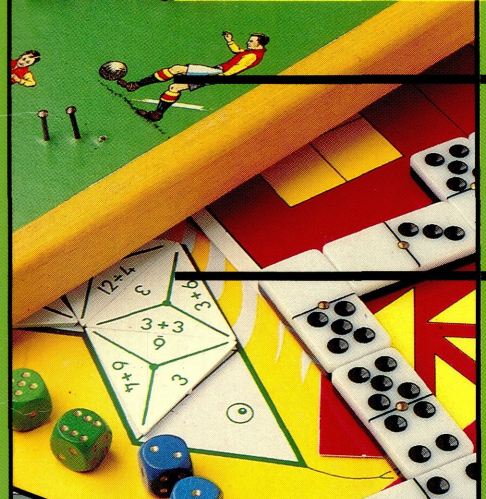
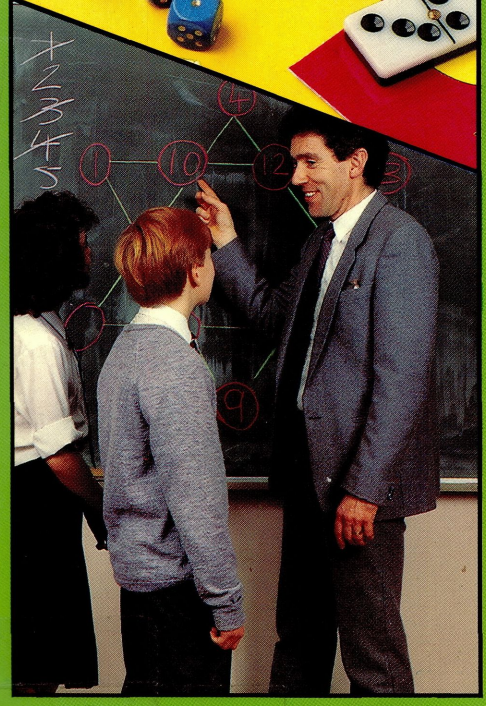
go further with

G·A·M·E·S



For National Curriculum levels 3-6



SPECTRUM MATHS

Dave Kirkby

go further with

G·A·M·E·S

go further with

G·A·M·E·S

For National Curriculum levels 3-6

SPECTRUM MATHS
Dave Kirkby

UNWIN HYMAN

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Introduction

Most schools use a mathematics scheme or schemes to teach basic skills and concepts, but teachers still require a wide range of materials to supplement these schemes. Such materials are provided by the **Spectrum Maths** series.

SPECTRUM MATHS G·A·M·E·S

This is a series of three books of mathematical games primarily for the primary years, although secondary school teachers with low attaining pupils will also find these books useful.

They are defined in terms of three ability levels. Broadly defined, these levels are:

Starting Games *Infants*
More Games *Lower Juniors*
Go Further With Games *Upper Juniors*

Format

Each book contains 40 games, each in the form of:

- a photocopiable gameboard or score sheet;
- a photocopiable set of rules for the game, together with notes for the teacher about the mathematical content and objectives, the apparatus required, and possible variations of the game for follow-up and extension work.

The content throughout focuses on number, with some shape work. Within each book the games are non-sequential, enabling teachers, aided by the notes provided, to make selections suited to the individual needs of their children. The apparatus required is restricted to common classroom items, mainly dice, counters and number cards.

At the back of each book some photocopiable blank gameboards are provided for variations and invented games.

Function

The classroom environment has a great effect on children's attitudes towards learning, and is largely responsible for their perception of mathematics. A positive attitude is an invaluable asset, and games can make an important contribution towards promoting this. Children need to experience:

- success
- satisfaction
- self-confidence
- enjoyment
- excitement
- enthusiasm
- interest
- active involvement

Few media are more successful than games in providing all of these experiences.

The **Spectrum Maths** games have a variety of functions. In particular, they help children to:

★ Understand mathematical concepts.
★ Develop mathematical skills.
★ Know mathematical facts.
★ Learn the language and vocabulary of mathematics.
★ Use mathematical notation.
★ Develop ability in mental mathematics.

In the wider context they:

★ Encourage co-operative learning.
★ Promote discussion between teacher and pupil(s) and between pupils.
★ Contribute to the development of communication skills – explaining rules; devising rules; describing strategies, etc.
★ Stimulate creativity and imagination – making up new games; devising rules; devising variations and extensions.

Using the teacher's notes

Number

Topic

Brief outline of the mathematical content and aim of the game.

Apparatus

Description of the apparatus required.

LEVEL	Profile Component 1				Profile Component 2		
	UA	N	A	M	UA	S	D
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							

KEY UA Using and Applying Mathematics
N Number
A Algebra
M Measures
S Shape and Space
D Handling Data

The teacher's notes for each game contain this table. It refers to the attainment targets and levels of the National Curriculum. An attempt has been made to locate, by means of dots in the table, the approximate content level for each game, but it must be appreciated that many activities can be performed at a variety of different levels.

GAME

This panel contains the rules for the game: it is assumed that the teacher will explain these rules to the players and, if necessary, supervise a 'trial run'.

In some cases it may be appropriate to photocopy this panel for the players. If possible, mount the gameboard or score sheet on card, with the rules alongside. The whole thing could then be covered with adhesive film. Remember to supply each player with additional score sheets on which to record, and with any extra boards that may be necessary.

Variations

Suggestions may include easier or harder versions of the game; modifications to the scoring method; changes to rules; changes in apparatus; and similar games.

Players

Number of players

Using the pupils' sheets

Number

You will need
(description of apparatus)

The information about apparatus is included here as well as on the teachers' notes, so that pupils have some idea of what apparatus they need.

The pupils' sheets take the form of:

GAMEBOARDS, for placing and moving counters, for example.

OR **SCORE SHEETS,** for recording results and scores.

Products

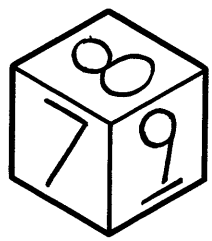
1

Multiplication

Multiplication of two-digit numbers. Different factors of a number.

Apparatus

Use two cubes as dice. Write 2, 3, 5, 7, 8, 9 on the faces of each cube. Each player has a set of counters.



LEVEL	Profile Component 1				Profile Component 2		
	UA	N	A	M	UA	S	D
1							
2							
3							
4		●					
5			●				
6							
7							
8							
9							
10							

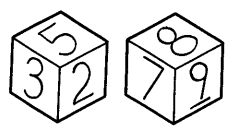
N4 Multiplication facts.
A5 Factors.

PRODUCTS

One player uses the left-hand board, the other uses the right-hand board.

Take turns to:

- Throw the dice.
- **Multiply** the dice numbers to find the **product**.

For example  give a product of **40**.

- Place counters on the board on numbers which multiply together to make the product.
  For example, if the product is **40**,
  a counter can be placed on **40**
  or on **4** and **10**
  or on **5** and **8**
  or on **2**, **4** and **5**.

The **winner** is the first to make a line of 3 counters, horizontally or vertically.

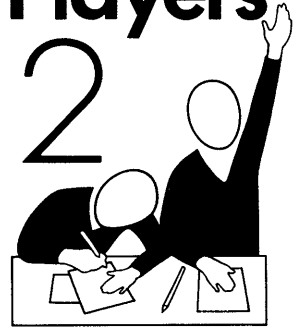
Variations

★ The winner is the first to (a) complete a line of 4 counters, (b) complete a column or row, or (c) complete the board.

★ Change the numbers on the dice and make a different board.

Players

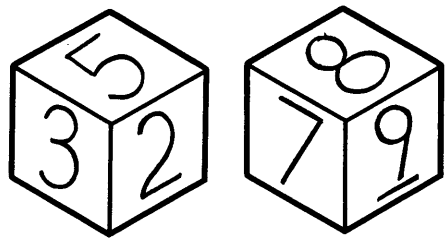
2

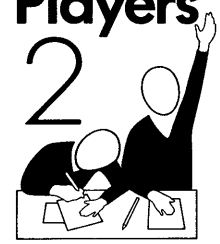


Products

1

You will need
two cubes for use as dice.
Write the numbers 2, 3, 5, 7,
8, 9 on the faces of each cube.
Each player has a set of counters.





PLAYER B

24	3	2	56	64	35
9	40	72	14	21	45
10	15	27	8	63	49
25	4	18	36	5	16

PLAYER A

24	3	2	56	64	35
9	40	72	14	21	45
10	15	27	8	63	49
25	4	18	36	5	16

Remainders

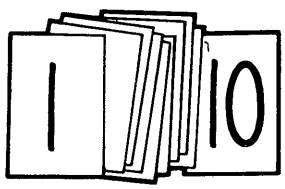
2

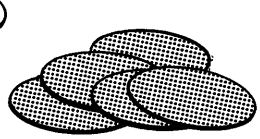
Division

Dividing a two-digit number by single-digit numbers, and finding remainders.

Apparatus

Use 20 numbers cards (2 sets of cards 1 to 10).
Each player has a set of counters (each set a different colour).





LEVEL	Profile Component 1				Profile Component 2		
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1							
2							
3		●					
4		●					
5							
6							
7							
8							
9							
10							

N3 Remainders.
N4 Division of a two-digit number by single-digit numbers.

REMAINDERS

Shuffle the 20 cards and place them in a pile, face down.

Decide on a two-digit target number, say 42.

Take turns to turn over the top card, **divide** the target number by the number on the card, and find the **remainder** (if any).

Suppose your card number is **5**.

42 ÷ 5 = 8, with a **remainder of 2**

You can place a counter on a number **2** on the board, provided there is not a counter on that number already. If you can not place a counter, do nothing.

When all 20 cards have been used, the **winner** is the player who has placed more counters.

Variations

★ When all 20 cards have been used, players add up the numbers covered by their counters. The player with the higher total wins.

★ Instead of number cards, use a dice numbered 1 to 6 and change the board numbers to 0 to 5 only.

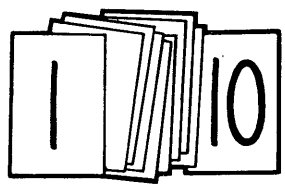
Players

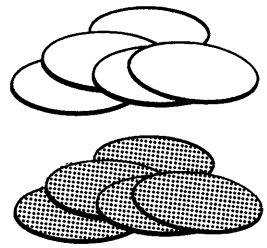
2

Remainders

2

You will need
20 number cards
(2 sets of cards 1 to 10).
Each player has a set of counters
(each set a different colour).





Players 2

3	1	5	0	4
4	2	9	1	2
8	3	4	0	4
2	0	2	7	1
1	3	3	0	6

Difference Race

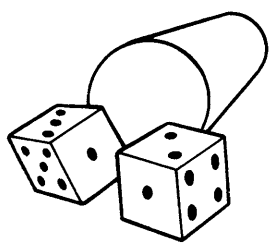
3

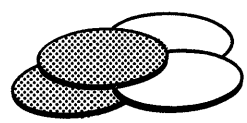
Subtraction

Difference between the numbers on two thrown dice. The concept of chance.

Apparatus

Use two dice numbered 1 to 6. Each player has a pair of counters (the pairs should be different in colour).





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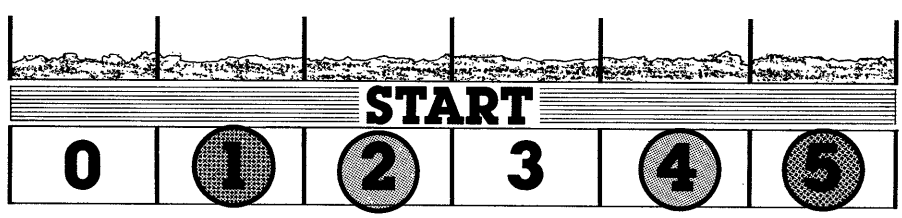
1							
2		●					
3							●
4							
5							
6							
7							
8							
9							
10							

N2 Subtraction facts to 10.
D3 Chance.

DIFFERENCE RACE

Each player chooses two horses (numbers) and places both his or her counters at the start.

For example:



Take turns to throw the dice and find the **difference** between the two numbers thrown.

If this difference matches the number of **any horse**, that horse is moved **one** place towards the finish.

If your number does not match a horse, do nothing.

The **winner** is the owner of the first horse to pass the finishing post, that is the player whose counters are the colour of the winning one.

Variations

★ Use one dice numbered 1 to 6 and one numbered 5 to 10. Make a board for horses numbered 0 to 9.

★ Organise a handicap race. For example, give horse 5 a two-place start and horse 4 a one-place start.

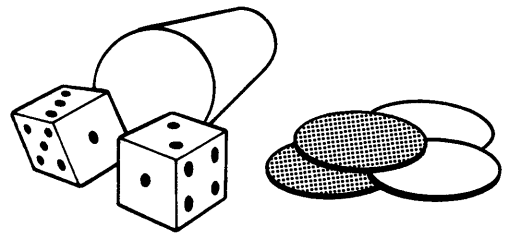
Players

2-3

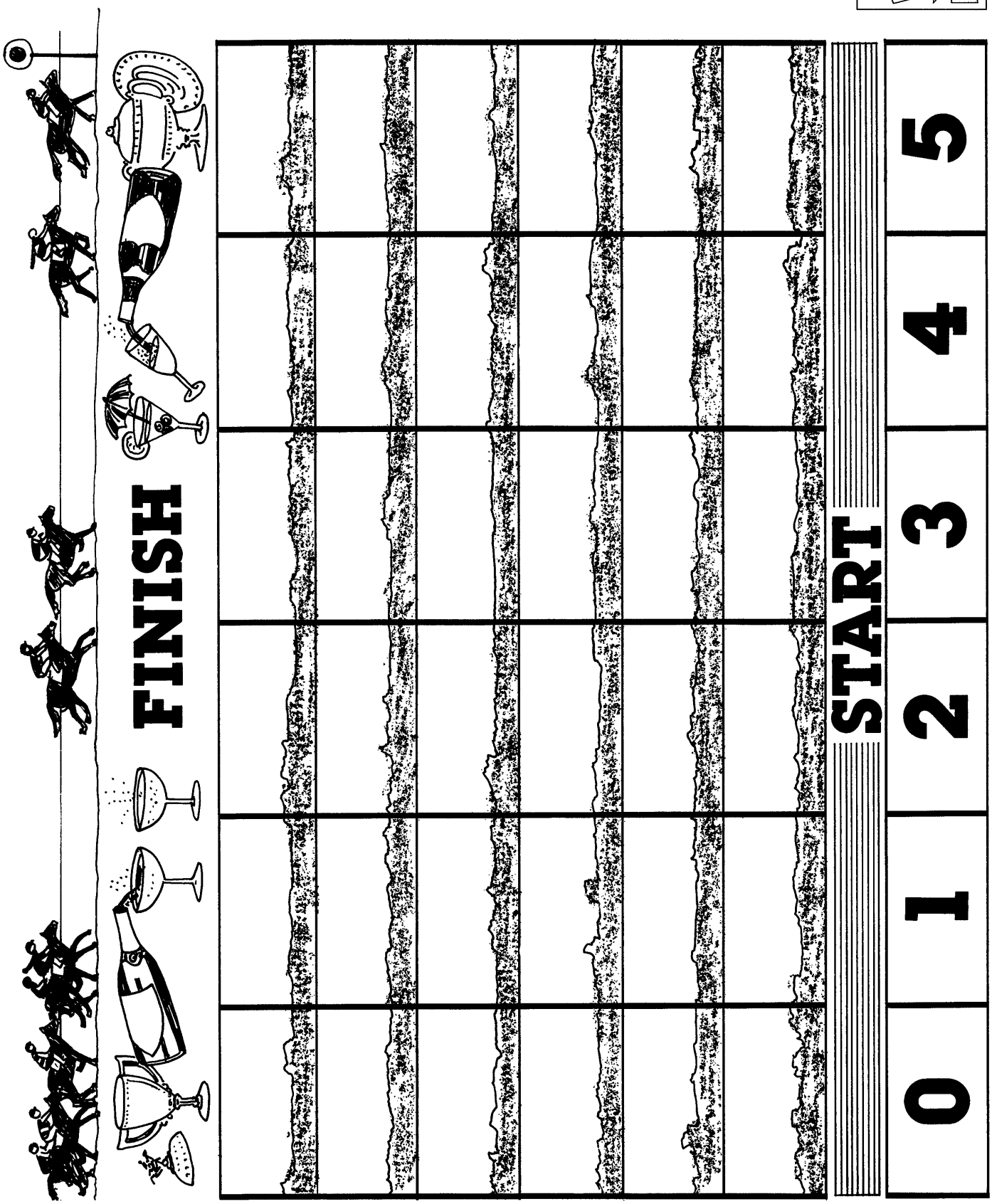
Difference Race

3

You will need
two dice numbered 1 to 6.
Each player has a pair of counters
(the pairs should be different in colour).



Players
2–3



Units Digits

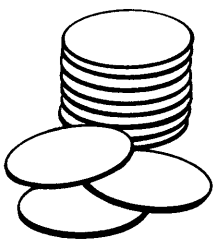
4

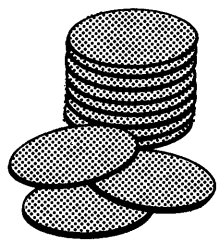
Multiplication

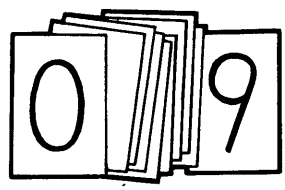
Multiplying two single-digit numbers.
Multiplying by zero.

Apparatus

Use 20 number cards
(2 sets of cards 0 to 9).
Each player has a set of counters
(each set a different colour).







LEVEL	Profile Component 1				Profile Component 2		
	UA	N	A	M	UA	S	D
1							
2							
3							
4		●					
5							
6							
7							
8							
9							
10							

N4 Multiplication facts up to 10 × 10.

UNITS DIGITS

Shuffle the 20 cards and place them in a pile, face down.

Take turns to:

- Turn over the top two cards. Suppose they are **7** and **5**.
- **Multiply** the card numbers together to find the **product**. In the example, this is **7 × 5** or **35**.
- Place a counter on a board number that is the **same as the units digit** in the product number: **5**
  If this is impossible, do nothing.

You may not put a counter on a square that has a counter on it.

Put the used cards to one side. When all the cards have been used, shuffle them and continue the game.

The **winner** is the first player to make or complete a straight line of three counters in any direction.

Variations

★ Design a board appropriate for a game which uses two dice instead of number cards.

★ Each player has a board. The winner is the first player to make a row or column of five counters.

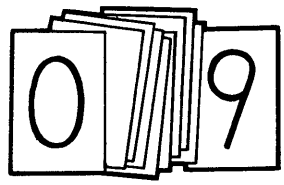
Players

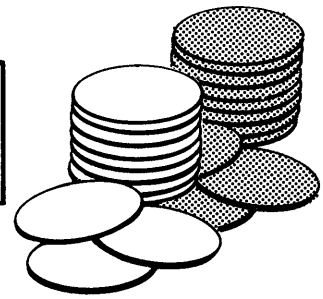
2

Units Digits

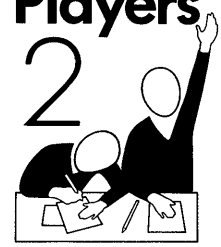
4

You will need
20 number cards
(2 sets of cards 0 to 9)
Each player has a set of counters
(each set a different colour).





Players
2



8	2	8	5	6
4	6	1	6	4
6	8	5	4	2
2	0	4	7	1
6	8	2	3	0

Avoid

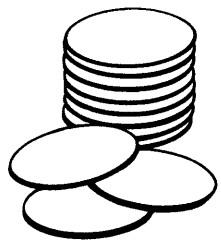
5

Shape

Spatial awareness: avoiding completing a line of 3 counters in any one of three directions.

Apparatus

Use one set of counters.



LEVEL	Profile Component 1				Profile Component 2		
	UA	N	A	M	UA	S	D
1							
2						●	
3						●	
4							
5							
6							
7							
8							
9							
10							

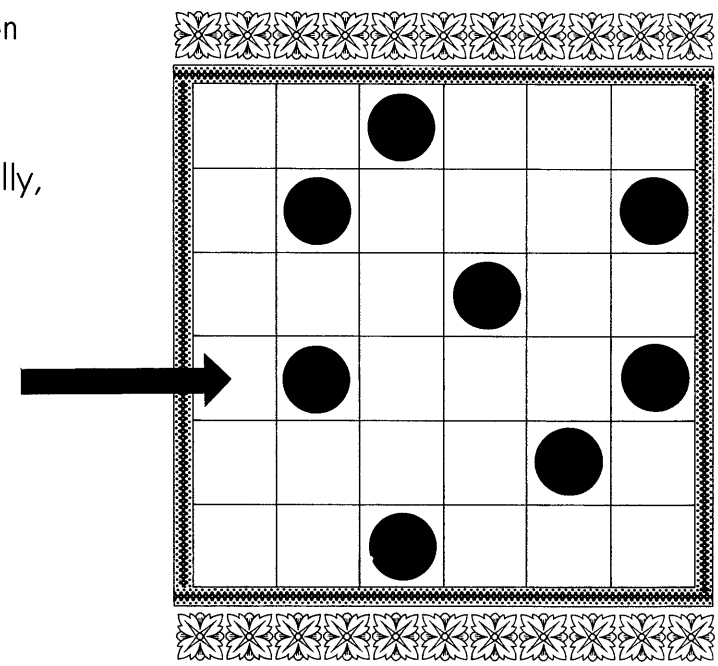
S2, S3 Recognise location.

AVOID

Take turns to place a counter on a square on the board.

The first player to complete a line of three counters, vertically, horizontally or diagonally, **loses** the game. The counters do **not** have to be adjacent.

For example: placing a counter in this square **loses** the game because it completes a line of three counters horizontally.



Variations

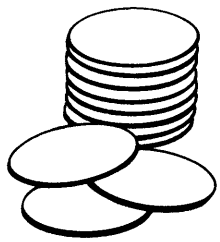
- ★ The first player to complete an *unbroken* line of three counters loses the game.
- ★ Change the size of the board.
- ★ Play with 3 players.

Players 2

Avoid

5

You will need
one set of counters.



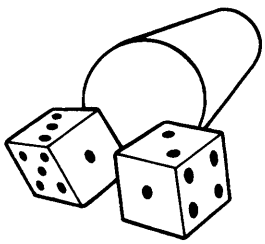
Players 2

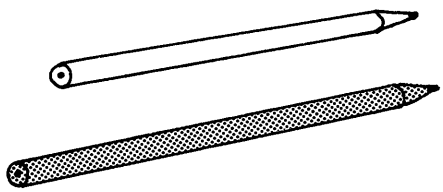
Crossed Lines

6

Co-ordinates Plotting points on a co-ordinate grid.

Apparatus Use two dice numbered 1 to 6.
Each player has a pencil
(different in colour).





LEVEL	Profile Component 1				Profile Component 2		
	UA	N	A	M	UA	S	D
1							
2						●	
3						●	
4			●			●	
5							
6							
7							
8							
9							
10							

A4 Co-ordinates.
S2, S3 Recognise location.
S4 Specify location by means of co-ordinates.

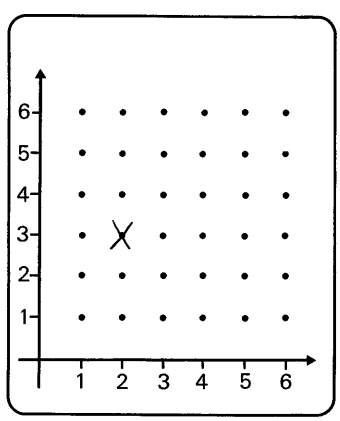
CROSSED LINES

Use one co-ordinate grid for each game.

Take turns to throw the dice, one at a time.
The **first** throw shows the **horizontal co-ordinate**.
The **second** throw shows the **vertical co-ordinate**.

Once a player has thrown the dice
and **plotted** the point on the grid,
he or she marks that point with a cross.

For example, suppose you throw a 2
and then a 3, you would
put a cross as shown here. →



If a point already has a cross on it,
do nothing.

The **winner** is the first to make a straight line
of three crosses in any direction.

Variations

- ★ Allow each player to use his or her own grid.
- ★ Play for 'four in a line'.
- ★ Play 20 rounds altogether.
  The winner is the player who has plotted more points.
- ★ Throw the two dice together and let the player
  choose which is the horizontal co-ordinate number and which the vertical.

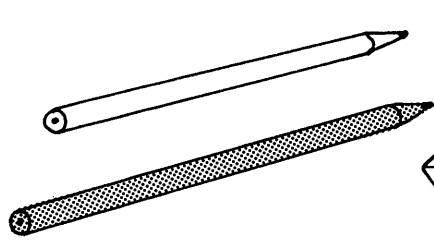
Players

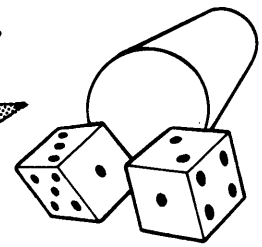
2

Crossed Lines

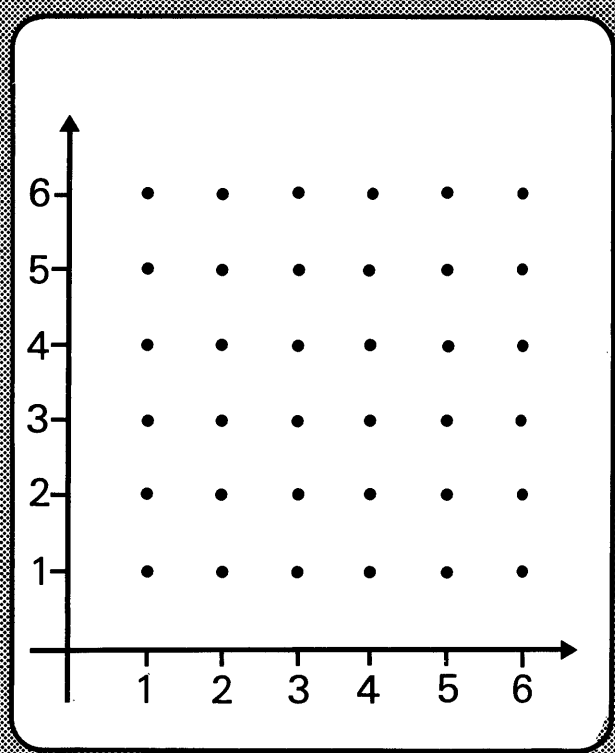
6

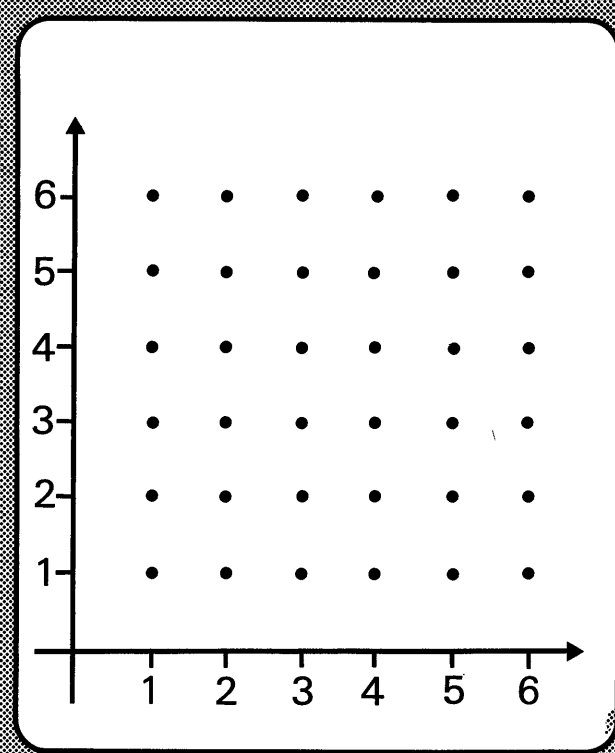
You will need
two dice numbered 1 to 6.
Each player has a pencil
(different in colour).

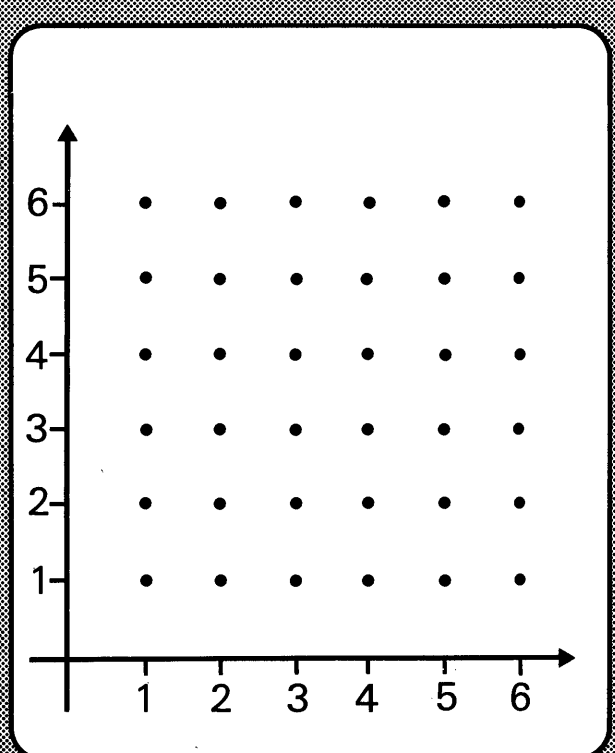


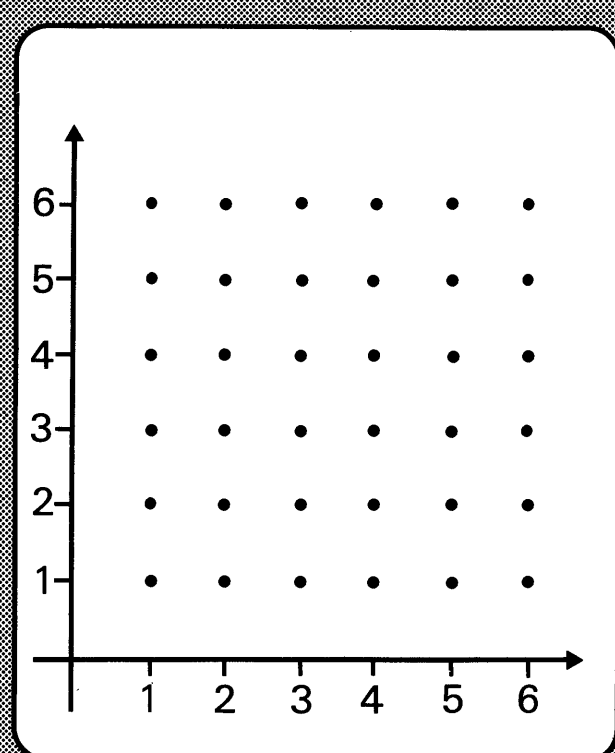


Players
2









Seven Against One

7

Strategy Development and Shape

Developing winning strategies in both attacking and defensive roles. Spatial awareness.

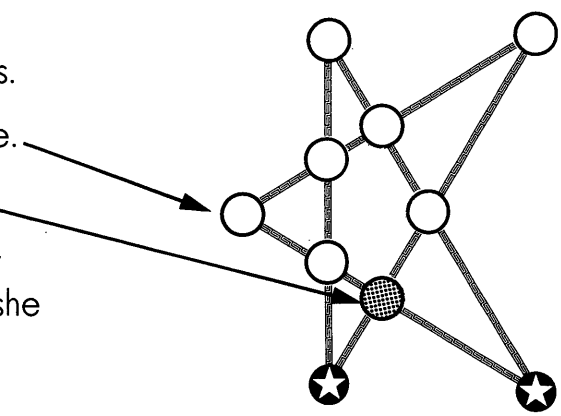
Apparatus

Use one counter of one colour and seven of another colour.

LEVEL	Profile Component 1				Profile Component 2		
	UA	N	A	M	UA	S	D
1							
2						●	
3					●	●	
4					●		
5					●		
6					●		
7							
8							
9							
10							

S2, S3 Recognise location.

SEVEN AGAINST ONE



Put the counters in their starting positions.

Player **A** has seven counters placed here.

Player **B** has one counter placed here.

Player **A** moves first by sliding a counter along a line to an **empty** spot. He or she can only move **one** spot at a time.

Player **B** moves by either:
sliding the counter **one** space along a line to an **empty** spot;
OR jumping over one of Player **A**'s counters into an **empty** spot beyond. The counter that is jumped over is captured. Successive jumps are allowed.

Player **A** wins if he/she can trap Player **B** so that **B can not move**.
Player **B** wins if he/she can capture **three** of **A**'s counters.

Variations

★ Try different starting positions.

★ Change the number of counters that Player B has to capture from Player A.

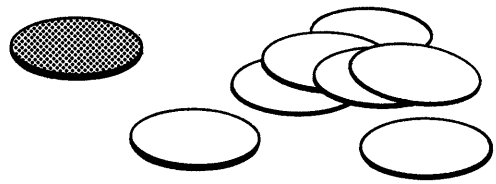
★ Devise a different board.

Players 2

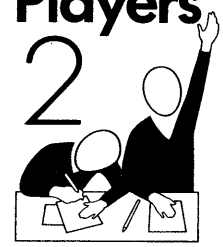
Seven Against One

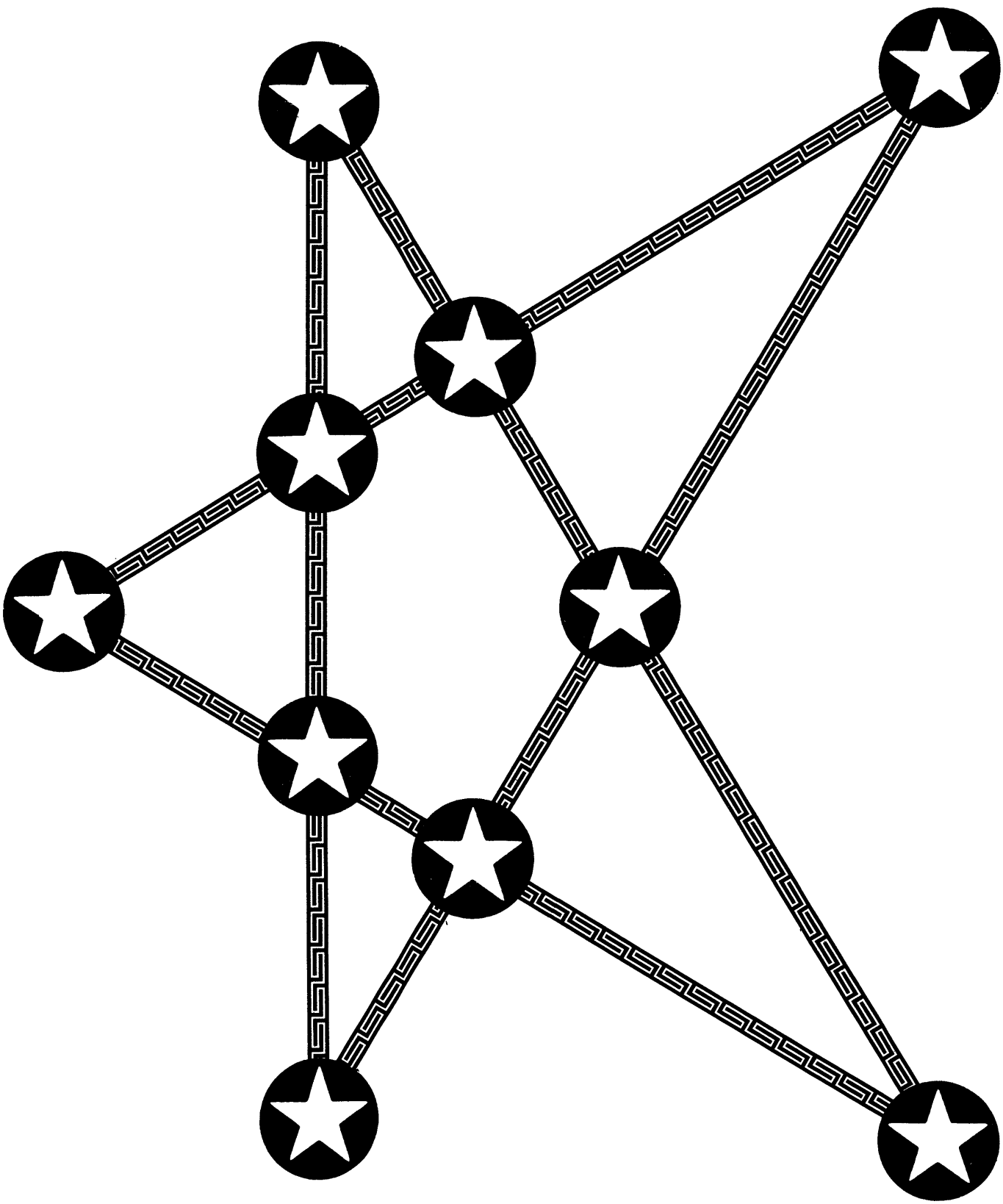
7

You will need
one counter of one colour and
seven counters of another colour.



Players 2





A Mouthful

8

Mixed Number Operations

Adding, subtracting multiplying and dividing. Writing and guessing different number sentences.

Apparatus

No apparatus is required.

LEVEL	Profile Component 1				Profile Component 2		
	UA	N	A	M	UA	S	D
1							
2							
3							
4		●					
5							
6							
7							
8							
9							
10							

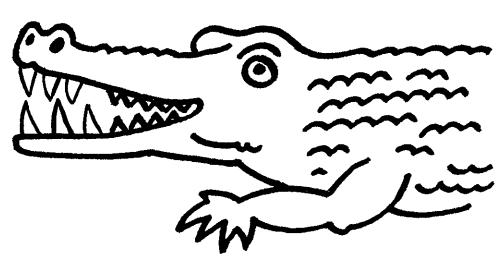
N4 Mixed number operations.

A MOUTHFUL

Player **A** secretly writes a number sentence.
Here are some examples: $5+3=8$
$9-5=4$
$2\times3=6$
$8\div4=2$

Player **B** tries to **guess** the number sentence.
He or she can guess a number (0 to 9) or a sign ($+$, $-$, $\times$, $\div$).

If the guess is correct, Player **A** writes the number/sign on the sheet.
If the guess is incorrect, a tooth is drawn in the crocodile's mouth and the guess is recorded in the 'No' column on the sheet.
If Player **B** can guess the whole number sentence before the crocodile has all **6 big teeth**, he/she wins.
If not, Player **A** wins.



Variations

★ Try different arrangements.

___ ___ ___ = ___ ___ (e.g. $6\times7=42$)
___ ___ ___ = ___ ___ ___ (e.g. $5+2=4+3$)
___ ___ ___ ___ = ___ ___ (e.g. $23-7=16$)

Players

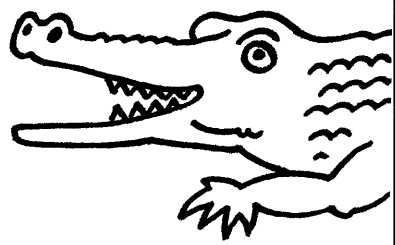
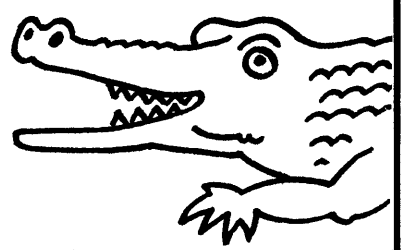
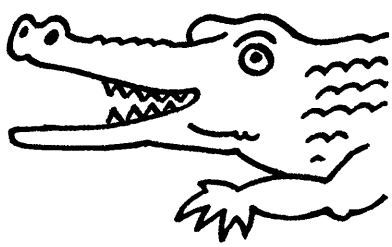
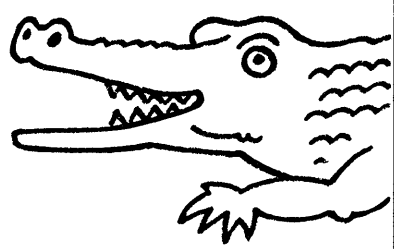
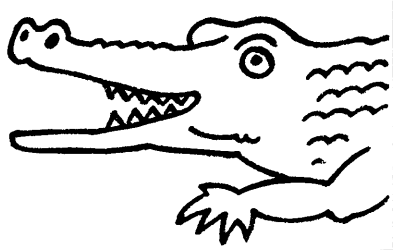
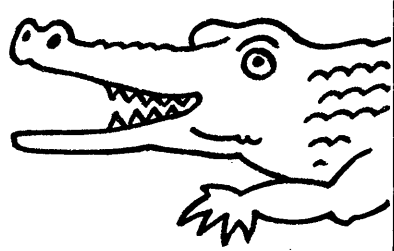
2

A Mouthful

8

You will need
no apparatus.

Players 2

1 ___ ___ ___ = ___	NO ☐	
2 ___ ___ ___ = ___	NO ☐	
3 ___ ___ ___ = ___	NO ☐	
4 ___ ___ ___ = ___	NO ☐	
5 ___ ___ ___ = ___	NO ☐	
6 ___ ___ ___ = ___	NO ☐	

Shapeguess

9

Shape

Use of the language associated with shape: rectangle, square, parallelogram, trapezium, kite, quadrilateral, symmetrical, equal sides, equal angles, etc.

Apparatus

No apparatus is required.

LEVEL	Profile Component 1				Profile Component 2		
	UA	N	A	M	UA	S	D
1							
2						●	
3						●	
4						●	
5						●	
6							
7							
8							
9							
10							

S2–S5 Recognition and sorting of shapes. Correct use of language.

SHAPEGUESS

Player **A** thinks about one of the shapes.
Player **B** has to **guess** which shape by asking questions.

Player **A** may only answer 'Yes' or 'No'.

Here are some examples of questions:

- Does it have a right angle?
- Does it have two equal sides?
- Is it a square?

Keep a record of the number of questions needed to identify the shape.

Now change roles so that Player **B** thinks of a shape and Player **A** guesses.

The **winner** is the player who needed **fewer** guesses.

Variations

★ Player A describes a shape to Player B, bit by bit, without naming it. Player B has one guess after each bit of information, until he/she finds the right shape. Then roles are reversed.

★ Player A describes to Player B how to draw a particular shape. Player B draws without letting Player A see the drawing until complete. Then roles are reversed. Compare drawings.

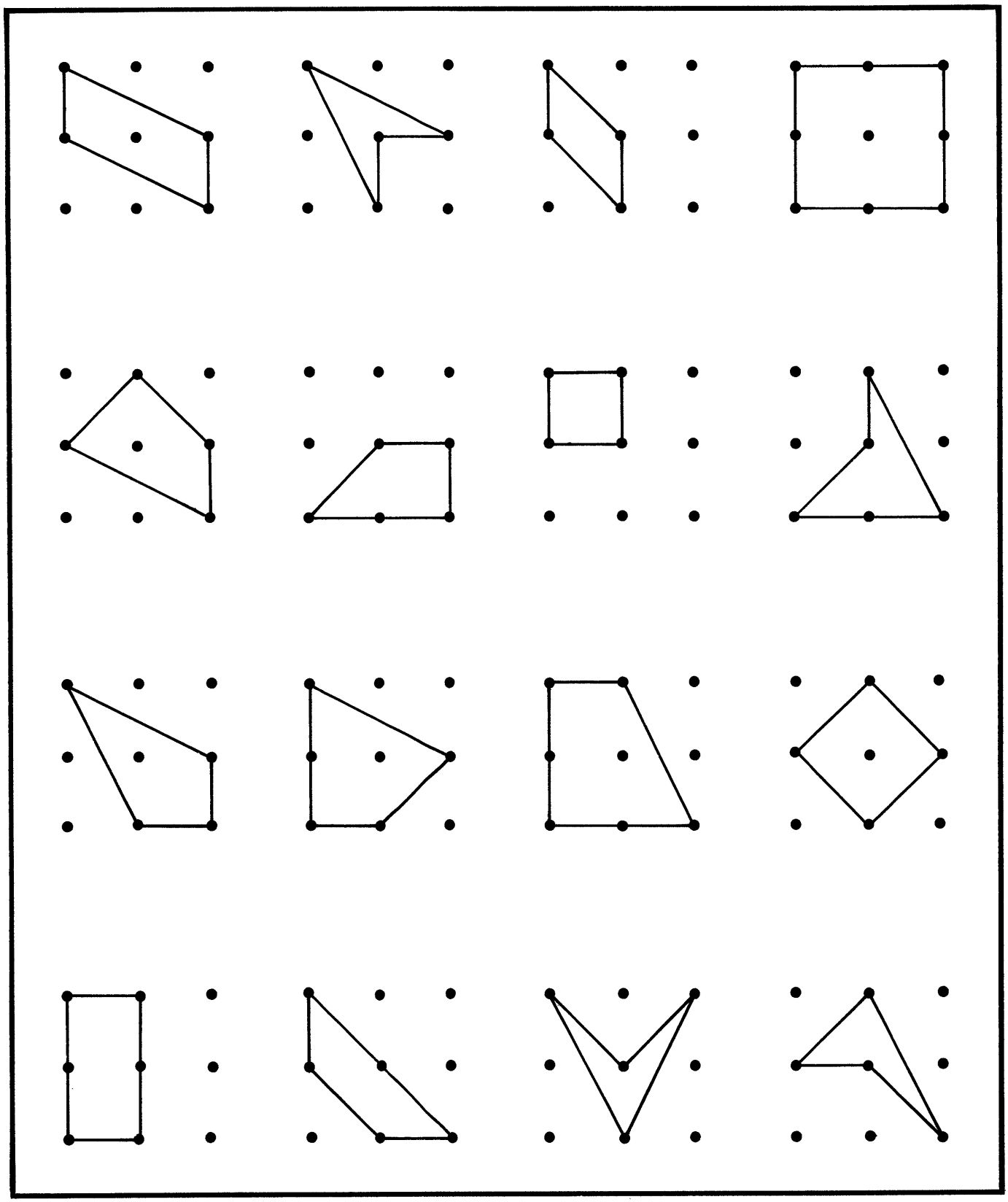
Players

2

Shapeguess

You will need
no apparatus.

Players 2



Sixes

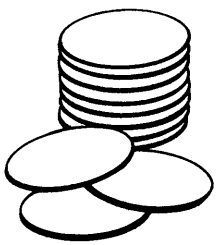
10

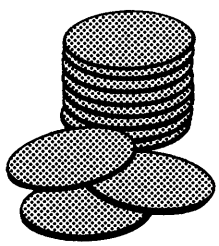
Division

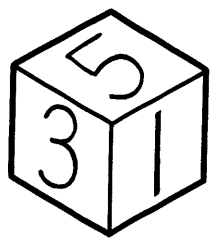
Dividing by six.

Apparatus

Use a cube as a dice. Write 0 to 5 on the faces of the cube. Each player has a set of counters (each set a different colour).







LEVEL	Profile Component 1				Profile Component 2		
	UA	N	A	M	UA	S	D
1							
2							
3		●					
4		●					
5							
6							
7							
8							
9							
10							

N3 Remainders.
N4 Division of two-digit numbers by single-digit numbers.

SIXES

Play the easier game first.

Take turns to:

- Throw the dice to find your **remainder**.
- Place a counter on a number on the board which, **when divided by 6**, gives your remainder.

  For example, suppose you throw **3**, then your remainder is **3**.
  You can place a counter on 9 or 15 or 21 because, when divided by 6, they each give a remainder of **3**.

If you can not place a counter, do nothing.
You may not place a counter on a square that has a counter on it.

Continue until the board is covered with counters.
The **winner** is the player who has placed more counters.

Variations

★ Play 10 rounds. The winner is the player who has placed more counters.

★ Play 10 rounds. Both players find the total of the numbers covered by their counters. The higher total wins.

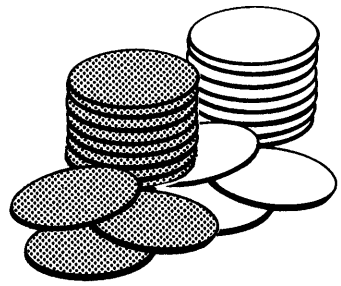
Players

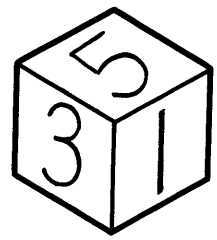
2

Sixes

10

You will need
a cube for use as a dice.
Write the numbers 0 to 5 on the faces. Each player has a set of counters (different in colour).





HARDER GAME

26	43	39	35	41	29
33	31	42	32	37	28
27	34	30	36	38	40

EASIER GAME

17	12	8	18	9	14
19	23	25	11	16	13
24	20	10	22	15	21

Soap Box

11

Addition and Subtraction

Addition and subtraction of numbers up to 10, from a starting point of 40.

Apparatus

No apparatus is required.

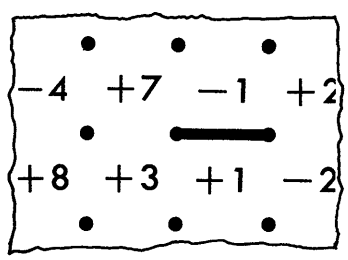
LEVEL	Profile Component 1				Profile Component 2		
	UA	N	A	M	UA	S	D
1							
2							
3							
4		●					
5		●					
6							
7							
8							
9							
10							

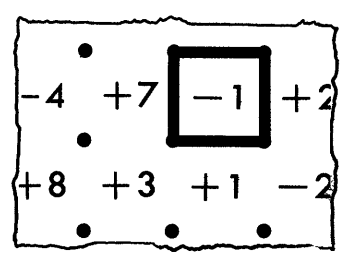
N4 Addition and subtraction of two-digit numbers.
N5 Positive and negative numbers.

SOAP BOX

Take turns to draw a **straight** line, horizontally or vertically, joining **two adjacent dots**.

For example:





If your line completes a small square, have another turn.

Each player starts with 40 points. When a player completes a square, he/she adds or subtracts the number **inside** the square.

When all the squares are complete, the player with the higher total **wins**.

Variations

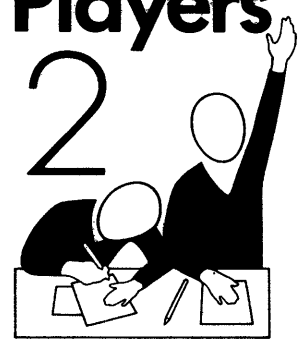
★ Begin with a different total score.

★ Use a grid of a different size, with different numbers.

★ Play so that there is no extra turn after completing a square.

Players

2



Soap Box

11

You will need
no apparatus.

Players 2

+2	+1	−3	−9	+6
−4	+7	−1	+2	−8
+8	+3	+1	−2	+10
−2	−5	−1	+9	−7
+5	+3	−6	+4	−3

+5	−1	+3	+9	−2
−8	+10	+2	−7	−3
+1	−9	−2	+2	+6
+7	−1	−5	+1	+3
−4	+4	−6	+8	−10

+9	−1	+8	+2	+3
+3	+1	−9	−3	−8
−2	+10	−7	−2	+7
+4	−1	−4	+2	−10
+1	+5	−6	−5	+6

+1	−1	−2	+3	−6
+8	+5	+9	+3	−4
−2	+2	+1	+7	+10
+6	−9	−5	−10	+2
−3	−1	−7	+4	−8

Decimate

12

Decimals

Choosing two out of three digits to make a decimal number (units and tenths) as close as possible to a given whole number.

Apparatus

Use one dice numbered 1 to 6. Make two other dice by writing 2, 3, 4, 5, 6, 7 on the faces of one cube, and 4, 5, 6, 7, 8, 9 on the faces of another.

LEVEL	Profile Component 1				Profile Component 2		
	UA	N	A	M	UA	S	D
1							
2							
3							
4		●					
5		●					
6							
7							
8							
9							
10							

N4, N5 Approximation involving decimal numbers.

DECIMATE

Take turns to:

- Throw the three dice.
- Choose two of the thrown numbers to form a **decimal number** as close as possible to the target number for that round.
- Write them on the score sheet as the decimal number.

The player who is closest to the target wins that round.

After all seven rounds, the **winner** is the player who has won most rounds.
If there is a tie, play a deciding round.

Variations

★ Use dice with different numbering.

★ Throw four dice and choose two numbers.

★ Throw four dice, choose three numbers and have targets of this type: □ · □ □.

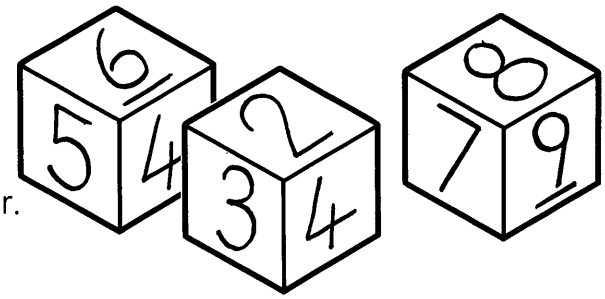
Players

3

Decimate

12

You will need
one dice numbered 1 to 6.
Make two other dice by writing
2 to 7 on the faces of one cube
and 4 to 9 on the faces of the other.



Players
3

TARGET	PLAYER A	PLAYER B	PLAYER C	WINNER
5	□ • □	□ • □	□ • □	
3	□ • □	□ • □	□ • □	
8	□ • □	□ • □	□ • □	
6	□ • □	□ • □	□ • □	
2	□ • □	□ • □	□ • □	
7	□ • □	□ • □	□ • □	
9	□ • □	□ • □	□ • □	

OVERALL WINNER

Race Track

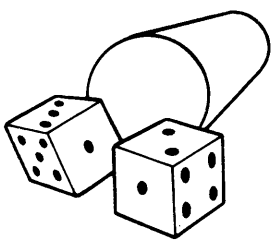
13

Properties of Numbers

Types of number: multiples, odd and even numbers, primes, square numbers.

Apparatus

Use two dice numbered 1 to 6. Each player has one counter (different in colour).



LEVEL	Profile Component 1				Profile Component 2		
	UA	N	A	M	UA	S	D
1							
2							
3							●
4							●
5			●				
6							
7							
8							
9							
10							

A5 Primes, squares, multiples.
D3, D4 Identifying chance.

RACE TRACK

One player places a counter on **A**, the other on **B**.

Each player chooses a set of numbers from these options:

multiples of 2	square numbers	prime numbers
multiples of 4	multiples of 3	odd numbers

Suppose Player **A** chooses prime numbers and Player **B** chooses multiples of 4.

Take turns to throw the dice and find the **sum** of the dice numbers. After each throw, if the sum is:

- a prime number, Player **A** moves forward that number of squares;
- a multiple of 4, Player **B** moves forward that number of squares;
- both a prime number **and** a multiple of 4, both players move.

The **winner** is the first to catch or overtake the other.

Variations

★ Choose different number sets as options.

★ Each player has two counters, and can choose two number sets.
If one counter is caught, it is removed from the board.
The winner is the first to catch or overtake both the opponent's counters.

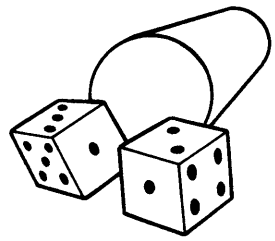
Players

2

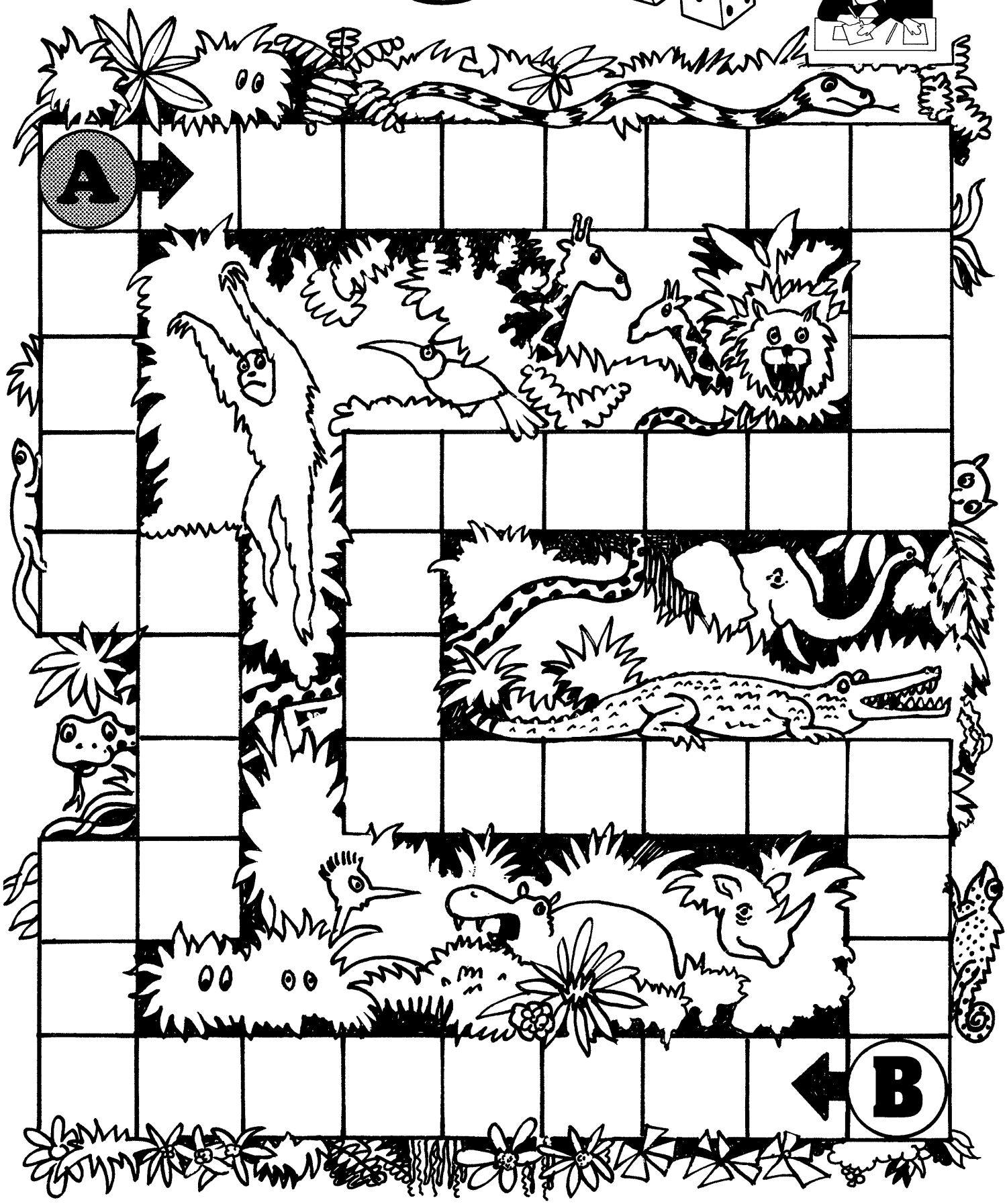
Race Track

13

You will need
two dice numbered 1 to 6.
Each player has one counter
(of different colours).



Players
2



Two Places

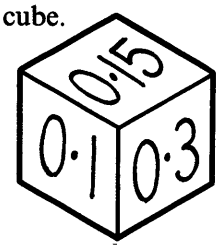
14

Decimals

Colouring parts of a 10 × 10 square according to decimal numbers thrown on a dice. Numbers include tenths and hundredths.

Apparatus

Make a dice by writing 0·1, 0·3, 0·05, 0·15, 0·35 and 0·2 on the faces of a cube.



LEVEL	Profile Component 1				Profile Component 2		
	UA	N	A	M	UA	S	D
1							
2							
3							
4		●					
5		●					
6							
7							
8							
9							
10							

N4 Decimal notation to two decimal places.
N5 Place value in decimals.

TWO PLACES

Each player needs a score sheet.

Take turns to throw the dice and colour the appropriate portion of one large square. Check each other's colouring.

The **winner** is the first player to colour two large squares completely.

Variations

★ Use a dice labelled $\frac{1}{10}$ $\frac{3}{10}$ $\frac{1}{4}$ $\frac{15}{100}$ $\frac{1}{5}$ $\frac{45}{100}$.

★ Use a dice labelled 0·15, 0·3, 0·65, 0·45, 0·2, 0·15.

★ Use a dice labelled 0·1, $\frac{3}{10}$, 0·4, 0·35, $\frac{15}{100}$, $\frac{1}{4}$.

Players

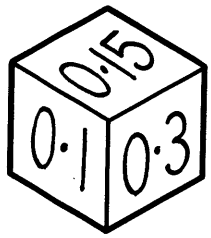
2+

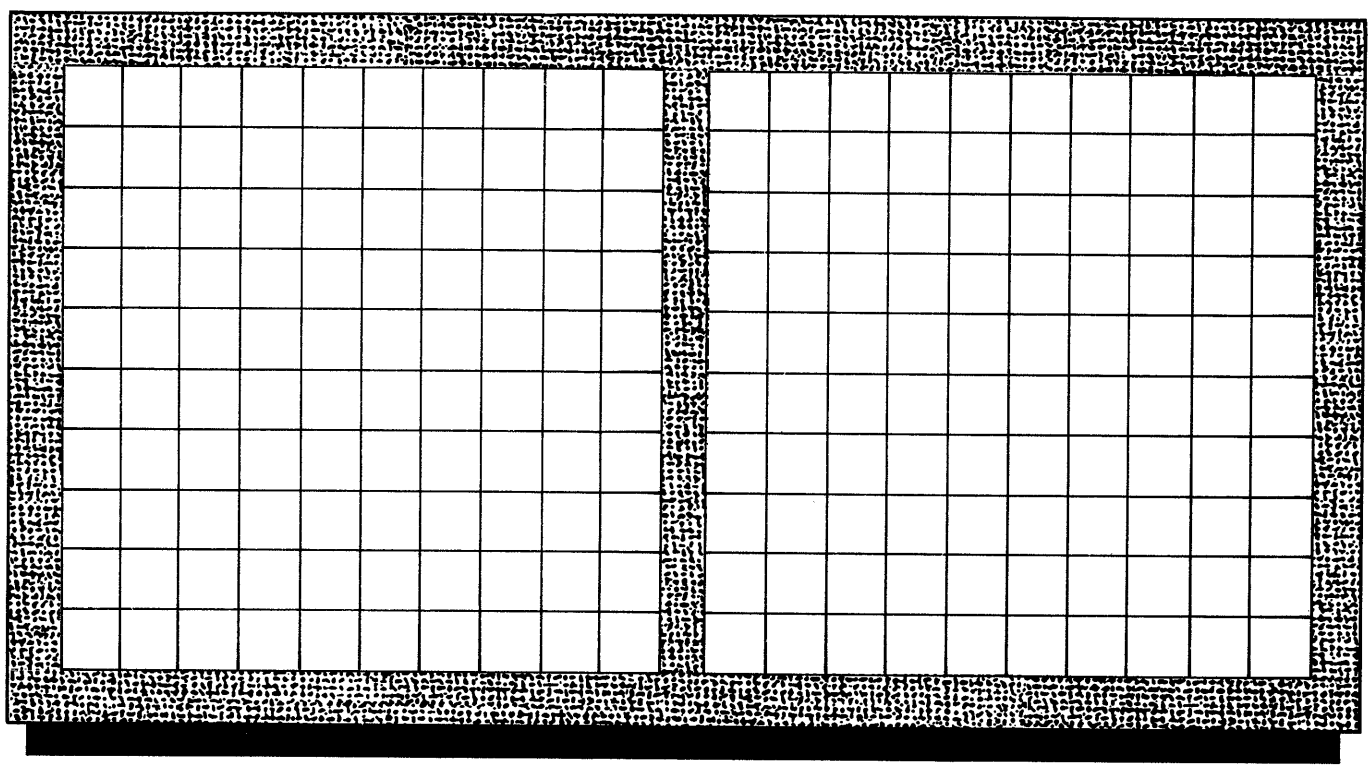
Two Places

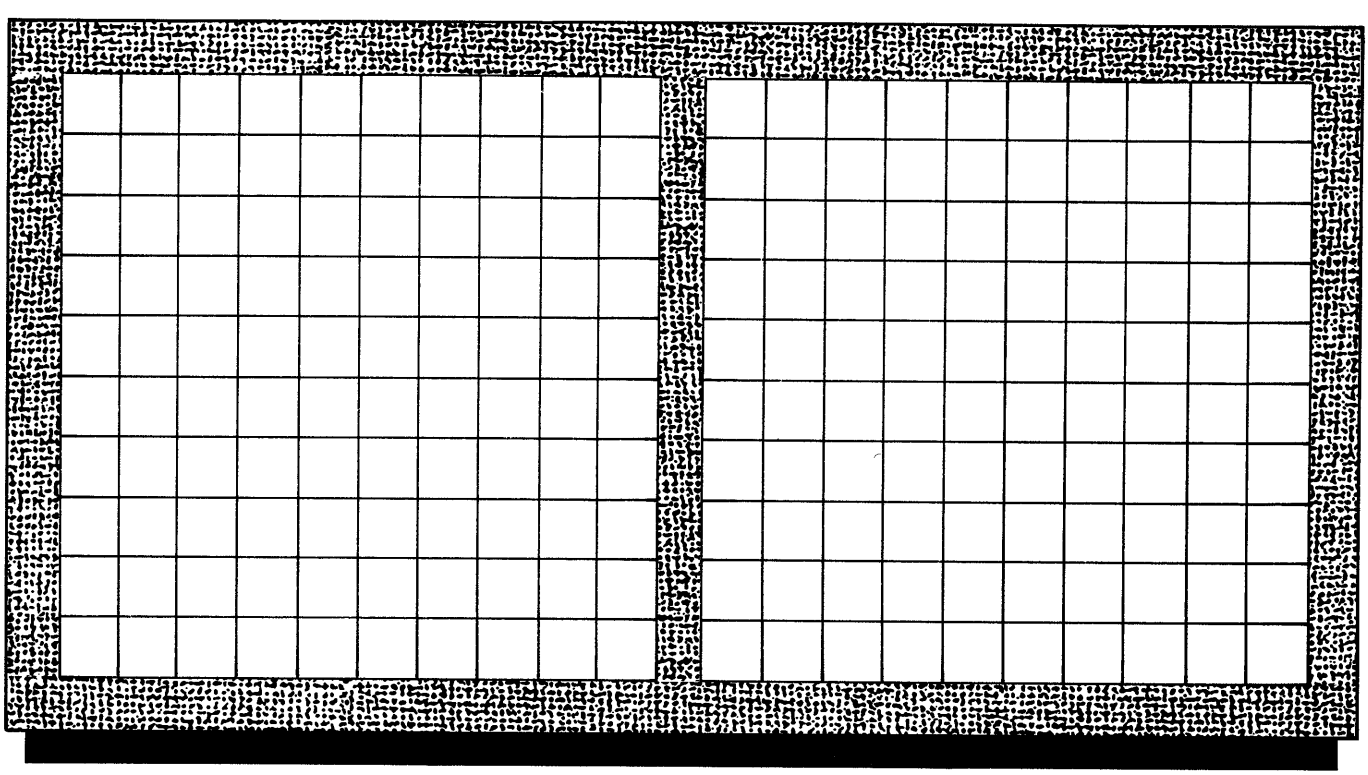
14

You will need

a cube for use as a dice.
Label the faces 0·1, 0·3, 0·05.
0·15, 0·35 and 0·2.







Square Charge

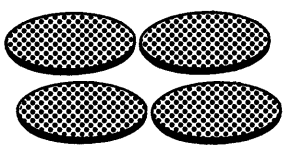
15

Shape

Spatial awareness. Developing a strategy for advancing one's own pieces while restricting movement of one's opponent's pieces.

Apparatus

Each player has 4 counters (the sets of counters should be different in colour).

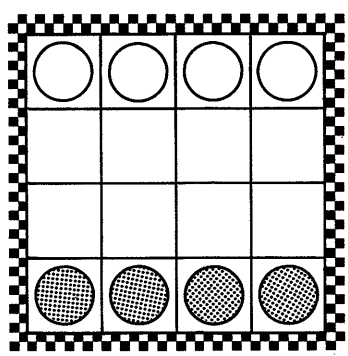


LEVEL	Profile Component 1				Profile Component 2		
	UA	N	A	M	UA	S	D
1							
2						●	
3						●	
4							
5							
6							
7							
8							
9							
10							

S2, S3 Recognise locations. Transformations.

SQUARE CHARGE

Put the counters in these starting positions. →



Take turns to move a counter **one** space, horizontally or vertically, into an **empty** square.

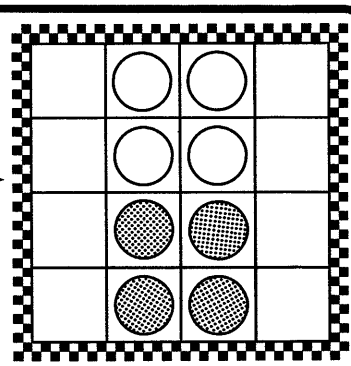
If you can not move you must miss your turn, or turns, until you can move.
You may not put a counter on a square that has a counter on it, or jump over a counter.

The aim for each player is to get his or her four counters into the opponent's starting positions.

The **winner** is the first player to do this.

Variations

★ Try different starting positions, for example →



★ Allow a counter to be jumped over another counter.

Players

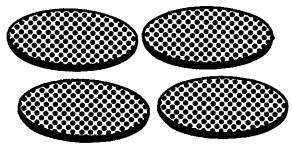
2

Square Charge

15

You will need

4 counters for each player
(the sets should be different in colour).



Players

2

Line Race

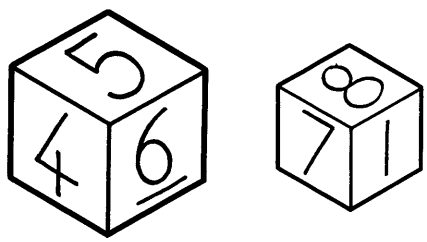
16

Length

Measuring distances in centimetres and millimetres.

Apparatus

Use a large dice numbered 1, 2, 3, 4, 5, 6 and a small dice numbered 1, 3, 5, 7, 8, 9.



LEVEL	Profile Component 1				Profile Component 2		
	UA	N	A	M	UA	S	D
1							
2							
3				●			
4				●			
5							
6							
7							
8							
9							
10							

M3 Measuring lengths.
M4 The relationship between centimetres and millimetres.

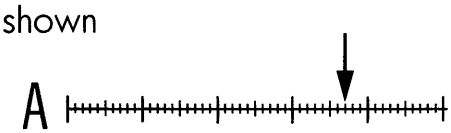
LINE RACE

Take turns to throw the dice.

The **large** dice shows the number of **centimetres**.
The **small** dice shows the number of **millimetres**.

So a 3 on the large dice and a 7 on the small dice represents 3·7 centimetres.

A player moves along his or her line the distance shown by his/her dice numbers, and marks an arrow.
The arrow is the starting position for that player's next turn.



Players should check each other's moves.

The first player to reach or pass the finish **wins**.

Variations

★ Start at finish and move towards start.

★ Change the numbers on the small dice, for example to 2, 3, 4, 5, 6, 8.

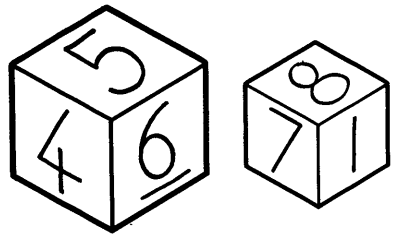
Players

3

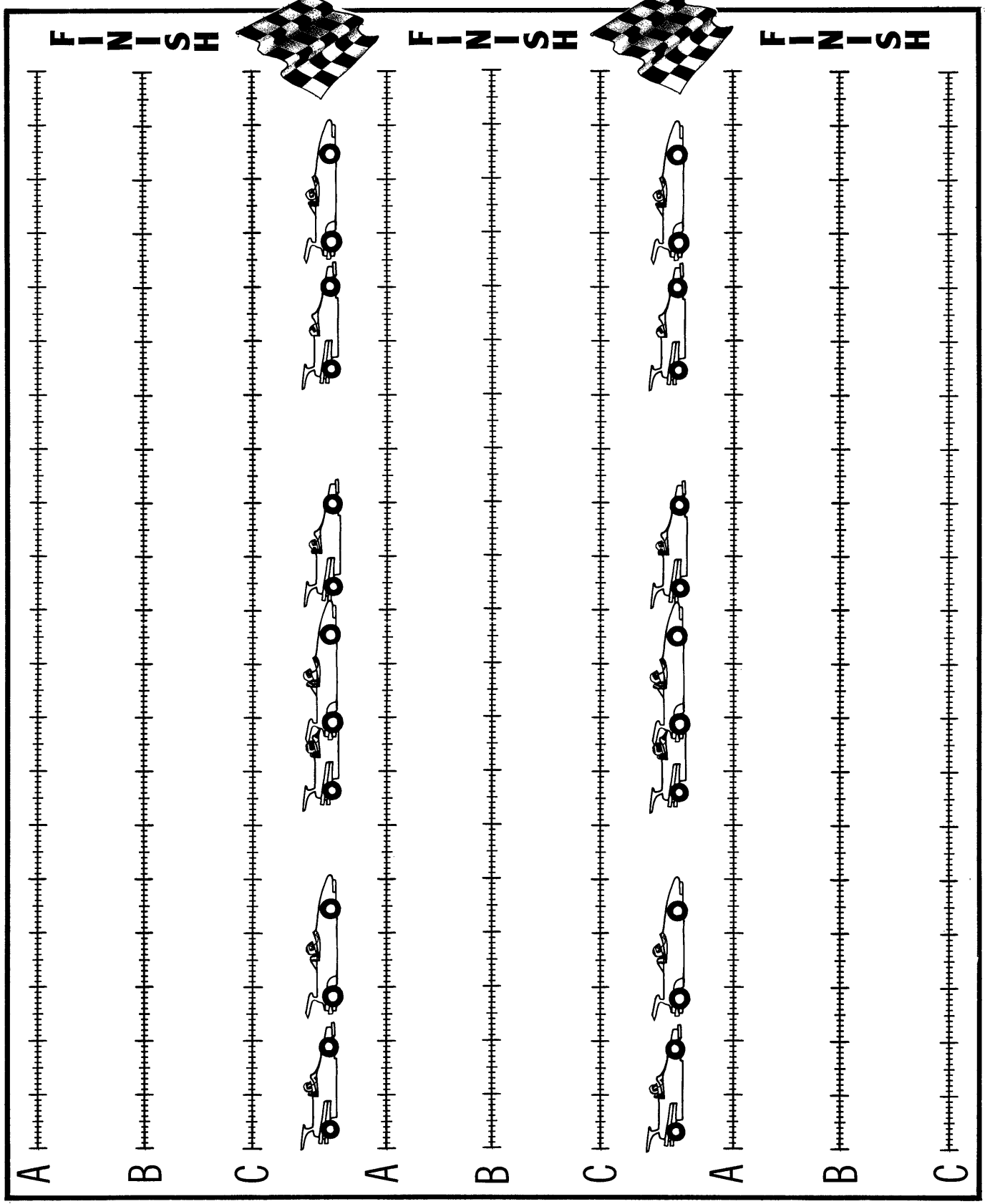
Line Race

16

You will need
a large dice numbered 1 to 6,
and a small dice (use a cube)
numbered 1, 3, 5, 7, 8 and 9.



Players
3



Fives and Threes

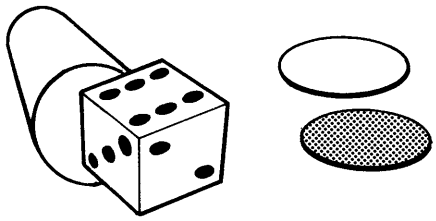
17

Multiplication

Multiples of numbers, including multiples beyond the tenth.

Apparatus

Use one dice numbered 1 to 6. Each player has a counter (different in colour).



LEVEL	Profile Component 1				Profile Component 2		
	UA	N	A	M	UA	S	D
1							
2							
3							
4							
5			●				
6							
7							
8							
9							
10							

A5 Multiples.

FIVES AND THREES

Take turns to:

- Throw the dice.
- Move your counter the number of squares shown by the dice.
- If your counter lands on a **multiple of 3**, jump **forwards** to the next multiple of 3.
- If your counter lands on a **multiple of 5**, jump **backwards** to the previous multiple of 5.

The two counters may land on the same square.

The **winner** is the first player to reach or pass 100.

Variations

★ Change the multiples, for example, move forwards on multiples of 4 and backwards on multiples of 7; or forwards on multiples of 5 and backwards on multiples of 9.

★ Use the sum of two dice numbers to indicate the number of squares the counters move.

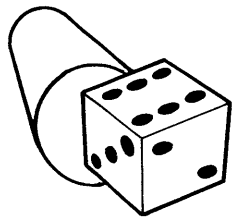
Players

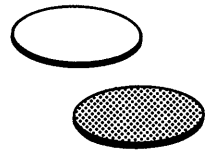
2+

Fives and Threes

17

You will need
one dice numbered 1 to 6.
Each player has one counter (different in colour).





Players 2+

START

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

Jumble

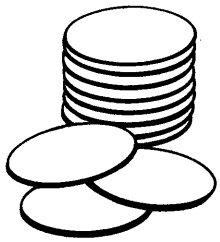
18

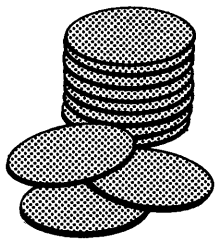
Mixed Number Operations

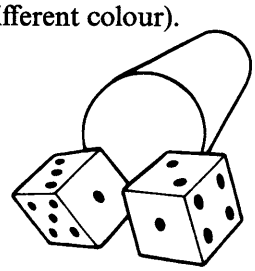
Operations of addition, subtraction, multiplication and division on two single-digit numbers.

Apparatus

Use two dice numbered 1 to 6. Each player has a set of counters (each set a different colour).







LEVEL	Profile Component 1				Profile Component 2		
	UA	N	A	M	UA	S	D
1							
2							
3							
4		●					
5							
6							
7							
8							
9							
10							

N4 Mixed number operations.

JUMBLE

Take turns to throw the dice and find the **sum** of the two numbers.

If, on your turn, the sum **matches the value of a square on the board**, you can place the counter on that square.

You may not put a counter on a square that has a counter on it.

The **winner** is the first player to make a straight line of four of his or her counters in any direction.

Variations

★ Make a rule that when a counter is placed, it must be put next to the counter last put on the board.

★ Extend the number of players to three or four.

★ The winner is the first to make a continuous chain of counters from one side of the board to the other, or from top to bottom.

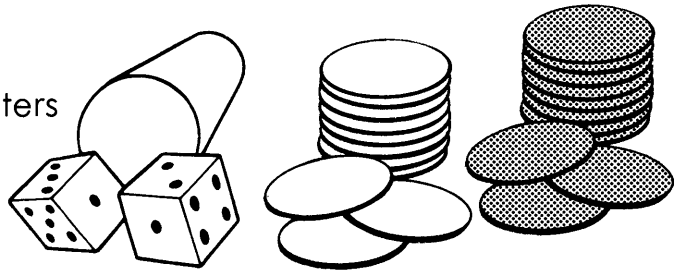
Players

2

Jumble

18

You will need
two dice numbered 1 to 6.
Each player has a set of counters (each set a different colour).



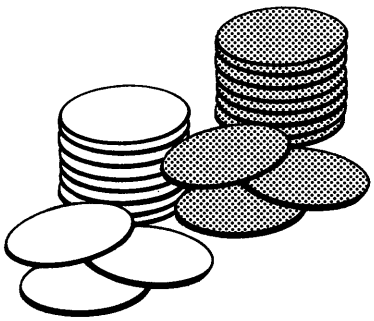
4+5	1+2	11−6	12÷3	1×3	4×2	3+4	17−6
5×2	6+2	14−4	2×2	1+3	10−5	9−5	21÷3
12−3	3×1	3+3	12−5	4−1	20÷4	20−9	12−4
1+4	2+2	18÷3	5×1	2+1	3×2	4+7	7+4
7−1	5−2	2×3	1×7	5+5	28÷4	7×1	10−3
16÷2	15÷5	8−5	10−1	10−2	3+1	3+2	2×5
4+3	4×2	1×9	27÷3	3×3	1×4	7−3	3+6
5+1	1×5	20−10	12−6	5+3	3+7	50÷5	14÷2

Double Up

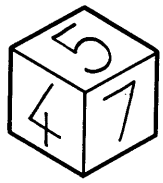
Mixed Number Operations

Finding the sum and the product of two dice numbers. Adding these to find a total score.

Apparatus



Use one dice numbered 1 to 6. Make another dice by writing 4, 5, 6, 7, 8, 9, on the faces of a cube.
Each player has a set of counters (different in colour).

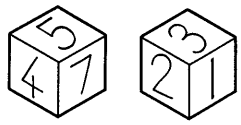


LEVEL	Profile Component 1				Profile Component 2		
	UA	N	A	M	UA	S	D
1							
2							
3		●					
4		●					
5							
6							
7							
8							
9							
10							

N3, N4 Addition and multiplication facts.

DOUBLE UP

Take turns to throw the two dice.

Suppose you throw 

To find your score:

Multiply the two dice numbers together, $3 \times 5 = 15$
add the two dice numbers, $3 + 5 = 8$
then find the **total**. **23**

If your total appears on the board, put a counter on it.
You may not put a counter on a hexagon that has a counter on it.

The **winner** is the first player to make or complete a straight line of three counters.

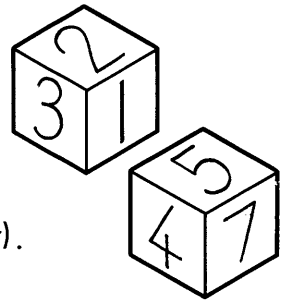
Variations

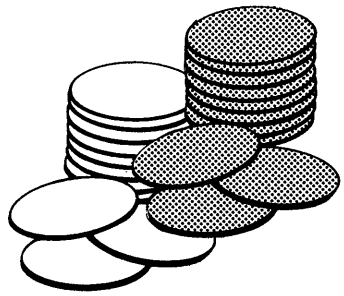
- ★ The winner is the first to make a straight line of 4 counters.
- ★ Score the sum of the product of and the difference between the two dice numbers. The first to reach or pass 200 wins.
- ★ Play 5 rounds. Each player then adds together the numbers covered by his or her counters. The player with the higher score wins.

Players 2

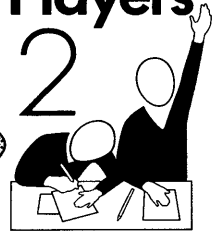
Double Up

You will need
one dice numbered 1 to 6.
Make another dice by writing the numbers 4 to 9 on the faces of the cube. Each player has a set of counters (different in colour).





Players
2



	44	27		
69	23	55	41	19
13	31	9	59	
62	53	20	34	24
17	35	48	47	
39	29	11	26	15
	49	14		

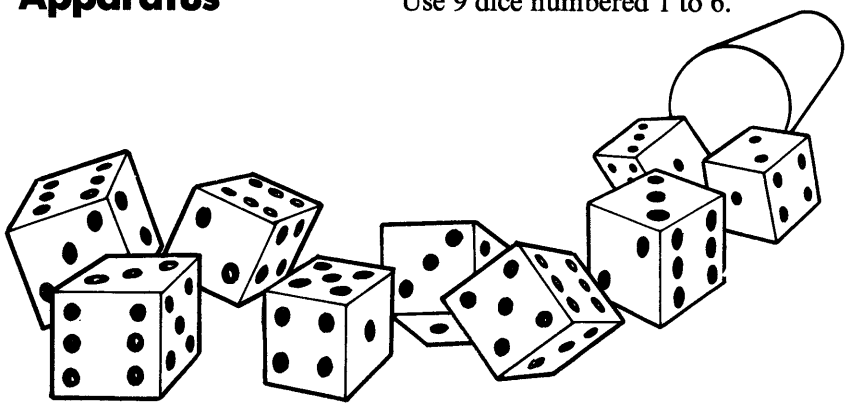
Factor

Division

Considering different divisors of specific numbers. Factors.

Apparatus

Use 9 dice numbered 1 to 6.



LEVEL	Profile Component 1				Profile Component 2		
	UA	N	A	M	UA	S	D
1							
2							
3							
4		●					
5			●				
6							
7							
8							
9							
10							

N4 Division of two-digit numbers by single-digit numbers.
A5 Factors.

FACTOR

Each player has a score sheet. Play Game 1.

One player throws all nine dice. **Both** players write the nine numbers on their score sheets.

For example:

Each player arranges the numbers in the grid on his or her sheet, aiming to place as many **factors** as possible in positions appropriate to the **row** and **column headings**.

Each correctly placed factor scores **1 point**.

The **winner** is the player with most points.

Dice numbers: 3 4 1 5 2 5 6 3 4

GAME 1

	20	9	12	
18	5	3	6	2pts
16	4	3	4	2pts
10	5	1	2	3pts
	3pts	3pts	3pts	

SCORE 16

Variations

★ Throw the dice one at a time. Players have to write each number in the grid before the next is thrown.

★ Use blank grids. Players choose their own headings.

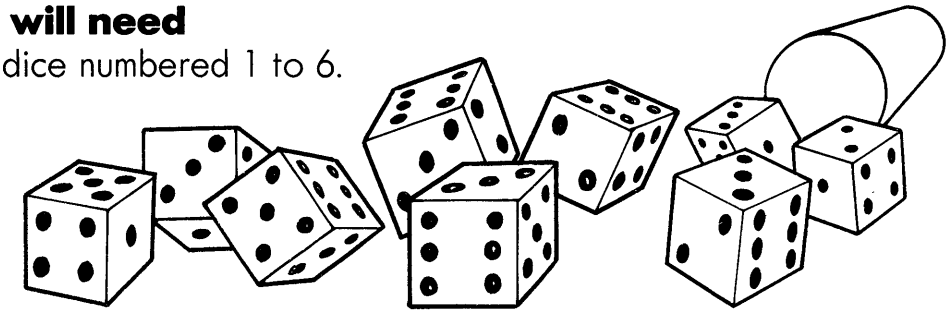
★ Throw 10 dice. Each player can reject one number of his or her choice.

Players

Factor

20

You will need
nine dice numbered 1 to 6.



Players 2+

GAME 1

Dice numbers

	20	9	12
18			
16			
10			

SCORE

GAME 2

Dice numbers

	30	8	24
15			
6			
12			

SCORE

GAME 3

Dice numbers

	15	18	24
40			
6			
12			

SCORE

GAME 4

Dice numbers

SCORE

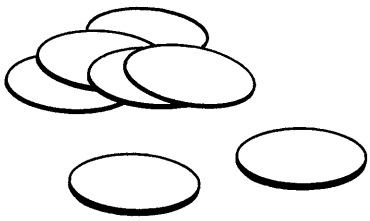
Slide

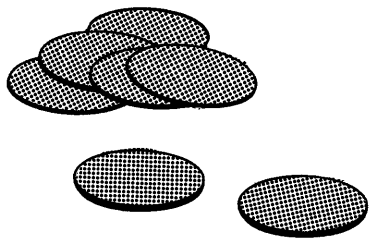
Shape

Spatial awareness. Making diagonal moves to get pieces 'home'.

Apparatus

Each player has 7 counters (the sets of counters should be different in colour).





LEVEL	Profile Component 1				Profile Component 2		
	UA	N	A	M	UA	S	D
1							
2						●	
3						●	
4							
5							
6							
7							
8							
9							
10							

S2, S3 Recognise locations. Transformations.

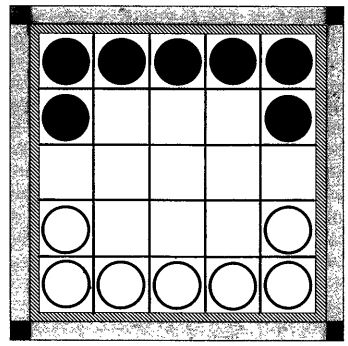
SLIDE

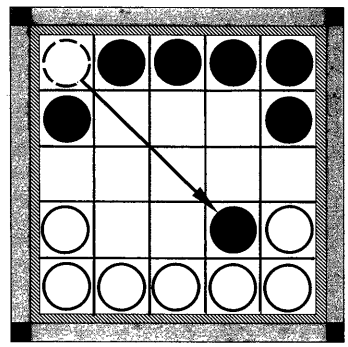
Place the counters in these starting positions.

Take turns to move one of your counters by sliding it **diagonally** to an **empty** square. You can move **as many squares as you like**, provided another counter is not in the way. You may not jump over a counter.

The aim of each player is to move his or her counters into the opponent's starting positions.

The first player to do this is the **winner**.

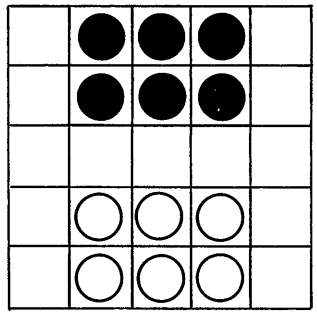




Variations

★ Try different starting positions with six counters each.

★ Allow counters to be jumped over each other.



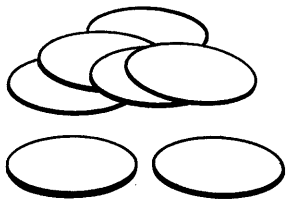
Players

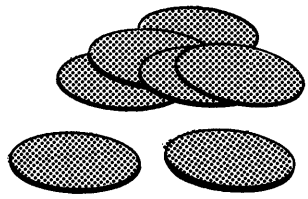
2

Slide

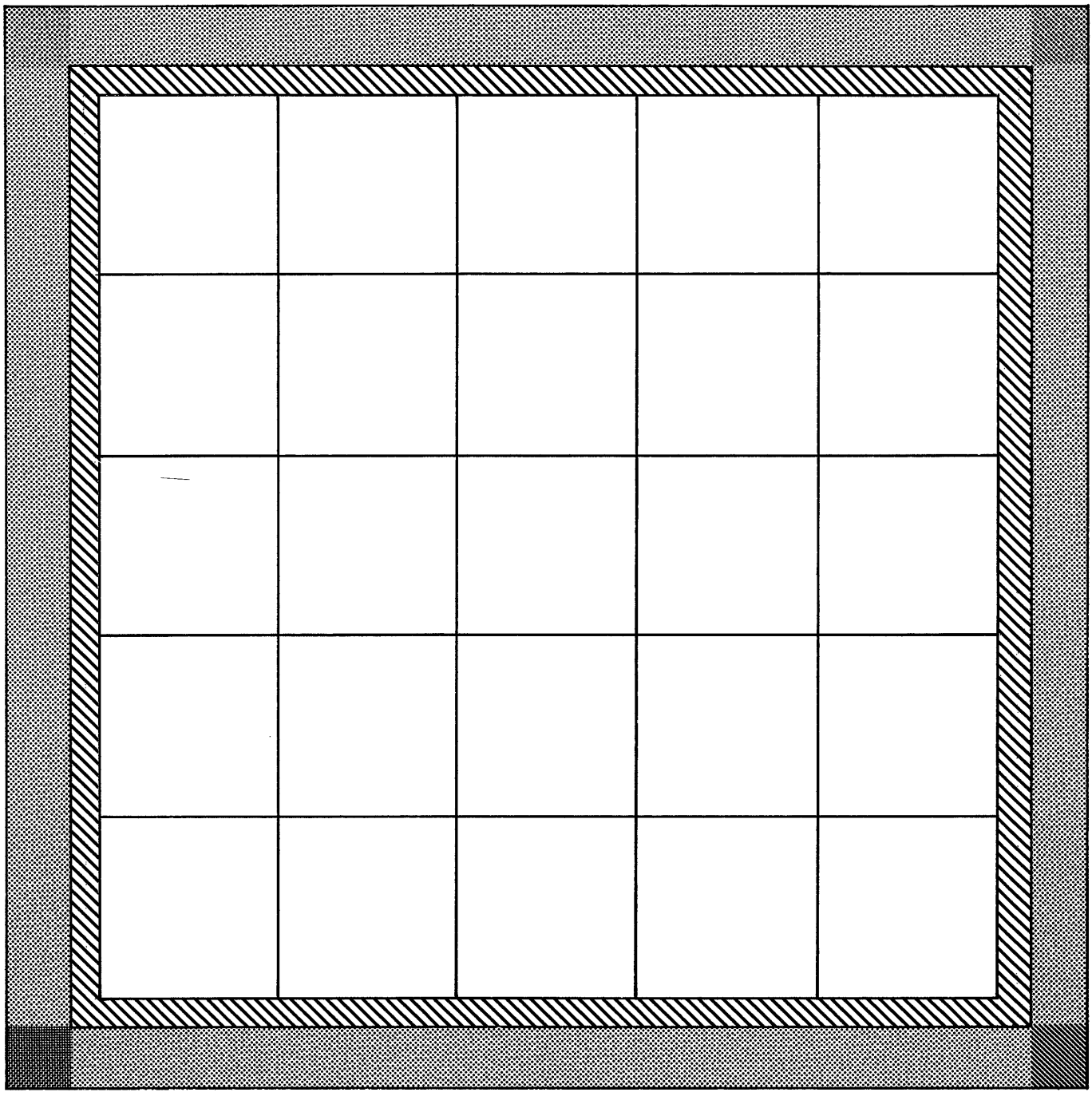
21

You will need
a set of 7 counters for each player (the sets should be different in colour).





Players 2



Three Piles

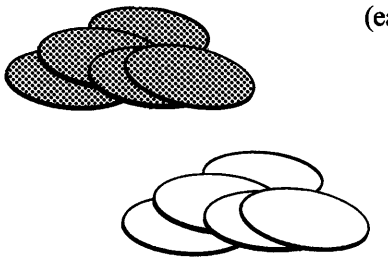
22

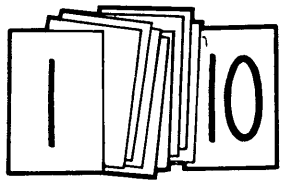
Multiplication

Selecting two numbers (range 1 to 10) from a choice of three, to make given products.

Apparatus

Use 3 sets of number cards 1 to 10. Each player has a set of counters (each set a different colour).





LEVEL	Profile Component 1				Profile Component 2		
	UA	N	A	M	UA	S	D
1						●	
2							
3							
4		●					
5							
6							
7							
8							
9							
10							

N4 Multiplication facts up to 10 × 10.
S1 Recognise lines of four.

THREE PILES

Shuffle each set of cards and place them in three piles, face up.

Take turns to remove two of the three top cards. The aim is to choose two numbers which, when **multiplied** together, make a board number.

Put the chosen cards at the bottom of their respective piles, and put a counter on the board number.

You may not put a counter on a square that has a counter on it.

The **winner** is the first player to make a straight line of four of his or her counters in any direction.

Variations

- ★ Play 15 rounds. The winner is the player who has placed more counters.
- ★ Use only two sets of cards in two piles.
- ★ Place the three piles of cards face down and take turns to choose two of the three top cards.
- ★ If a player covers a square number, he or she has another turn.

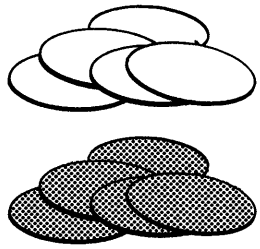
Players

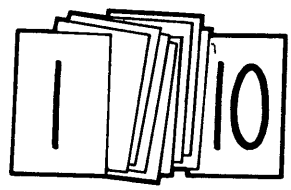
2

Three Piles

22

You will need
3 sets of number cards 1 to 10.
Each player has a set of counters (each set a different colour).





12	64	21	3	72	36
2	35	54	20	40	10
70	15	1	48	24	80
25	9	42	14	4	45
5	63	27	81	28	8
90	16	50	6	60	30
7	56	32	18	100	49

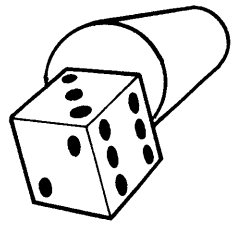
Stopper

Addition

Adding several single-digit numbers to obtain the score for a round.
Adding two-digit numbers.

Apparatus

Use one dice numbered 1 to 6.



LEVEL	Profile Component 1				Profile Component 2		
	UA	N	A	M	UA	S	D
1							
2							●
3							
4		●					
5							
6							
7							
8							
9							
10							

N4 Addition of several single-digit numbers.
Addition of two-digit numbers.
D2 Recording scores in a table.

STOPPER

Each player needs a score sheet.

Take turns to throw the dice.

On your turn, throw the dice as many times as you like, keeping a **running total**.
If you throw a 6, you must stop and you score nothing for that round.

You may choose to stop throwing at any time and claim the score at that stage.
The running total is your **score** for that round.

The **winner** is the player with the highest total after ten rounds.

Variations

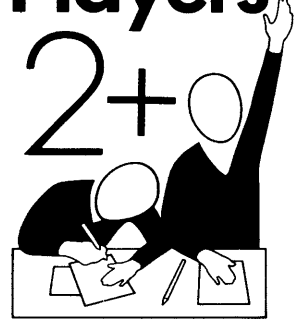
★ The winner is the first to reach 100 points.

★ Each player starts with 100 points and subtracts his or her total from this score at each round. The winner is the first to reach or pass zero.

★ Throw two dice numbered 1 to 6. Add the two numbers. If the score is 7, you score nothing for that round. A player can keep throwing until he or she scores 7.

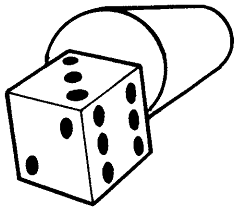
Players

2+



Stopper

You will need
one dice numbered 1 to 6.



Round	Score	Total
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		

Round	Score	Total
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		

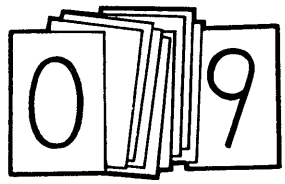
Round	Score	Total
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		

Round	Score	Total
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		

Multiple Choice

Multiplication Two-digit multiples of numbers in the range 2 to 9.

Apparatus Use one set of number cards 0 to 9.



LEVEL	Profile Component 1				Profile Component 2		
	UA	N	A	M	UA	S	D
1							
2							
3							
4		●					
5			●				
6							
7							
8							
9							
10							

N4 Multiplication facts.
A5 Multiples.

MULTIPLE CHOICE

Each player needs a score sheet.

Shuffle the cards and place them in a pile, face down.

Turn over the top four cards.

The four card numbers can each be used up to **four times** by each of the players.

For example, suppose the cards are 7 4 5 2

Each player can use four 7s, four 4s, four 5s and four 2s to put in the sixteen boxes on his/her score sheet.

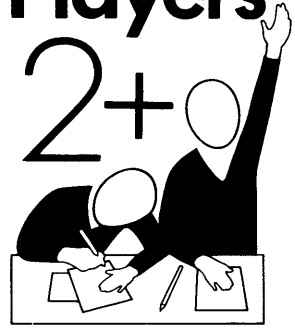
The aim of the game is to make two-digit numbers that make as many of the statements as possible correct.

The **winner** is the player who makes most correct statements.

Variations

- ★ Allow single-digit as well as two-digit numbers.
- ★ Allow each card number to be used five times by each player.
- ★ Choose five cards instead of four and allow each player to choose his/her sixteen numbers.
- ★ Extend the game to include greater multiples.

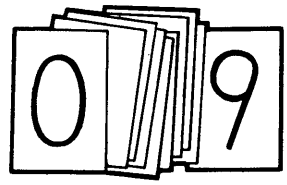
Players 2+



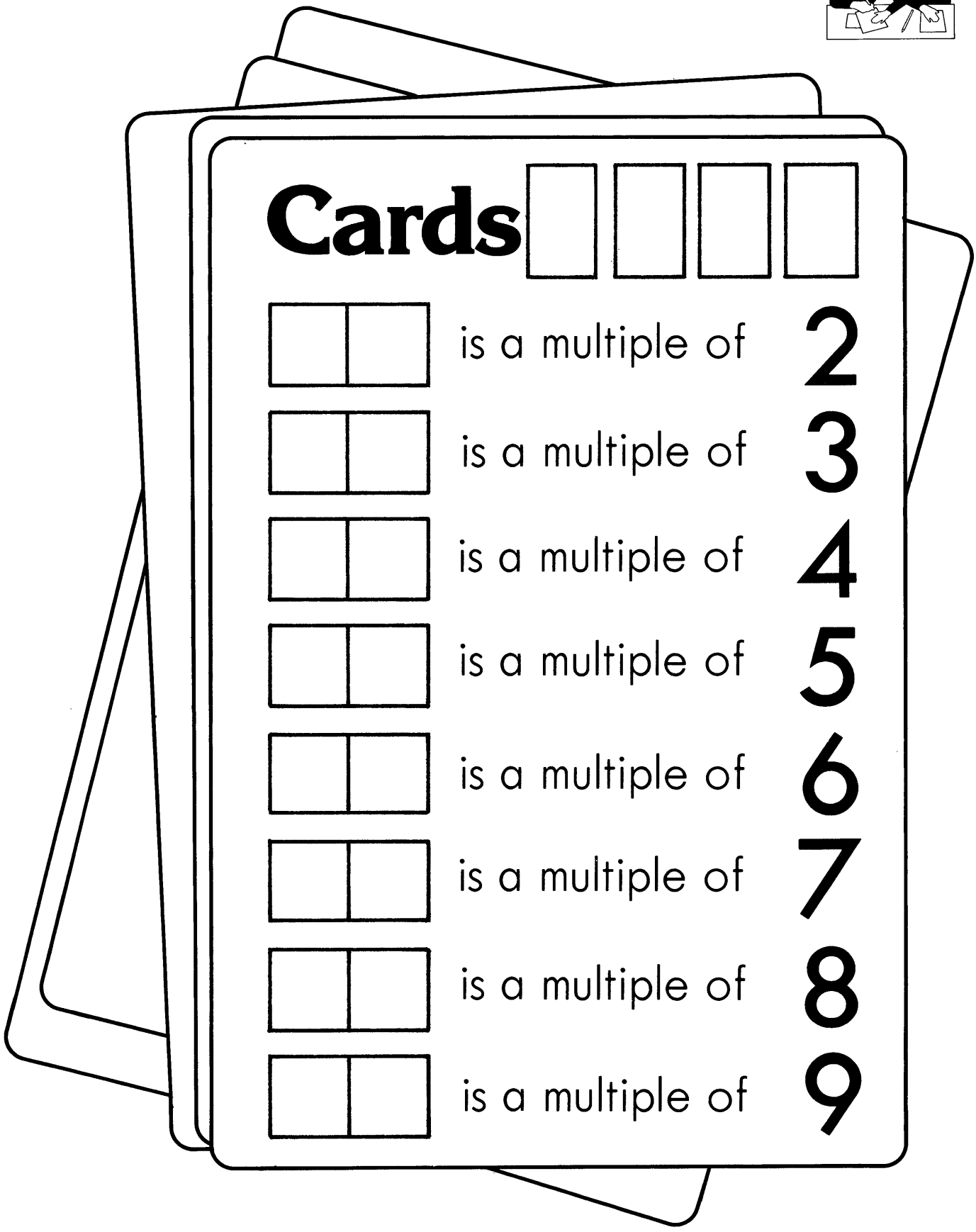
Multiple Choice

24

You will need
number cards 0 to 9.



Players 2+



Snowman

25

Mixed Number Operations

Addition and subtraction of three-digit numbers.

Apparatus

No apparatus is required.

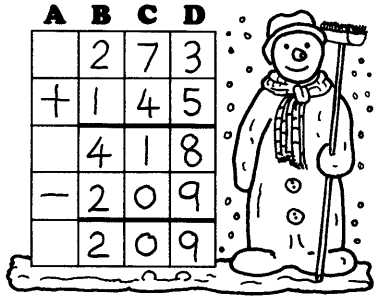
LEVEL	Profile Component 1				Profile Component 2		
	UA	N	A	M	UA	S	D
1							
2							
3							
4		●					
5							
6							
7							
8							
9							
10							

N4 Addition and subtraction of three-digit numbers.

SNOWMAN

Player **A** works out a calculation using both addition and subtraction and gives to Player **B** a grid showing the mathematical signs and spaces used.

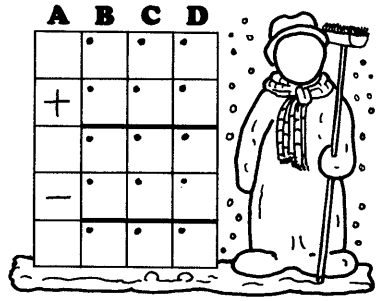
A	B	C	D
	2	7	3
+	1	4	5
	4	1	8
−	2	0	9
	2	0	9



2 eyes, nose and mouth

2 buttons

A	B	C	D
+			
−			



Player **B** makes **guesses** to identify the numbers in the calculation.
The number range is 0 to 9. He or she must specify the column.
For example: '3 in column B' or '6 in column D',
If Player **B**'s guess is correct, Player **A** writes the number in position on the sheet.
If Player **B**'s guess is incorrect, a finishing touch is added to the snowman.
If Player **B** guesses the whole calculation before the snowman is complete, he or she wins. Otherwise Player **A** wins.

Variations

★ Use different operations (include × and ÷).

★ Relax the rule about having to specify the column when guessing; but A need only reveal one number at a time.

Players

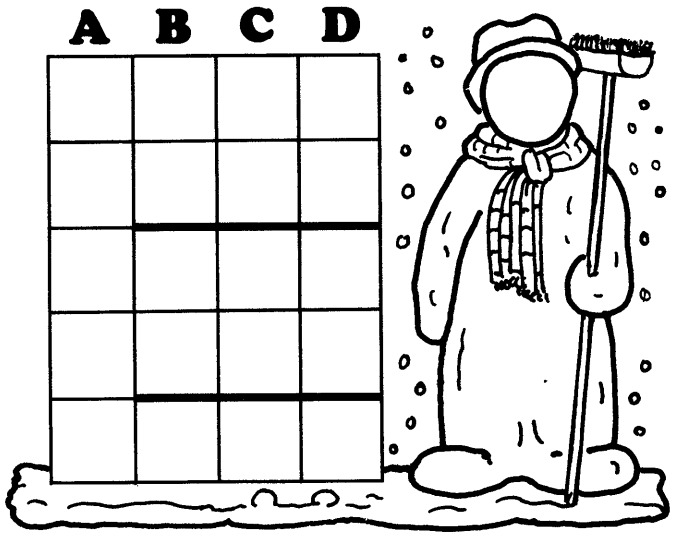
2

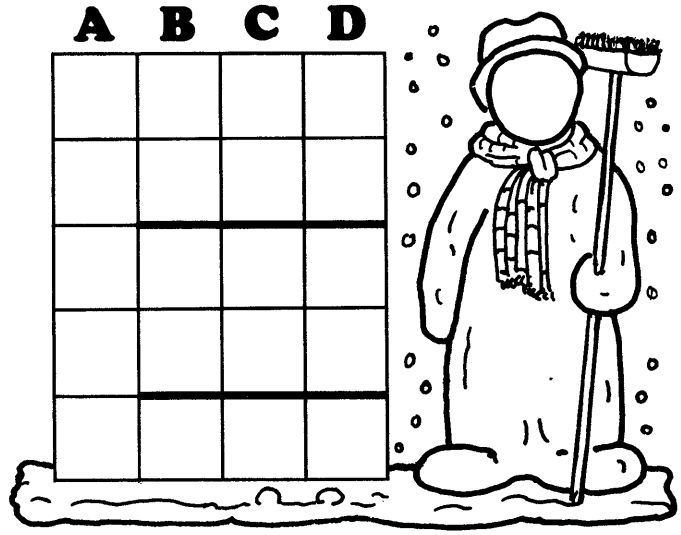
Snowman

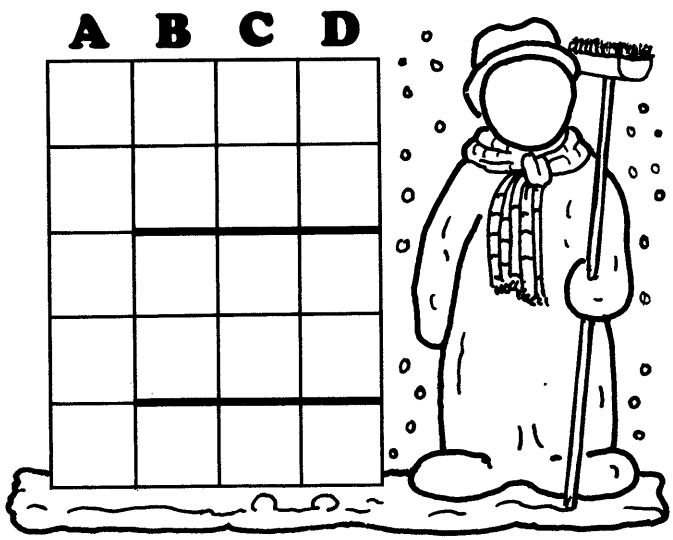
25

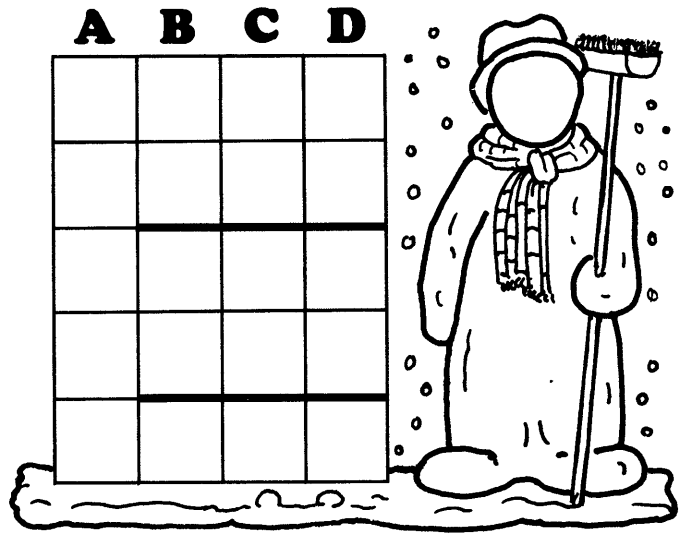
You will need
no apparatus.

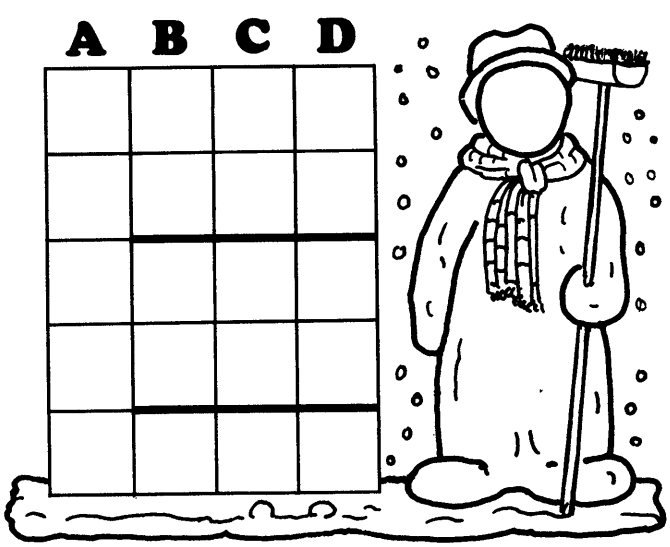
Players 2

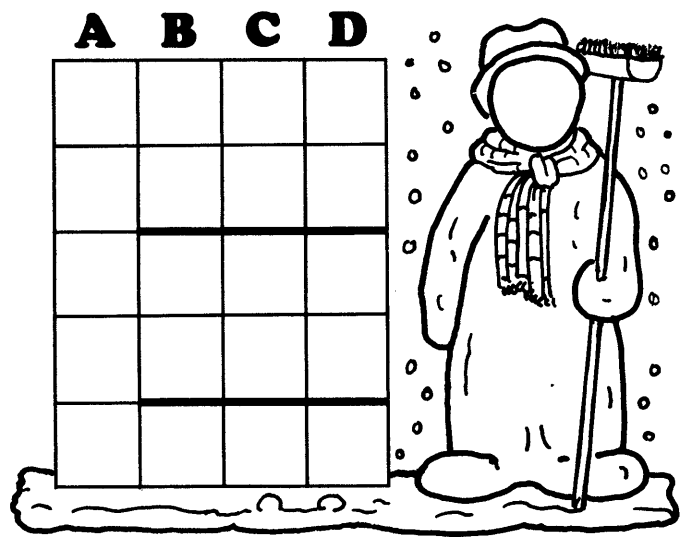












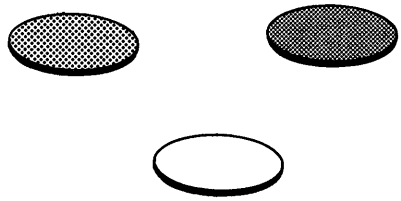
Spiral

Strategy Development

Developing a winning strategy for moving counters in one direction around a spiral.

Apparatus

Use 3 counters (different in colour).



LEVEL	Profile Component 1				Profile Component 2		
	UA	N	A	M	UA	S	D
1							
2						●	
3					●	●	
4					●		
5					●		
6					●		
7							
8							
9							
10							

S2, S3 Recognise location.

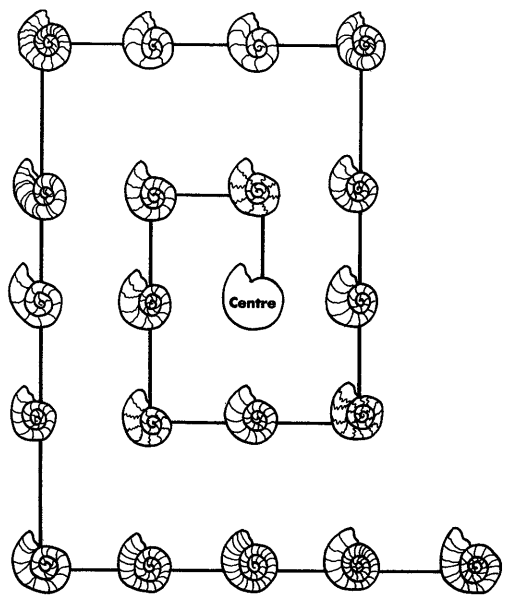
SPIRAL

Together, decide where to place the three counters anywhere on the board.

Take turns to move one of the counters **any number** of spaces along the spiral towards the centre. Jumping over a counter is not allowed, and you may not put two counters on the same spot.

When a counter is moved to the centre, it is removed.

The player who removes the **last** counter **loses** the game.



Variations

★ Start with 4 counters.

★ Make a rule that a counter may not be moved more than four spaces towards the centre.

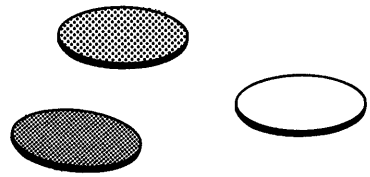
Players

2

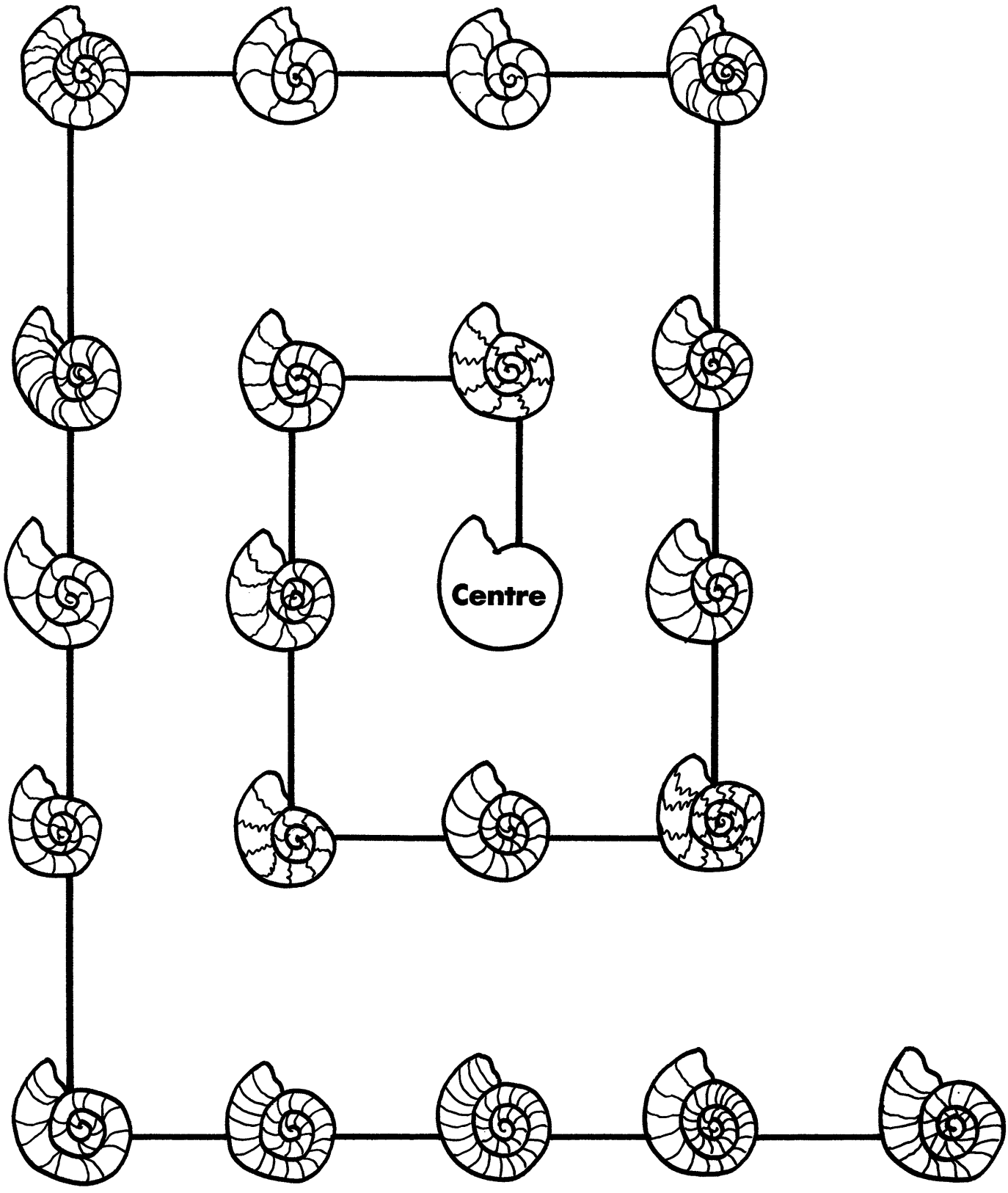
Spiral

26

You will need
3 counters (different in colour).



Players
2

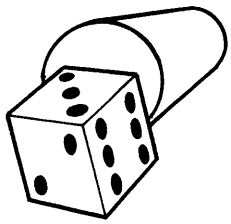


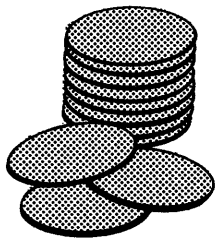
Sevens

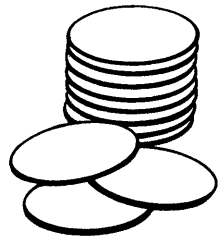
27

Division Dividing by seven.

Apparatus Use one dice numbered 1 to 6.
Each player has a set of counters.







LEVEL	Profile Component 1				Profile Component 2		
	UA	N	A	M	UA	S	D
1							
2							
3		●					
4		●					
5							
6							
7							
8							
9							
10							

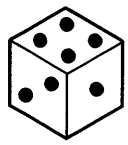
N3 Remainders.
N4 Dividing a two-digit number by a single-digit number.

SEVENS

One player uses the left-hand board, the other uses the right-hand board.

Take turns to:

- Throw the dice. The number you throw is your **remainder**.
- Place a counter on a board number which, **when divided by 7**, gives your remainder.

For example, suppose you throw  your remainder is **4**.

You could place a counter on 11, or on 18, or on any other board number that, when divided by 7, gives a remainder of **4**.

The **winner** is the first to make a row of three counters.

Variations

★ Play 12 rounds.
The winner is the player who has placed more counters.

★ Use different boards.
Here is one harder version.

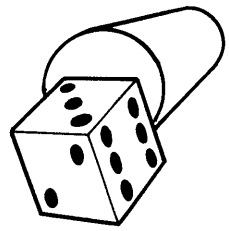
29	43	34
30	37	40
45	47	32
33	39	46
44	31	36
41	48	38

Players

2

Sevens

You will need
one dice numbered 1 to 6.
Each player has a set of counters.



Players 2

PLAYER B

8	17	12	23	22	16
19	9	26	10	25	18
27	15	24	13	20	11

PLAYER A

8	17	12	23	22	16
19	9	26	10	25	18
27	15	24	13	20	11

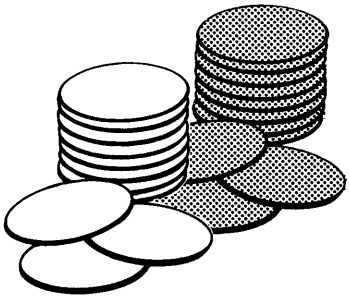
Divide It

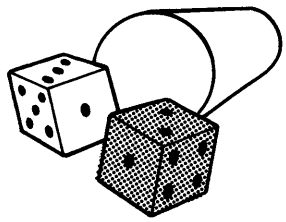
Division

Considering different divisors of two-digit numbers.

Apparatus

Use two dice numbered 1 to 6.
The dice should be different in colour – one is for 'tens' and the other for 'units'.
Each player has a set of counters (each set a different colour).





LEVEL	Profile Component 1				Profile Component 2		
	UA	N	A	M	UA	S	D
1							
2							
3							
4		●					
5			●				
6							
7							
8							
9							
10							

N4 Division of a two-digit number by a single-digit number.
A5 Factors, multiples.

DiViDE iT

One dice is for 'tens' and the other is for 'units'.
Take turns to throw the dice to make a two-digit number.

Suppose, on your turn, you throw **15**.
Place a counter on any board number that divides **15** without leaving a remainder, for example **3** or **5**.

Put a counter on 3 **or** 5
(you can only place **one** counter at each turn).

If you can not place a counter, do nothing.

The **winner** is the first player to make or complete a straight line of four counters in any direction.

Variations

★ Allow players to place more than one counter on each turn.

★ Each player has his or her own board.
The winner is the first to make a row or column of five counters.

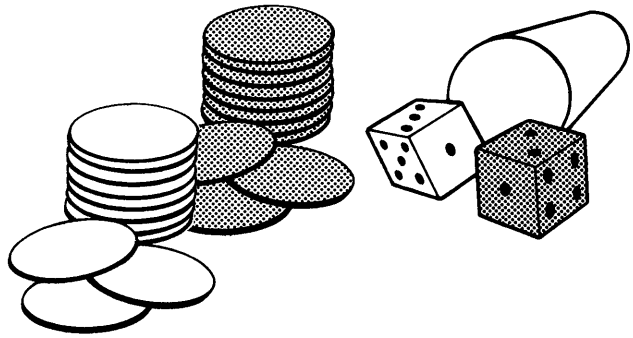
★ Use a 'tens' dice numbered 3, 4, 5, 6, 7, 8.

Players

2

Divide It

You will need
two dice (of different colours) numbered 1 to 6. Each player has a set of counters (each set a different colour).



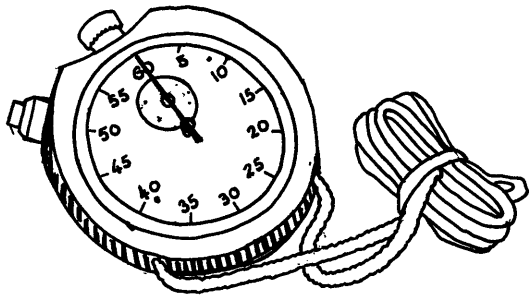
Players 2

8	6	4	2	9
4	2	7	3	8
7	6	2	5	6
3	3	4	8	5
5	7	2	3	9

Time to Guess

Time Estimating short periods of time.

Apparatus Use a stopclock or stopwatch.



LEVEL	Profile Component 1				Profile Component 2		
	UA	N	A	M	UA	S	D
1							
2							●
3		●		●			
4				●			
5							
6							
7							
8							
9							
10							

N3 Subtraction (for errors).
M3, M4 Estimate periods of time.
D2 Recording results in a table.

TIME TO GUESS

Take turns to **estimate** a period of time using a stopclock or stopwatch.

For example, suppose you are estimating 14 seconds. Start the watch, then do not look at it again until you stop it when you think 14 seconds have passed.

Write down your estimate (the amount of time that has actually passed, according to the stopwatch). Then calculate your **error** and write that down as well.

Then it is your friend's turn. You both use the same score sheet to record.

Time	PLAYER A		PLAYER B		Winner
	Guess	Error	Guess	Error	
14 seconds	17 seconds	3 seconds	8 seconds	6 seconds	A

The player with the smaller error **wins** the round.
The **overall winner** is the player who wins more rounds.

Variations

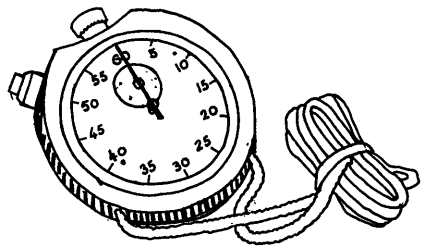
★ Add each player's errors after 5 rounds.
The player with the smaller total error wins.

★ A third person starts and stops the watch.
Both players guess the period of time that has passed.
The better guess wins. Play 5 rounds.

Players 2

Time to Guess

You will need
a stopclock or stopwatch.



Time	PLAYER A		PLAYER B		Winner
	Guess	Error	Guess	Error	
14 seconds					
38 seconds					
22 seconds					
1 min. 30 secs					
2 minutes					

Time	PLAYER A		PLAYER B		Winner
	Guess	Error	Guess	Error	
23 seconds					
1 minute					
10 seconds					
45 seconds					
4 minutes					

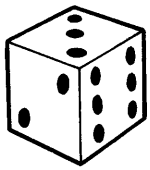
Pointers

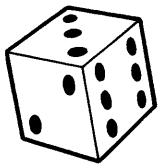
Co-ordinates

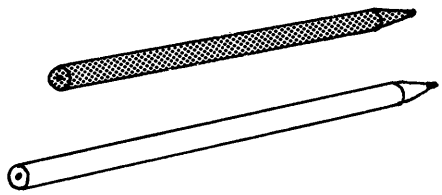
Plotting points on a co-ordinate grid according to throws of a dice. Drawing a route of horizonal and vertical lines across a 6 by 6 co-ordinate grid.

Apparatus

Use two dice numbered 1 to 6. Each player has a pencil (different in colour).







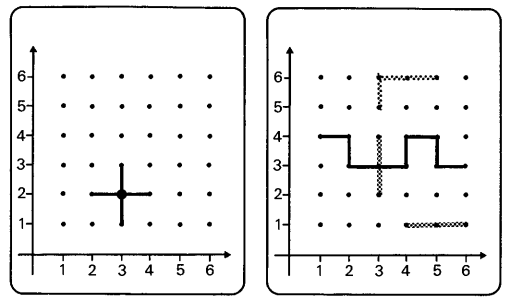
LEVEL	Profile Component 1				Profile Component 2		
	UA	N	A	M	UA	S	D
1							
2						●	
3						●	
4			●			●	
5							
6							
7							
8							
9							
10							

A4 Co-ordinates.
S2, S3 Recognise location.
S4 Specify location by means of co-ordinates.

POINTERS

Use one co-ordinate grid for each game. Take turns to:

- Throw the dice, one at a time.
  The **first** throw shows the number on the **horizontal co-ordinate**.
  The **second** throw shows the number on the **vertical co-ordinate**.
- **Plot** the point on the grid.
- Draw a straight line of unit length, horizontally or vertically, from that point. Suppose your point is (3, 2), you can draw any one of the **four** lines shown here.



The aim is to make a continuous line of your colour from one side of the grid to the other.
You may cross over or draw alongside your opponent's line, but you may not draw over it.

The first to draw a complete line from side to side **wins** the game.

Variations

★ Allow diagonal as well as horizontal and vertical lines.

★ Let each player have a sheet of his or her own.

★ Throw the two dice together. Players choose their 'horizontal' and 'vertical' numbers.

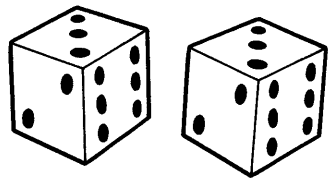
Players

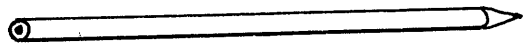
2

Pointers

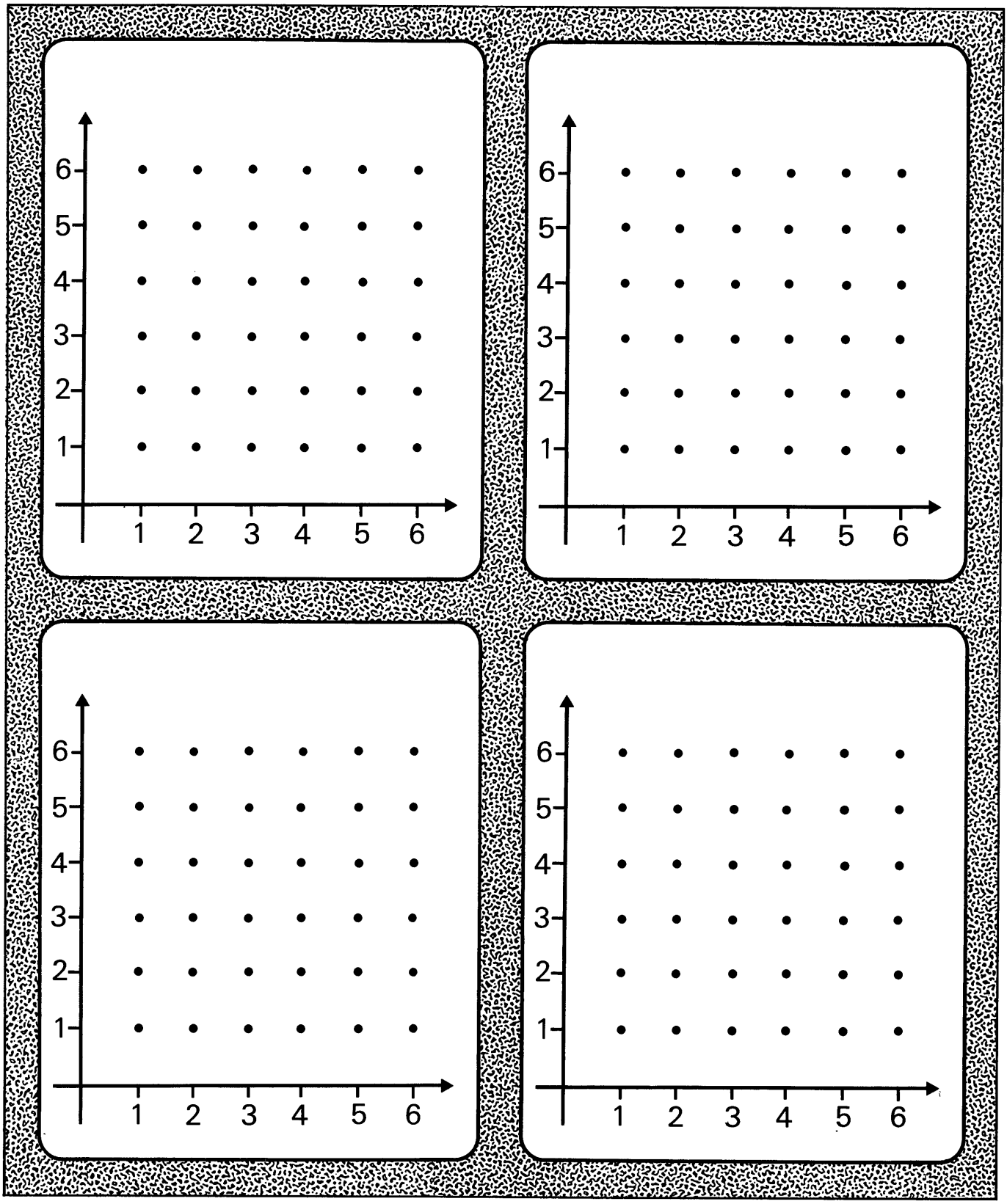
30

You will need
two dice numbered 1 to 6.
Each player has a pencil (different in colour).





Players 2



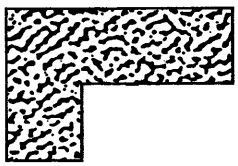
Twiddle

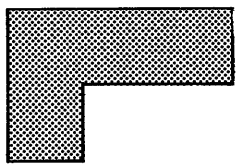
Shape

Arranging two L-shapes and two squares on a grid in such a way as to prevent an opponent's move.

Apparatus

Use two L-shaped pieces of card in different colours, and two squares in a third colour (see game board).





LEVEL	Profile Component 1				Profile Component 2		
	UA	N	A	M	UA	S	D
1							
2						●	
3						●	
4							
5							
6							
7							
8							
9							
10							

S2, S3 Recognise location. Rotations. Reflections.

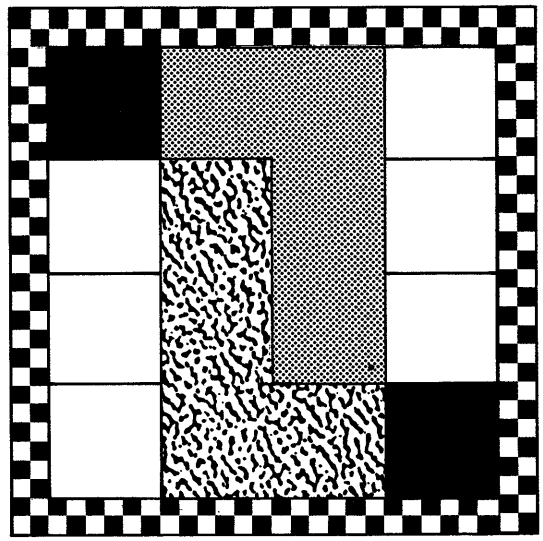
TWIDDLE

Place the pieces in this starting arrangement.

Take turns to move **first** your own L-piece and **then** one of the squares.

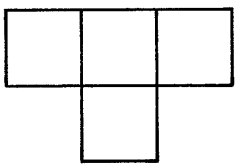
The L-pieces can be turned over, but pieces should not be overlapped.

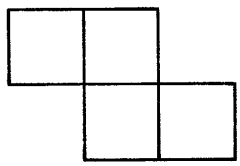
The first player who is unable to move **loses** the game.



Variations

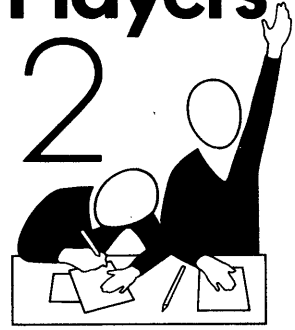
★ Replace the L-pieces with either T-pieces or Z-pieces.





Players

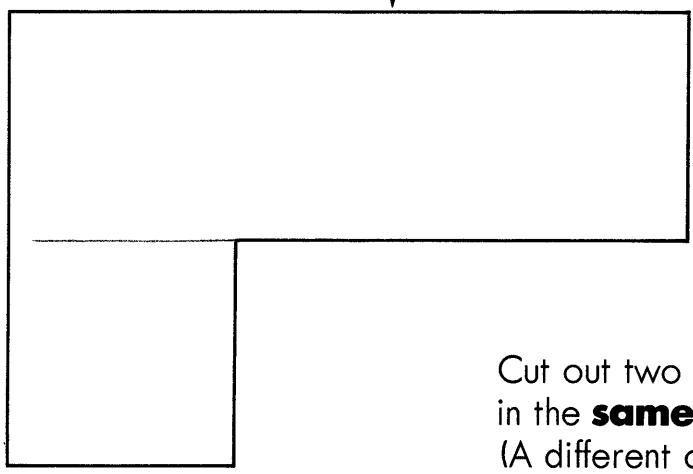
2



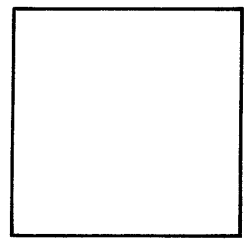
Twiddle

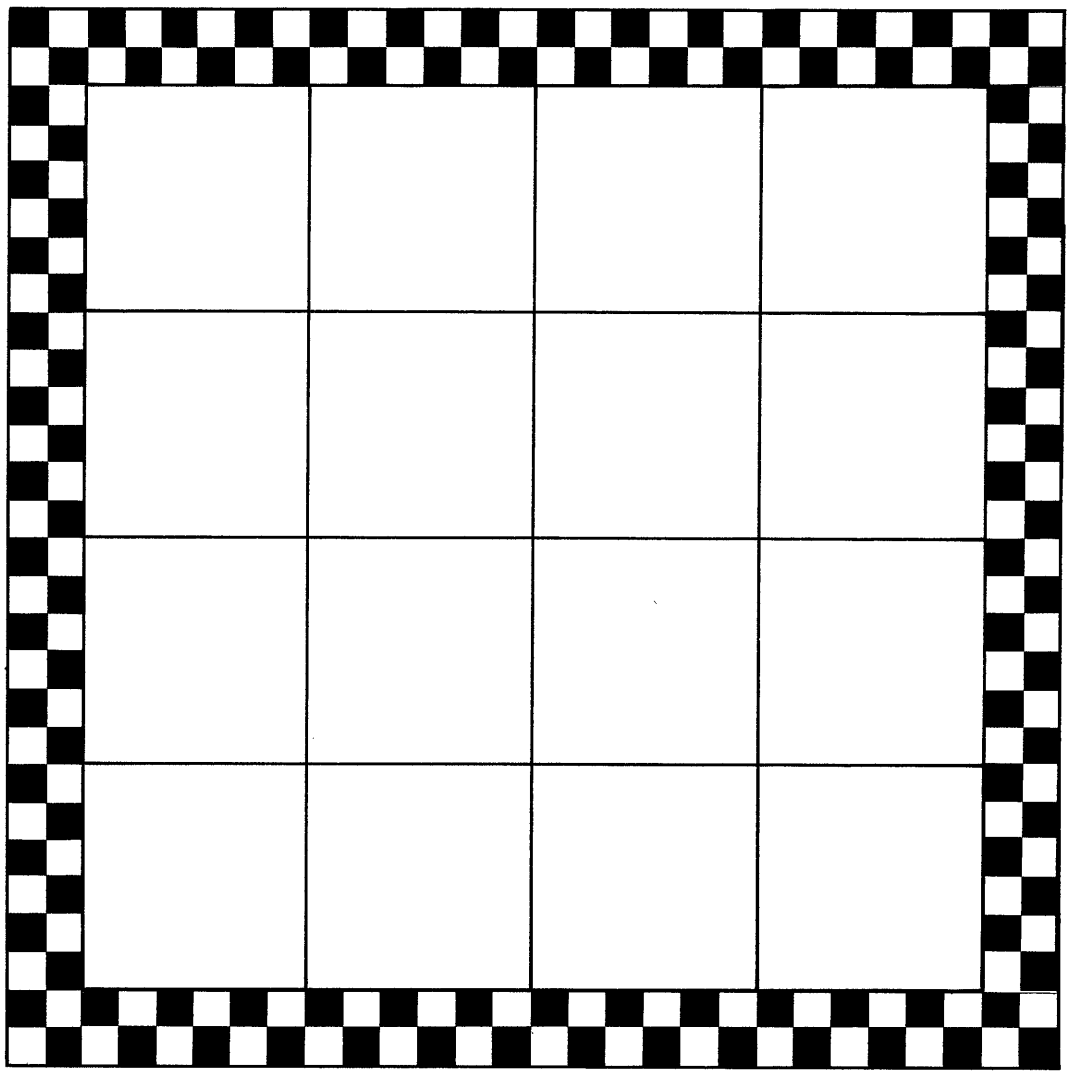
31

You will need
card.
Cut out two of these pieces,
in **different** colours,
one for each player.



Cut out two of these squares
in the **same** colour.
(A different colour from either L-shape.)





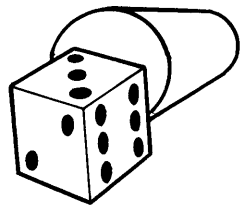
Add and Match

Addition

Adding sets of three single-digit numbers, aiming to make equal totals.

Apparatus

Use one dice numbered 1 to 6.

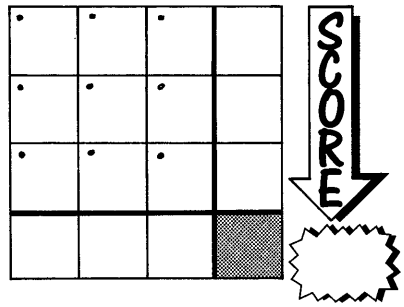


LEVEL	Profile Component 1				Profile Component 2		
	UA	N	A	M	UA	S	D
1							
2							
3							
4		●					
5							
6							
7							
8							
9							
10							

N4 Addition of three single-digit numbers.

ADD AND MATCH

Each player needs a score sheet.
One player throws the dice 9 times.
After each throw, **all** the players must write the number in one of these nine boxes on their score sheets, before the dice is thrown again.
Once a number has been written in a box it can not be changed.

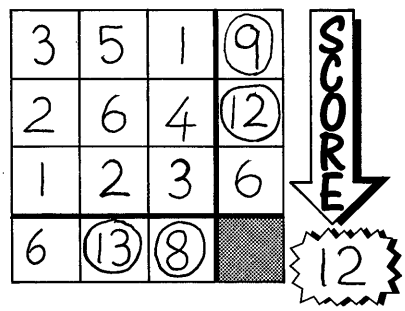


The aim is to position numbers to make **row totals** and **column totals** that appear **more than once**.

Suppose this is a player's completed grid after all nine throws. The row totals and column totals have been filled in.

Any totals that apear only **once** have to be **eliminated**. The remaining totals are added together for the score.

The player with the highest score **wins**.



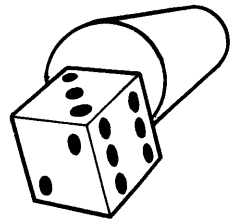
Variations

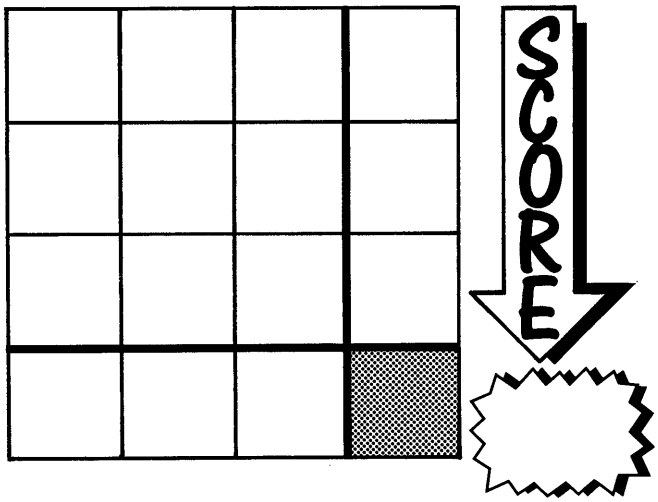
- ★ The player with the lowest score wins.
- ★ Throw nine dice all at once so that players can decide how to allocate positions for them on the grid.
- ★ Use dice or cards to generate the numbers 1 to 9.

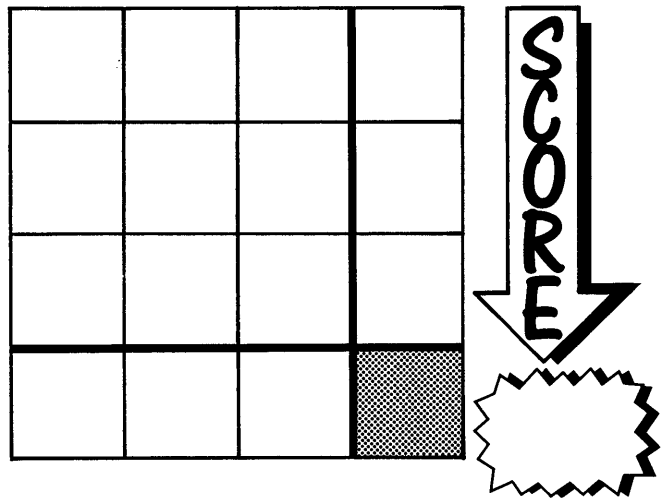
Players

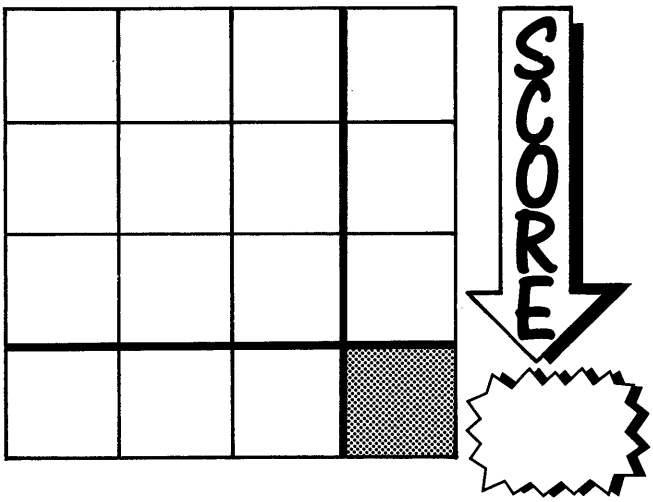
Add and Match

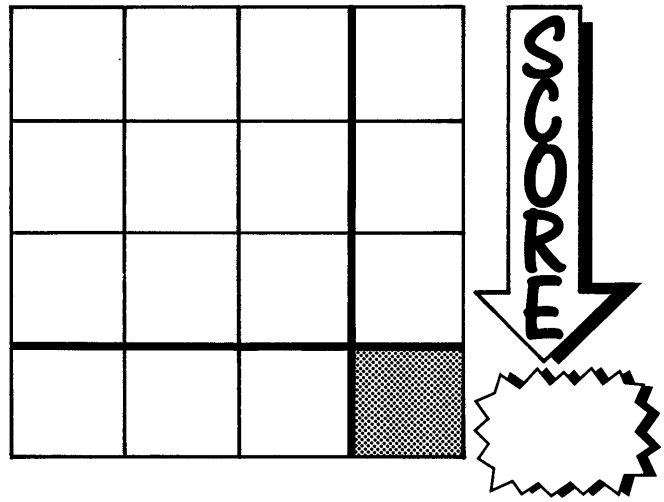
You will need
one dice numbered 1 to 6.

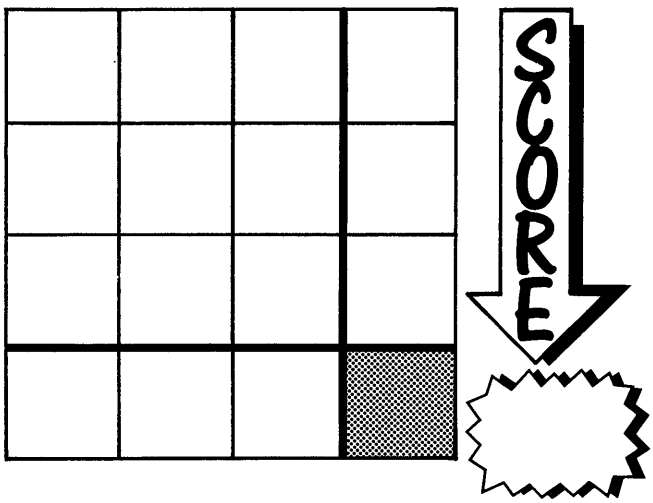


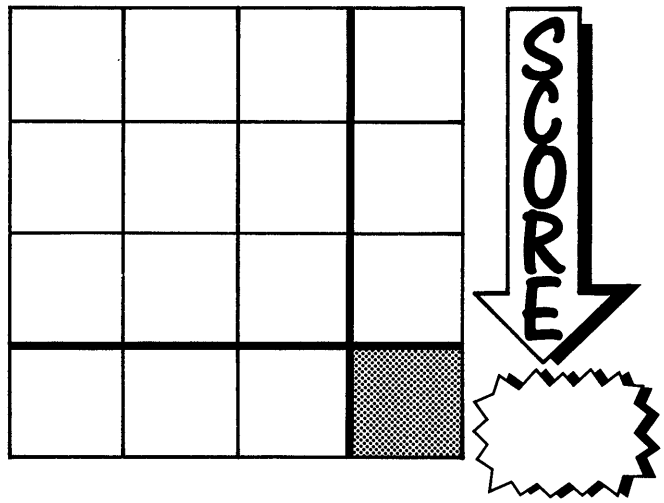










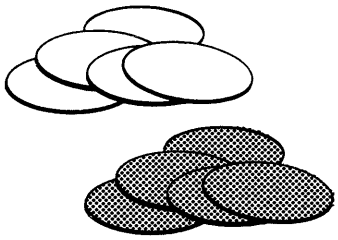


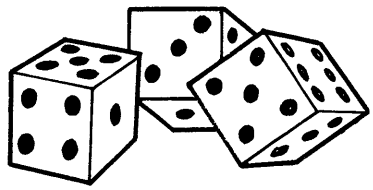
Mixed Number Operations

Using three dice numbers and operation signs to make an expression for a number displayed on a board.

Apparatus

Use three dice numbered 1 to 6. Each player has a set of counters (each set a different colour).





LEVEL	Profile Component 1				Profile Component 2		
	UA	N	A	M	UA	S	D
1							
2							
3		●					
4		●					
5							
6							
7							
8							
9							
10							

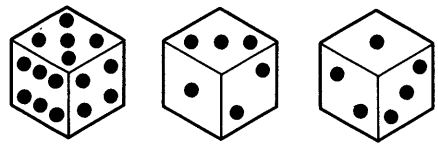
N3, N4 Mixed number operations.

CHALLENGE

Take turns to:

- Throw the three dice.
- Use the three dice numbers to make an **expression** for one of the numbers on the board.

For example, suppose you throw:



Some possible expressions are: $\mathbf{9} = 5 + 3 + 1$

$\mathbf{16} = (5 \times 3) + 1$ $\mathbf{8} = (5 \times 1) + 3$ $\mathbf{34} = 35 - 1$ $\mathbf{1} = 5 - 3 - 1$

- State your expression. If it is correct you can place a counter on the appropriate board number. If the expression is incorrect, you miss that turn.

You may not put a counter on a square that has a counter on it.

The **winner** is the first to make a straight line of four of his or her counters in any direction.

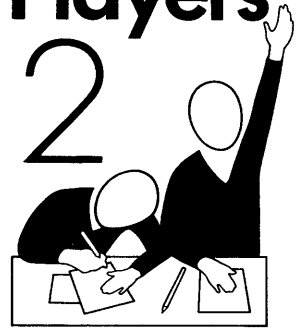
Variations

★ Play a team game, three against three.

★ Use four dice instead of three.

★ Who can cover more squares in a game lasting for fifty throws?

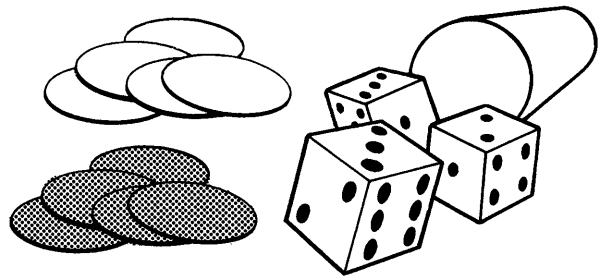
Players 2



Challenge

33

You will need
three dice numbered 1 to 6.
Each player has a set of counters (each set a different colour).



Players 2

60	24	38	54	14	43	4	57
7	18	41	52	31	49	12	42
22	61	2	40	63	16	35	26
28	13	3	58	33	53	19	30
48	32	56	11	46	21	1	50
15	44	64	29	8	59	34	20
17	36	27	47	6	51	23	10
37	55	45	25	39	5	62	9

Left Overs

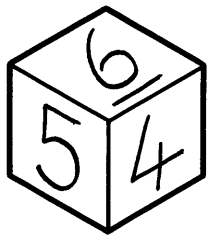
34

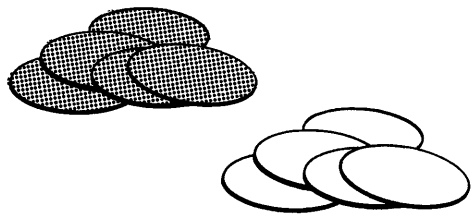
Division

Finding remainders when selected two-digit numbers are divided by numbers in the range 2 to 7.

Apparatus

Make a dice by writing 2, 3, 4, 5, 6, 7 on the faces of a cube. Each player has a set of counters (each set a different colour).





LEVEL	Profile Component 1				Profile Component 2		
	UA	N	A	M	UA	S	D
1							
2							
3		●					
4		●					
5							
6							
7							
8							
9							
10							

N3 Remainders.
N4 Division of two-digit numbers by single-digit numbers.

LEFT OVERS

Take turns to:

- Choose a board number and then throw the dice.
- Score the **remainder** when your chosen **board number is divided by your dice number**.
- Place a counter on the chosen board number.

You may not put a counter on a square that has a counter on it.

When all the board numbers have been covered, the **winner** is the player with the higher total score.

Variations

★ The winner is the first player to reach a score of 15 points.

★ Use a dice with different numbers, *for example*, 4, 5, 6, 7, 8, 9.

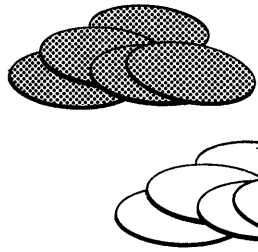
★ If the board number can be divided exactly by the dice number, the player has another turn.

Players

2

Left Overs

You will need
a cube for use as a dice.
Label the faces 2 to 7.
Each player has a set of counters
(each set a different colour).



18	29	19	14
31	13	22	25
23	26	15	30
27	17	34	20
35	32	12	33
21	28	24	16

Hexchain

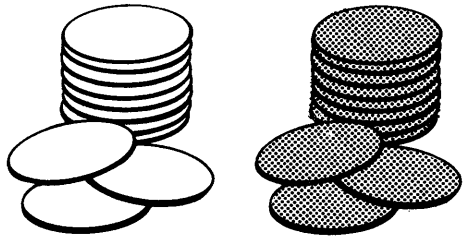
35

Shape

Spatial awareness. Planning strategies for making an unbroken line of counters and blocking an opponent's lines.

Apparatus

Each player has a set of counters (each set a different colour).



LEVEL	Profile Component 1				Profile Component 2		
	UA	N	A	M	UA	S	D
1							
2						●	
3						●	
4							
5							
6							
7							
8							
9							
10							

S2, S3 Recognise location.

HEXCHAIN

Take turns to place a counter on one of the hexagons on the board.

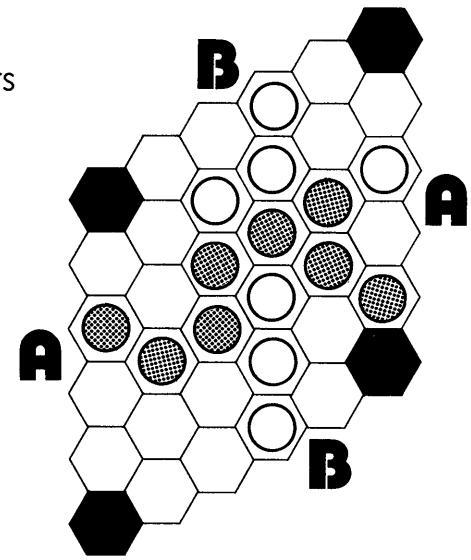
Player **A** tries to make a linked chain of counters joining sides marked **A**.

Player **B** tries to make a linked chain joining sides marked **B**.

You may not put a counter on a hexagon that has a counter on it.

The first player to make his or her chain **wins**.

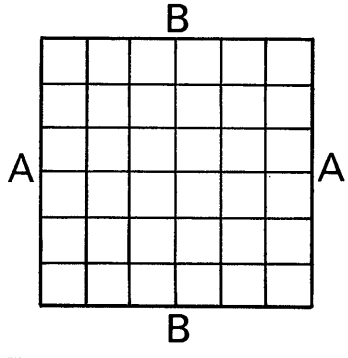
The coloured 'corner' hexagons can count as either **A** or **B**.



Variations

★ Play on a square board.

★ Play to make a linked chain joining any pair of opposite sides.



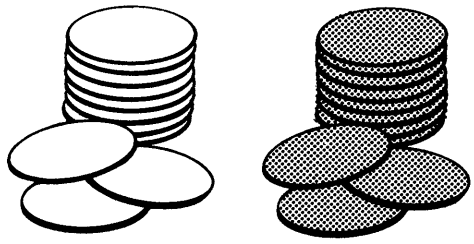
Players

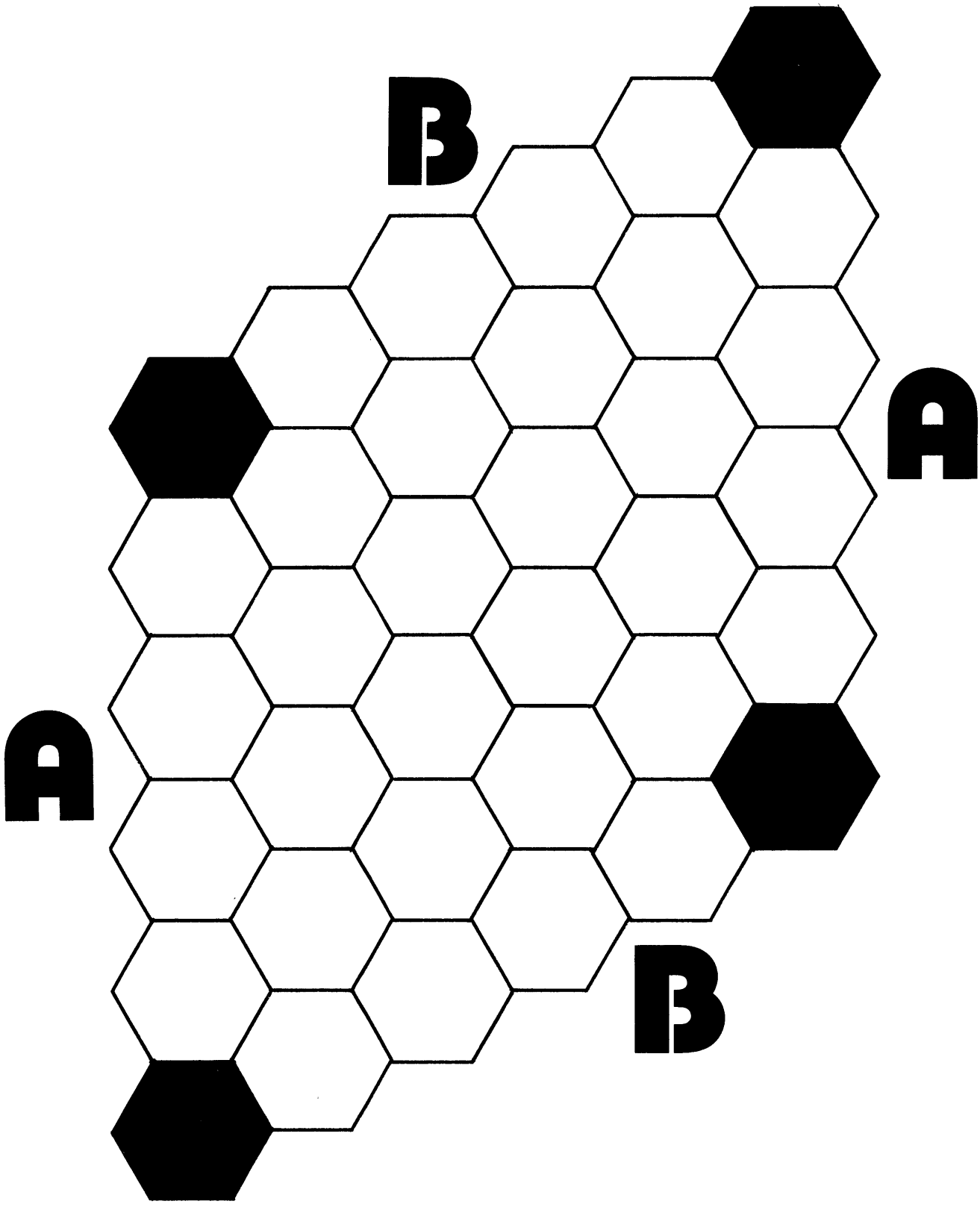
2

Hexchain

35

You will need
a set of counters for each player (different in colour).





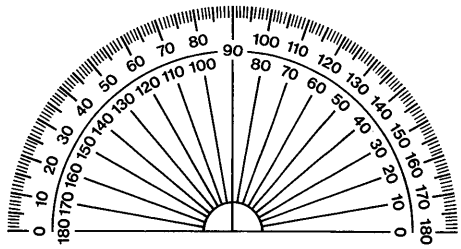
Degrees

Angle

Estimating the size of angles in degrees; measuring angles. (The angles are all acute.)

Apparatus

Use protractors to measure the angles.



LEVEL	Profile Component 1				Profile Component 2		
	UA	N	A	M	UA	S	D
1							
2							●
3							
4		●		●			
5				●			
6							
7							
8							
9							
10							

N4 Subtraction.
M4, M5 Estimating the size of angles in degrees. Measuring angles.
D2 Recording results in a table.

DEGREES

First, players make a table like the one below to record the game.

Then each player **guesses** the size, in degrees, of the first angle. The guesses are written in the table.

Then the angle is **measured** with a protractor and the measurement is recorded.

The player whose guess was closest to the actual size wins that round.

Angle	Guess		Exact size of angle	Winner
	Player A	Player B		
1	40°	75°	55°	A

The **overall winner** is the player who wins most rounds.

Variations

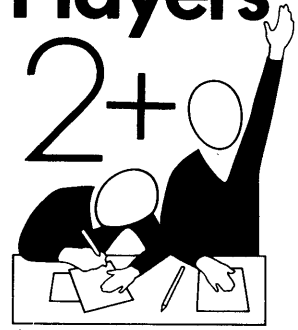
★ Score the errors (the differences between the guesses and the exact measurement). Lowest overall total wins.

★ Use sheets with different angles.

★ Use sheets that include angles of more than 90°.

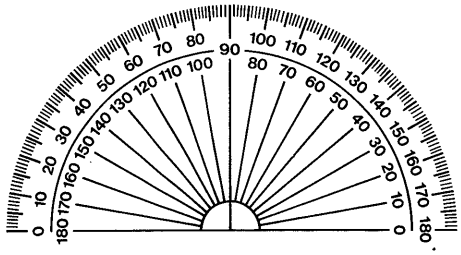
Players

2+



Degrees

You will need
a protractor.



Players 2+

1

2

3

4

5

6

7

8

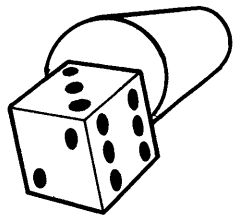
Four Rounds

Decimals

Place value: units and tenths.
Adding decimal numbers.
Difference between a decimal number and a whole number.

Apparatus

Use one dice numbered 1 to 6.



LEVEL	Profile Component 1				Profile Component 2		
	UA	N	A	M	UA	S	D
1							
2							
3							
4		●					
5		●					
6							
7							
8							
9							
10							

N4, N5 Approximations involving decimals. Addition and subtraction of decimals.

FOUR ROUNDS

Each player needs a score sheet.
Play the first game 'Nearest to 6'.

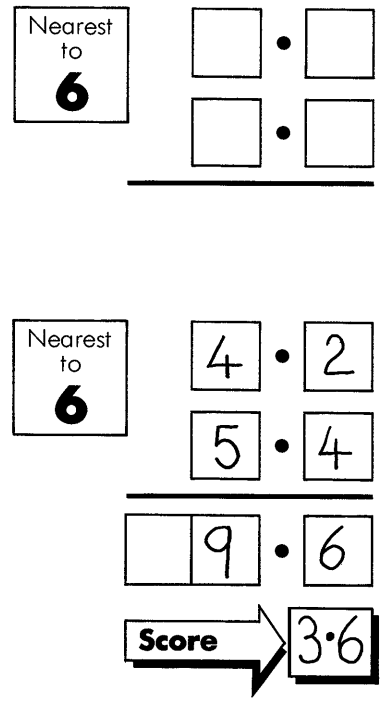
One player throws the dice four times. After each throw, **all** the players write the number in one of the four boxes, before the dice is thrown again.

Once a number is written in a box it can not be changed.

After the four throws, each player **adds** his or her decimal numbers.

The score is the **difference between the result of the addition and the target**.

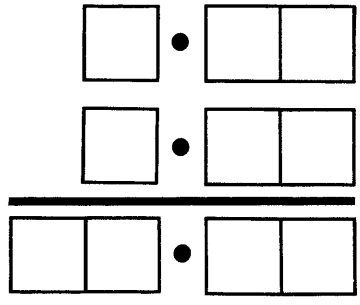
The **winner** is the player with the lowest score after the four games.



Variations

★ Throw four dice together and let each player decide how best to arrange the numbers in his or her boxes.

★ Change the board to include hundredths. →



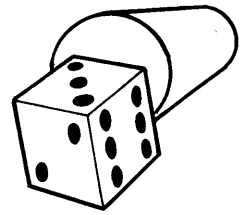
Players

2

Four Rounds

37

You will need
one dice numbered 1 to 6.



Players 2

Nearest to **6**

□ • □
□ • □
—————
□□ • □

Score □

Nearest to **8**

□ • □
□ • □
—————
□□ • □

Score □

Nearest to **10**

□ • □
□ • □
—————
□□ • □

Score □

Nearest to **7·5**

□ • □
□ • □
—————
□□ • □

Score □

Total score

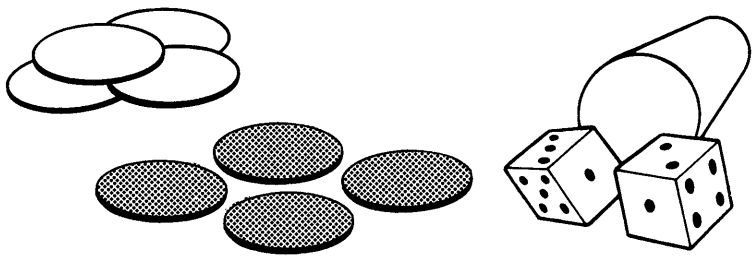
Switch

Mixed Number Operations

Addition, subtraction, multiplication and division, using single-digit numbers.

Apparatus

Use two dice numbered 1 to 6. Each player has 4 counters (each set a different colour).



LEVEL	Profile Component 1				Profile Component 2		
	UA	N	A	M	UA	S	D
1							
2						●	
3						●	
4		●					
5							
6							
7							
8							
9							
10							

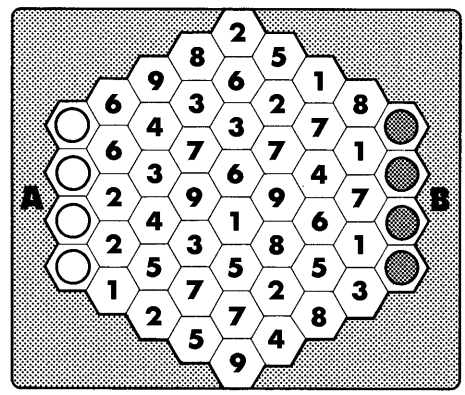
N4 Mixed number operations.
S2, S3 Recognise location.

SWITCH

Place the counters in these starting positions.

Take turns to throw the dice and move one of your counters.

A counter can be moved to an **empty** space next to it, provided that it is possible to make the number on that space using the thrown **dice numbers and a sign**.



For example, suppose you throw 6 and 3, it is possible to make these board numbers. **9** (6 + 3) **3** (6 − 3) **2** (6 ÷ 3)

If it is possible to move a counter, you must do so.

The aim for each player is to move his or her counters to the opponent's starting positions. The first to do so **wins**.

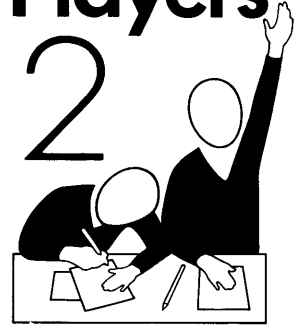
A player can also win if he or she manages to get **three** counters 'home' before his or her opponent has moved all four counters from their starting positions.

Variations

- ★ Each player has only two counters.
- ★ Use 3 dice and make expressions like $7 = 6 + 3 - 2$.
- ★ Start with an empty board. Take turns to throw the dice and place a counter. The aim for each player is to make a continuous chain of his or her counters from side to side of the board.
- ★ Number the dice differently.

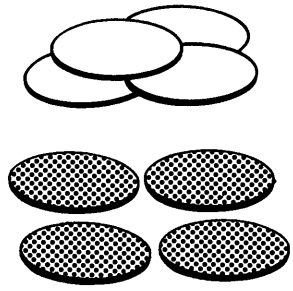
Players

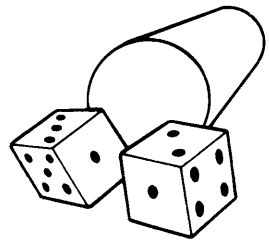
2



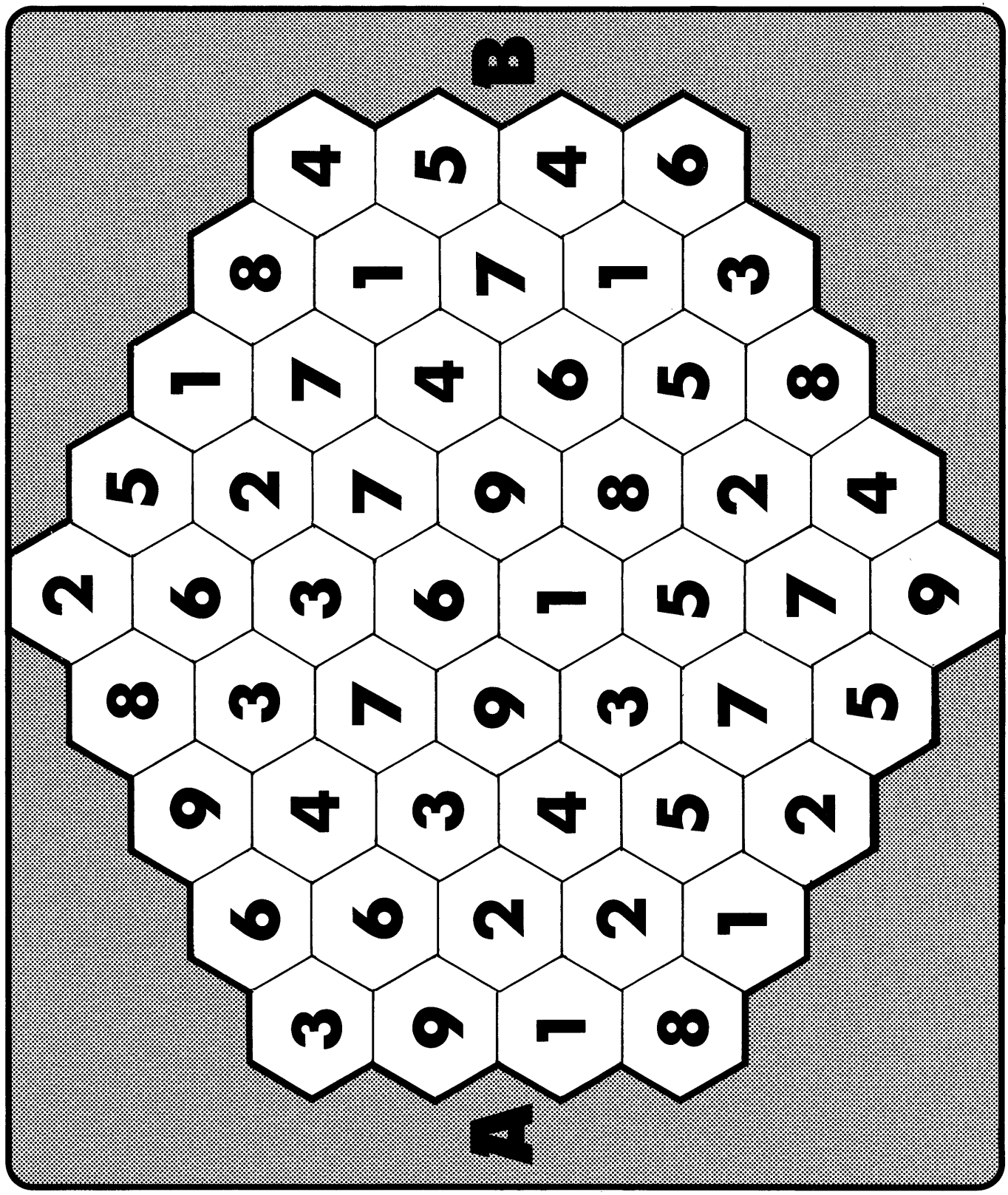
Switch

You will need
two dice numbered 1 to 6.
Each player has 4 counters
(each set a different colour).





Players 2



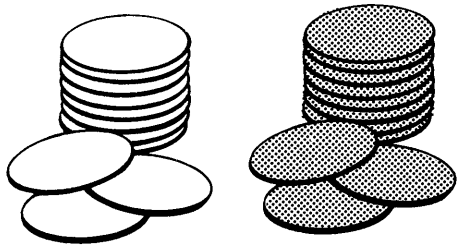
Cornered

Shape

Spatial awareness in the placement of counters: recognising squares of different sizes and orientation.

Apparatus

Each player has a set of counters (each set a different colour).



LEVEL	Profile Component 1				Profile Component 2		
	UA	N	A	M	UA	S	D
1							
2						●	
3						●	
4							
5							
6							
7							
8							
9							
10							

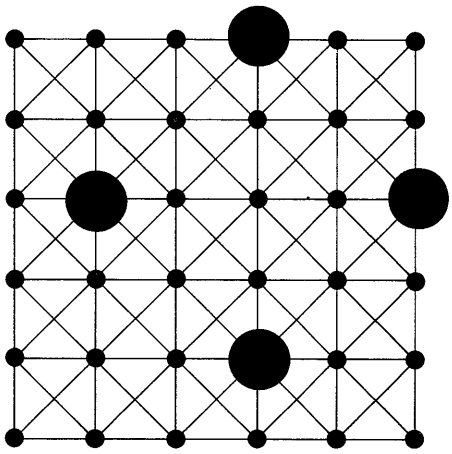
S2, S3 Recognise location. Recognise squares.

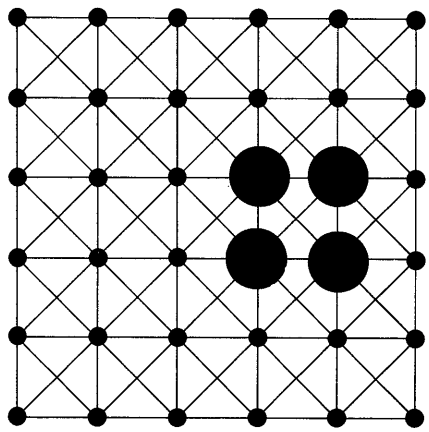
CORNERED

Take turns to place a counter on an empty spot.

The **winner** is the first player to have four counters on the **corners of a square**.

The square can be of any available size and orientation.





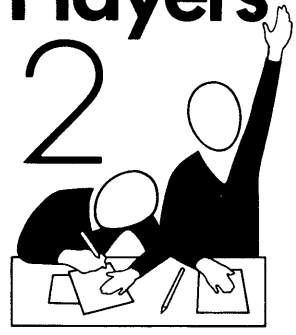
Variations

★ Allow squares with vertical and horizontal sides only.

★ The first player to place four counters on the corners of a square loses the game.

Players

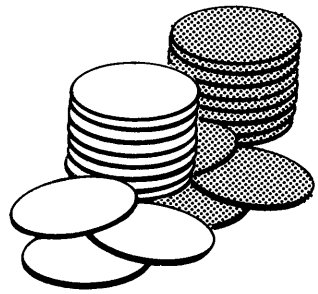
2



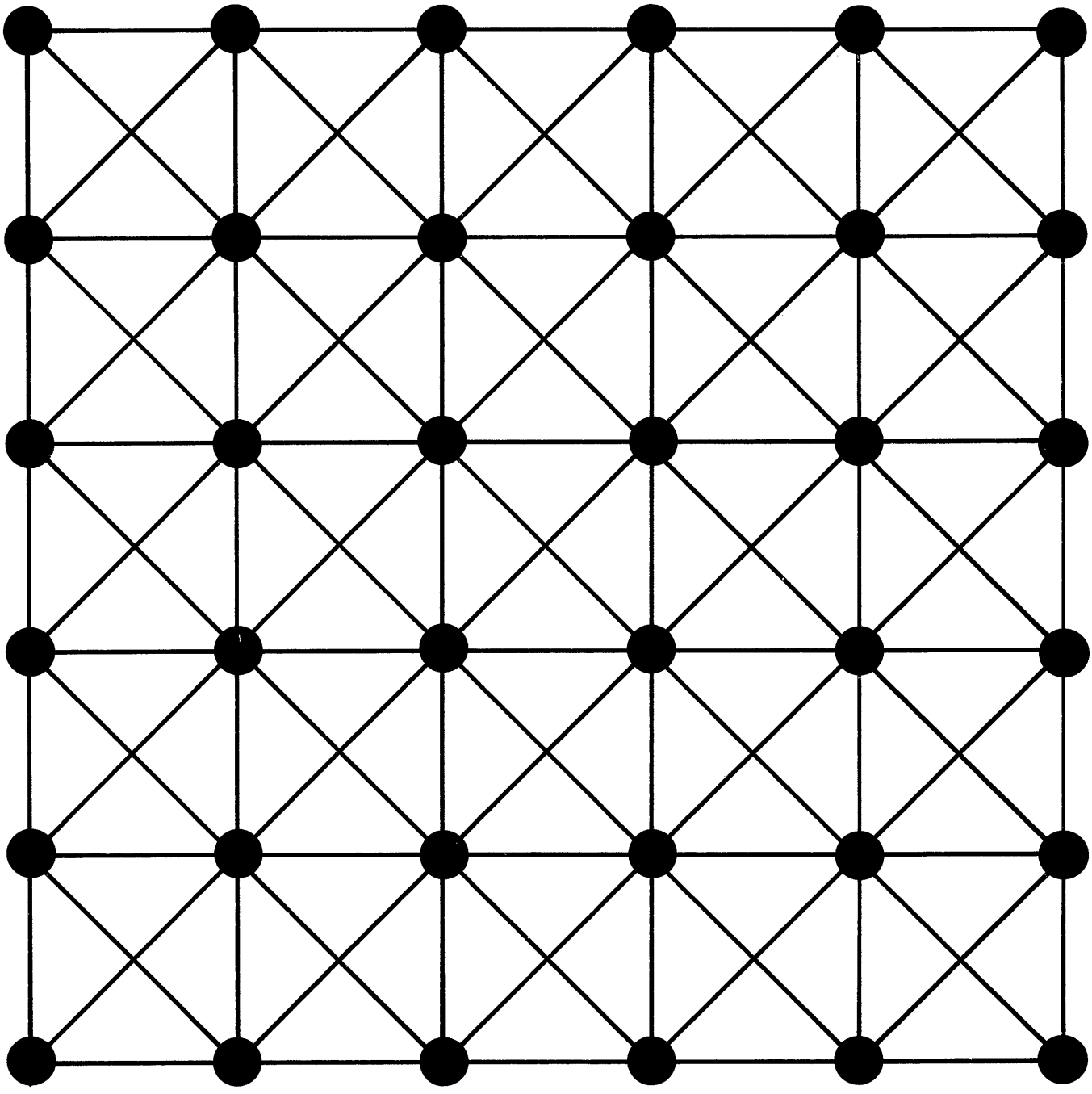
Cornered

39

You will need
a set of counters for each player
(the sets should be different in colour).



Players 2



Take Six

40

Subtraction

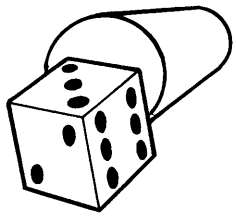
Subtracting one single-digit number from another.
The numbers are generated by thrown dice; the aim is to make subtractions with as many different results as possible.

LEVEL	Profile Component 1				Profile Component 2		
	UA	N	A	M	UA	S	D
1							
2		●					
3		●					
4							
5							
6							
7							
8							
9							
10							

N2, N3 Subtraction facts.

Apparatus

Use one dice numbered 1 to 6.



TAKE SIX

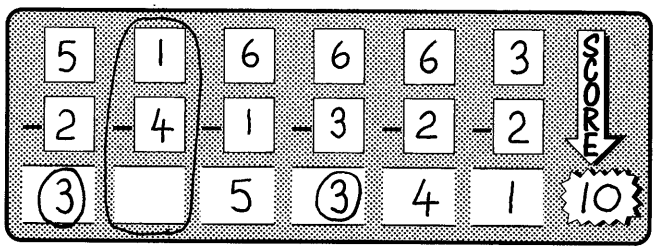
Each player needs a score sheet.

One player throws the dice 12 times. After each throw, **all** the players write the number in one of the first twelve boxes on their sheets, before the dice is thrown again. Once a number is written in a box it can not be changed.

When all 12 throws have been made, players complete as many of their subtractions as possible. If the top number in a subtraction is **smaller** than the bottom one, the calculation is eliminated.

In the completed subtractions, any answers that are **repeated** are also **eliminated**. The remaining answers are **added** to find the score.

For example:



The **winner** is the player with the largest score.

Variations

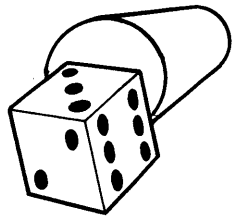
- ★ Instead of eliminating repeated scores, eliminate scores which are not repeated.
- ★ Use a ten-sided dice numbered 0, 1, 2, 3, 4, 5, 6, 7, 8, 9.
- ★ Score all totals greater than 3.
- ★ Score all totals less than 3.

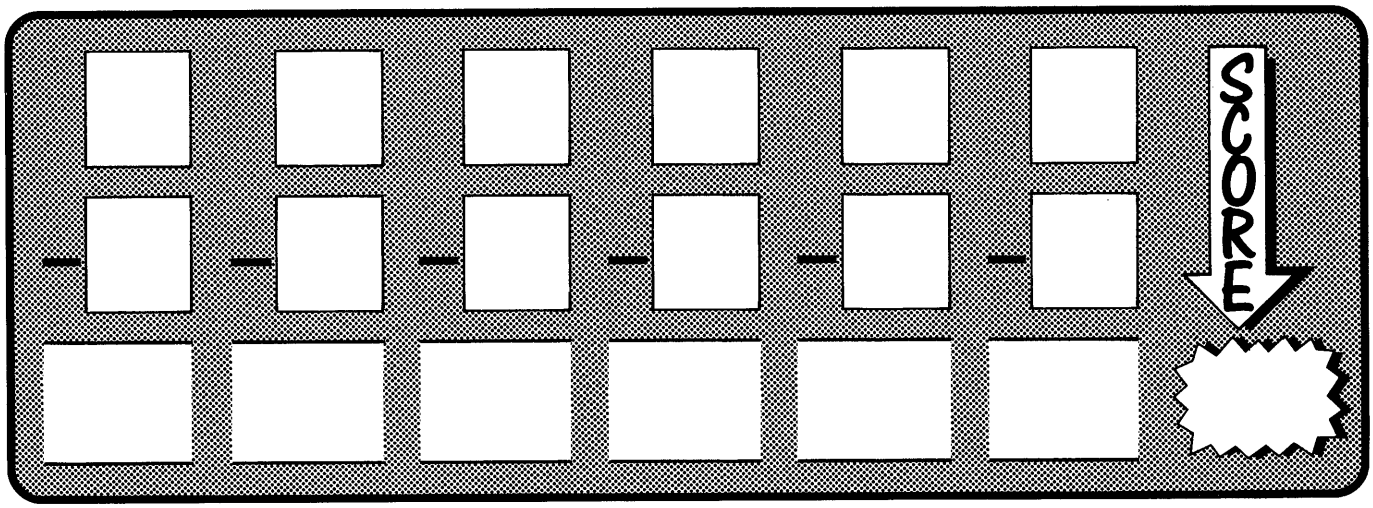
Players

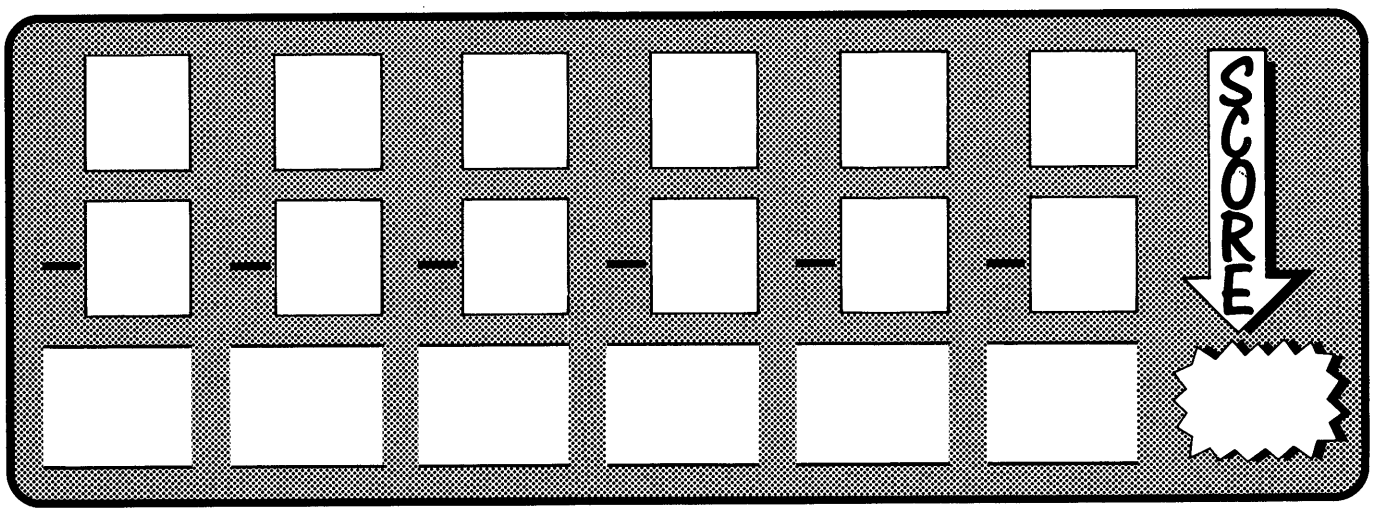
2+

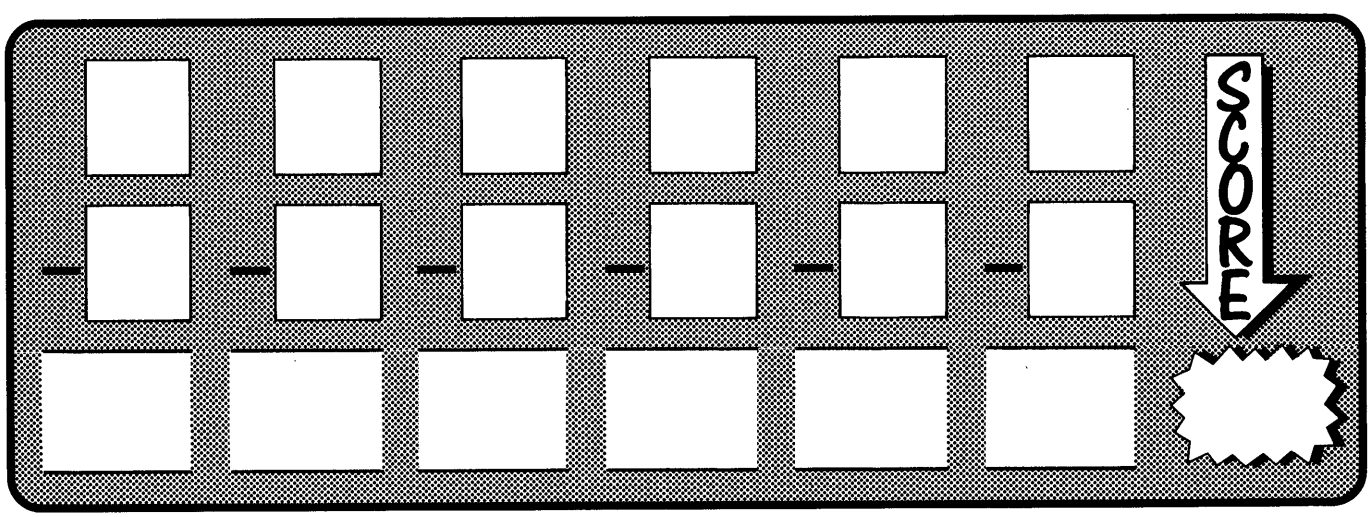
Take Six

You will need
one dice numbered 1 to 6.

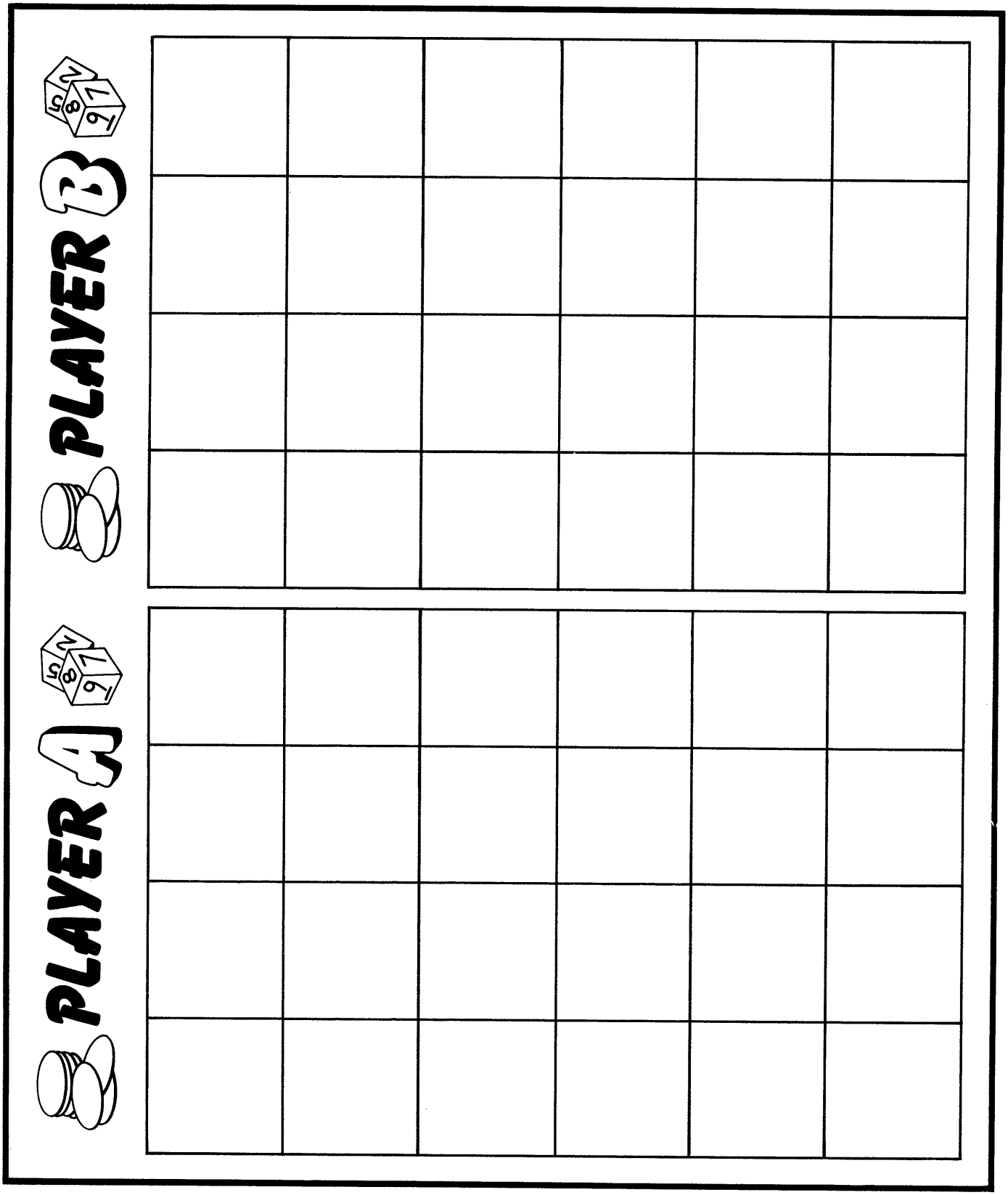




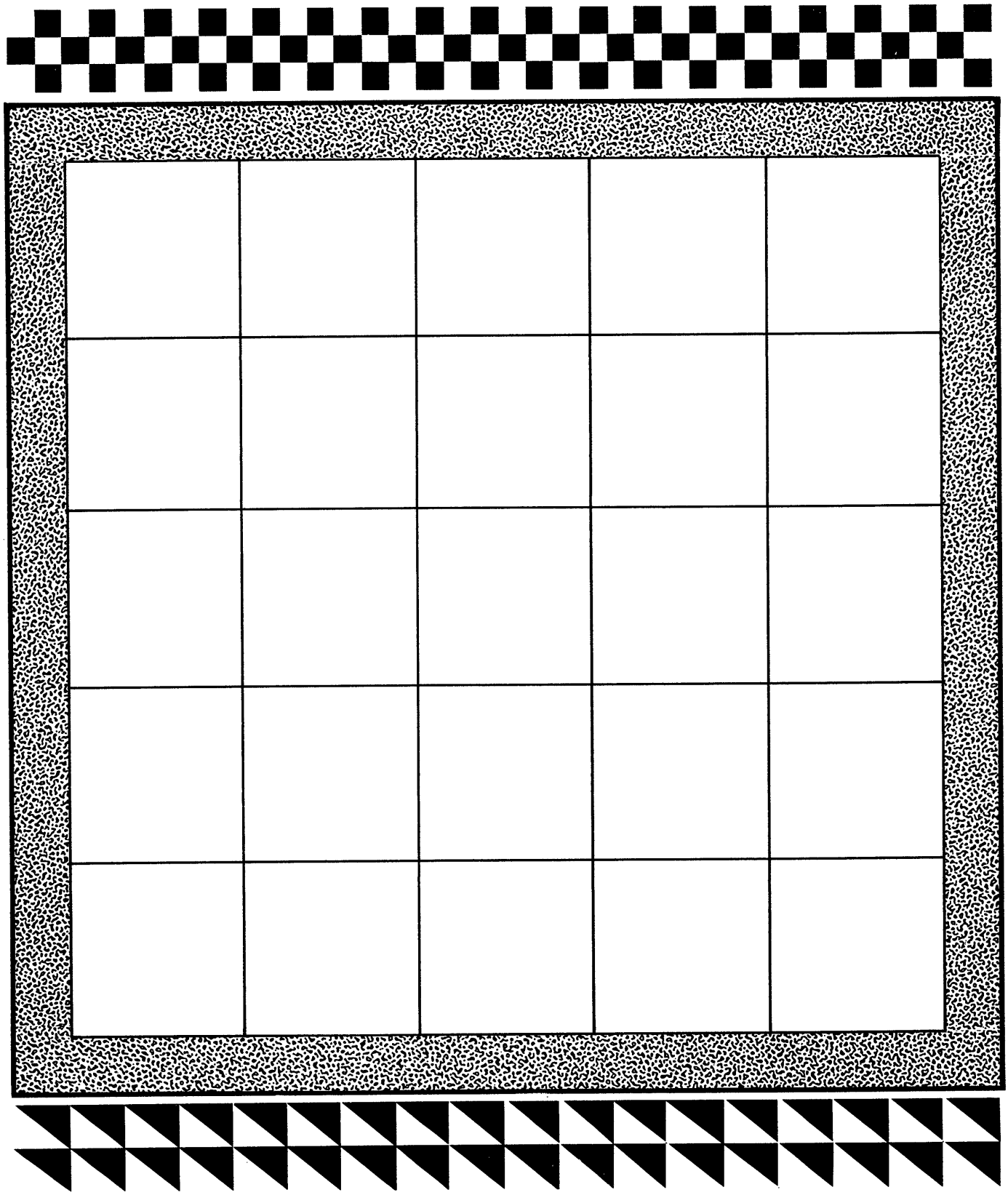




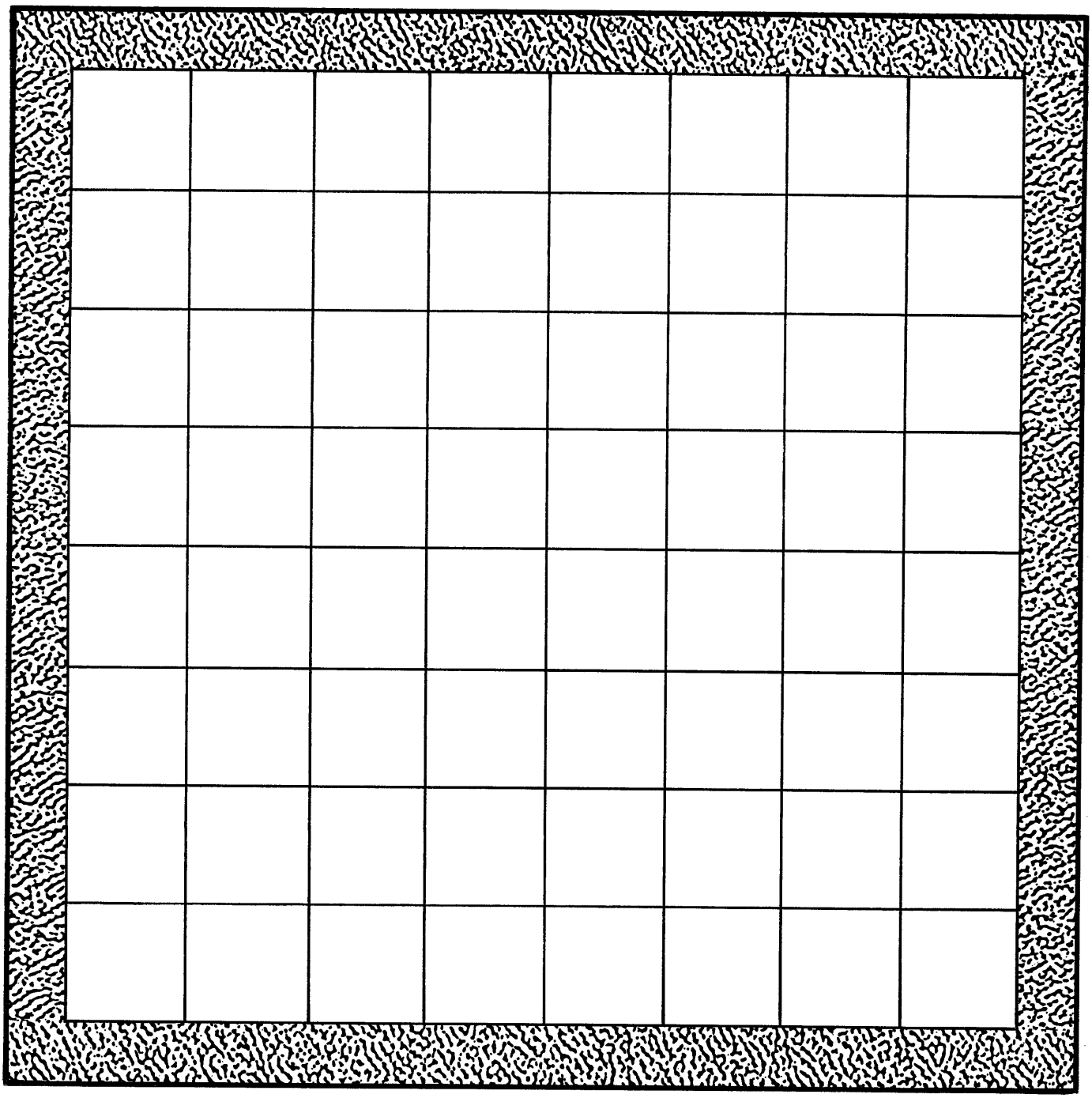
Gameboard master 1



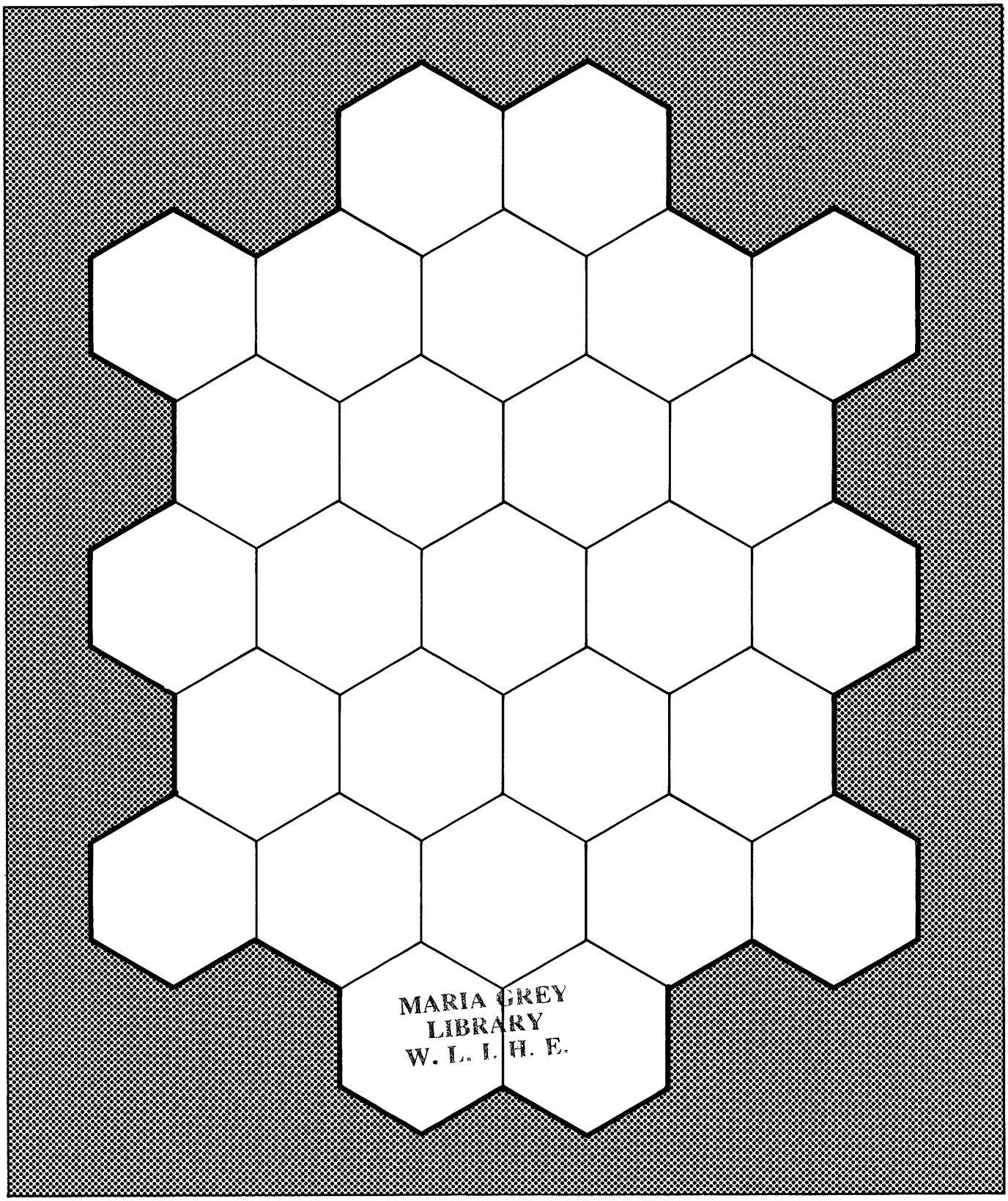
Gameboard master 2



Gameboard master



Gameboard master



RIVER EXPEDITION

RAFT

LIFE BELT

FINISH

START

BASE CAMP

WATER

MAP

DANGER ZONE

FOOD

RULES

A game for 2 players.

The object of the game is to follow the course of the river from start to finish. Before starting, each player must collect food, water, a life belt, a map and a raft.

Each player needs 6 counters (use different colours). Use one counter to slide along the grid lines on the map. Use the other counters to cover items on the score sheet as they are collected.

Use two dice numbered 1–6.

Each player places a counter on any grid point at base camp.

Take turns to throw the dice. Choose which number is the horizontal move and which is the vertical move. For example, a throw of 3 and 2 gives these choices of move:
2 units horizontally and 3 units vertically or
3 units horizontally and 2 units vertically.
Vertical moves can be up or down.
Horizontal moves can be left or right.

You must move each time, but you cannot go through a danger zone.

An item is collected by landing on a grid point inside its position on the board.
If you land in the river before collecting a raft, then miss the next turn.
If you land off the board, then go back to base but keep the items you have collected.
When all 5 items have been collected, move towards the start.

You may leave the river to go from point to point, but if you land on the river bank, then miss the next turn.

The winner is the first player to reach any point within the finish.

PLAYER A	FOOD	WATER	LIFE BELT	MAP	RAFT
PLAYER B	FOOD	WATER	LIFE BELT	MAP	RAFT

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