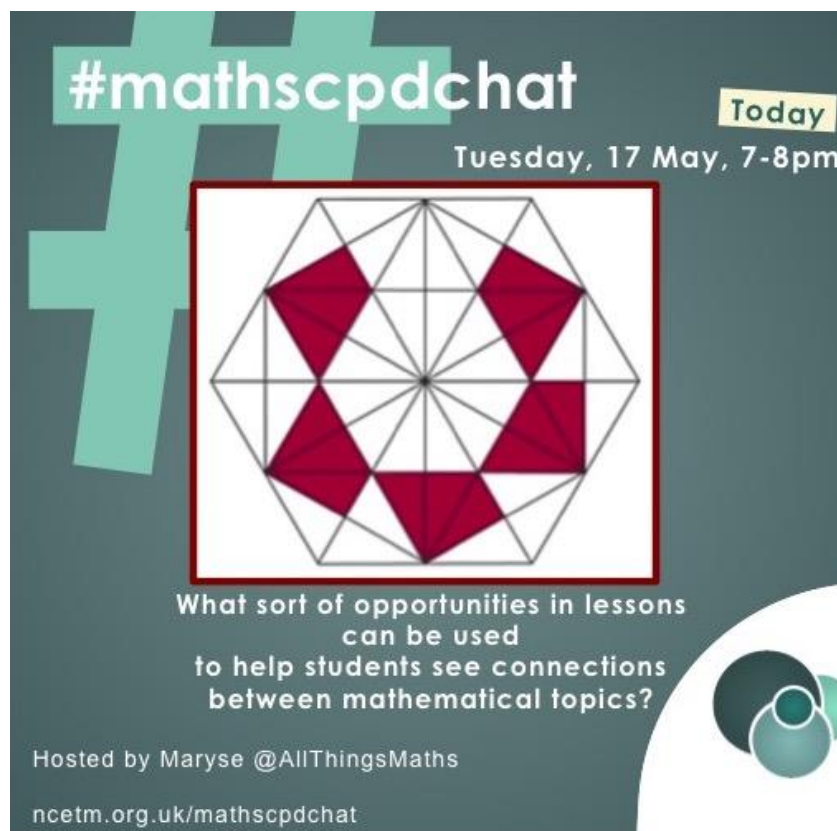


#mathscpdchat 17 May 2022

What sort of opportunities in lessons can be used to help students see connections between mathematical topics?

Hosted by [Maryse Dare](#)

This is a summary of the discussion – to see all the tweets, follow the hashtag #mathscpdchat in Twitter



The graphic features a dark teal background. On the left, a large, light green hashtag symbol is partially visible. The text '#mathscpdchat' is written in white, bold font. To the right, a yellow box contains the word 'Today', and below it, the date and time 'Tuesday, 17 May, 7-8pm' are displayed. In the center, a red-bordered square contains a geometric diagram of a hexagon divided into 18 smaller triangles, with six of these triangles shaded in red. Below the diagram, the discussion topic is repeated in white text. At the bottom left, the host's name and Twitter handle '@AllThingsMaths' are listed, along with the website 'ncetm.org.uk/mathscpdchat'. The NCETM logo is positioned in the bottom right corner.

#mathscpdchat **Today**
Tuesday, 17 May, 7-8pm

What sort of opportunities in lessons
can be used
to help students see connections
between mathematical topics?

Hosted by Maryse @AllThingsMaths
ncetm.org.uk/mathscpdchat

The links shared during this discussion were:

[National Curriculum Resource Tool](#) which are NCETM materials to support teachers and schools in embedding the National Curriculum. This link takes you to the section *KS3 – Ratio and Proportion and Rates of Change*. It includes a sub-section about 'Making connections to other topics within Key Stage 3' (maths). It was shared by [Maryse Dare](#)

[Tour of Mathematical Connections](#) which is a YouCubed video in which Jo Boaler 'shows the connected nature of maths highlighting number sense, geometry, and algebra, under the big idea of ratio and proportion. It was shared by [Maryse Dare](#)

[Maths topics poster](#) which is a free downloadable PDF poster by William Emery from *Great Maths Teaching Ideas*. It was shared by [Maryse Dare](#)

[Interwoven Maths](#) which is a website designed by [Nathan Day](#) containing sets of 'questions and tasks that bring together multiple different topics from mathematics (i.e. interweaving those topics). It was shared by [Maryse Dare](#)

[Underground Mathematics](#) which are resources developed by the University of Cambridge to support teachers of mathematics to post-16 students in the classroom. 'They help students build firm foundations for mathematical understanding by *connecting ideas* and developing techniques.' It was shared by [Susan Whitehouse](#)

[Ratio Tables Across the Curriculum](#) which is a beautifully illustrated detailed recent blogpost by [Kathryn Darwin](#) about using ratio tables as a tool for multiplicative thinking. It was shared by [Nathan Day](#)

[Key Ideas in Teaching Mathematics: Research-Based Guidance for Ages 9-19](#) which is a book by Anne Watson, Keith Jones and Dave Pratt. The authors address the big ideas in the mathematics curriculum for older students, especially those that are hard to learn and hard to teach. They show how students' understanding can grow as their learning builds on their earlier ideas. It was shared by [Mary Pardoe](#)

[Using ATM MATs](#) which is a resource from the Association of Teachers of Mathematics (ATM). It includes 'Activities to try using Triangles' and 'Activities to try using Triangles and Squares' both of which are free-to-download PDF documents. There is also a video providing guidance about making models with MATs. It was shared by [Mary Pardoe](#)

[Working with rods and why](#) which is a free PDF booklet from the Association of Teachers of Mathematics (ATM). It brings together inspirational writings on the theory of reforming mathematics education together with articles by teachers who exemplify the Cuisenaire-Gattegno approach. It was shared by [Mary Pardoe](#)

[Focus on...Dudeney's Greek cross dissection puzzles](#) which is a 'Focus On...' article in the archived Secondary Magazine 61 produced some years ago by the NCETM. It was shared by [Mary Pardoe](#)

A full illustrated summary of the discussions in this #mathsCPDchat follows.

The host's first question ...



Maryse #Antiracist @AllThingsMaths · 14h



First question of the evening...

What connections do you hope/plan for students to see between mathematical topics?

[#mathscpdchat](#)

... prompted many replies. Maryse's comments generated thoughts about A-level teaching ...



Maryse #Antiracist @AllThingsMaths · 14h

...

Replying to @AllThingsMaths

One of my favourite topics to teach is transformation of curves. Linking it to completing the square.

[#mathscpdchat](#)



Maryse #Antiracist @AllThingsMaths · 14h

...

One way I approach it is to give expressions in completing the square that I return to later when we do transformations... and it all ties up!

[#mathscpdchat](#)



Susan Whitehouse @Whitehughes · 14h

...

Replying to @AllThingsMaths

Transformations of curves links to so many things. I like to look at equations of straight lines using transformations [#mathscpdchat](#)



Maryse #Antiracist @AllThingsMaths · 14h

...

Yes!!! Love it! I've hinted at it but I tend to use tables of values to show the transformation alongside parallel lines moving. I've consciously tried to mirror language with sequences this term too.

[#mathscpdchat](#)



Susan Whitehouse @Whitehughes · 14h

...

Replying to @AllThingsMaths

I find the @UndergroundMath pervasive ideas very useful at A-level. I think about these six things for every topic I teach and see what links I can make

[#mathscpdchat](#)



Maryse #Antiracist @AllThingsMaths · 14h

...

Replying to @Whitehughes and @UndergroundMath

I need to go back and look at these! It's been a while since I've had A level but I remember loving the resources here.

[#mathscpdchat](#)



Susan Whitehouse @Whitehughes · 14h

Yes, I sometimes need to be reminded to highlight connections when teaching A-level so it's really helpful to me to have something that I can do as a matter of routine in my planning [#mathscpdchat](#)



Maryse #Antiracist @AllThingsMaths · 14h

It was A level teaching (I had C1 & C2 in my first year of teaching) that really opened my eyes to how the topics synthesised. I then explored in earlier years and back tracked the topics right through to EY. It was fascinating. [#mathscpdchat](#)

... and there was also a different kind of reply to Susan's tweet about *Underground Maths*:



Mary Pardoe @PardoeMary · 14h

And it's amazing what links between ideas working with Cuisenaire rods can reveal/lead-to!

This is a part of one of Gattegno's own diagrams, reproduced in ATM's (free) 'Working with rods and why', which is here: atm.org.uk/Working-with-R...

[#mathscpdchat](#)



A reply from Nathan Day to the host's first question generated much discussion ...



Nathan Day @nathanday314 · 14h

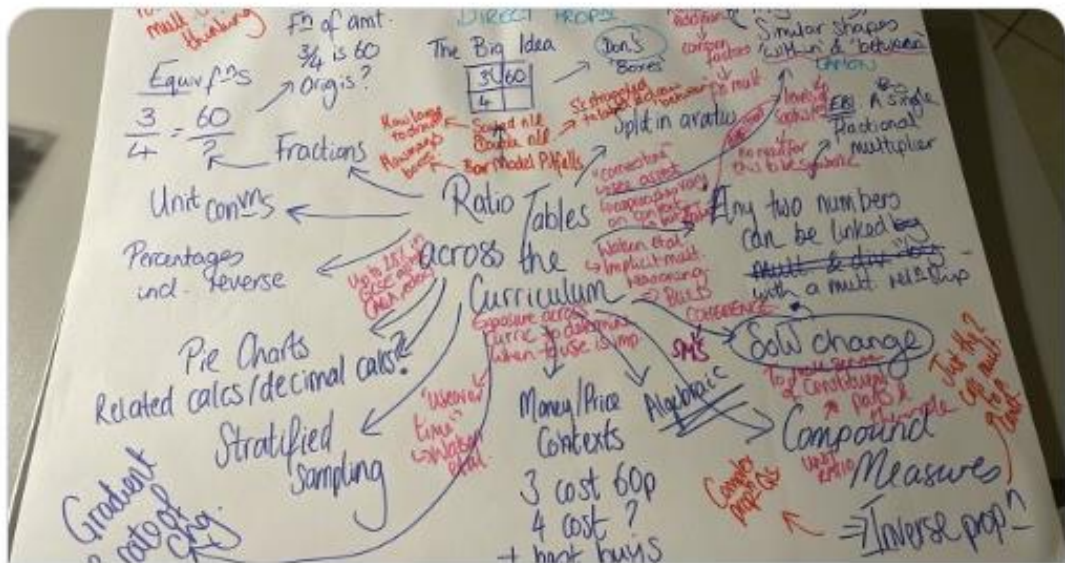
Replying to @AllThingsMaths

The multiplicative and proportional relationships underpinning *everything*!

Ratio, proportion, %ages, fractions, gradients, compound measures, similarity, unit conversions, value for money, trigonometry, wages,...

arithmaticks.wordpress.com/2022/03/13/rat... (@Arithmaticks)

#mathscpdchat



arithmaticks.wordpress.com

Ratio Tables Across the Curriculum

Yesterday, at MathsConf28 in Gloucester, I shared my obsession with Ratio Tables as a tool for multiplicative thinking. It followed on from m...



Maryse #Antiracist @AllThingsMaths · 15h

Replying to @nathanday314 and @Arithmaticks

This is fantastic! Do you actively plan to include this within your lessons?

#mathscpdchat



Nathan Day @nathanday314 · 15h

Every opportunity I get.

Nary a lesson goes by without us drawing a ratio table or two!

What I want to do more is use questions simultaneously from those different topics that explicitly call to attention their common underlying structures.



Maryse #Antiracist @AllThingsMaths · 15h

Drawing attention to core concepts and approaches?

[#mathscpdchat](#)

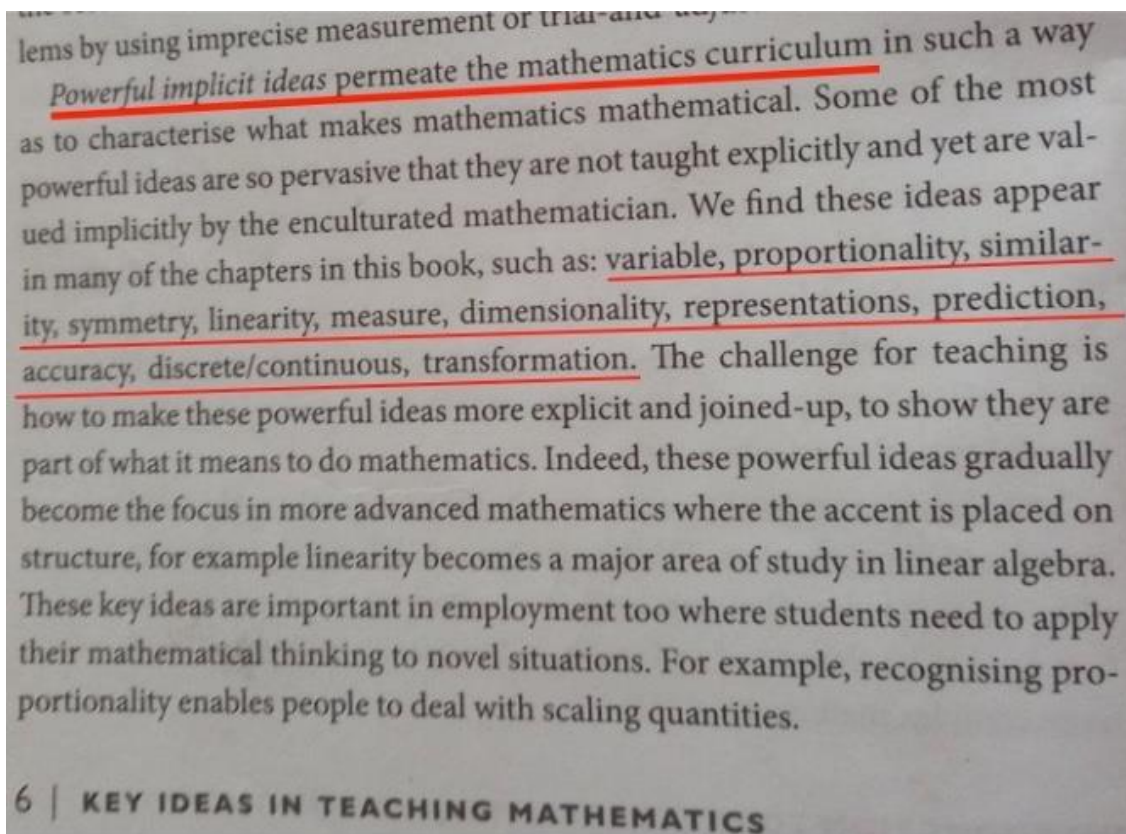


Mary Pardoe @PardoeMary · 15h

...and to ideas that permeate all mathematics?

E.g ... from 'Key Ideas in Teaching Mathematics', here: amazon.co.uk/Key-Ideas-Teac...

[#mathscpdchat](#)



Kathryn MCCT 🙋 @Arithmatics · 14h

I love love love this book



Mary Pardoe @PardoeMary · 14h

Yes ... it is SO very, very helpful and useful! Also great for suggesting research ideas for teachers' own classroom research!

[#mathscpdchat](#)

... for example, Maryse's question above set off some instant creativity that prompted yet more comments:



Maryse #Antiracist @AllThingsMaths · 15h

Drawing attention to core concepts and approaches?

[#mathscpdchat](#)

...



Nathan Day @nathanday314 · 15h

Replying to @AllThingsMaths and @Arithmaticks

Something like this, perhaps, but not written in 20 minutes on a Tuesday evening!

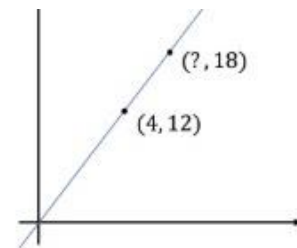
'Find two ways of answering each question!'

([#mathscpdchat](#) !)

$$\frac{4}{12} = \frac{?}{18}$$

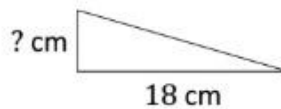
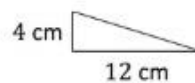
Maryse walks 12 miles in 4 hours.

How long does it take her to walk 18 miles?



Kathryn earns £12 for every 4 trees she plants.

How much does she earn for planting 18 trees?



4 yards is equal to 12 feet.

How many yards are there in 18 feet?



Nathan Day @nathanday314 · 15h

Replying to @nathanday314 @AllThingsMaths and @Arithmaticks

With a bonus (unintended) 'Which is the odd one out?'

...



Mr Graham @MrGraham_Maths · 15h

Replying to @nathanday314 @AllThingsMaths and @Arithmaticks

love this ... currently doing proportion with Y9, which has followed on from similar shapes. Trying my best to get them to see links so this will be perfect. Thank you!

...



Maryse #Antiracist @AllThingsMaths · 15h ...

Replying to @nathanday314 and @Arithmaticks

I LOVE this! Explores the key concept in so many ways! I taught gradient by linking to expressing a ratio in the form 1:n for the first time this year. Students seem to be retaining the concept better.

These questions though... love em!

[#mathscpdchat](#)



Maryse #Antiracist @AllThingsMaths · 15h ...

Other things I like about these questions... they are practice, increase retention and fluency. They cover a wide range of topics. They allow students to understand topics in different ways by exploring the links.

[#mathscpdchat](#)



Maryse #Antiracist @AllThingsMaths · 15h ...

I'm wondering if this assists problem solving insomuch as students are more open to a question being a mix of topics.

[#mathscpdchat](#)



Nathan Day @nathanday314 · 15h ...

Yes! I love both ends of the SSDD (same surface, different depth) and SDDS (same depth, different surface) stick for that purpose.



Maryse #Antiracist @AllThingsMaths · 15h ...

Maybe open a drop box and we can all contribute a couple?

[#mathscpdchat](#)



Kathryn MCCT 🙋 @Arithmaticks · 15h ...

Replying to @nathanday314 and @AllThingsMaths

Always like it when my name makes it into a question 😂 [#mathscpdchat](#)

There was another very positive reply to Nathan's initial reply to Maryse's main question ...



Nathan Day @nathanday314 · 14h

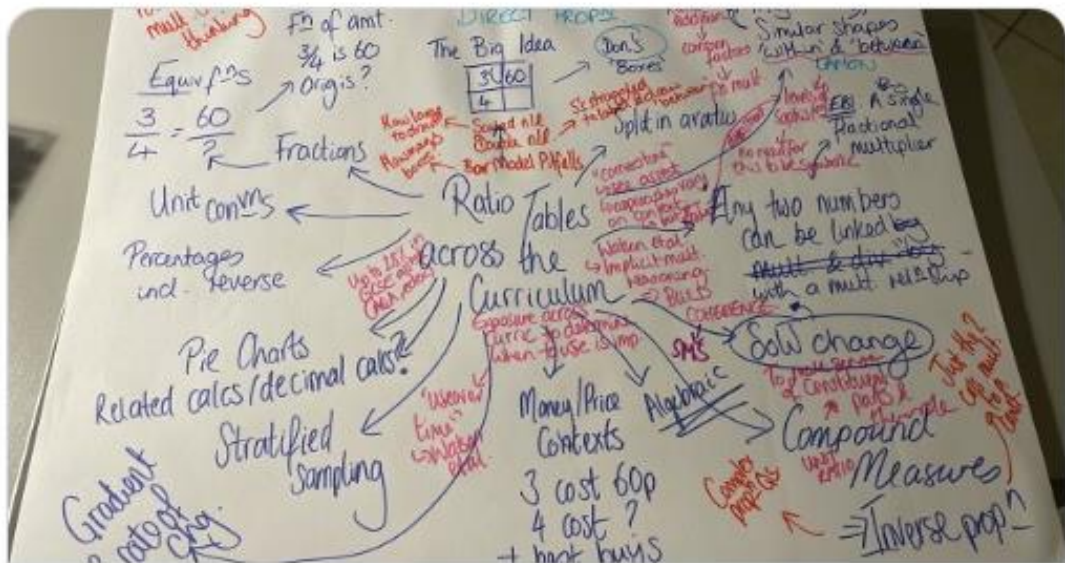
Replying to @AllThingsMaths

The multiplicative and proportional relationships underpinning *everything*!

Ratio, proportion, %ages, fractions, gradients, compound measures, similarity, unit conversions, value for money, trigonometry, wages,...

arithmaticks.wordpress.com/2022/03/13/rat... (@Arithmaticks)

#mathscpdchat



arithmaticks.wordpress.com

Ratio Tables Across the Curriculum

Yesterday, at MathsConf28 in Gloucester, I shared my obsession with Ratio Tables as a tool for multiplicative thinking. It followed on from m...



Mr J Habimana @Mr_JHabimana · 13h

Replying to @nathanday314 @Arithmaticks and @AllThingsMaths

I have been thinking about this this whole week and weekend. As a non mathematician who is infiltrating this has changed my thinking. Wish I had attended this one at the conference.

... and also this comment in response to it:



Mary Pardoe @PardoeMary · 15h

Replying to @nathanday314 @AllThingsMaths and @Arithmaticks

Yes! Even when making, looking-at, and thinking about, say, ATM MATs!

atm.org.uk/Using-ATM-MATs

#mathscpdchat

E.g. ...

If you have made a larger Tetrahedron, look at its edge lengths, and its faces. What ratios are to be found here? What ratio will there be between the volumes?

Use this knowledge to work out the ratio of the volume between a Regular Tetrahedron and a regular octahedron made from the same sized Equilateral Triangles. Knowing that the Regular Octahedron is a Square-based pyramid doubled, what can you find out about the ratio of volumes between the Square-based pyramid and Regular Tetrahedron?

Information: Regular Tetrahedra and Octahedra fit together into a Honeycomb that fills all of the space – like a 3D Tessellation.

Knowing that, imagine you have a supply of (T) Regular Tetrahedra, (O) Regular Octahedra, and (S) Square Pyramids that are half a Octahedron. How many of each polyhedron will be needed to make larger versions of these?



The first main question from the host also prompted a conversation in which the sharing of ideas and approaches was mentioned ...



Catherine Edwards @Edwards08C · 15h

...

Replying to @AllThingsMaths

I've been really starting to embed place value and start making the links to standard form, index laws and metric units right from the beginning
[#mathscpdchat](#)



Maryse #Antiracist @AllThingsMaths · 15h

...

Place value is so important. I am noticing it more this year with Y7, maybe because of the disruptions before. I often still use the columns to show value with SF etc. Do you plan for this across the dept?
[#mathscpdchat](#)



Catherine Edwards @Edwards08C · 15h

...

Just me at the moment... although if they use my resources it's all on there
[#mathscpdchat](#)



Maryse #Antiracist @AllThingsMaths · 15h

...

It all starts somewhere I sometimes find it helps to share things I've already done with others. Shows the benefits and folks can learn from what I've done already!
[#mathscpdchat](#)

... and these comments and images:



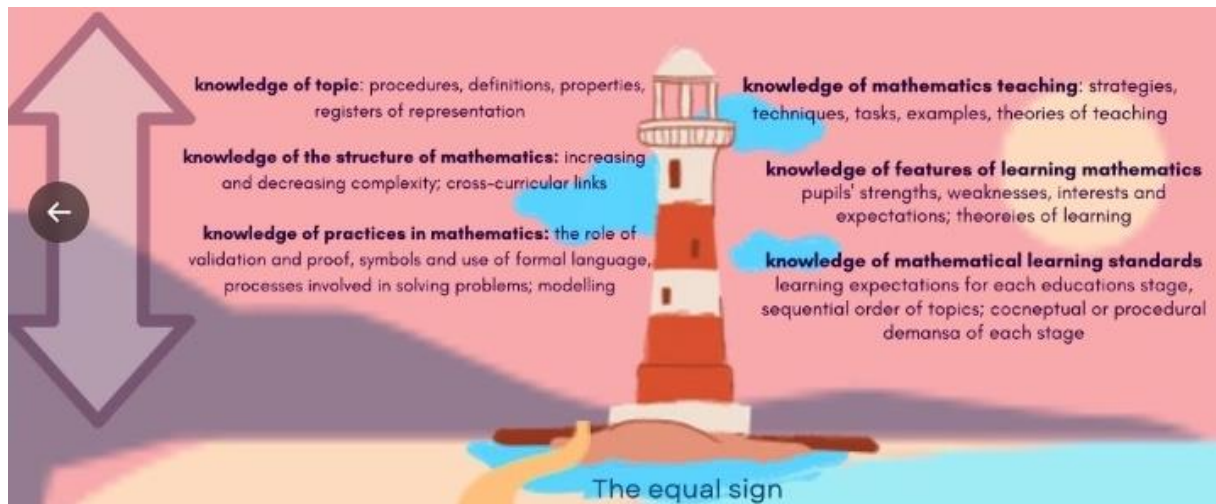
Lucy 🇧🇷 🟦 @honeypisquared · 15h

Replying to @AllThingsMaths

We talked about this topic recently at a @BSRLM_maths conference! It is so interesting to think about ways to visualise/represent connections in mathematics learning. Here are a few sketches that may be of interest...

#mathscpdchat





The host's first question also prompted interesting comments from a teacher who, unusually, has recently moved from primary school teaching to teaching maths in a secondary school:



Rob Shaw @TheEvolvingTchr · 15h

Having just taught Pythagoras, it was nice to see their understanding of what a square number is to help in understanding why the formula works.

Also just stated ratio with Y7 and fraction work has aided with this (finding equivalent fractions and simplifying).

[#mathscpdchat](#)



Rob Shaw @TheEvolvingTchr · 15h

Replying to @TheEvolvingTchr and @AllThingsMaths

I think John Dewy sums it up nicely... that we are to look at learning through the eyes of the children. Be that evaluator of impact.

I mean it's great for me, as I am 3 weeks into teaching secondary (from primary) and there is a lot of learning I have been doing [#mathscpdchat](#)



Maryse #Antiracist @AllThingsMaths · 15h

What have you brought from primary to secondary? I've always been slightly envious of the opportunities to applying skills in different subjects in primary.

[#mathscpdchat](#)



Rob Shaw @TheEvolvingTchr · 14h

Good question. At this stage I'm not sure how to answer that one 😊

What I will say, is that I think I know the primary maths curriculum well, so it has been eye opening to see the drop off for those Y7s and even Y8s from where they might have been at the end of Y6.



Maryse #Antiracist @AllThingsMaths · 14h

I've become increasingly aware of the work done in primary in maths and that drop off has always been a bugbear.

[#mathscpdchat](#)



Maryse #Antiracist @AllThingsMaths · 15h

Replying to @TheEvolvingTchr

I've been exploring ratio, simplifying fractions and enlargement recently. The skills and concepts are very transferable.

How do you make sure the students don't "get mixed up" between topics?

[#mathscpdchat](#)



Rob Shaw @TheEvolvingTchr · 15h

Ensuring chn work with the topic on more than one occasion. They see follow up Q's as part of our 5 a day (to start the lesson), days and weeks later. We also have a quiz every 4 weeks or so to understand what learning has been retained. A green pen lesson follows this.



Maryse #Antiracist @AllThingsMaths · 15h

So this is aiding retention and fluency also! Is this all planned into your SoW centrally?

[#mathscpdchat](#)



Rob Shaw @TheEvolvingTchr · 15h

Each Cycle 12 weeks. Mid-cycle quiz week 3 and 7 and end of cycle quiz week 11/12. Six or so Qs... mix of easy and hard.

All 5 a day and drills are part of each lesson and this gives us a chance to recap content and enable chn to feel successful [#fluency](#)

[#mathscpdchat](#)



Rob Shaw @TheEvolvingTchr · 17h

...

Replying to @TheEvolvingTchr and @AllThingsMaths

But yes, most lessons are centrally planned and we adapt for our classes and insert 5 a day and drills mostly.

Example: Y7 add/subtract fractions. The drills were to convert fractions to improper fractions. I had to spend a bit of time on this... [#misconceptions](#)
[#mathscpdchat](#)



Maryse #Antiracist @AllThingsMaths · 15h

...

So the structure is there in the SoW. Do you have any go to activities or resources that you use?

[#mathscpdchat](#)



Rob Shaw @TheEvolvingTchr · 15h

...

Yes, structure is there and we use sparx for Y7-8 in lessons.

There were no replies to the host's second question ...



Maryse #Antiracist @AllThingsMaths · 15h

...

Do you include topics that aren't on the curriculum to explore and apply concepts or skills?

[#mathscpdchat](#)

... or to her third question ...



Maryse #Antiracist @AllThingsMaths · 17h

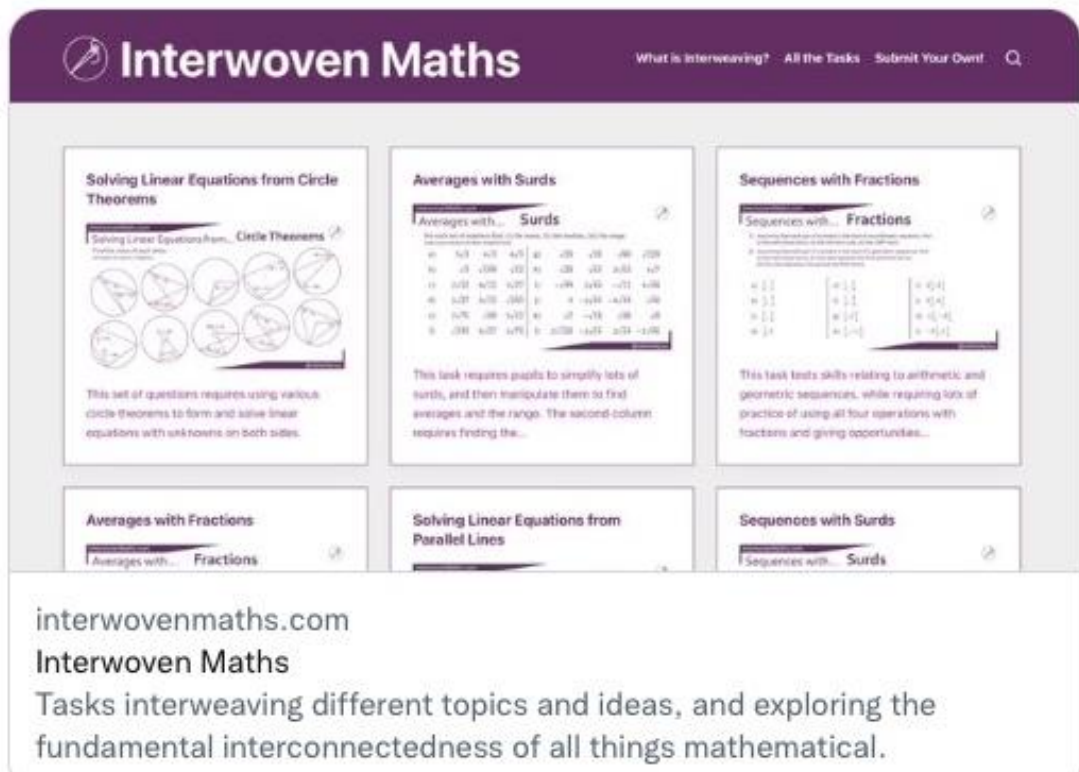
...

Do you have any "go to" resources for making connections? I've had a look at these questions, which apply skills in different topics but give an opportunity to embed and practise.

interwovenmaths.com

[#mathscpdchat](#)

Thank you [@nathanday314](#)



The screenshot shows the 'Interwoven Maths' website interface. At the top, there's a navigation bar with the site name and a search icon. Below, there are several task cards arranged in a grid. Each card has a title, a small image or diagram, and a brief description of the task. The tasks include: 'Solving Linear Equations from Circle Theorems', 'Averages with Surds', 'Sequences with Fractions', 'Averages with Fractions', 'Solving Linear Equations from Parallel Lines', and 'Sequences with Surds'. Below the grid, there's a text box with the website's name and a description: 'Tasks interweaving different topics and ideas, and exploring the fundamental interconnectedness of all things mathematical.'

... there was one reply to her fourth main tweet ...



Maryse #Antiracist @AllThingsMaths · 17h

...

There are some great ideas for links between topics on the @NCETM website. Here's one example: ncetm.org.uk/in-the-classr..

[#mathscpdchat](#)



The screenshot shows a tweet reply. On the left, there's a document icon. To the right, the text reads: 'ncetm.org.uk National Curriculum Resource Tool National Curriculum Resource Tool'.



Oonagh Kelleher DDSL #Antiracist MCCT  @OonaghKelle... · 16h ...

Replying to @AllThingsMaths and @NCETM

I love teaching maths- one of my happy places. Thanks for sharing  

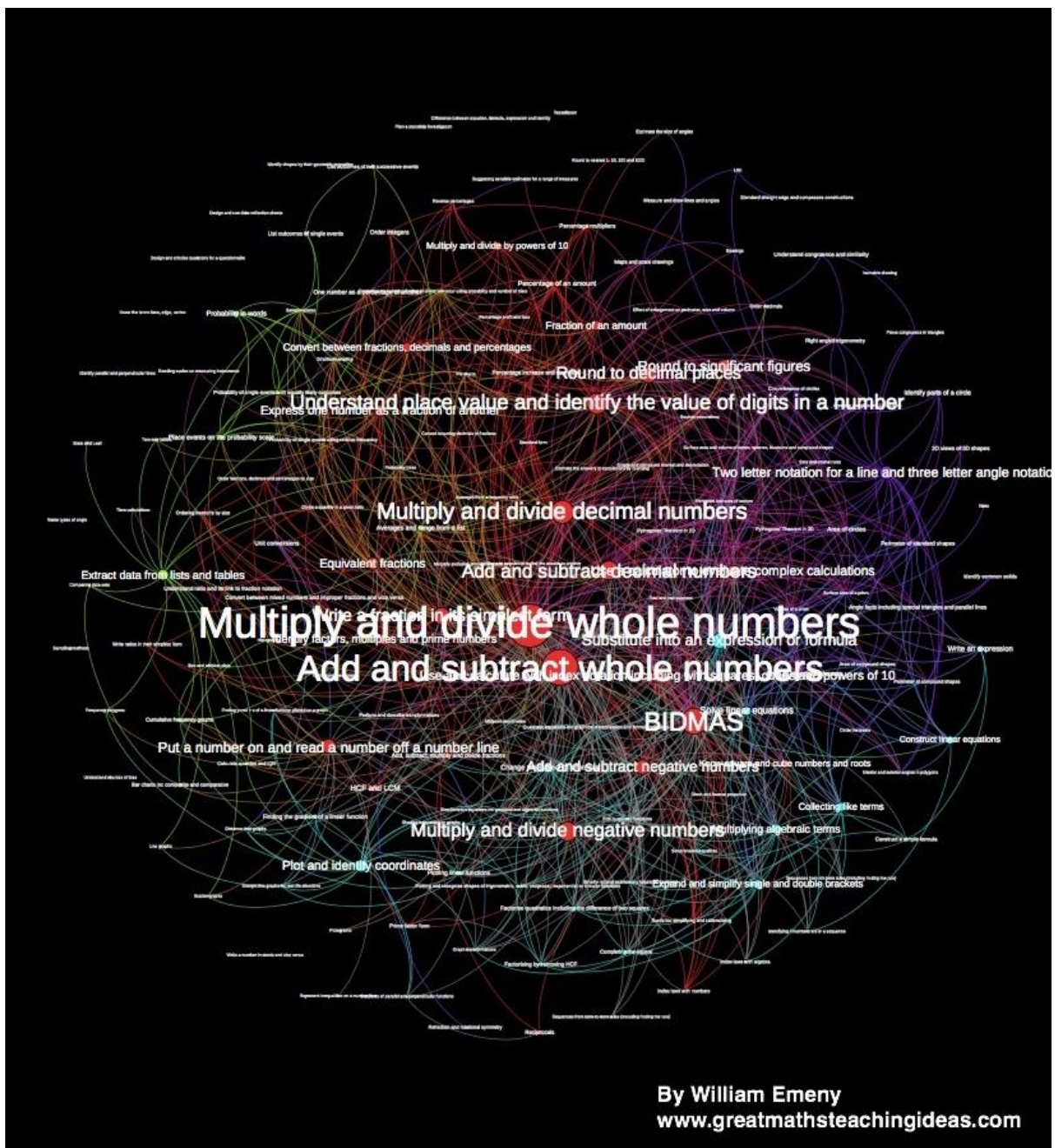
... but there were no replies to this fifth general comment from the host:



Maryse #Antiracist @AllThingsMaths · 17h ...

[greatmathsteachingideas.com/wp-content/upto/](https://www.greatmathsteachingideas.com/wp-content/upto/)

This was one resource I used with the department when starting this conversation. We couldn't stay doing one skill forever so how could we use links to be more efficient with time.



By William Emery
www.greatmathsteachingideas.com

The (linked-to-Twitter) screenshots below show replies and conversations generated by the host's fourth question. Click on any screenshot-of-a-tweet to go to that actual tweet on Twitter. That is, the following conversations and replies were in response to this question from the host [Maryse Dare](#) ...



Maryse #Antiracist @AllThingsMaths · 17h

How (I'm assuming it does!) does making connections between topics strengthen student understanding? What other benefits are there?
[#mathscpdchat](#)

... to which she replied with this tweet:



Maryse #Antiracist @AllThingsMaths · 17h

Replying to [@AllThingsMaths](#)

I have spent a lot more time in recent years exploring division and linking it to fractions. We cancel down to solve. This in turn links to ratio and proportion and we use diagrams to support understanding. [#mathscpdchat](#)

This short conversation was between [Marc](#), [Susan Whitehouse](#) and [Maryse Dare](#):



Marc @marcmaths · 17h

...

Replying to @AllThingsMaths and @PardoeMary

I think building the connections *is* the strengthening of understanding. The more ways a students can see a concept the better their understanding of that concept is



Susan Whitehouse @Whitehughes · 17h

...

Replying to @marcmaths @AllThingsMaths and @PardoeMary

I like that a lot; seeing it as the end in itself rather than something that facilitates something else #mathscpdchat



Maryse #Antiracist @AllThingsMaths · 17h

...

Replying to @marcmaths and @PardoeMary

Agreed. I often think about my students' relationship with maths and how we prod and tweak, nudge and explore. Each time we explore in a different way we're deepening and strengthening our relationship with maths #mathscpdchat

A longer conversation was initiated by [Susan Whitehouse](#), and also included comments from [Maryse Dare](#) and [Tazreen Kassim-Lowe](#):



Susan Whitehouse @Whitehughes · 17h

...

Replying to @AllThingsMaths

I think that it stops students from seeing the methods we teach as recipes to solve specific questions on specific topics, and leads them towards thinking of them more as a toolkit that they can apply wherever appropriate #mathscpdchat



Maryse #Antiracist @AllThingsMaths · 17h

...

Replying to @Whitehughes

Definitely. If we try to teach every outcome discretely then very few would get through the course! #mathscpdchat



Susan Whitehouse @Whitehughes · 17h

...

So, in that way, I think it's essential if we're to develop students' problem-solving skills. But I also think it's very empowering and builds students' confidence - every time that an idea clicks into place with another one, Maths makes a bit more sense to them #mathscpdchat




Tazreen Tershanah @tershanah · 17h

...


#mathscpdchat Agreed. I also think reasoning has a huge role to play in noticing patterns across topics.

 **Susan Whitehouse** @Whitehughes · 17h ...
Yes, a virtuous circle with the two things reinforcing each other
[#mathscpdchat](#)

 **Maryse #Antiracist** @AllThingsMaths · 17h ...
Replying to @Whitehughes and @tershanah
Thank you! You've voiced the mist of that idea in my head! (What came first???). Virtuous circle!

[#mathscpdchat](#)

 **Susan Whitehouse** @Whitehughes · 17h ...
I think that we need our students to expect Maths to make sense and many of them don't at the moment. But this building and reinforcing of their own mathematical landscapes is a very important part of making that happen
[#mathscpdchat](#)

 **Maryse #Antiracist** @AllThingsMaths · 17h ...
I think it's harder to get away with drilling students for exams too. We need them to understand their maths and not just be exam oriented. However, that investment pays off IMO, and for maths beyond GCSE too.

[#mathscpdchat](#)

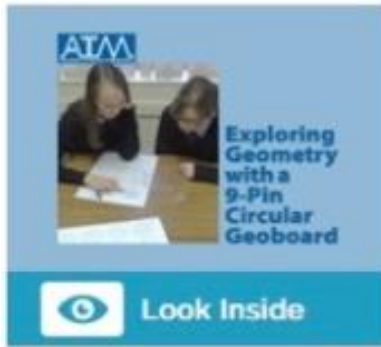
A comment by [Susan Whitehouse](#) in the conversation above generated a short discussion between Susan, [Maryse Dare](#) and [Mary Pardoe](#):

 **Susan Whitehouse** @Whitehughes · 17h ...
So, in that way, I think it's essential if we're to develop students' problem-solving skills. But I also think it's very empowering and builds students' confidence - every time that an idea clicks into place with another one, Maths makes a bit more sense to them [#mathscpdchat](#)

 **Maryse #Antiracist** @AllThingsMaths · 17h ...
Replying to @Whitehughes
Yes! I have found spending time on enlargement and trig really useful to ensure concrete understanding. [#mathscpdchat](#)

 **Susan Whitehouse** @Whitehughes · 17h ...
Yes, all the tying together of enlargement, similar triangles, Pythagoras and trig is very powerful [#mathscpdchat](#)

 **Mary Pardoe** @PardoeMary · 17h ...
Students may do that if they respond to tasks like those in here? ...
atm.org.uk/Shop/Exploring...
[#mathscpdchat](#)



Exploring Geometry with a 9 Pin Geoboard, Book and Download

A book to introduce your students to geometric reasoning, from visualising to calculating angles in shapes drawn on a circular 9 pin geoboard. Written by Geoff Faux. KS3 & KS4. Available from £16.50.

Non-Member Price: £22.00
Member Price: £16.50

Quantity [Add to cart](#)

Exploring Geometry with a 9 Pin Geoboard Pack

A brilliant book to introduce your students to geometric reasoning. From visualising to calculating angles in shapes drawn on a circular 9 pin geoboard, this book covers the rigour of deductive reasoning. With clear diagrams that can be projected or copied and a narrative that opens up the problems for any reader, Geoff Faux has written a book that deserves a place in the collection of every maths teacher.

The ideas included encourage problem solving while covering many areas of mathematics including angles, geometry, proof, justifying and reasoning.

Another comment by [Susan Whitehouse](#) (in the conversation about reasoning and 'noticing patterns across topics') prompted a conversation between Susan and [Maryse Dare](#) about developing teaching approaches together as a team:



Susan Whitehouse @Whitehughes · 17h

I think that we need our students to expect Maths to make sense and many of them don't at the moment. But this building and reinforcing of their own mathematical landscapes is a very important part of making that happen
[#mathscpdchat](#)



Maryse #Antiracist @AllThingsMaths · 17h

Replying to [@Whitehughes](#) and [@tershanah](#)

This is such an important point. And perhaps requires a bit of courage to take the time to do so. I truly believe (inc 5 years as HoD) that it's time efficient.

[#mathscpdchat](#)



Susan Whitehouse @Whitehughes · 17h

...

Yes, in the slightly longer term I really think it is, but there is a lot of pressure on teachers to achieve very short term goals [#mathscpdchat](#)



Maryse #Antiracist @AllThingsMaths · 17h

...

I think this is where SoW really come into play, which is why I've been nudging with that question this evening. It needs (IMO) to be part of a longer plan, approach and ethos.

[#mathscpdchat](#)



Susan Whitehouse @Whitehughes · 17h

...

I agree. It is a very very hard thing for one teacher to do in isolation. It needs to be how the Department operates [#mathscpdchat](#)

[Susan Whitehouse](#)'s original reply to the main question from the host, [Maryse Dare](#), also prompted this interchange between the two of them:



Susan Whitehouse @Whitehughes · 17h

...

Replying to [@AllThingsMaths](#)

I think that it stops students from seeing the methods we teach as recipes to solve specific questions on specific topics, and leads them towards thinking of them more as a toolkit that they can apply wherever appropriate [#mathscpdchat](#)



Maryse #Antiracist @AllThingsMaths · 17h

...

Replying to [@Whitehughes](#)

Do you ever go outside the curriculum to find contexts or different topics to shore up the maths curriculum?

[#mathscpdchat](#)



Susan Whitehouse @Whitehughes · 17h

...

I don't tend to go looking for anything outside the curriculum but sometimes I already know something that's too good not to share! [#mathscpdchat](#)



Maryse #Antiracist @AllThingsMaths · 17h

...

For KS3 I enjoy exploring number systems so they have a real understanding of our decimal system.

[#mathscpdchat](#)

This shows [Nathan Day](#)'s reply to the main question from the host, [Maryse Dare](#):



Maryse #Antiracist @AllThingsMaths · 17h

...

How (I'm assuming it does!) does making connections between topics strengthen student understanding? What other benefits are there?

[#mathscpdchat](#)



Nathan Day @nathanday314 · 17h

Replying to @AllThingsMaths

It forces/allows students to see tree as well as its fruits. (Apologies for the metaphor, I can't think of any other words to express what I want to say!)

[#mathscpdchat](#)



Maryse #Antiracist @AllThingsMaths · 17h

It's such a simple idea (when you see it - I haven't extended my own thoughts to doing it so thank you for sharing) with such huge potential and impact.

[#mathscpdchat](#)

(to read the discussion sequence generated by any tweet look at the 'replies' to that tweet)

There were no replies to this information-tweet from the host ...



Maryse #Antiracist @AllThingsMaths · 17h

I found this video in the week. It threw up some thinking points for me.

youcubed.org/resources/tour...



youcubed.org

Tour of Mathematical Connections - YouCubed

This short tour shows the connected nature of math highlighting number sense, geometry, and algebra, under the big idea of ratio and ...

... but this tweet from the host generated a short interchange ...



Maryse #Antiracist @AllThingsMaths · 17h

Some of my "go to" links...

I teach Pythagoras through area and cut out squares so students can fit 3^2 and 4^2 into 5^2

[#mathscpdchat](#)



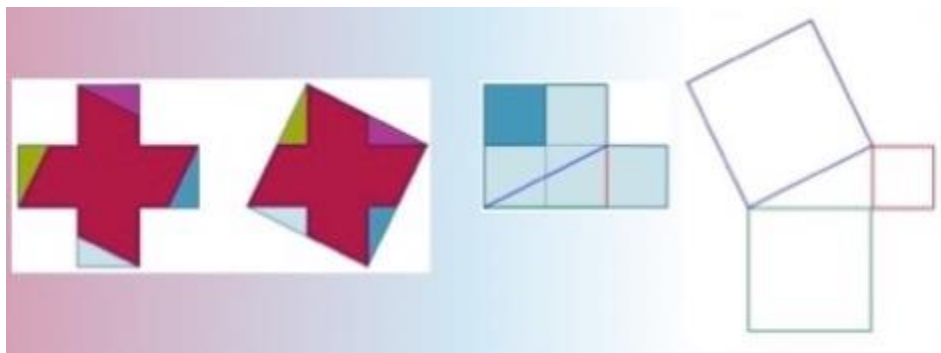
Mary Pardoe @PardoeMary · 17h

Replying to @AllThingsMaths

Might also do that using some of Dudeney's Greek cross dissections?!!

[#mathscpdchat](#)

Article here: ncetm.org.uk/resources/24971 (not sure if it still works.)



Maryse #Antiracist @AllThingsMaths · 17h

Oooh - that's one to read later on!

[#mathscpdchat](#)



Maryse #Antiracist @AllThingsMaths · 17h

Replying to @AllThingsMaths

I also use area for expanding brackets although students often start to "short cut" to expanding without grids.

[#mathscpdchat](#)

... and there were two replies to the host's last question. We will let Susan have the final say in this summary!



Maryse #Antiracist @AllThingsMaths · 17h

We're entering the last 5 minutes of [#mathscpdchat](#) and I've got loads I'm taking away with me! I hope others have to.

If we think linking topics and applying concepts is the way forward, how can we support other staff to do this?



Maryse #Antiracist @AllThingsMaths · 18h ...

Replying to @AllThingsMaths

One idea came through this evening that we can model first to support staff. The questions from @nathanday314 could be easily shared too #mathscpdchat



Susan Whitehouse @Whitehughes · 18h ...

Replying to @AllThingsMaths

Joint planning looking for links between topics, and not testing every five minutes, spring to mind! I think you are so right about it needing to be the ethos of the Department #mathscpdchat