

Sustaining Work Group

Whole class teaching and differentiation



NCETM

NATIONAL CENTRE FOR EXCELLENCE
IN THE TEACHING OF MATHEMATICS

Overview

In-class differentiation, through providing differentiated teaching, activities or resources, has generally not been shown to have much impact on pupils' attainment.

(Ofsted 2019)

Good teaching for mastery is now removing the need for differentiation in primary school maths teaching.

(NCETM 2021)

Differentiation has not worked



“So let me get this straight: we’re behind the rest of our class and we’re going to catch up to them by going slower than they are?”

- Bart Simpson on differentiation.

Accessible to all

Let the primary thought not be ‘What can I do for my lower, middle and higher attainers?’ but ‘How can I teach this concept in such a way that all children will get it?’

(NCETM 2022)

If children find the maths easy, is that a problem?

Whether it's easy or not is irrelevant. Where teaching for mastery is working well, children often do find it easy but that's not to say it's boring, or they aren't learning anything – they find it easy because they understand it and have made connections, and that's good for their self-esteem. I think we've got a bit of a culture in this country that unless children find it 'hard', they are not learning. We need to move away from that. Effective learning is enjoyable!

(NCETM 2022)

Using the NCETM curriculum prioritisation materials

‘The children said ‘maths is easy’

The tiny steps that it took you through allowed you to break everything down to such a degree that all children had a really deep understanding of each tiny concept as it built into a wider model.

Where is challenge in the curriculum?

the provider has the same academic, technical or vocational ambitions for almost all learners. Where this is not practical – for example, for some learners with high levels of SEND – its curriculum is designed to be ambitious and to meet their needs (Ofsted 2019)

Greater Depth

What we should mean by 'greater depth' is that they've got a really secure understanding of the structures of the mathematics within that concept, so fluency and problem-solving capability are developing alongside. The teacher should be aiming for this with ALL children – some children shouldn't be given second best and not access that. There's nothing else that any child needs than to get to the fundamentals of the concept, be able to connect and become fluent with it.

(NCETM 2022)

Individual Needs

Some might argue that we should be responding to children's needs - which we absolutely should. So if we identify that a child isn't getting it in class, we respond to that. We might put in a small in-class intervention – but that approach is for all children. If you've spotted a child who isn't getting it, there's probably a few others too, so we'll ALL talk about it and ALL think about it together. We're not just railroading through with a script – we are very definitely looking for children not getting it and responding to that.

Year 3 Clip 2

<https://vimeo.com/ncetm/review/745406811/17fc4a2581>

What numbers would come between multiples of 10?

Where would you place 75? (2:37)



Adaptive teaching

teachers present subject matter clearly, promoting appropriate discussion about the subject matter they are teaching. They check learners' understanding systematically, identify misconceptions accurately and provide clear, direct feedback. In doing so, they respond and adapt their teaching as necessary, without unnecessarily elaborate or differentiated approaches

(Ofsted 2019)

A refocusing

- Away from a focus on isolated task design to what do we want children to learn, consideration of how will we get them there?
- A focus on the whole class, rather than individuals

According to the 2015 PISA results, “adaptive instruction” is one of the approaches most positively correlated with student performance.

Adaptive teaching promotes high attainment for all.

Without creating unnecessary workload, teachers can develop an understanding of different pupil needs, and provide opportunities for all pupils to experience success.

Can be a very useful strategy for the creation of a fully inclusive classroom.

Part of a learning community

Children being questioned and challenged on their initial understanding - that's good for everyone. You might get some better responses from some children, but everyone is hearing those responses, and the likelihood is that they aren't always from the same children. It's important for all children to feel part of that learning community, without being labelled.... If the teacher has high expectations of all learners and provides maths teaching that is accessible, the pupils' self-esteem will grow and that will contribute to their learning as well.

(NCETM 2022)

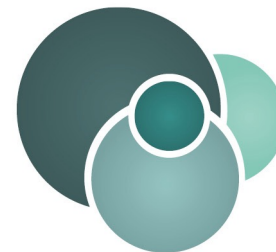
Raising the tide for all

*Constructing and curating the curriculum and the enactment of it is a long term bet that requires a long term investment – **it is precisely the coherence and sequence built progressively over time that lifts and raises the tide for all and particularly disadvantaged learners.***



Practice makes perfect?

Intelligent Practice



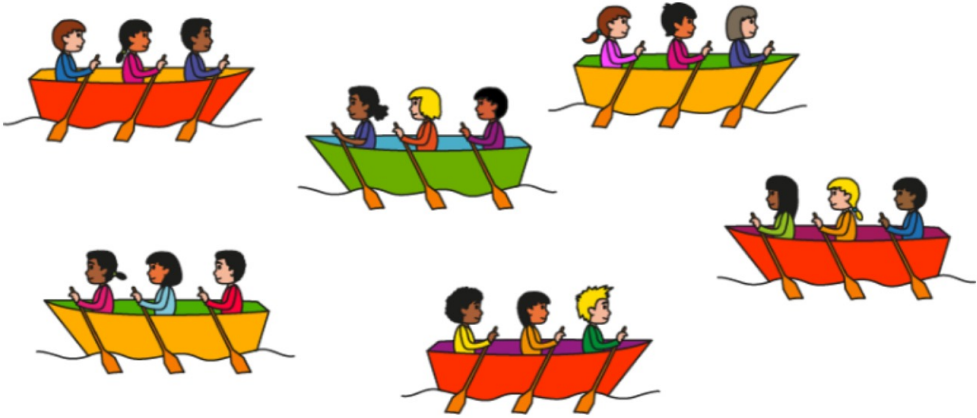
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What is the purpose of practice?

Choosing a description to match a representation:

- 'Underline the sentence that correctly describes the picture.'



- There are 3 equal groups.
- There are 6 equal groups.

Drawing equal groups to match an existing description:

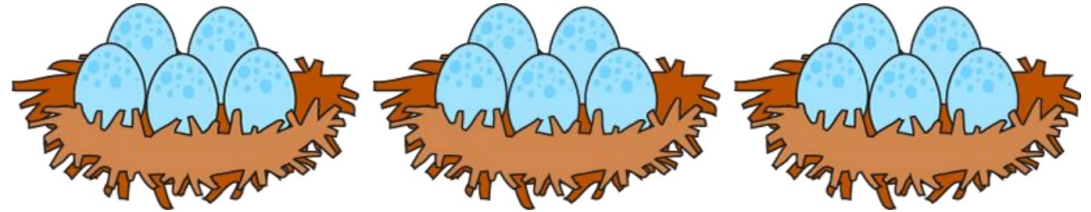
'James started to draw some equal groups. Complete his drawing.'

I have 4 groups of 3.



Completing written sentences to describe a representation:

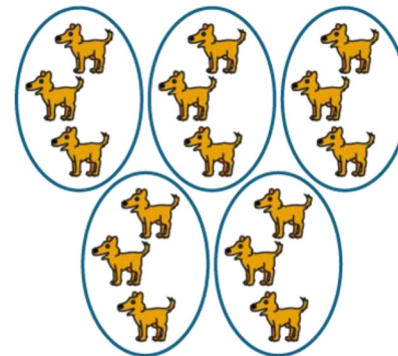
'Complete the sentences.'



- There are ___ equal groups of eggs.
- There are ___ eggs in each group.
- There are ___ groups of ___.

'Tick the representation that matches the description.'

There are 3 groups of 5.



A



B

Fluency, reasoning and problem solving

24.03.2023

LO: Add mixed numbers where the whole is bridged.

Fluency

I	GW	S	R
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Reasoning

Problem solving

Fluency - Solve these.

a.

$$5\frac{1}{3} + \frac{2}{3} =$$
$$5\frac{2}{3} + \frac{2}{3} =$$

b.

$$4\frac{1}{4} + \frac{3}{4} =$$
$$4\frac{2}{4} + \frac{3}{4} =$$

c.

$$2\frac{3}{6} + 1\frac{3}{6} =$$
$$2\frac{3}{6} + 1\frac{5}{6} =$$

d.

$$3\frac{5}{7} + 2\frac{5}{7} =$$

e.

$$4\frac{5}{6} + 2\frac{5}{6} =$$

Reasoning - Use your knowledge of the relationship between addition and subtraction to solve these.

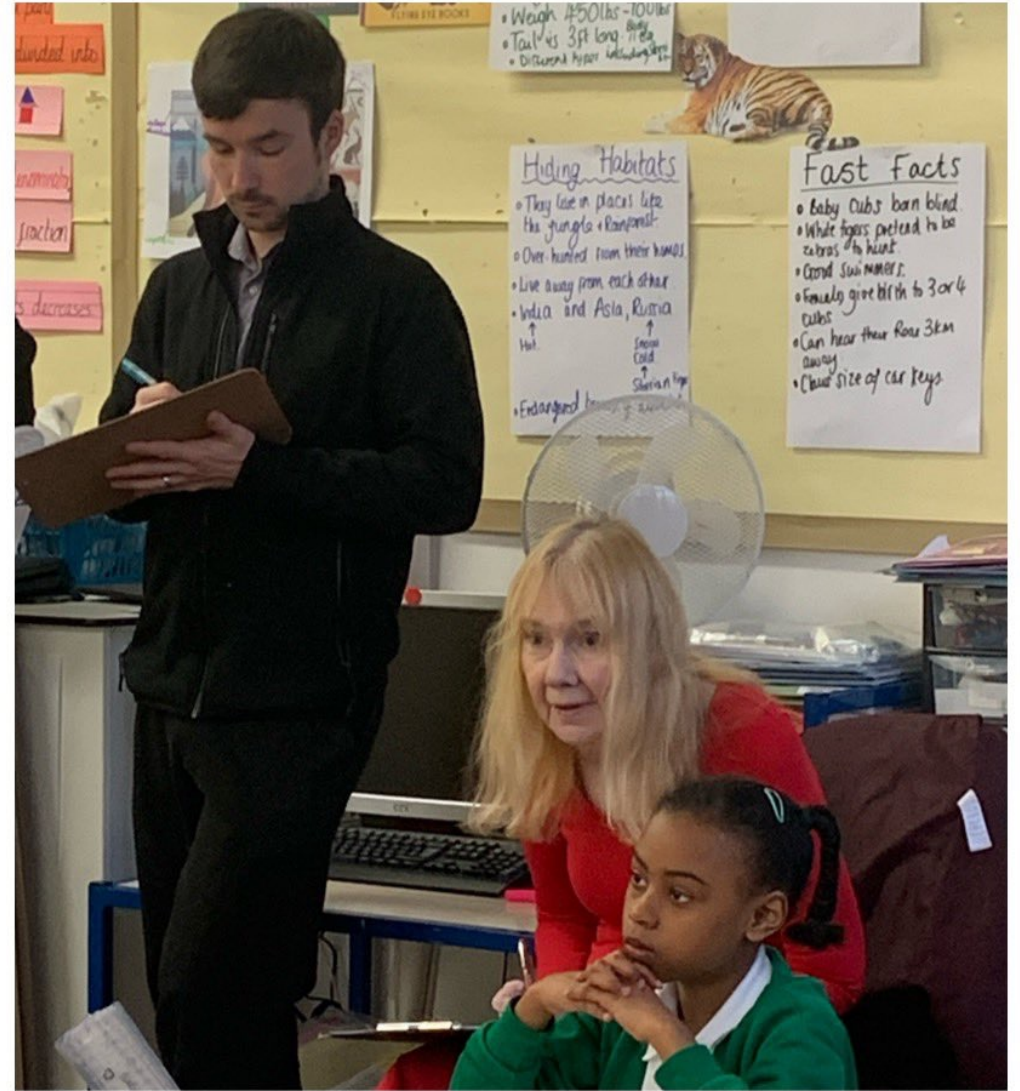
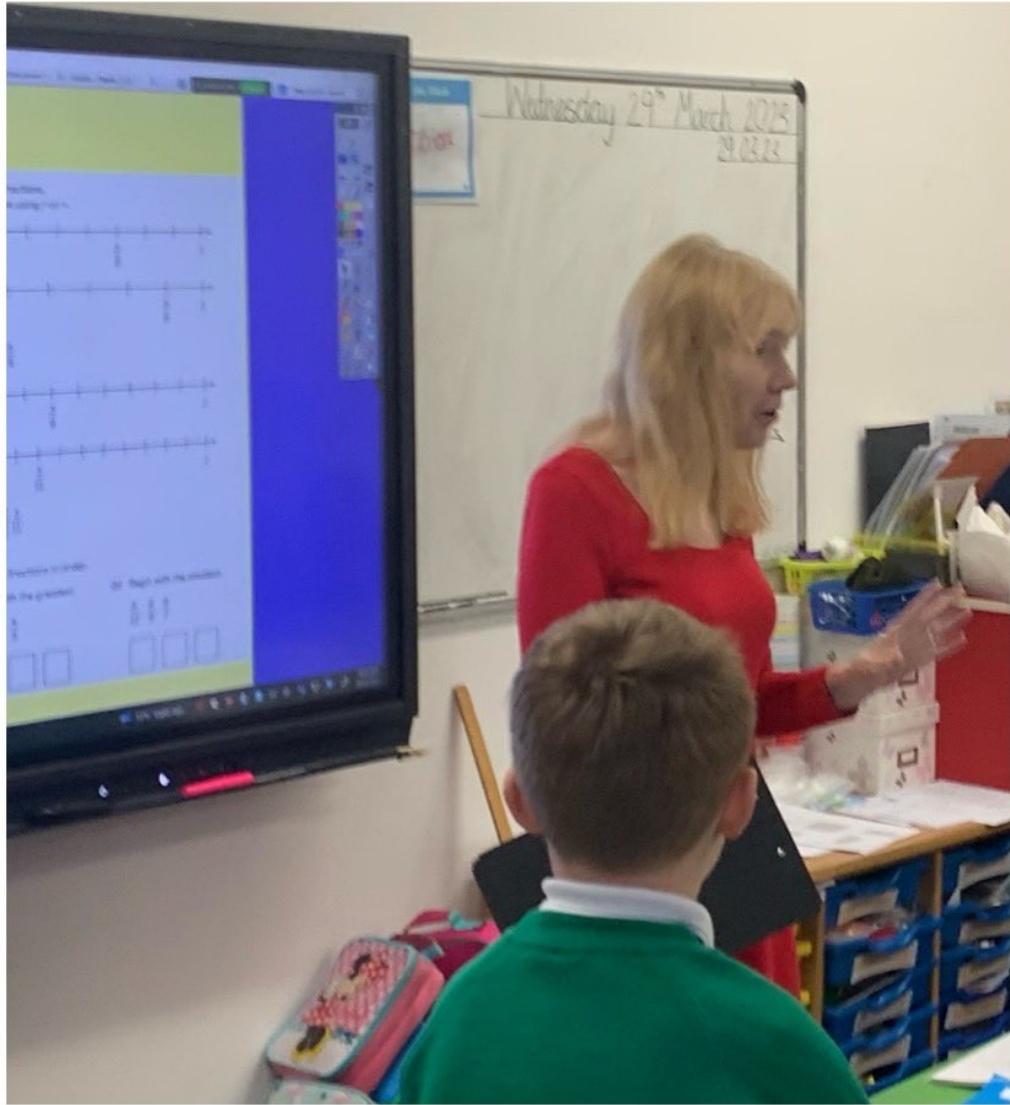
$$2 - \frac{1}{4} = \boxed{}$$

$$5 - \frac{1}{3} = \boxed{}$$

Problem Solving

$\frac{2}{7}$	$\frac{5}{7}$	$1\frac{1}{7}$		2	
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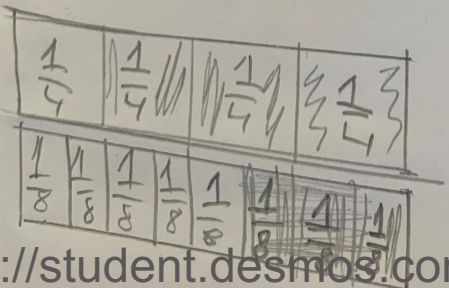
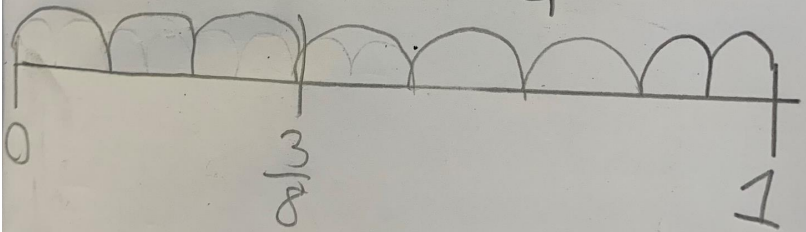
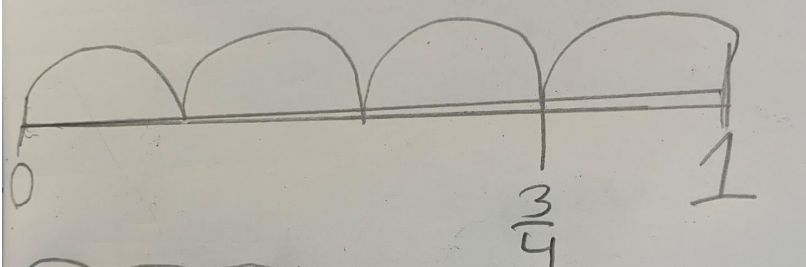
3	$2\frac{3}{5}$	$2\frac{1}{5}$			1
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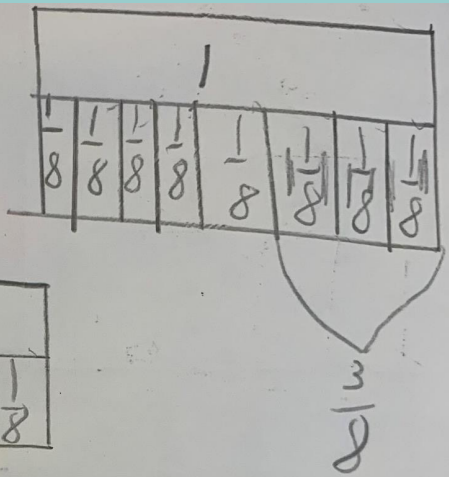
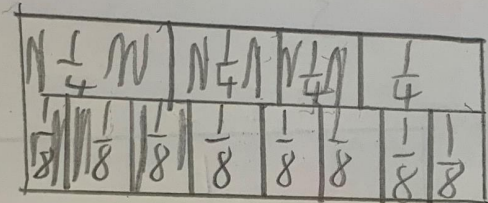
29/3/2023

LO: To compare non unit fractions with the same numerator.

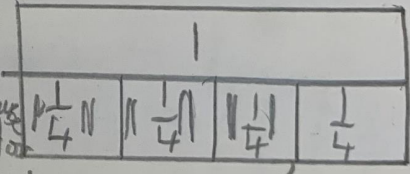


<https://student.desmos.com/join/retb6s>

If Oak drank $\frac{3}{4}$ of his drink and Ravi drank $\frac{3}{8}$ of his drink, who drank more?



Oak drank more because the smaller the denominator the greater the fraction and the greater the denominator the smaller the parts are.



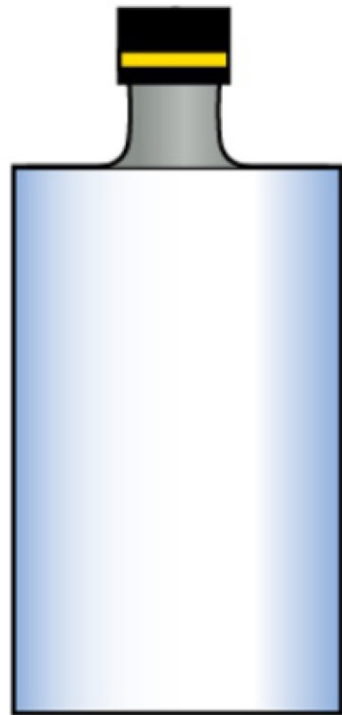
When we compare fractions with the same **numerator**, the greater the **denominator**, the the fraction.

If Oak drinks $\frac{2}{3}$ of her water and Ravi drinks $\frac{2}{4}$ of his, who has drank the most water?

What is the same?



Oak



What is different?



Ravi

Summary

- An accessible starting point
- All children respond and get to the end point
- There will be some children who are exceptional and may need a different curriculum
- Does take practice and time
- Its about access for all and getting all pupils to the same end point