	0.40	40%
Three Fifths	3/5	0.60	60%
Four Fifths	4/5	0.80	80%
Five Fifths	5/5	1.00	100%
One Sixth	1/6	0.166	17%
Two Sixths	2/6	0.333	33%
Three Sixths	3/6	0.50	50%
Four Sixths	4/6	0.666	67%
Five Sixths	5/6	0.833	83%
Six Sixths	6/6	1.00	100%
One Seventh	1/7	0.143	14%
Two Sevenths	2/7	0.286	29%
Three Sevenths	3/7	0.429	43%
Four Sevenths	4/7	0.571	57%
Five Sevenths	5/7	0.714	71%
Six Sevenths	6/7	0.857	86%
Seven Sevenths	7/7	1.00	100%
One Eighth	1/8	0.125	12.5%
Two Eighths	2/8	0.25	25%
Three Eighths	3/8	0.375	37.5%
Four Eighths	4/8	0.50	50%
Five Eighths	5/8	0.625	62.5%
Six Eighths	6/8	0.75	75%
Seven Eighths	7/8	0.875	87.5%
Eight Eighths	8/8	1.00	100%
One Ninth	1/9	0.111	11%
Two Ninths	2/9	0.222	22%
Three Ninths	3/9	0.333	33%
Four Ninths	4/9	0.444	44%
Five Ninths	5/9	0.555	56%
Six Ninths	6/9	0.666	67%
Seven Ninths	7/9	0.777	78%
Eight Ninths	8/9	0.888	89%
Nine Ninths	9/9	1.00	100%
One Tenth	1/10	0.10	10%
Two Tenths	2/10	0.20	20%
Three Tenths	3/10	0.30	30%
Four Tenths	4/10	0.40	40%
Five Tenths	5/10	0.50	50%
Six Tenths	6/10	0.60	60%
Seven Tenths	7/10	0.70	70%
Eight Tenths	8/10	0.80	80%
Nine Tenths	9/10	0.90	90%
Ten Tenths	10/10	1.00	100%
One Eleventh	1/11	0.091	9%
Two Elevenths	2/11	0.182	18%
Three Elevenths	3/11	0.273	27%
Four Elevenths	4/11	0.364	36%
Five Elevenths	5/11	0.454	45%
Six Elevenths	6/11	0.545	55%
Seven Elevenths	7/11	0.636	64%
Eight Elevenths	8/11	0.727	73%
Nine Elevenths	9/11	0.818	82%
Ten Elevenths	10/11	0.909	91%
Eleven Elevenths	11/11	1.00	100%
One Twelfth	1/12	0.083	8%
Two Twelfths	2/12	0.166	17%
Three Twelfths	3/12	0.25	25%
Four Twelfths	4/12	0.33	33%
Five Twelfths	5/12	0.417	42%
Six Twelfths	6/12	0.50	50%
Seven Twelfths	7/12	0.583	58%
Eight Twelfths	8/12	0.667	67%
Nine Twelfths	9/12	0.75	75%
Ten Twelfths	10/12	0.83	83%
Eleven Twelfths	11/12	0.92	92%
Twelve Twelfths	12/12	1.00	100%

ORDER IN THE COURT

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.

POCKET FRACTIONS

LEVEL: Grade 3 and up

SKILLS: Identifying missing fractions, problem solving

PLAYERS: 2

EQUIPMENT   Fraction pieces

GETTING STARTED: Player One selects any three fraction pieces and places them into their "pocket" (or uses a secret hidden container). Player One gives a riddle like the following:

#1. "I have a total of $\frac{5}{6}$ - one of the pieces is a 1/4 What are my other two pieces?"

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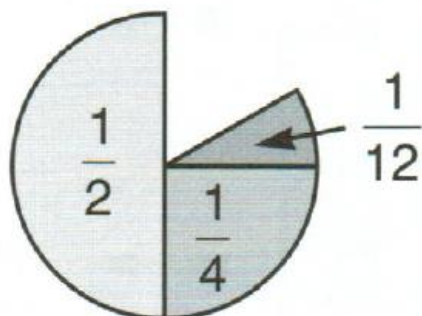**OR**

</div>

#2. "I have a total of $\frac{1}{2}$ - one of the pieces is $1/6$ What are my other two pieces?"

Player Two selects fraction pieces to model and calculate the answer. If they are correct they score a point. If they are correct but have modelled a different or alternate answer than the one hidden, that player would still earn a point. If they are stumped then Player One earns 1 point. Players continue to alternate turns. The first player to score 10 points is the winner.

Answers to above questions:

#1.

#2.