National Centre for Excellence in the Teaching of Mathematics

#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*

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;

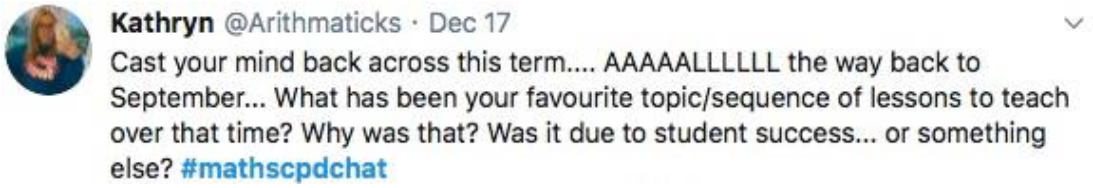
- ‘properly getting into **retrieval practice**’;
- really believing that **we can influence what happens in our schools**;

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’.

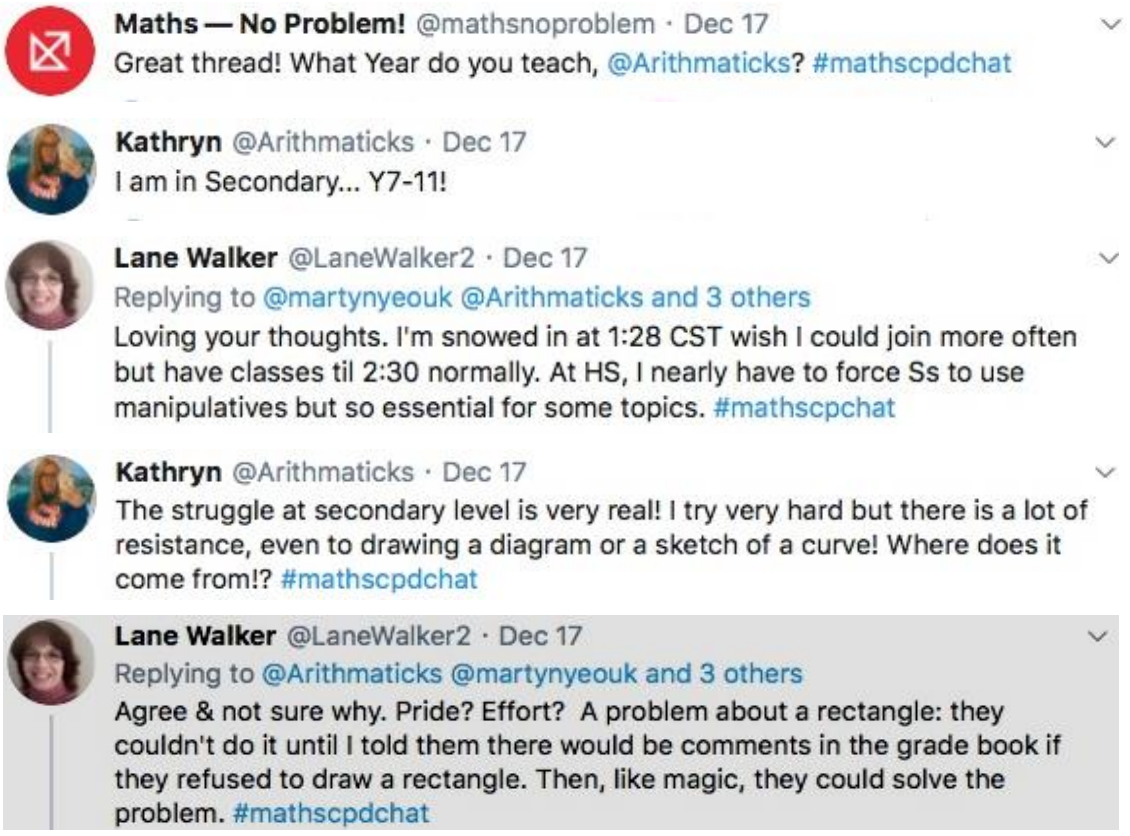
In what follows, click on either the first tweet of the conversation (from Kathryn Darwin) or on the highlighted (grey) tweet (from Lane Walker) to go to the whole conversation on Twitter.

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:

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



(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