



## Four 4's Grades 3-4

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### Introduction

This is one of my favorite inquiry tasks that helps to set norms on the first day of the year. The timing for the lesson is given after my description of the tasks.

### Video

Choose a mindset video with important brain and mindset evidence that will encourage students in maths. It will be good if you have time to discuss the video, after the video or at the end of the lesson. Or you could ask the students to reflect on the ideas in writing later.

### Agenda

Activity	Time	Description/Prompt	Materials
Mindset Video	4 min	Play mindset video.	Mindset video
Four 4's	20 min	Find the numbers 1 - 20 using only four 4's and any operation. Students work in groups and come up to the board to share solutions whenever they find them.	Paper, pencil/pen
Debrief Mindset Message	5 min	Debrief the mindset messages for this activity.	

### Activity

I chose four 4's as a first day activity as it is exciting and engaging for students and it also provides a gentle way to encourage reluctant students to come to the board to share their thinking. I always start the activity by putting the numbers 1 to 20 on the board with plenty of space in between them:

Write the numbers 1 - 20 on the board so students can share their solutions.

1.	6.	11.	16.
2.	7.	12.	17.
3.	8.	13.	18.
4.	9.	14.	19.
5.	10.	15.	20.

Ask students to include as many examples as they can think of for each solution.



I then tell students we are going to try and find every number from 1 to 20 using only four 4's – all four of them have to be used each time – and any operation.

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I ask them to think of operations and together we make a list. Usually they come up with:

$$+ \quad - \quad \times \quad \div$$

In grades 5 and above I suggest reminding students of the square root symbol which they can use, giving them;  $\sqrt{4}$  or the number 2.

If this is not appropriate for your students then I would not introduce it and just ask students to try and get as many numbers as they can using the operations they know. In our trials the 3rd graders loved this task. They worked in groups to come up with as many numbers as they could. The teacher, Nick, reported that it was really helpful to have the students use  $4 / 4$  as they used this in their inquiry work, allowing them to develop a deeper understanding of its meaning.

You could give students an example of a solution to one of the numbers eg

$$\frac{4}{4} + 4 - 4$$

I tell students to put on the board as many solutions they can think of for each number, and to come and put their solution up on the board whenever they think of one.

If a student puts up an incorrect solution do not correct it, wait as students will often see it for themselves, as more solutions are shared.

Another strategy that you may or may not want to teach 3rd and 4th graders is the factorial operation. When I have the gave the four 4's task to 6th graders I did not show this initially. Instead I waited for them to become stuck on some numbers (11, 13, 19) that they could not find and used that as a teachable moment to introduce factorial.

Factorial is something that younger children can understand so it may be appropriate to introduce it to your students after they have found some of the solutions.

**Factorial**

$2! = 2 \times 1 = 2$

$3! = 3 \times 2 \times 1 = 6$

$4! = 4 \times 3 \times 2 \times 1 = 24$



This activity has many extensions. If students have found the 20 numbers and you have more lesson time, ask them if they can think of other questions to try. Or pose other questions, such as, extending beyond 20, extending into negative numbers, or five 5's.

### Extensions

- Can you continue using Four 4's to find numbers greater than 20?
- Make a number challenge of your own that is similar to Four 4's
- Can you use Four 4's to make negative numbers?
- How many numbers can you make with Five 5's?