

Introducing 'Rows of' and 'Arrays'

Teacher Talk:

- It's important for students to start thinking of the X symbol to mean 'rows of'.
- They usually know the X symbol to mean 'groups of', 'times' and 'multiplied by'.
- Adding 'rows of' to student vocab, helps them develop more sophisticated understandings of multiplication.
- Thinking about 'rows of', then helps introduce *arrays*, which will be very important in helping students visualise new multiplication strategies.

***Use these session ideas below as part of a 'Multiplication and Division' unit**

Or

***Use some of these ideas below as part of Tools/Warm Up sessions regularly**

***Repeat these sessions regularly-** it takes time for the students to grasp the concepts and begin naturally using them in context.

Session One:

Learning Intention: To learn the meaning of the X sign:

- Ask students to brainstorm the meaning of the X sign
 - Write 3×2 for example and ask-
"How would you read this number sentence?"
 - Record variations- '3 times 2', '3 groups of 2', '3 multiplied by 2'
 - Introduce the idea that X also means 'rows of'
 - Add '3 rows of 2' to the list
 - View: Teacher Talk Video- Using Arrays (in video section)
-

Session Two:

Learning Intention: To understand 'rows of'

- Discuss: when is a time when we use rows?- (e.g. we sit in rows at the movies, rows at the footy, eggs are in cartons in rows, desks can be arranged in rows)
 - Ask students to draw an example of when they have seen rows in real life
 - Share some of the student examples (clear ones) with the class and reiterate "You've drawn 3 rows, with 6 in each" etc
-

Session Three:

Learning Intention: To use 'rows of'

- "We are going to make rows."
- Ask the class to get into rows of 6
- "Yes, I can see 1 row of 6 at the front, there's 2 rows of 6 (pointing it out)..." etc
- "How how many rows of 6 did we make?"
- "4 rows of 6" or "3 rows of 6"
- "Can anybody write that as a number sentence?"
- 4×6
- "That's right, we can read that as '4 rows of 6'."

- Give each student 20 counters/blocks and ask them to make 'rows of'
 - *"Rows must be equal"*
 - How many different 'rows of' can they make with the 20 counters?
 - Can they record a matching number sentence ($10 \times 2 = 20$) *Enabling prompt- write the matching sentence using words rather than numbers (10 rows of 2 makes 20)
-

Session Four:

Learning Intention: To learn what an array is

*each student to have an individual whiteboard/ workbook in front of them

- *"Here's a number sentence": teacher writes 3×5 on board*
 - *"Can you read it to me?"*
 - take various answers- ...
 - *"Today we're thinking about 'rows of'."*
 - *"So let's read it- '3 rows of 5'."Add 'rows of' to the various other answers.*
 - *"Can you draw 3 rows of 5?"*
 - Teacher note- many children will draw 5 rows of 3. This is not what you asked for and it does matter. Discuss with class. Demonstrate that you will get the same answer, but 3 rows of 5 is the other way around to 5 rows of 3- you can literally turn their array around to show the two ways
 - *"What we are drawing are called 'arrays'."*
 - Bring up www.amathsdictionaryforkids.com online and read definition of array
 - Further illustrate by showing the teacher drawing of 3 rows of 5
 - *"It's got 3 rows with 5 in each."*
 - *"It's a neat way to show multiplication."*
 - *"It's easier and clearer than drawing 'groups of'."*
-

Session Five:

Learning Intention: To read arrays

- Print and laminate the [array cards](#) to use as flashcards
 - or
 - Alternatively- use paper plates and dot stickers to create your own set
 - Hold up each array card
 - Begin by asking "What do you see?"
 - Allow for various answers and ideas, such as '15 dots' or '3 rows' or '3 rows with 5 in each'
 - Then move to asking students to 'read the array'
 - They must call out the number sentence shown- e.g. '3 rows of 5' / '4 rows of 5'
 - Explain that at this stage we are not asking for the answer, just the array
 - Flash the cards faster
 - Then add in that we want them to read the array and say the answer (product) too- hands up to answer
 - '3 rows of 5 equals 15'
-

Session Six:

Learning Intention: To use arrays help us to work out the number of items

- Print out 'Partial Array' activities: [3 x 5](#) [2 x 4](#) [3 x 3](#)

- Show students the arrays, which are partially hidden
 - Ask them to say how many items altogether, even though they can't see them
 - Ask 'how do you know?' 'how did you work that out?'
-

Session Seven:

Learning Intention: To make arrays

- Play [‘Making Arrays’ game](#)
-

Teacher Talk:

- Like most maths concepts, do not assume students have grasped the ‘rows of’ and ‘arrays’ concepts in just a couple of lessons.
- They may ‘talk the talk’ during these sessions, but when it comes to using the concepts of arrays in a new situation, many students will not make the leap.
- It is essential to reuse these session ideas many times over and continue to relate multiplication to the array model.
- Make sure the students read this (3 x 4) as ‘3 rows of 4’ among other definitions.
- The ‘groups of’ and ‘times’ definitions are so ingrained, it’s a difficult habit to break and get the students thinking in ‘arrays’.
- Arrays provide a model for mastering efficient multiplication strategies up to 10 x 10. It is important to grasp the meaning of ‘arrays’ and ‘rows of’ before getting started on the multiplication strategies.