

## #mathscpdchat 17 December 2019

Your work in maths education this term: what went particularly well?

Hosted by [Kathryn Darwin](#)

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



**#mathscpdchat**  
TONIGHT – Tuesday, 17 December, 7-8pm



They were really excited by some of the representations

Your work in maths education this term:  
what went particularly well?

Hosted by Kathryn Darwin @Arithmaticks  
[nceetm.org.uk/mathscpdchat](http://nceetm.org.uk/mathscpdchat)

Some of the areas where discussion focussed were:

**positive aspects of 17 December 2019 (the day of the discussion), which for contributors to the discussion included:**

- teaching a lesson on long division;
- 'being reunited with my favourite class of the year, and **being able to help every pupil who ran into any difficulty**';
- 'all classes were lovely today';

- ‘my Y11s nailed tangents to curves, and chords, and how to interpret them’;
- challenging pupils to tackle an **open-ended task ... their conjecturing, conjecture-testing, pattern-spotting, and their following their own lines of enquiry**;
- a class discussing **differences between theories, hypotheses and conjectures** ... being approached later in the day by normally quiet pupils to show/tell me their conjectures;
- **phoning a parent to say how impressed I was with the questions their son was asking** in maths lessons, and hearing the parent’s consequent pride;
- pupils loved **making flexagons, and using nets to make ‘Christmas trees’**;

**topics that contributors to the discussion particularly enjoyed teaching during this autumn term, which included:**

- **arithmetic sequences**;
- **teaching ‘equivalent calculations’ as a topic**, and pupils seeing links and distinctions between adding and multiplying, and between subtracting and dividing;
- **teaching Y7 ‘intervention’ sessions ... observing ‘leaps and bounds’ in the pupils’ learning**, such as when they ‘saw for themselves’ that their knowledge of number-bonds-to-ten gave them knowledge of ‘first-decimal-place-number-bonds-to-one’;
- **teaching Y13 mechanics for the first time** ... students’ appreciation that ‘this might not be my (the teacher’s) strongest topic’ possibly helped them to learn what was being taught;
- **negative numbers with Y7** ... the pupils became ‘really comfortable’ with using them;
- **vectors** ... ‘the recent #mathscpdchat discussion about vectors (hosted on 19 November by @daniquinn) **prompted me to sit down and, for the first time, think carefully about how to sequence the learning** ... I love planning when I have time to do it’;
- **proofs by induction** ... ‘I love playing around with them ... you can prove all sorts of cool stuff’;
- teaching **algebra to my Y9 pupils** ... seeing their confidence grow;
- teaching **circle theorems** ... ‘for example, if we throw proof by contradiction into the mix, we (they) can prove why tangents are perpendicular to radii, rather than just telling them’;
- teaching **completing the square using algebra tiles** (for the first time) ... ‘a total game changer’;

- that teaching **geometrical constructions** may not be liked because **‘we don’t do anything with them’**;

**changes in their teaching that contributors to the chat made during the autumn term, which included:**

- **using a ‘pit’ question at the start of a lesson** ... pupils finding themselves ‘in the learning pit’ (stuck) are challenged to get out of it by solving a carefully chosen problem;
- **‘at the end of each lesson I write (privately) questions that address misconceptions revealed during the lesson** (to use as ‘retrieval practice starters’ in future lessons) because it’s easier to think of them (scribble them down) at the end of the lesson and type them up later’;
- **‘managing’ students by assigning them roles within semi-permanent small teams, in order to help those with behaviour problems;**
- **finding short videos that bring relevance at the beginning of lessons** ... they seem to help students engage better/faster with the mathematics;
- **‘using a visualiser has made a great impact on my teaching** ... showcasing pupils’ work is groundbreaking’ ... ‘my favourite teaching tool’;

**other aspects of their work during the autumn term that went particularly well for contributors to the discussion included:**

- **‘getting to grips with a new-to-me primary maths scheme’** that incorporates work with many **visual images and representations, and the use of various manipulatives;**
- carefully **devising questions to expose misconceptions;**
- being ‘really careful’ with **‘variation’** ... using ‘my turn, your turn’;
- ‘two Y8 pupils who **had been removed from another maths lesson** asked to join my group, and having reluctantly agreed, I found that **they worked and behaved well’**;

**aspects of their teaching that contributors to the discussion want to keep up in 2020, or something new they want to consider, which included:**

- creating a **bank of resources** on my website;
- getting **students’ work under the visualiser** more often;
- running (via a Maths Hub) **‘maths subject knowledge’ sessions for Teaching Assistants**, for example a session focussing on subitising;
- **modelling a maths lesson** to student teachers;

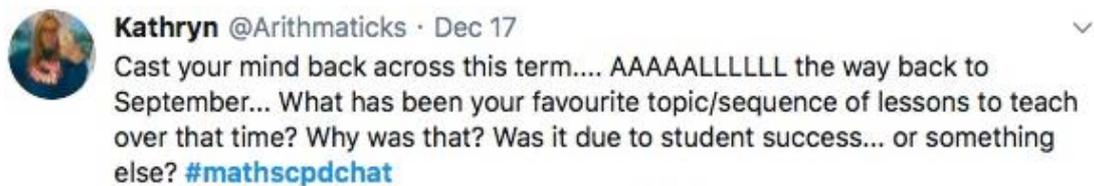
- ‘properly getting into **retrieval practice**’;
- really believing that **we can influence what happens in our schools**;

**aspects of their teaching that contributors to the chat want to ‘bin’ in 2020, which included:**

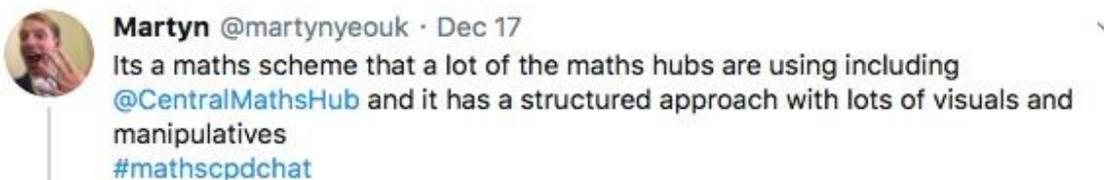
- a poor **work-life balance**;
- **fear**;
- ‘**being too ‘warm’ without being strict enough** to support it’.

In what follows, click on either the first tweet of the conversation (from [Kathryn Darwin](#)) or on the highlighted (grey) tweet (from [Lane Walker](#)) to go to the whole conversation on Twitter.

This is a conversation about how the willingness of pupils to use manipulatives to aid their learning often decreases as they grow older. The conversation was generated by this tweet from [Kathryn Darwin](#):



and included these from [Kathryn Darwin](#) and [Martyn Yeo](#):



 **Kathryn** @Arithmaticks · Dec 17  
Interesting... so do you think that older students need them less? Why so?  
[#mathscpdchat](#)

 **Martyn** @martynyeouk · Dec 17  
Dont think they "need" them less. I think there is still a stigma to using resources and they dont see themselves as mathematicians if they have to use diennes!

But they certainly did want them today when we did long division!

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 **Kathryn** @Arithmaticks · Dec 17  
I always think this - but they are so useful in explaining so many complex things... how do we break that stigma? Is it just through using them more throughout students mathematical lives? [#mathscpdchat](#)

 **Martyn** @martynyeouk · Dec 17  
I think so...and modelling it to students.  
Change takes time. Pupils will be going home and parents will be explaining how they solve things without manipulatives...

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 **Kathryn** @Arithmaticks · Dec 17  
Perhaps we need parents to be more on board too then! [#mathscpdchat](#)

and these from [Maths - No Problem!](#), [Kathryn Darwin](#) and [Lane Walker](#):

 **Maths — No Problem!** @mathsnoproblem · Dec 17  
Great thread! What Year do you teach, @Arithmaticks? [#mathscpdchat](#)

 **Kathryn** @Arithmaticks · Dec 17  
I am in Secondary... Y7-11!

 **Lane Walker** @LaneWalker2 · Dec 17  
Replying to @martynyeouk @Arithmaticks and 3 others  
Loving your thoughts. I'm snowed in at 1:28 CST wish I could join more often but have classes til 2:30 normally. At HS, I nearly have to force Ss to use manipulatives but so essential for some topics. [#mathscpchat](#)

 **Kathryn** @Arithmaticks · Dec 17  
The struggle at secondary level is very real! I try very hard but there is a lot of resistance, even to drawing a diagram or a sketch of a curve! Where does it come from!? [#mathscpdchat](#)

 **Lane Walker** @LaneWalker2 · Dec 17  
Replying to @Arithmaticks @martynyeouk and 3 others  
Agree & not sure why. Pride? Effort? A problem about a rectangle: they couldn't do it until I told them there would be comments in the grade book if they refused to draw a rectangle. Then, like magic, they could solve the problem. [#mathscpdchat](#)



**Kathryn** @Arithmaticks · Dec 17

So very interesting... Something to look into... [#mathscpdchat](#)

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

Among the links shared were:

[Mathematical Hooks](#) which is a large collection, created by [Tess Maths](#), of varied starting points that can provide interesting contexts for mathematical exploration and learning. It was shared by [Kathryn Darwin](#)

[Applets Gallery](#) which is a collection of applets. It was shared by [Lee McJames](#)