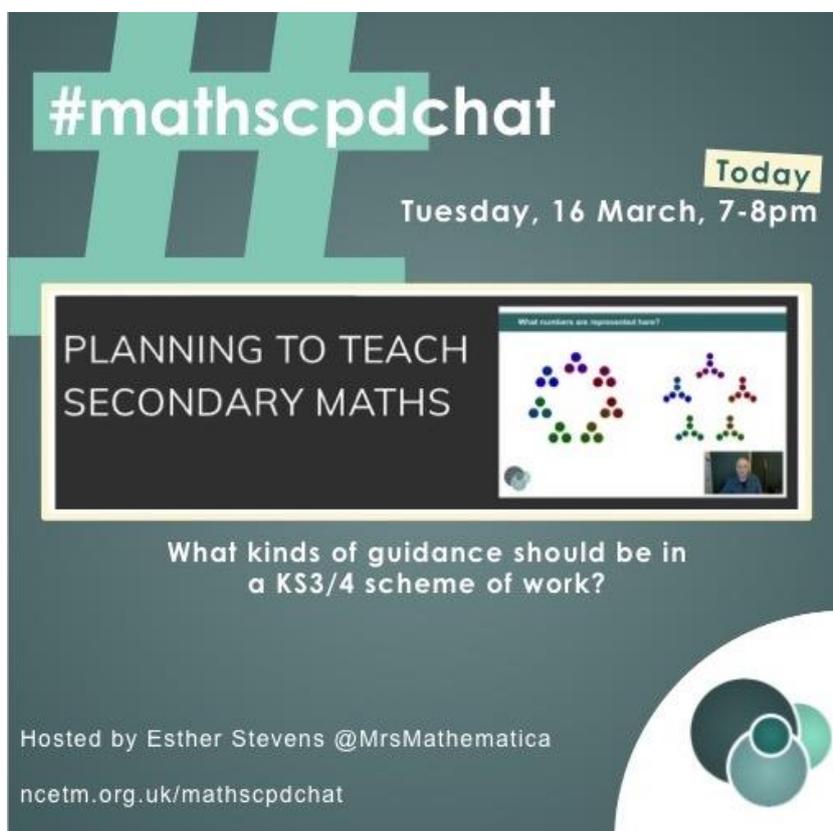


#mathscpdchat 16 March 2021

What kinds of guidance should be in a KS3/4 scheme of work?

Hosted by [Esther Stevens](#)

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



The graphic features a large teal hashtag symbol on the left. To its right, the text '#mathscpdchat' is written in white. Further right, a yellow box contains the word 'Today', followed by 'Tuesday, 16 March, 7-8pm' in white. Below this, a central white box with a black border contains the text 'PLANNING TO TEACH SECONDARY MATHS' in white. To the right of this box is a screenshot of a presentation slide titled 'What numbers are represented here?' showing two diagrams of colored dots arranged in patterns. Below the central box, the text 'What kinds of guidance should be in a KS3/4 scheme of work?' is written in white. At the bottom left, it says 'Hosted by Esther Stevens @MrsMathematica' and 'ncetm.org.uk/mathscpdchat'. The NCETM logo is in the bottom right corner.

Among the links shared during the discussion were:

[Mathematics in the National Curriculum 1989](#) which are the statutory orders that were introduced into England, Wales and Northern Ireland following the Education Reform Act 1988. They set out the content of mathematics to be taught by grouping it into 14 Attainment Targets (ATs).

Attainment Targets 1 and 9 were significant in that they were both about using and applying the mathematics addressed in other ATs. It was shared by [Heather Scott](#)

[The Standards Unit: Improving Learning in Mathematics: Challenges and Strategies](#), (2000 - 2009), which is a book of resources developed by Dr Malcolm Swan from Nottingham University assisted by other leading maths experts in the country. It was a part of the Department for Education and Skills' response to the Smith Report, and built on research evidence strongly suggesting that learning mathematics is facilitated by actively engaging learners in mathematical thinking. It was shared by [Mary Pardoe](#)

[NRICH: Secondary Curriculum](#) which is a page providing links to advice on using NRICH tasks in the classroom, and to Secondary Curriculum Mapping Documents which give an overview of the maths met between the ages of 11 and 16, with linked NRICH tasks for each curriculum topic. It was shared by [Mary Pardoe](#)

[Planning for mathematics learning](#) which is Chapter 5, written by Keith Jones and Julie-Ann Edwards, in *Learning to teach mathematics in the secondary school: A companion to school experience*. It was shared by [Mary Pardoe](#)

[Mapping App](#) which shows the stage reached so far by [Catherine Edwards](#) in her work to create an interactive mapping diagram that shows links between 'learning units'. It was shared by [Catherine Edwards](#)

The screenshots below, of chains of tweets posted during the chat, show parts of three conversations about teachers developing, expanding and adapting their own schemes of work. They include tweets about implications of adopting a 'thematic' approach, and whether it is sensible always to stick to schemes of work in the present circumstances. **Click on any of these screenshots-of-a-tweet to go to that actual tweet on Twitter.**

The conversations were generated by this tweet from [Esther Stevens](#):



and included these from [Gemma Scott](#), [Mary Pardoe](#) and [Peter Lacey](#):

-  **Laura** @mathsteachlaura · 14h ...
Replying to @MrsMathematica
Our key stage 3 scheme of work is based on 4 'big ideas' in each year and it has been the most inspiring and most challenging part of my year so far
[#mathscpdchat](#)
-  **Esther** @MrsMathematica · 14h ...
[#MathsCPDChat](#) that sounds fascinating! What are your 'big ideas' and how were they chosen?
-  **Laura** @mathsteachlaura · 14h ...
Y7: iteration, golden ratio, graph theory, tiling the plane
Y8: number theory, topology, game theory and conics

They were chosen before I joined :) [#mathscpdchat](#)
-  **Esther** @MrsMathematica · 14h ...
I can't find the perfect gif but that has literally made me go "ooooh!"
They sound absolutely fascinating to have tying everything together!
[#MathsCPDChat](#)
-  **Catherine Edwards** @Edwards08C · 14h ...
This is interesting, how do you make sure the content needed is covered? So where do percentages fit for example? What does lesson planning look like? I'm really intrigued [#mathsCPDchat](#)
-  **Laura** @mathsteachlaura · 14h ...
Lesson planning has been a challenge for me as it is my first year in post, I cannot wait for September so I can teach everything again... but better!!!
[#mathscpdchat](#)
-  **Catherine Edwards** @Edwards08C · 14h ...
I'm so used to teaching relatively discreet topics , it would be a big shift to plan more thematically. Although I can see the benefits. Do you find the students are better at linking ideas with this approach? [#mathsCPDchat](#)
-  **Laura** @mathsteachlaura · 14h ...
I think so but I would give it longer before I gave you a definite answer. If I were to ever go back to a KS3 curriculum that is more typical I would absolutely build in opportunities to explore some of the amazing bits of maths we look at now [#mathscpdchat](#)
-  **Colin Wright** @ColinTheMathmo · 14h ...
Replying to @mathsteachlaura and @MrsMathematica
(not a teacher)

Are there any incentives for teachers and schools to share things like "The four big ideas" with other schools and/or teachers?

Or is it discouraged?

and these from these from [Esther Stevens](#), [Laura Kavalier](#), [Miss Ward-Gow](#) and [Laura Gilbert](#):

-  **Esther** @MrsMathematica · 16h ...
Next up
- Q6 - Ignoring the technical upskilling we've all had to do, has teaching through a pandemic changed what you want or need from a SOW (a) during remote/hybrid teaching (b) now that we're (mostly) face to face again?
- [#MathsCPDChat](#)
-  **Laura** @mathsteacher09 · 16h ...
Replying to @MrsMathematica
- I think staff need to feel like they are not tied to a SOW but instead free to address the needs of the class in front of them. I think SOWs can sometimes force staff to push on with more content which sts may not be ready for.
- [#mathscpdchat](#)
-  **Miss Ward-Gow** @mcwardgow · 16h ...

- Think this is really key - lots of schools may feel more pressure, especially now, due to time constraints and this may have a negative impact on enriching activities 😞 [#mathscpdchat](#)
-  **Miss Ward-Gow** @mcwardgow · 16h ...

- Replying to @mcwardgow @mathsteacher09 and @MrsMathematica
- And I totally get the whole "it's not the time to bring in new initiatives/try to change things" because we've got enough on, but can't help but feel that it's the students who will miss out 😞 [#mathscpdchat](#)
-  **Laura** @mathsteachlaura · 16h ...
Replying to @mcwardgow @mathsteacher09 and @MrsMathematica
- You are so right, and yet more than ever it is so important! [#mathscpdchat](#)

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

Some of the areas where discussion focused were:

the first four 'questions' from the host were in the form of polls that contributors were invited to complete and/or respond to in tweets:



Esther @MrsMathematica · 13h

Replying to @MrsMathematica

#MathsCPDChat Our first few questions are going to take the form of a poll - please comment under each poll with your thoughts/rationale/ideas!

Our SOW(s) are:



48 votes · Final results

- **Key Stage specific**, but 'definitely with the five years at the forefront of thinking';
- at least one teacher has created '**an 'all through' SOW for us**', using knowledge about **KS1/2 learning** 'to inform start points';
- at least one other department has '**a 5 year curriculum plan and then our schemes of learning detail on a class by class basis how the curriculum is delivered**' ... extra maths sessions are provided for any students who are moved from one set to another;



Esther @MrsMathematica · 13h

#mathscpdchat

Q2 - Our lower school SOW is



36 votes · Final results

- in some schools the teachers in the maths department **collaboratively design and write their own schemes of work**, 'making adaptations when we see good practice in other places' ... it was suggested that this might be thought of as 'whilst on the journey using real time information to make modifications to the journey' ... 'it can be **tweaked en route to match the needs and interests of the learners. And also giving them a say in our navigation**';
- at least one school has devised thematic schemes of work for Years 7 and 8, basing the SoW for each year on four 'big ideas', such as 'golden ratio' or 'topology' ... the intended learning within themes is mapped to the national curriculum ... with this approach students are likely to be 'better at linking ideas';



Esther @MrsMathematica · 13h

#MathsCPDChat

Q3 - Our GCSE years SOW is



42 votes · Final results

- a teacher in a 3–18 school that follows its own maths curriculum, wondered whether an ‘off the shelf’ scheme of work might ‘go a long way to offer consistency throughout’ ... that teachers in a 3-18 school ‘have such an opportunity to seek thorough understanding of all phases’;

Q4 - Our A Level SOW is



46 votes · Final results

there were no tweets in response to this poll;

teachers’ thoughts about the exact denotation of the phrase ‘Scheme of Work’, and about what they believe it ought to denote:

- whether, or not, **guidance as to how to follow teaching and learning ‘principles’** (such as those discussed in *Improving Learning in Mathematics: challenges and principles* ... the Standards Unit publication produced in response to *Making mathematics count: the report of Professor Adrian Smith’s inquiry into post-14 mathematics, 2004* ... link provided above) can/ought to be provided in a scheme of work ... some teachers expressed concern that ‘writing principles into SoW’ might result in them being superficially addressed merely as ‘a tick list’ ... that they are ‘the kind of thing we discuss as a department, and then plan tasks together’ ... there was a response suggesting that, by discussing principles and then planning a SoW together, those principles are automatically being ‘incorporated’ into the SoW;
- whether teachers are allocated enough **time to work together effectively** on developing their own schemes of work;

- that a scheme of work should include ‘enough detail so that **someone who hasn’t taught a topic before** could plan a sequence of lessons without having to find too much additional stuff’;
- that a scheme of work should be clearly presented ‘showing links between and through topics/areas’ ... it should **show ‘how to enact the curriculum’** ... ‘how to enact that is decided by us as a department’;
- that a scheme of work should give ‘an idea of the order to teach in, and some detail of what to include and when, maybe linking topics to what came before’ ... while some SoWs include **‘timings’**, **many teachers believe that they are not appropriate** because their inclusion often has negative consequences;
- a scheme of work ought to **‘mirror what happens in the classroom and reflect best practice’**;
- some people believe that to many teachers a scheme of work means **just ‘a list of topics’**;
- some teachers would like every scheme of work to include **‘a series of tasks that teachers use as stepping stones through units’** ... ‘some ‘essential’ tasks might ensure consistency without being too directed’ ... **‘tasks that the whole department discuss before and after using them are a great thing to factor into a SoW’** ... at least one teacher would like to see ‘a booklet with tasks instead of guidance’ ... ‘where it gives guidance for each objective I tend just to look at the title. Then I look for reading about how to teach it best, then I look for great tasks’;
- a contributor commented that the **1989 first national curriculum** (link provided above) was intended ‘to **show some stages on the journey to learning maths**, and departments were expected to **put in other things inbetween the staging posts**’;

the host asked whether/how teaching through a pandemic has changed what teachers need/want there to be in a scheme of work:

- that ‘the links and sequencing have needed to be even more explicit’ ... that in the coming weeks teachers will sometimes need to **allow time for consolidation ‘to ensure we are building on a firm foundation’** ... that ‘the hokey-cokey nature of classes has exposed **areas that we need to make sure are better secured**’ ... that where teachers are using an exam board SoW the guidance is ‘just bullet points from the spec, with no detail on pre-requisites’;
- some teachers are creating detailed **spreadsheets that show links between ‘topics-and-topics’ and between ‘topics-and-resources’** (link provided above);
- that teachers need to feel that they are not ‘tied to a SoW but instead **free to address the needs of the class in front of them**’;
- that teachers ‘need to be in **regular communication with colleagues about the pace they’re going**’ ... partly in order to ensure that cross-group ‘assessment isn’t demoralisingly difficult or too easy’;

the host's final question aimed to generate tweets indicating contributors' views about the kinds of guidance that ideally ought to be in a KS3/4 scheme of work:

- that it should show '**clear links forward and backward**' ... and contain explicit ideas/examples of ideas and materials to support **enrichment** of/in what students learn, and development of **students' problem-solving and mathematical-thinking abilities**;
- some teachers would 'love a clear **list/spiral-representation of the hierarchy of topics right from the start of primary through to the end of secondary** ... discussed and agreed upon by our team' ... a contributor to the chat offered to 'dig out old plans' in order to 'kick start' his work on continuing to create something of that kind (to which in the past encouraging responses had been somewhat lacking) ... contributors to the present chat were, on the other hand, very encouraging;
- that a scheme of work might include reference to, and examples of: **tasks** of various kinds, including **open-ended work, group work and individual work** ... teaching and learning **approaches** ... possible **misconceptions** and ways of overcoming them ... **key points, difficult points and critical points** in lessons and units-of-work ... **assessment opportunities** ... ways of **recording students' achievements and progress**.