



# Multiplication - Arrays

2.3.5

**Word Wall:** times, multiply, arrays, rows, columns, addition, subtraction, pattern, record, share rule

## Introduction

Students will understand the commutative property of multiplication using an array model.

## Resources

- Counters
- Felt square
- Large rubber bands
- Rods
- Calculator
- FISH Kit

## Time / Classroom Organisation

Introduce the activity process as a whole class lesson or in a small group. Review the commutative rule regularly.

**Australian Curriculum---Year level: Two** Recognise and represent multiplication as repeated addition, groups and arrays (ACMNA031)

## Proficiency Strand:

**Understanding** – Identifying and describing the relationship between addition and subtraction and multiplication and division.

**Understanding** --- Connecting number calculations with counting sequences.

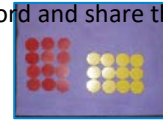
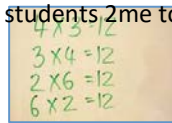
**Reasoning** – using known facts to derive strategies for unfamiliar calculations.

**Reasoning**--- Comparing and contrasting related models of operations.



## Activity Process--- Rows

- Give each student 12 counters.
- Ask students to arrange counters into equal rows.
- Ask students:  
*How many different ways can you arrange counters into equal rows?*
- Allow students time to record and share their answers.

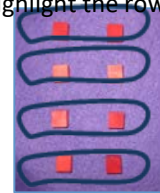


- Repeat with larger or smaller collections of objects.

Source: Board of Studies NSW, *Mathema2cs K---6 Units of work.*  
[http://k6.boardofstudies.nsw.edu.au/files/maths/maths\\_k6\\_ws.pdf](http://k6.boardofstudies.nsw.edu.au/files/maths/maths_k6_ws.pdf)p21

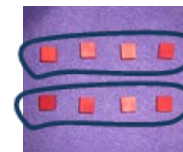
## Activity Process – Turnarounds

- Place an array on a felt square For example: 4 rows of 2. Use the large rubber bands to highlight the rows. Write: *4 rows of 2 or 4 by 2 =8*

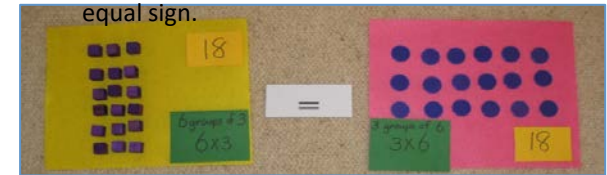


Remove the bands, and turn the felt square 90° to see the turn-around. 2 rows of 4.

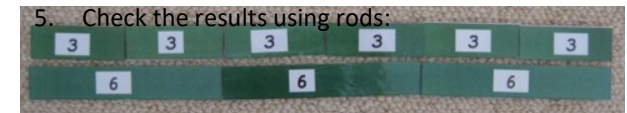
- Use bands to highlight the grouping. Write: *2 rows of 4 or 2 by 4 =8*. Count to make sure this is true. Have each student check the results on a calculator.



- Give each student an array to make with counters on a felt square. Turn the felt square to see the turn around – write them down as before.
- Ask each student to find someone with a pattern that is a matching turn-around. Use equal sign.



- Check the results using rods:



- Photograph the turn-around to make a display in the classroom
- Use calculators to see if the same rule applies for 2 digit numbers. Ask:  
*Is 12 by 24 the same as 24 by 12?*  
*Does it work for addition?*  
*Subtraction?*  
*Division?*  
*Record the results.*



## Variations and Extensions

### 1. Match Me

Resources: Match Me Game Board and Cards  
Each player takes 1 game board.  
Draw one card from pile and place in the red frame on the game board.



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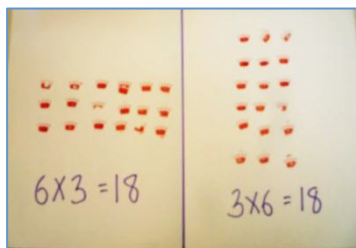
Each player takes a turn drawing a card. If the card is the same value as the card on the game board, the player places the card in one of the three frames at the bottom of the page. If the drawn card is not the same value, the card is thrown on a discard pile. The first player to fill the game board is the winner.



## 2. Poster Stamps

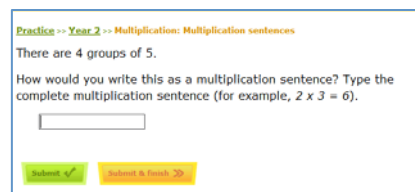
Resources: Paper, Paint, Stamps

Students can use paint stamps to create posters that display a multiplication fact and the turn around.



## Digital Resources

<http://au.ixl.com/math/year---2/mul2plica2on---sentences>



[https://www.eduplace.com/math/mw/background/3/05/te3\\_05\\_array\\_ideas.html](https://www.eduplace.com/math/mw/background/3/05/te3_05_array_ideas.html)



## Contexts for Learning

### Play:

Play snap using Multiplication facts flash cards

### Investigation:

Give students 5 bowls. Ask students to place one counter in each bowl and record this multiplication fact  $5 \times 1 = 5$ . Ask students to then place two counters in each bowl and record this multiplication fact  $5 \times 2 = 10$ . Continue until students have placed ten counters in each bowl. Ask students to explain the pattern to you.

### Real life experience:

Provide students with real life objects that a multiplication sum could be used to find the quantity. For example egg cartons, muffin tins, ice cube trays, block of chocolate, rice cracker packet and so on.

### Routines and Transitions:

Use Multiplication facts flash cards as students transition to a new activity. Hold up a card and ask students to answer the fact displayed.

## Assessment

Observe students when playing the *Match Me* game. Note their ability to find the matching cards and give an answer to the algorithm.

**Achievement Standard:** Represent multiplication and division by grouping into sets.

## Background Reading

The commutative property applies for addition and multiplication. This property means that you can add or multiply in either order.

The commutative property of addition means that when you reverse the numbers being added, the answer will be the same i.e.  $3+7$  is the same as  $7+3$ .

The commutative property of multiplication means that when you reverse the numbers being multiplied, the answer is the same i.e.  $4 \times 9$  is the same as  $9 \times 4$ .

Commutatively is also known as a "turn around". The commutative property does not apply to subtraction and division.

## Year three NAPLAN Numeracy test links

[Multiplication - Number Problems](#)

## Links to Related MAGs

2.2.6 – Multiplication – repeated addition

2.3.4 - Multiplication - arrays

2.4.5 – Multiplication – solve problems

3.2.4 – Multiplication Facts (1)

3.3.1 – Multiplication Facts (2)

3.3.4 – Multiplication and Division Problems

1	2	3
$\begin{array}{r} \times 5 \\ \hline \end{array}$	$\begin{array}{r} \times 5 \\ \hline \end{array}$	$\begin{array}{r} \times 5 \\ \hline \end{array}$
4	5	6
$\begin{array}{r} \times 5 \\ \hline \end{array}$	$\begin{array}{r} \times 5 \\ \hline \end{array}$	$\begin{array}{r} \times 5 \\ \hline \end{array}$
7	8	9
$\begin{array}{r} \times 5 \\ \hline \end{array}$	$\begin{array}{r} \times 5 \\ \hline \end{array}$	$\begin{array}{r} \times 5 \\ \hline \end{array}$

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