Preparatory School Math Workshop

PRINCE ALFRED COLLEGE

Notes....

Make 7 and/or Make 11

Materials

- Pack of cards

Players: 2 to 4

Aim of the game is to collect as many cards as you can.

Task Instructions:

- Lay all cards face down on the table
- Player 1 turns over two cards at a time. If the card total 7 (or 11 depending on what version you are playing), he/ she keeps the cards and has another go.
- If they don't total 7 (or 11), replace the cards and the next player has a turn.
- Encourage the players to return the card back to where they turned them over. Other players will remember where they are and, if they know they need a given card to make their total, they will know where to look.
- This supports and consolidates number facts.
- Continue playing until all cards are taken.
- The winner is the player with the most cards.

Task Variations:

With make 11 you can use the face cards (Jack =11, Kind =13)
Change game to make 15, 20 etc

99 or Bust!

Materials

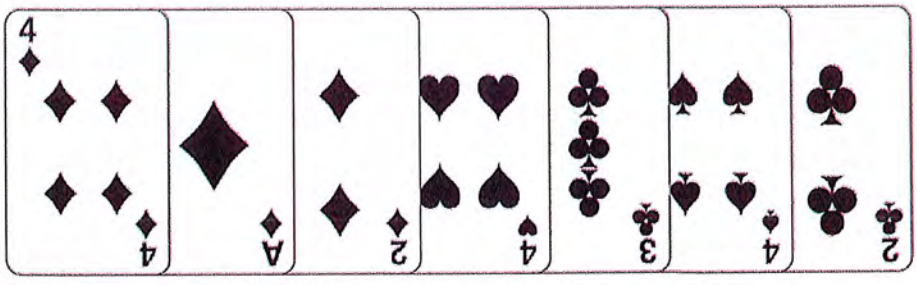
- Pack of cards
- Score sheet

Players: 2 to 4

Aim of the game is to reach 99 or force an opponent to go over 99.

Task Instructions:

- Cards are counted according to their face value
- Each player is dealt three cards and the balance of the pack is placed face down on the table.
- Play commences with the player to the left of the dealer and continues in a clockwise direction.
- In turn each player draws a card from the pack and then discards one from his/ her hand.
- A running total of the cards on the table is kept.
- The aim of the game is to reach 99 or force your opponent to discard a card which makes the total higher than 99.



e.g. (4 + 1 + 2 + 4 + 3 + 4 + 2 = 20)

Avoid!

Materials

- Pack of cards

Players: 2 to 4

Aim of the game is to avoid making a certain total.

Task Instructions:

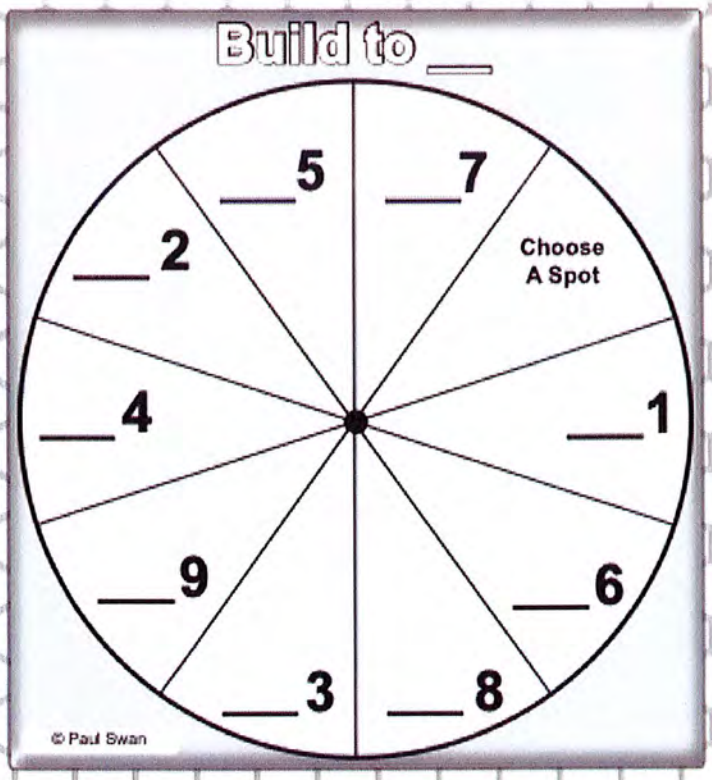
- At the start of the game a set of numbers to avoid is stated. For example: Prime Numbers, Square numbers, multiples of 5 etc
- Each player is dealt 3 cards. The remaining cards are placed face down on the table.
- The first player places a card face up on the table and picks one off the pack to replenish his/ her hand to three cards.
- The second player places another card on the table next to the original card and a cumulative total is kept.
- Other players do the same.
- If a player places a card on the table that takes the cumulative total to a 'poison number', that is a number to avoid, then that player is eliminated for that round.
- Play continues until only 1 player is left.

Eg. if multiples of 5 were chosen as the numbers to avoid and the cumulative total was 22 and a player placed a 3 on the table, making the total 25, then that player would lose.

Build to...

Build to ___

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



Build To:

A game for two players.

Aim: To be the first player to place three counters, next to each other, in a row, column or diagonal.

Materials Required: 36 transparent counters, 18 of one colour and 18 of another colour.

- Players take turns to flick the spinner and place a counter on the board that 'builds the number shown on the spinner to ten'. For example, if the spinner shows 7, the player would place a counter on 3.
- Play continues until one player has placed three counters, next to each other, in a row, column or diagonal.

Variation

- Allow a 'bump off' rule
- Play "Build to any Decade" (see back).

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Make 10

Players: 2

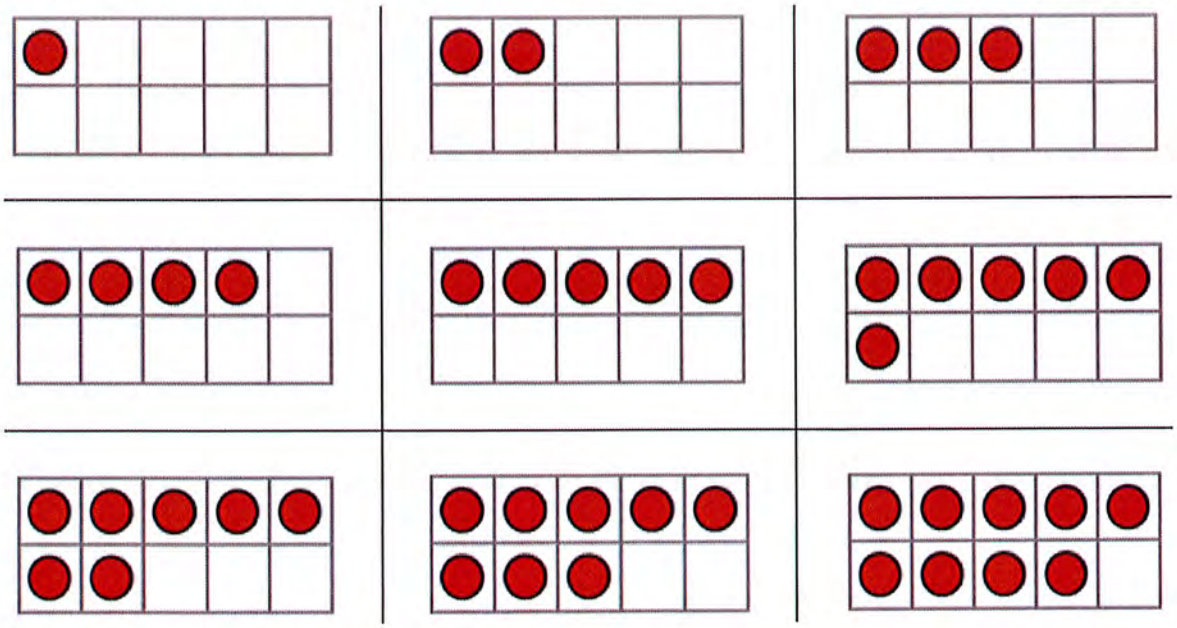
Materials: 1 or 2 dice, scratch paper (for keeping score)

Object: Make a 10 from the number rolled

One Die Version: One die is rolled. Players try to be the first player to shout what number needs to be added to the number on the die to make a ten. The number needed to make ten becomes the player's score for that round. For example, if a 3 is rolled, players would shout 7, because 3 and 7 make 10. The first player to answer correctly earns 7 points.

Two Die Version: Two dice are rolled. Players must now add or subtract to make ten. For example, if two 6s are rolled, players would shout 2, because 6 + 6 = 12 and 12 - 2 = 10.

Players can use the ten-frames below for additional support.

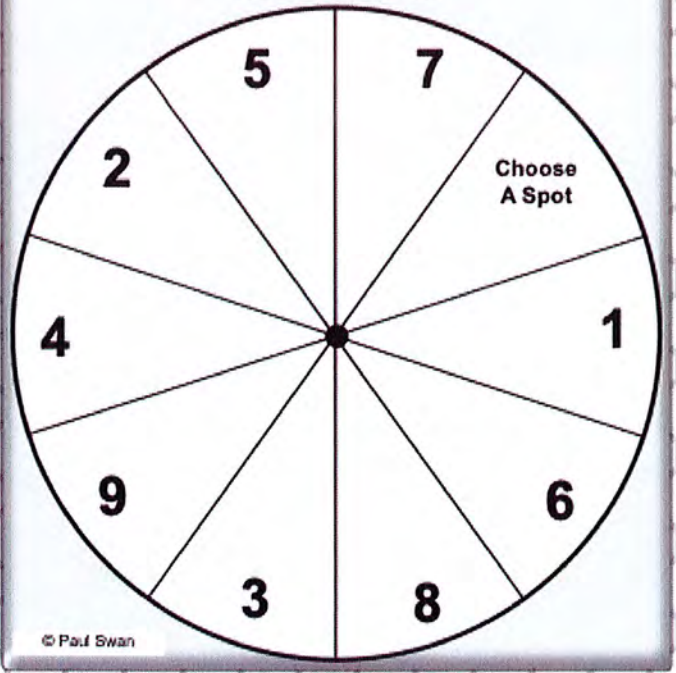


Doubles

Doubles

2	6	18	14	8	4
8	14	12	16	2	10
4	16	2	6	10	18
10	6	16	12	18	14
12	2	16	8	4	18
6	14	4	10	12	8

Doubles



Doubles:

A game for two players.

Aim: To be the first player to place three counters, next to each other, in a row, column or diagonal.

Materials Required: 36 transparent counters, 18 of one colour and 18 of another colour.

- Players take turns to flick the spinner and place a counter on a spot on the board that is double the number shown on the spinner. For example, if the spinner shows 7, the player would place a counter on 14.
- Play continues until one player has placed three counters, next to each other, in a row, column or diagonal.

Variation

- Allow a 'bump off' rule

Nice or Nasty!

Materials

- 6 sided dice
- Score sheet

Players: 2

Task Instructions

Game 1:

Take turns to throw the dice and decide which of the four cells to fill.

Do this four times each until all your cells are full.

Whoever has the largest four-digit number wins.

Scoring:

A point for a win. The first person to read 10 wins the game.

Work out the difference between the two four-digit numbers after each round.

The winner keeps this score. First to 10000 wins!

Variations:

Game 2:

Whoever makes the smallest four-digit number wins.

Game 3:

Set a target to aim for.

Then throw the dice four times each and work out how far each of you is from the target number. The closest wins.

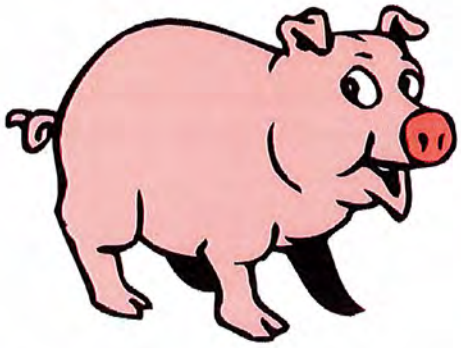
Game 4: Nasty version

Roll the dice – you decide if you want the number rolled in your cell or your opponent's cell. Whoever makes the largest number wins.

Scoring Sheet

Decide on a target number before playing each round or game

Player 1	Player 2	P1 Score	P2 Score



Pig!

Players: 2

Materials: 1 or 2 dice, 120 chart (optional)

Object: Be the first player to reach 100

One Die Version: On a turn, a player can roll repeatedly until one of two things happens (1) the player rolls a 1 or (2) the player chooses to hold (stop rolling). Each number rolled is added to the player's total. If a 1 is rolled, all points for that turn are lost!

Scoring examples:

1. Suzy rolls a 4 and decides to continue. She then rolls 5 more times (3, 4, 2, 6, 1). Because she rolled a 1, her turn ends and she receives no points for the numbers rolled.
2. Marcus rolls a 6 and decides to continue. He rolls 3 more times (4, 3, 5) and decides to hold. His score for the round is 18 (6 + 4 + 3 + 5 = 18).

Two Dice Version: Two dice are rolled. If a single 1 is rolled on either dice, the turn ends and all points are lost. If two 1s are rolled on a single turn, the player scores 25 points. Doubles, for example a 2 and a 2, are worth double points (4 x 2 = 8).

Race to 100!

Materials

- Two dice
- One hundred chart
- Two markers
- Pencils and scratch paper

Players: 2

Task Instructions

- Each player takes turns rolling the two dice. Markers are placed at zero.
- Player 1 may choose to calculate the sum, difference, product or quotient of the two numbers displayed on the dice.
- Player 1 then moves their marker to that number on the chart.
- Player 2 takes their turn.
- For player 1's second turn they determine the sum, difference, product or quotient. This number is then added to the number under their marker and the marker is moved to this sum.
- Play ends when one player reaches one hundred.
- If a player rolls and computes a number that cannot be added to the last number without going over 100 they lose their turn.
- If player 1 reaches 100 first, player 2 finishes the round to see if they can tie the game.

Variation

Players can choose to include negative number achieved through taking the difference of two numbers where the number subtracted is greater than the starting number.

Factors Game

Materials

- 100 square
- Counters

Players: 2

Task Instructions

- The first player chooses a positive even number that is less than 50 and places a counter on it
- The second player chooses a number that is either a factor or a multiple of the first number
- Players continue to take turns to select numbers that are either factors or multiples of the previous number
- The first person who is unable to cross out a number loses.

Possible extension

Switch the challenge from winning the game to covering as many numbers as possible. Players can again work in pairs trying to find the longest sequence of numbers that can be crossed out.

Can more than half the numbers be crossed out?

This challenge could run for an extended period: the longest sequence can be displayed on a noticeboard and players can be challenged to improve on it; any improved sequences can be added to the noticeboard.

Ask players to explain why their choice of numbers is good.

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

DOUBLE UP

Materials: A dice, counters in two colours. A game for two players.
Aim: To place four counters in a row, column or diagonal.

Rules: Roll the dice and move along the track. Double the number you land on and place a counter on that number in the centre square. The first player with four in a row wins.

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

2	6	18	14	8	4
8	14	12	16	2	10
4	16	2	6	10	18
10	6	16	12	18	14
12	2	16	8	4	18
6	14	4	10	12	8

ODD ONE OUT

Materials: Dice counters in two colours. A game for two players.
Aim: To be the player with the most counters.

Rules: Players take turns to roll a dice and move that many squares. If you land on an odd number place a counter in your opponent's scorebox.

Start	1	2	3	4	5	6	7	8
								9
32	33	34	35	36	37	38		10
31						39		11
30		50	Finish			40		12
29		49				41		13
28		48				42		14
27		47	46	45	44	43		15
26								16
25	24	23	22	21	20	19	18	17

Scorebox: Player 1	Scorebox: Player 2

The Spinner Array Game

Australian Curriculum Links

Yr 2: (ACMNA031) Recognise and represent multiplication as ... arrays.

Yr 3: (ACMNA056) Recall multiplication facts of two, three, five and ten ...

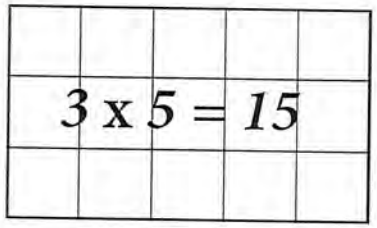
Yr 4: (ACMNA075) Recall multiplication facts up to 10 × 10 ...

Teacher Notes

There are several concepts associated with the development of multiplication. In the early years students will be exposed to the idea of multiplication as repeated addition (equal groups), grouping and arrays. This game is designed to focus students on the array model of multiplication. The array model is used to emphasise the commutative property of multiplication, that is, 3 x 5 = 5 x 3. If students understand this property it will greatly reduce the number of table facts that need to be learned.

The following array shows that there are:

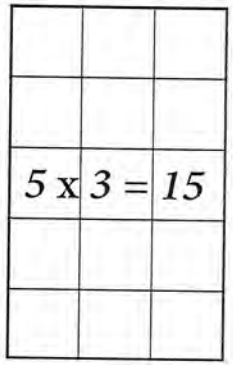
5 squares in each row
3 rows
3 *fives* are 15



The same array has been rotated 90 degrees.

Now it shows

3 squares in each row
5 rows
5 *threes* are 15



Some students, who do not know the fact, will count individual squares; others may count by threes or fives. If students are given Cuisenaire Rods then that will encourage counting in equal groups. Each time a new rod is placed it will represent another group. In the three rows of 5 example, a student might lay down one yellow rod, then another and finally a third rod. This would be quicker than laying down five light green rods.

Eventually they will learn the that 3 rows of 5 is 15. Encourage the students to write the fact on the rectangle (array).

When playing the game, students may note that some of the arrays (rectangles) are in fact squares. Point out the dimensions of the squares and link this to 'square numbers'. For example, 4 x 4 = 16 will produce a square array. If the spinners are changed or dice are substituted, then students will have to multiply by zero. This will lead to the realisation that a rectangle or array cannot be drawn.

Aim: To colour (capture the most area).

Materials: Two different coloured pens or erasable markers, optional 10 mm grid paper, rods

A game for two players.

Rules

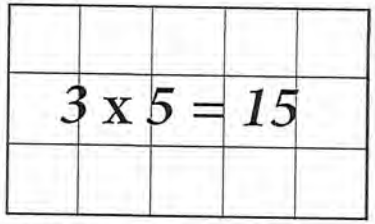
Each player flicks the spinners and draws a rectangle (array) according to the what is indicated on the spinners.

The player should lightly shade the inside of the rectangle and write the calculation.

A time limit can be set and the winner is the player who captures the most area in this time period.

Variations

In the initial stages students should draw the rectangle as the spinners indicate. Three rows of 5 would look like this.



Later a strategy version of the same game may be played where play continues until one player cannot draw an array. In this case you may wish to allow players to turn their arrays (rectangles) around to fit them in. This will highlight the commutative property of addition, that is, $a \times b = b \times a$, or 3 x 5 = 5 x 3.

Games may be made shorter by folding the sheet of grid paper in half. If playing on a laminated sheet of grid paper then certain squares may be shaded in at the start of the game and made 'off limits'.

For larger multiplication facts, 0 - 9 spinners or 0 - 9 dice may be used. When a zero turns up the student will not be able to draw an array, emphasising that anything multiplied by zero is zero (multiplication property of zero).

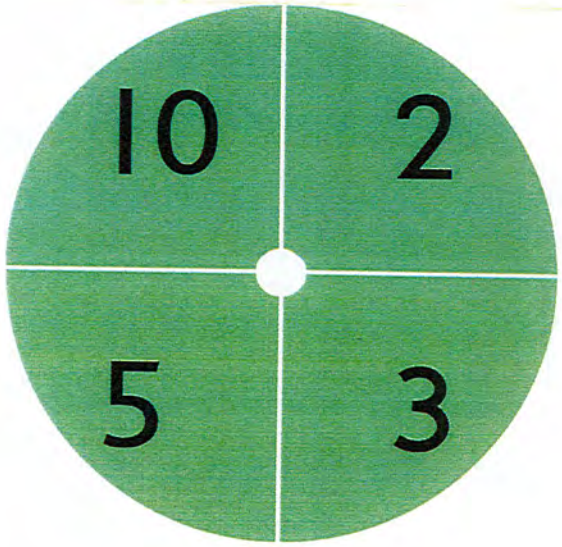
For facts beyond 9 x 9, different spinners or dice may be used. The larger numbers will mean that more squares are consumed more quickly, so it makes sense to use 5 mm grid paper instead of 10 mm grid paper.

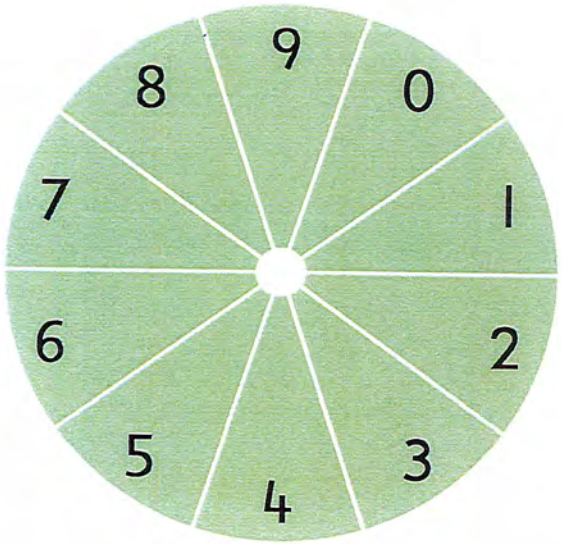
ARRAYS GAME 1 (QUICK)

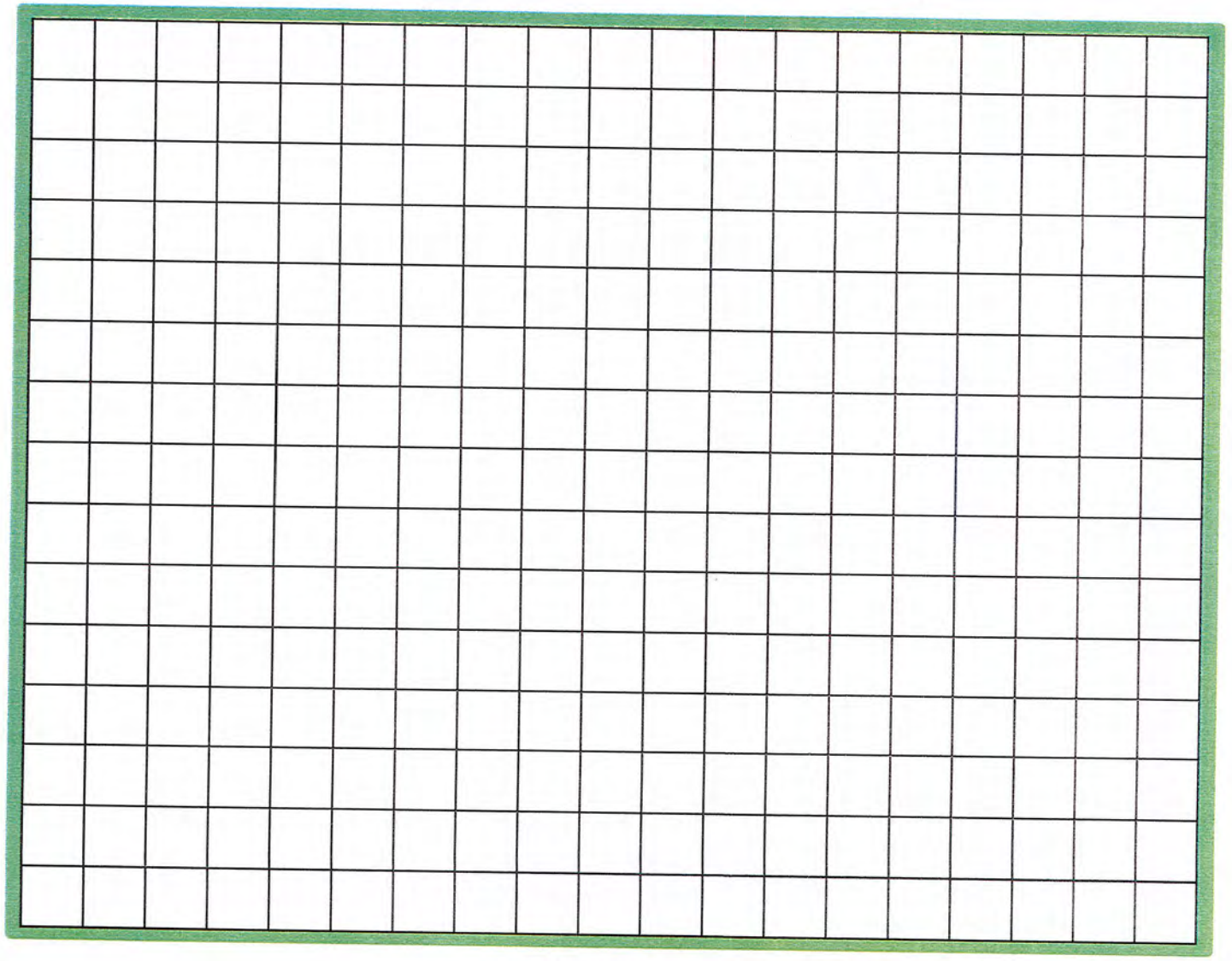
2x, 3x, 5x, 10x tables

Aim: To colour (capture the most area).
Materials: Two different coloured pens or erasable markers.
A game for two players.

Rules:
Each player flicks the spinners and draws a rectangle (array) according to what is indicated on the spinners. The player should lightly shade the inside of the rectangle and write the calculation.
A time limit can be set and the winner is the player who captures the most area in this time period.





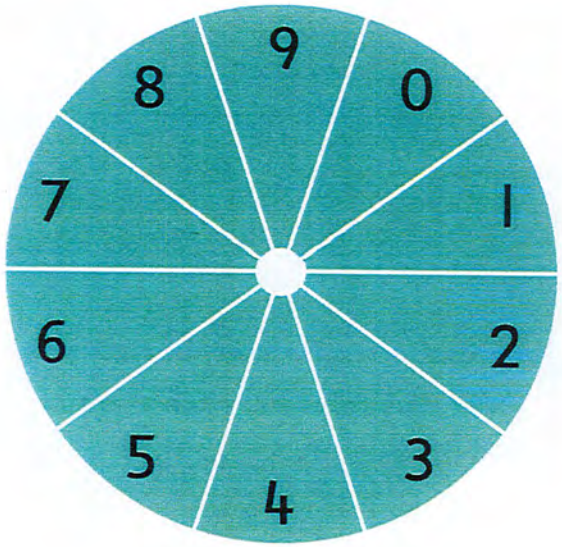


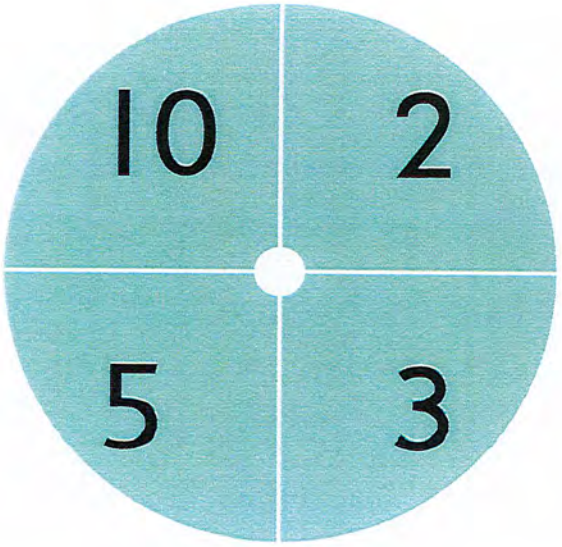
ARRAYS GAME 2 (QUICK)

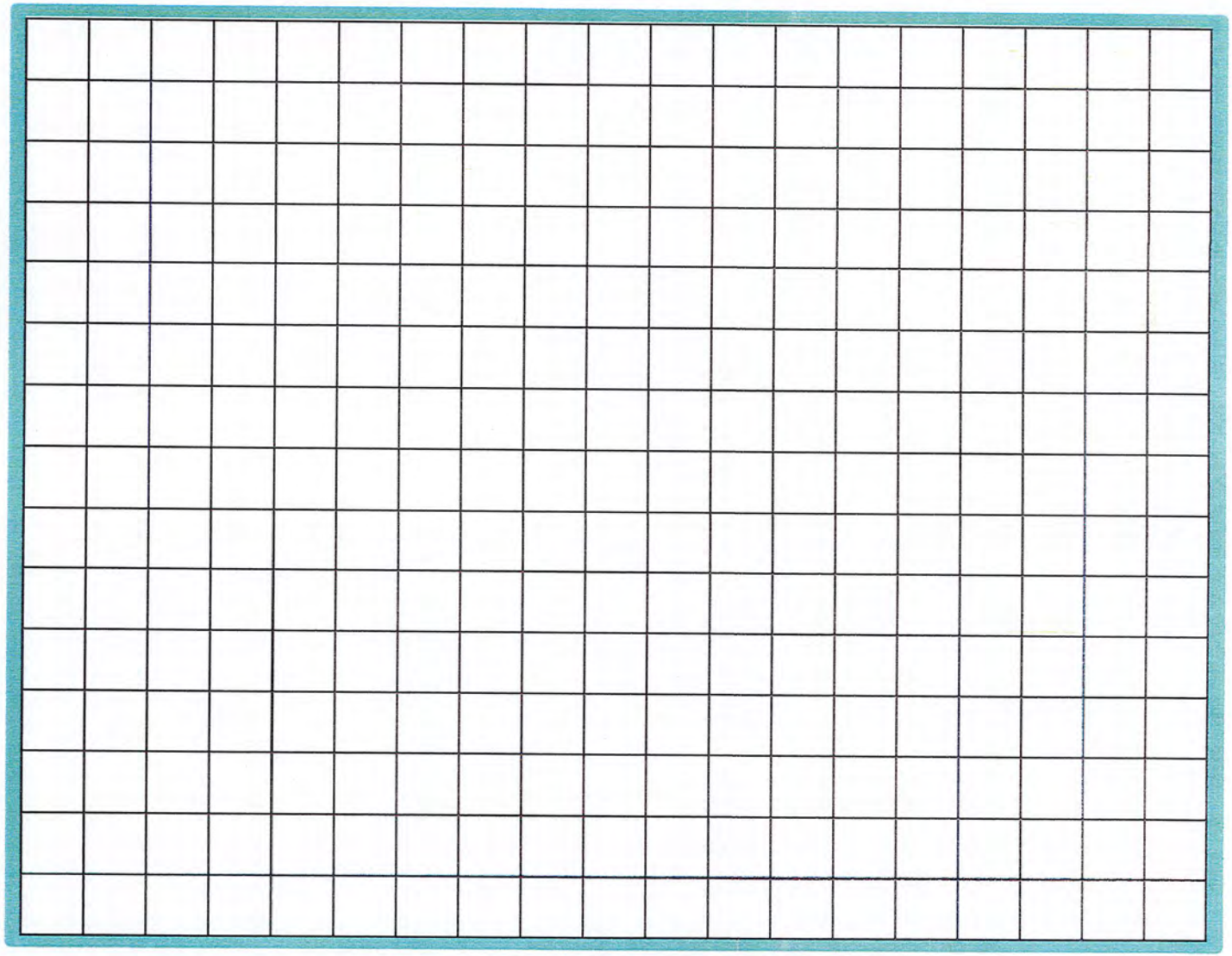
2x, 3x, 5x, 10x tables (commutative)

Aim: To colour (capture the most area).
Materials: Two different coloured pens or erasable markers.
A game for two players.

Rules:
Each player flicks the spinners and draws a rectangle (array) according to what is indicated on the spinners. The player should lightly shade the inside of the rectangle and write the calculation.
A time limit can be set and the winner is the player who captures the most area in this time period.





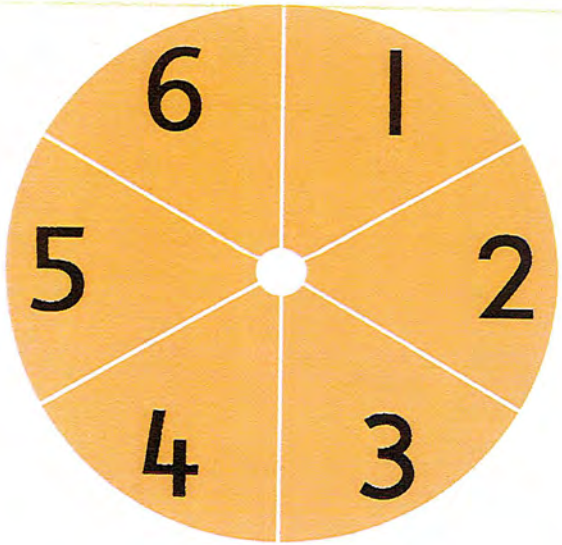


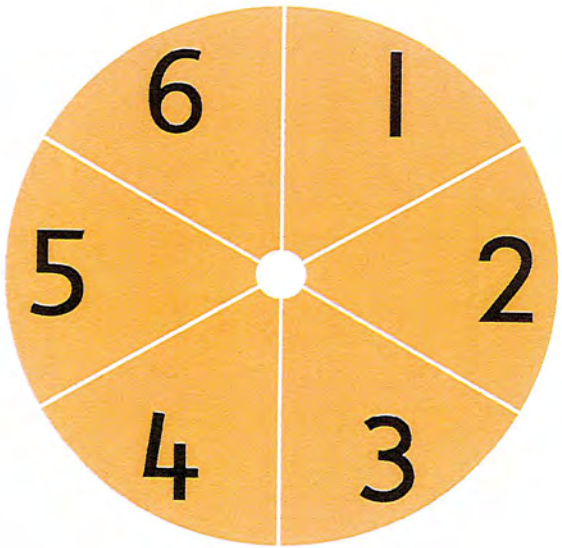
ARRAYS GAME 3 (QUICK)

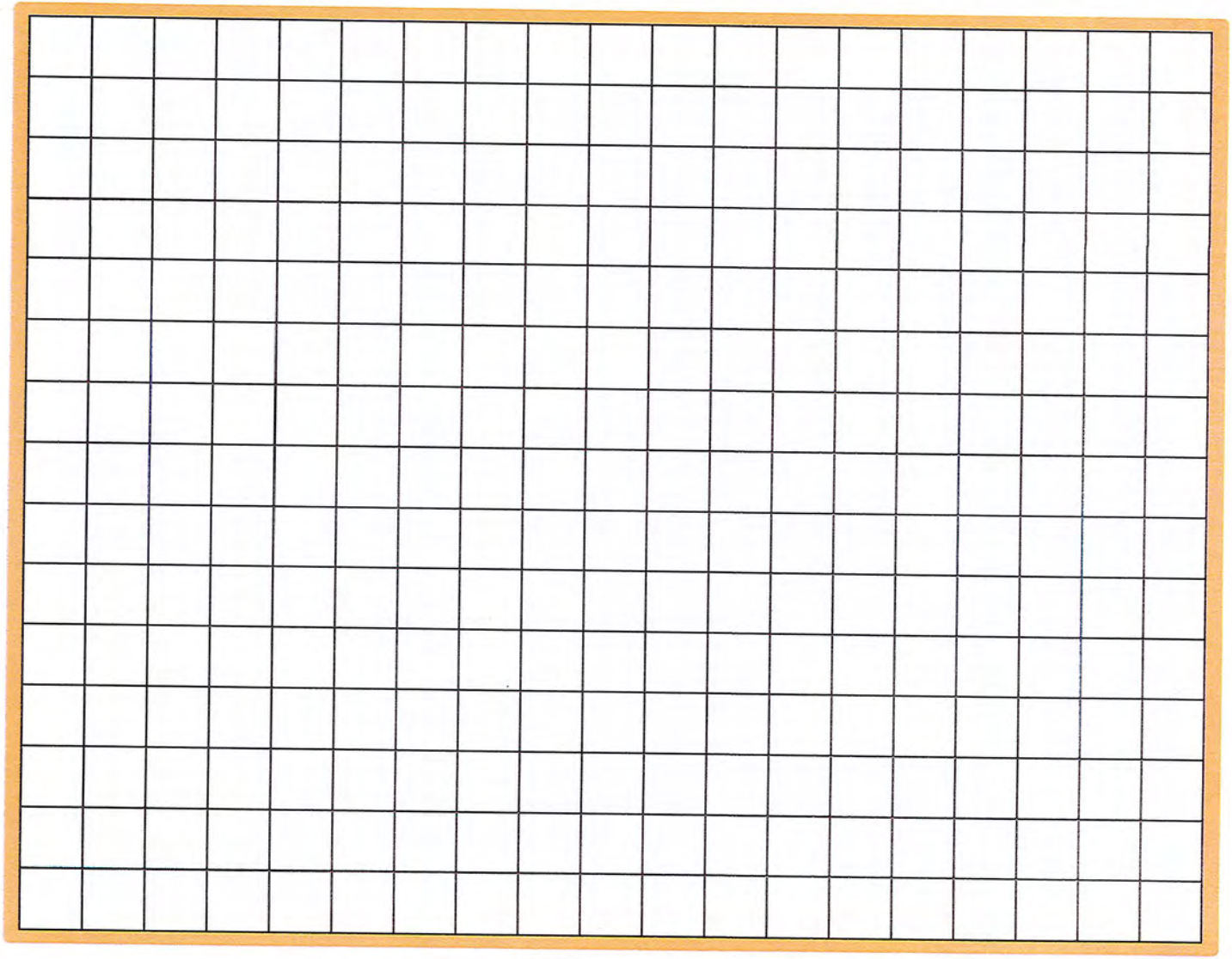
Up to 6 x 6

Aim: To colour (capture the most area).
Materials: Two different coloured pens or erasable markers.
A game for two players.

Rules:
Each player flicks the spinners and draws a rectangle (array) according to what is indicated on the spinners. The player should lightly shade the inside of the rectangle and write the calculation.
A time limit can be set and the winner is the player who captures the most area in this time period.







Useful Websites

Nrich Maths – contains games/ blogs/ explanations/ problems to solve
https://nrich.maths.org/

Jenny Eather – maths dictionary
http://www.amathsdictionaryforkids.com/

Maths is Fun – great site for explanations of math concepts/ games
https://www.mathsisfun.com/

Dr Paul Swan – great games/ explanations
https://drpaulswan.com.au/

Prodigy – fun learning of maths through game play
https://www.prodigygame.com/main-en/

Jo Boaler – excellent games/ insight into math learning
https://www.youcubed.org/