

ARRAYS GAME

0 - 9

Aim: To colour (capture the most area).

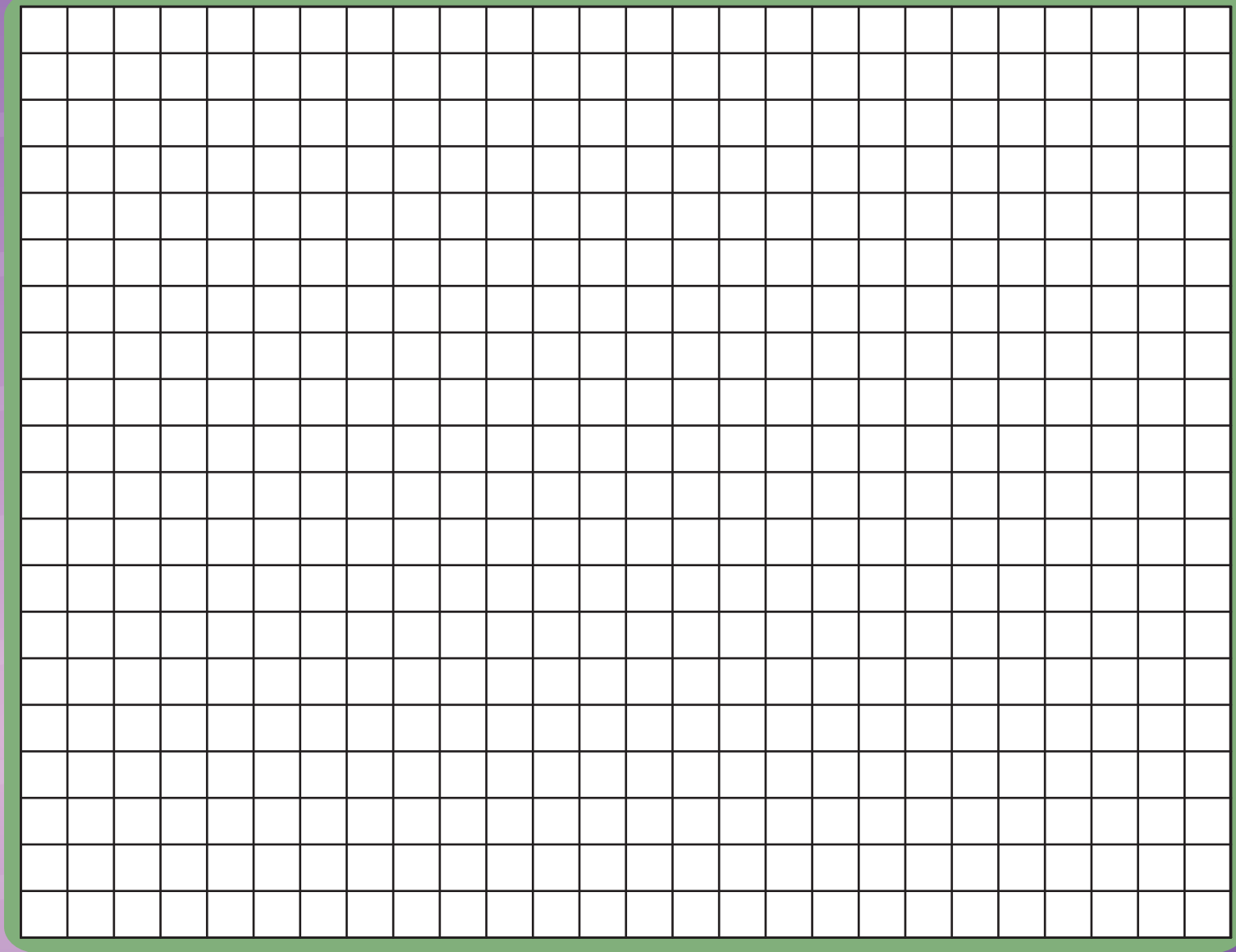
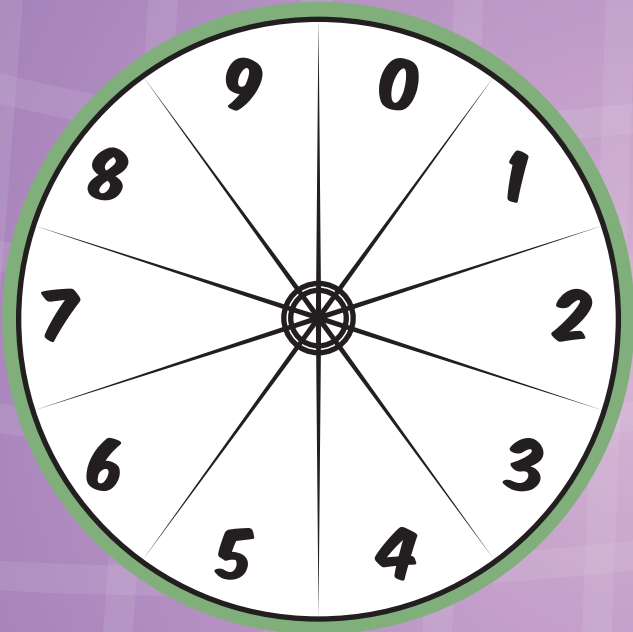
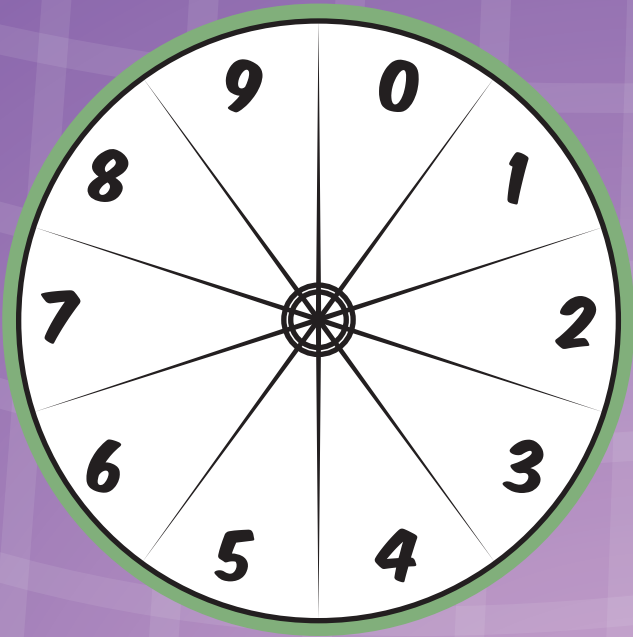
Materials: Two different coloured pens or erasable markers.

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.



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, $3 \times 5 = 5 \times 3$. 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

$3 \times 5 = 15$				

The same array has been rotated 90 degrees.

Now it shows

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

$5 \times 3 = 15$		

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 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, $4 \times 4 = 16$ 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 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.

$3 \times 5 = 15$				

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 $3 \times 5 = 5 \times 3$.

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 9×9 , 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.