#mathscpdchat 29 March 2022

How do students learn to communicate clearly and effectively in mathematics?
Hosted by Jane Hawkins

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

The links shared during this discussion were:

Private talk, public conversation which is an article by Mike Askew, King's College, London. The author explores what sort of talk teachers might be encouraging in mathematics lessons. It was shared by Jane Hawkins

Modelling through think alouds which is an article in the Literacy Teaching Toolkit from Education and Training in the Australian state of Victoria. It describes how 'the articulation of thinking' can be used 'as an effective instructional tool'. It was shared by Jane Hawkins

Effective Questioning and Responding in the Mathematics Classroom which is an article from 2010 by John Mason, the Open University and the University of Oxford. The author explores how questions arise in the mathematics classroom, how teachers can use them effectively, and how they can stimulate students to ask their own questions. It was shared by Jane Hawkins

Which quadratic? which is a task from Underground Mathematics. It is a task to be tackled in a team of four students, working as two pairs. One pair tries to identify the quadratic shown on a randomly-chosen card (from a set of cards that are provided) solely by listening to verbal 'clues' from the other pair of students who are the only students who can see the card. It was shared by Susan Whitehouse

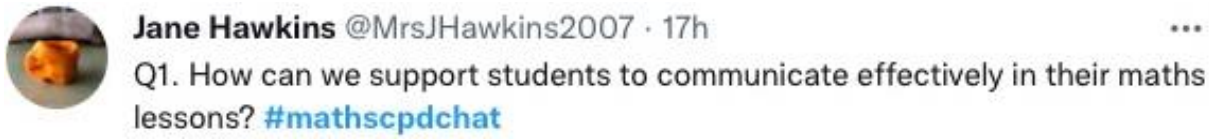
Backwards fading applet which is a tweet from Sudeep. The applet generates non-monic quadratic expressions to factorise. It was shared by Peter Williams

How to make a Jam Sandwich which is a hilariously amusing YouTube video that sends a serious message. Watch it if you have never seen it! It was shared by Peter Williams

Mathematics Education OpenLearn which is a webpage from the Open University that provides links to OU courses suitable for maths teachers, and to courses suitable for anyone seeking to improve their maths at school level. It was shared by Maryse

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

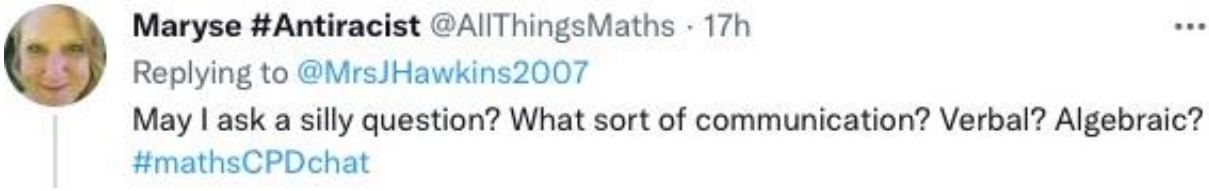
The host's first main question …



… generated much more discussion than either of her other two main questions. This tweet 'sums it up':

All the conversations that developed from direct replies to Q1 follow.

This was an early direct reply:



Jane Hawkins @MrsJHawkins2007 · 17h

Hi @AllThingsMaths, great question, thank you! I was thinking verbally. but you're right there is lots of non-verbal communcation that happens in maths lessons. If you're interested in other types - including disciplinary literacy maybe connect with @runningstitch #mathscpdchat

'Thinking aloud' featured in this long conversation that began with a direct reply to Jane's Q1:

Jane Hawkins @MrsJHawkins2007 · 17h

Q1. How can we support students to communicate effectively in their maths lessons? **#mathscpdchat**

MrHawesMaths @HawesMaths · 17h

Replying to @MrsJHawkins2007

Modelling throughout the lesson. I think it is important for students to actually hear your thinking and the processes. Plus a good list of vocab and glossary for each unit will help. #mathscpdchat

Jane Hawkins @MrsJHawkins2007 · 17h

I was offered this the other day education.vic.gov.au/school/teacher.. 'Think alouds' what do you think? #mathscpdchat

Peter Williams @MathsImpact · 16h

Narrating your thought process is really helpful.

I think it's a key element of the example problem pair (my turn, your turn) strategy.

It's also great for unpicking problems with students. "When I'm stuck I ask myself..."
#mathscpdchat

Mary Pardoe @PardoeMary · 20h

Yes ... plenty of 'thinking aloud' and explaining thinking to other students as well as the teacher (you) ... then you can ask "How could you write that?" #mathscpdchat

MrHawesMaths @HawesMaths · 20h

Replying to @PardoeMary and @MrsJHawkins2007

I have at times done it silently and ask the students to fill the silence with their own think aloud. Could perhaps utilise this as a paired activity with students modelling to each other? #mathscpdchat

Jane Hawkins @MrsJHawkins2007 · 19h

Love this idea! Might try it tomorrow!! Thank you! #mathscpdchat

Margaret Anne Clark @maclark35 · 18h
Replying to @MrsJHawkins2007 @PardoeMary and @HawesMaths
I do this ALL THE TIME in literacy,very successfully (mind of a writer) probably not as much in maths… Why not? Actually I don't know. I think I need to do it more - mind of a mathematician #mathscpdchat

Jane Hawkins @MrsJHawkins2007 · 21h
I wonder if narrating something we can clearly already do, and narrating something that would be an unfamiliar and genuinely challenging question would have the same impact? Is one more useful than the other? #mathscpdchat

Richard Dare @dare_richard · 19h
Good to model both.
Sometimes modelling getting stuck and unstuck is important.

MrHawesMaths @HawesMaths · 21h
There's a thought. How about a random question selection from a student (on a task they might do) and you model it live in front of them. Keeps you on your toes and makes the think aloud more realistic #mathscpdchat

Mr Payne @Tom_does_maths · 21h
Replying to @HawesMaths @MrsJHawkins2007 and 2 others
Or ask them to bring a question to the lesson? Entirely their own choice… Live in hope you can answer it :-p (Though it might do them good to see we don't actually know all the maths answers there are…)

MrHawesMaths @HawesMaths · 21h
Nice idea there.

Jane Hawkins @MrsJHawkins2007 · 20h
Yes! Love this! Great for them to see what we can (and can't) do, and that sometimes needing to think about a problem (can I come back to you with this next lesson?) for more than 5 seconds is often the case! #mathscpdchat

Maryse #Antiracist @AllThingsMaths · 16h
And getting intentionally stuck can be useful for the questions you ask yourself to get unstuck. #MathsCPDChat

Peter Williams @MathsImpact · 16h
Also getting accidentally stuck is perfectly acceptable sometimes.

I do not have time to work through every single question I give my a-level students, so sometimes I get stuck stuck and have to model the process for real!

Jane Hawkins @MrsJHawkins2007 · 16h
Or going through with their weird way of solving an equation and then looking for other more straightforward / simpler / elegant solutions! #mathscpdchat

MrHawesMaths @HawesMaths · 16h
Have you ever done it where you get the students to dictate how to solve a problem and you follow their cues verbatim to the point where they need to be really concise with their language. #mathscpdchat

Richard Dare @dare_richard · 16h
Nice!

Peter Williams @MathsImpact · 17h
Sounds like the classic sandwich robot activity in computer science.
youtu.be/ONoa7liSYxw

#mathscpdchat

youtube.com
How to make a Jam Sandwich
We have developed a variety of online workshops, including Digital Technologies – which was created...

MrHawesMaths @HawesMaths · 17h
Saw this exact thing being done in Primary. It was hilarious

A direct reply to Q1 from Susan Whitehouse generated many conversations as 'branching threads', which are shown by repeating any tweet whenever (each time) it generated a different/new conversation … as follows:

Susan Whitehouse @Whitehughes · 17h

Replying to @MrsJHawkins2007

I think we need to move away from valuing correct answers to valuing methods for students to realise the importance in communicating those methods clearly #mathscpdchat

Jane Hawkins @MrsJHawkins2007 · 17h

Couldn't agree more! Efficient and elegant, method comparison and selection. How do we 'teach' this though? #mathscpdchat

Susan Whitehouse @Whitehughes · 18h

Replying to @MrsJHawkins2007

If we genuinely made this transition in what we valued in our maths classrooms then I think a lot of it would happen naturally. It's too easy for students see it as an add-on at the moment; a bit of a distraction from the "real" task of getting to the answer #mathscpdchat

Maryse #Antiracist @AllThingsMaths · 18h

Yes! The old plenary question tagged on after doing 100 questions on the same skills. #MathsCPDChat

Jane Hawkins @MrsJHawkins2007 · 18h

I love this 2010 paper by John Mason - Effective Questioning and Responding in the Mathematics Classroom mcs.open.ac.uk/jhm3/Selected%... and his category of 'genuine enquiry'! #mathscpdchat @JohnMOxford

A question by Jane (above and repeated) prompted a discussion about getting students to explain/compare methods, and also use 'back-to-back' student communication tasks:

Jane Hawkins @MrsJHawkins2007 · 17h

Couldn't agree more! Efficient and elegant, method comparison and selection. How do we 'teach' this though? #mathscpdchat

Maryse #Antiracist @AllThingsMaths · 16h

Speaking out loud about a problem. What we know. What we want to know. How can we move from the former to the latter? #MathsCPDChat

Susan Whitehouse @Whitehughes · 16h

Giving answers and asking students for the method to get there, instead of asking for the answers, can really help too. Make the communication the task #mathscpdchat

Mary Pardoe @PardoeMary · 16h
A useful kind of task too is pair work ('Back-to-back') in which one student describes something that the other can't see, who has to reproduce whatever it is from what the first student says. #mathscpdchat

Susan Whitehouse @Whitehughes · 16h
I've never thought of this. It's a lovely idea. I'm already thinking of ways to incorporate it into A-level...#mathscpdchat

A new branch thread:

Susan Whitehouse @Whitehughes · 16h
Giving answers and asking students for the method to get there, instead of asking for the answers, can really help too. Make the communication the task #mathscpdchat

Jane Hawkins @MrsJHawkins2007 · 19h
Replying to @Whitehughes and @AllThingsMaths
Oh yeah, I love one from @ProfSmudge about 3x + 77 = 203 has solution x=42, what's the solution to 6x + 77 = 203 series, not quite the same perhaps but great for getting conversation going!! #mathscpdchat

A new branch thread about 'back-to-back' tasks and 'barrier games':

Mary Pardoe @PardoeMary · 16h
A useful kind of task too is pair work ('Back-to-back') in which one student describes something that the other can't see, who has to reproduce whatever it is from what the first student says. #mathscpdchat

Tom Oakley @ThatMathsMan · 20h
Replying to @PardoeMary @Whitehughes and 2 others
Ah yes, I call those types of tasks "barrier games". Sometimes they're not back to back, but Partner A can see something Partner B can't.

The best example of a competitive barrier game is Battleships, of course. #mathscpdchat

Mary Pardoe @PardoeMary · 20h
Even conveying a simple geometrical image can really help students focus on effective use of precise language … without having to be TOLD to focus on it … e.g. "I don't know hat you mean … can you say it clearer?" #mathscpdchat

Susan Whitehouse @Whitehughes · 20h

There is an excellent @UndergroundMath task called something like "Which quadratic" which is a yes/no Q&A game for one team to work out the equation on the other team's card. It's amazing how quickly the students improve their questions #mathscpdchat

Tara Harper @Korenth69 · 5h

Just had a look. What a great idea. Why haven't I thought of that before. So adaptable.

Another thread:

Mary Pardoe @PardoeMary · 16h

A useful kind of task too is pair work ('Back-to-back') in which one student describes something that the other can't see, who has to reproduce whatever it is from what the first student says. #mathscpdchat

Maryse #Antiracist @AllThingsMaths · 20h

Replying to @PardoeMary @Whitehughes and @MrsJHawkins2007

I have a tab open with visualisation!!! I LOVE this. It really unpicks communication and throws up some lovely properties of numbers or shapes or.... #MathsCPDChat

Maryse #Antiracist @AllThingsMaths · 20h

This isn't what I was looking for (I couldn't find the specific resource so if anyone has anything to hand then great...) but in case it's of any interest: stem.open.ac.uk/study/professi...

#mathsCPDchat

(Deleted previous tweet as wrong link)

A thread about students comparing methods and 'efficiency':

Jane Hawkins @MrsJHawkins2007 · 17h

Couldn't agree more! Efficient and elegant, method comparison and selection. How do we 'teach' this though? #mathscpdchat

Margaret Anne Clark @maclark35 · 18h

Replying to @MrsJHawkins2007 and @Whitehughes

Number Talks and number sense activities - thru cold tasks, I discovered my learners used place value strategies almost exclusively. We've extended that now, and talk a lot about efficiency in solving problems.

Jane Hawkins @MrsJHawkins2007 · 17h

That's awesome, what did you do to support them in that development? How long did it take them to get there? #mathscpdchat

Margaret Anne Clark @maclark35 · 17h

1/3 Cold task analysis by interviewing each child on how they solved the problems, then systematically teaching a variety of strategies - but always talking about looking at the relationships between the values used, @pwharris work on this is amazing. #mathscpdchat

Margaret Anne Clark @maclark35 · 17h

2/3 number strings (again @pwharris) to build calculation relationships and 'solve me 1 way/2 ways/many ways' for practise in developing confidence, accuracy and the sense of efficiency. #mathscpdchat

Margaret Anne Clark @maclark35 · 17h

3/3 We've been working on this for about 3 months and will continue to until all learners are secure - but it's clear they have all made progress. My P4 wants to talk about partial products at the Learning Celebration!! 😂😂😂😂😂 #mathscpdchat

New thread … talking helps students focus on what they know:

Maryse #Antiracist @AllThingsMaths · 16h

Speaking out loud about a problem. What we know. What we want to know. How can we move from the former to the latter?
#MathsCPDChat

Maryse #Antiracist @AllThingsMaths · 20h

Replying to @AllThingsMaths @MrsJHawkins2007 and @Whitehughes

Then we can explore different strategies for the skills element of the question. E.g. how you'd choose to multiply two numbers is a different conversation to how we'd go about solving this overall problem.
#MathsCPDChat

Jane Hawkins @MrsJHawkins2007 · 19h

Given a recipe for 6 cupcakes, how would you work out the recipe for 11 cupcakes, 12 cupcakes - my guess would be two quite different methods for two quite similar questions! #mathscpdchat

Jane Hawkins @MrsJHawkins2007 · 19h

Replying to @AllThingsMaths and @Whitehughes

Awesome - I've been wondering about this recently, what is it that means I know what a maths question is asking me to do (veiled in some weird half contextual exam question) and Y11's find tricky, do you think it's the language involved? #mathscpdchat

Susan Whitehouse @Whitehughes · 19h

Not necessarily but even if it isn't I think verbalising can help! I think there's an element of panic when confronted with an unfamiliar Maths question that students don't immediately know how to tackle. Talking about it helps them focus on what they do know #mathscpdchat

Jane Hawkins @MrsJHawkins2007 · 19h

This is a nice way of putting it I think, Y11 yesterday (forecast grade 8) was not happy with one fifth (probability) being the same as one-out-of-five #mathscpdchat

New thread … whether language difficulties cause students to not know what a question is asking them to do/find:

Jane Hawkins @MrsJHawkins2007 · 19h

Replying to @AllThingsMaths and @Whitehughes

Awesome - I've been wondering about this recently, what is it that means I know what a maths question is asking me to do (veiled in some weird half contextual exam question) and Y11's find tricky, do you think it's the language involved? #mathscpdchat

Maryse #Antiracist @AllThingsMaths · 21h

Replying to @MrsJHawkins2007 and @Whitehughes

Exactly this. They know the skill but not the context. I think tbh it comes back to what Susan said earlier. The practice needs to be embedded into our subject. THIS is what it's about - not the skills (altho you need these of course). #mathsCPDchat

Jane Hawkins @MrsJHawkins2007 · 20h

This is what the KS3 PoS has to say on the matter, is this what is felt in classrooms do you think? #mathscpdchat

Spoken language

The national curriculum for mathematics reflects the importance of spoken language in pupils' development across the whole curriculum – cognitively, socially and linguistically. The quality and variety of language that pupils hear and speak are key factors in developing their mathematical vocabulary and presenting a mathematical justification, argument or proof. They must be assisted in making their thinking clear to themselves as well as others and teachers should ensure that pupils build secure foundations by using discussion to probe and remedy their misconceptions.

Susan Whitehouse @Whitehughes · 21h

Replying to @MrsJHawkins2007 and @AllThingsMaths

I do think we have to be very careful that we don't confuse our students communicating clearly about Maths with issues connected with RP, slang etc. in spoken language in general. We want our Maths classrooms to become more not less inclusive! #mathscpdchat

Maryse #Antiracist @AllThingsMaths · 20h

I think it is some classrooms, although not all. I don't get out and about anymore so my views are limited. I have been thinking a lot about language recently with directed number. I think the rigor here can support avoiding misconceptions #mathsCPDchat

Maryse #Antiracist @AllThingsMaths · 20h

I also think it's important to let students develop their ideas too, regardless of the vocabulary they use. E.g. we've been working on commutative properties but just using our fingers to indicate switching. Then we learned the actual word. #mathscpdchat

Maryse #Antiracist @AllThingsMaths · 20h

The language can support students to express what they want to but can also be a hindrance if they MUST use it first (IMO). The ideas can be more secure than the words sometimes #mathscpdchat

The following short thread ends the network of conversations that resulted from a direct reply to Q1 from Susan Whitehouse:

Maryse #Antiracist @AllThingsMaths · 20h

I also think it's important to let students develop their ideas too, regardless of the vocabulary they use. E.g. we've been working on commutative properties but just using our fingers to indicate switching. Then we learned the actual word. #mathscpdchat

Susan Whitehouse @Whitehughes · 21h

Replying to @AllThingsMaths and @MrsJHawkins2007

Absolutely! A student could communicate their Maths clearly without knowing precise vocabulary #mathscpdchat

Jane Hawkins @MrsJHawkins2007 · 21h

Oooh, not sure about this one - student offered me 'out-terior' in relation to a new bit of a shape we were thinkin about - I knew what they meant! #mathscpdchat

Maryse #Antiracist @AllThingsMaths · 21h

But does the vocab have to come first? Sometimes it can come after esp when students are forming their own ideas and exploring concepts rather than straight DI #mathsCPDchat

A direct reply to Q1 from Simon Ball initiated this conversation:

Jane Hawkins @MrsJHawkins2007 · 17h

Q1. How can we support students to communicate effectively in their maths lessons? #mathscpdchat

Simon Ball @ballyzero · 17h

Replying to @MrsJHawkins2007

An emphasis on correct terminology helps. I still find my Year 13 students unwilling to say things like “two to the power of n” or “log to the base two of x”. I’m sure they’re writing the right things down, but the words are important too! #mathscpdchat

Jane Hawkins @MrsJHawkins2007 · 17h

Yes! Definitely! To what extent do you think their experience up to Y13 has impacted on their internal dialogue around the maths? What do they want to say instead of "two to the power of n"? #mathscpdchat

Simon Ball @ballyzero · 16h

Oh, well, their experiences in education over the past two years has made them unique in my teaching experience, and there are all sorts of odd gaps in their knowledge and dialogue. The answer to the second question is “two n”, unfortunately! #mathscpdchat

Jane Hawkins @MrsJHawkins2007 · 16h

Ah, yes the gap thing is weird isn't it. Do you think the 2n is a misconception or mis-reading or otherwise? When they see 2^n do they do 2xn or 2x2x2x2x..... #mathscpdchat

Simon Ball @ballyzero · 16h

In my opinion, it’s more laziness than anything else! 😅 They’ve not used actual 2n for much in quite a while, so it’s easier to say “two n” for “two to the power n”. A shortcut. An incorrect one, mind you! #mathscpdchat

A direct reply to Q1 from Martyn Yeo initiated this conversation about sentence starters and stem sentences:

A direct reply to Q1 from Alice Ward-Gow initiated this conversation about 'modelling' and whether/how teachers use language differently with different groups of students

Jane Hawkins @MrsJHawkins2007 · 17h

love this reply, thank you @mcwardgow! Do you mean teacher modelling or peer modelling? Can I also ask, what KS you're thinking/working in mainly? #mathscpdchat

Miss Ward-Gow @mcwardgow · 16h

I meant teacher modelling (but can also see a benefit to peer modelling). Does the Key Stage affect the modelling? 🤔 KS3/4 but only because that's what I teach 😃 #mathscpdchat

Jane Hawkins @MrsJHawkins2007 · 16h

Great question, I'm not sure it does, the language used in KS2 (and 1) is really sophisticated, perhaps 'ability' set impacts more than KS in our language choices? #mathscpdchat

Miss Ward-Gow @mcwardgow · 16h

Had a conversation once at a meeting about whether we use different language/definitions depending on sets - it was very thought-provoking (and made me reflect) #mathscpdchat

Maryse #Antiracist @AllThingsMaths · 17h

My daughter is in Y4 and I'm blown away with the rigor in language. I need to revisit primary as it's been a while, and see the amazing things they are doing. #mathsCPDchat

Jane Hawkins @MrsJHawkins2007 · 16h

100% agree!!! Consistency and coherence - if you're interested in the KS2/3 transition stuff check out #Y58Continuity #mathscpdchat

This direct reply to Q1 …

Jane Hawkins @MrsJHawkins2007 · 17h

Q1. How can we support students to communicate effectively in their maths lessons? **#mathscpdchat**

… from Margaret Anne Clark introduced 'concept cartoons' into the discussion:

Margaret Anne Clark @maclark35 · 17h

Replying to @MrsJHawkins2007

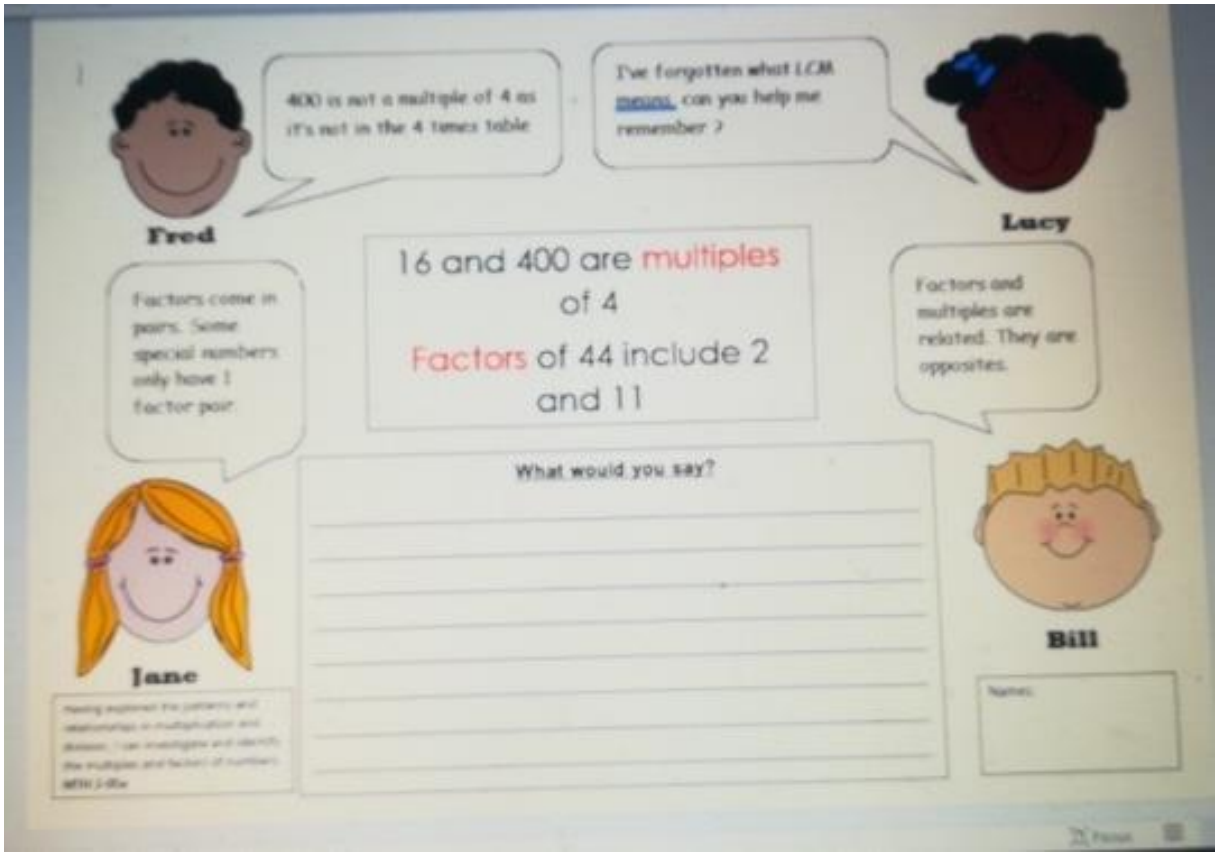
I've recently been using concept cartoons as a provocation - this has encouraged some of my learners who find cold-call a bit scary

Jane Hawkins @MrsJHawkins2007 · 16h

Oh wow, where do you get your maths cartoons from?!?!? #mathscpdchat

Margaret Anne Clark @maclark35 · 16h

think you can buy books, but I'm cheap so I make my own!Same template for all concepts - just change the provocation and what the cartoon kids say.Making my own means I can pick up on misunderstandings I've heard or expect and get learners to think them thru. #mathscpdchat



Margaret Anne Clark @maclark35 · Mar 29

Once you've got your templates, they literally take 5 mins to change. My kids really like them!

Wait.... Could get the kids to make them!! #nextsteps #mathscpdchat

Martyn (He/Him) @martynyeouk · 16h

Ive used teachers saying things instead of cartoons - especially enjoy when I say the wrong thing to show I make mistakes too. Plus the children love proving me wrong! #mathscpdchat

Margaret Anne Clark @maclark35 · 16h

Ha ha ha! Yes! I was thinking that a dress-up photo version would be fun...

.... Or weird.....!

Amanda Mckay @amandamckay235 · 21h

Replying to @maclark35 and @MrsJHawkins2007

@mathsRae could we build this in?

Rae @mathsRae · 2h

Great idea. Reminds me of when I used to use a phone template for key points and get pupils to 'text' a friend what they just learnt.

Another direct reply to Q1 …

Jane Hawkins @MrsJHawkins2007 · 17h

Q1. How can we support students to communicate effectively in their maths lessons? **#mathscpdchat**

… from Tom Oakley led to more discussion about modelling:

Tom Oakley @ThatMathsMan · 17h

Replying to @MrsJHawkins2007

1. We can provide clear models of communication. By modelling coherent and concise explanations, we can describe concepts clearly and set high expectations. #mathscpdchat

Jane Hawkins @MrsJHawkins2007 · 17h

So much here @ThatMathsMan! Modelling seems to be a recurring theme, do you plan what you're going to say as part of your modelling?

Couldn't agree more about high expectations too! #mathscpdchat

Tom Oakley @ThatMathsMan · 17h

Absolutely. We need to be as intentional about our explanations as we are about our choice of examples.

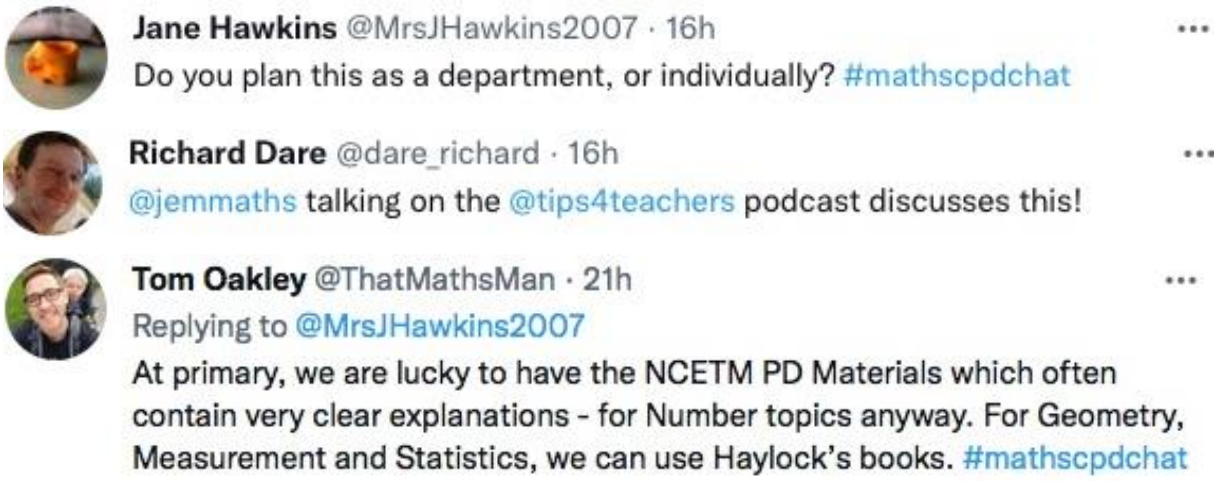
It's too easy to overlook how best to define or describe something when planning, but it certainly pays off when we do.
#mathscpdchat

Jane Hawkins @MrsJHawkins2007 · 16h

Do you think part of that is because we are all going to speak, without planning, to all of our students every lesson, so planning our talk gets overlooked? #mathscpdchat

Tom Oakley @ThatMathsMan · 16h

Maybe. But I hope that, of all the things we plan, key explanations are near the top of the list. #mathscpdchat



In this conversation started by a direct reply to Q1 …

… from Peter Williams 'backwards fading' was discussed:

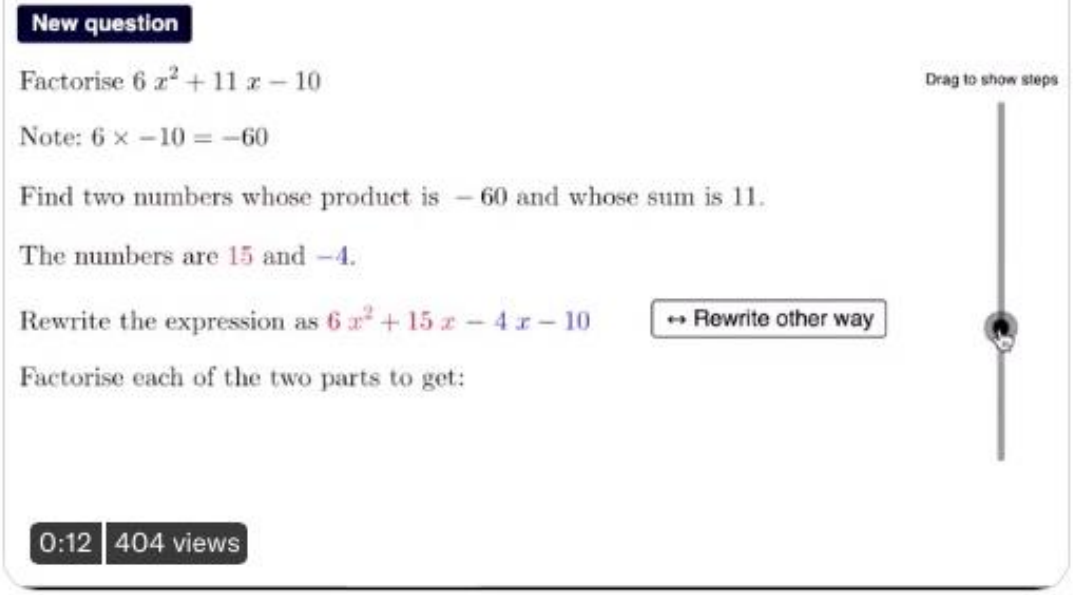
Peter Williams @MathsImpact · 16h

Start with the full process, then slowly remove steps for students to complete the process.

They have to practice writing every step, not just the final answer.

Here's a nice interactive example
twitter.com/boss_maths/sta..

#mathscpdchat

> **Sudeep** @boss_maths · Jan 26, 2020
>
> In response to a recent request from a fan of backwards fading: an applet that generates non-monic quadratic expressions to factorise by grouping, with full step-by-step solutions that can be revealed incrementally.
>
> 
>

This conversation, which was started by a direct reply to Q1 …

Jane Hawkins @MrsJHawkins2007 · 17h

Q1. How can we support students to communicate effectively in their maths lessons? #mathscpdchat

… from Margaret Anne Clark, was about various teaching strategies, such as using the student-working structure known as 'think, pair, share':

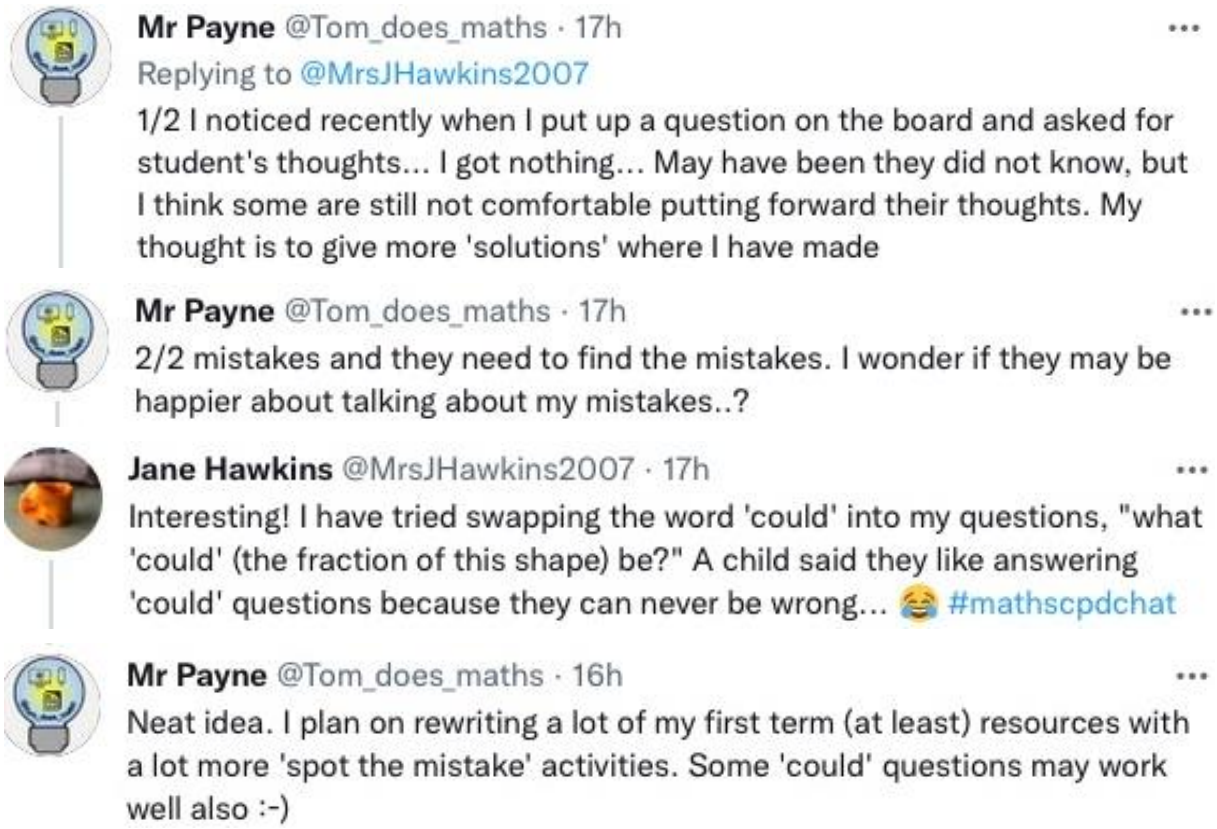
Margaret Anne Clark @maclark35 · 17h
Replying to @MrsJHawkins2007
Think, pair, share so that every child has an answer to give, thinking time before we ask a child to answer, questions such as 'do you agree? Can you add anything? Can you give an example?' modelling,rephrasing and using correct terminology as other people have said #mathschatcpd

Amanda Mckay @amandamckay235 · 16h
Totally agree, I love think pair share. Build one the previous answer, do you agree with... the list goes on

Jane Hawkins @MrsJHawkins2007 · 16h
Have you read 'Private talk, public conversation' by Mike Askew? If not, definitely worth a read. Only a few pages and really accessible!
mikeaskew.net/page3/page5/fi... @mikeaskew26 #mathscpdchat

Margaret Anne Clark @maclark35 · 16h
No, but heading over - thanks for the link!

This conversation is the last one recorded here that was prompted by Jane's Q1. It is about changing something in one's practice as a result of a 'noticing':



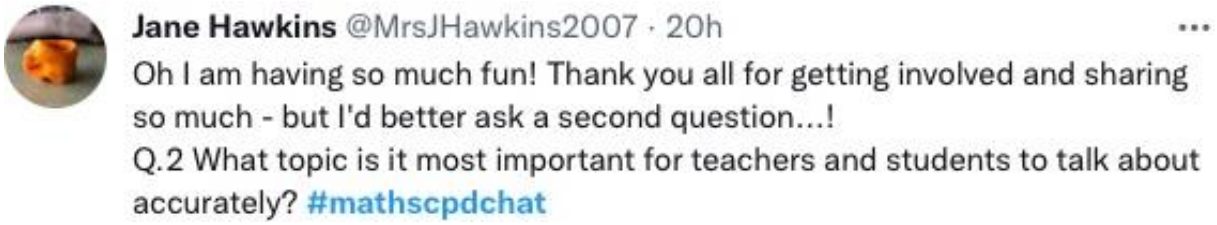
Mr Payne @Tom_does_maths · 17h
Replying to @MrsJHawkins2007
1/2 I noticed recently when I put up a question on the board and asked for student's thoughts... I got nothing... May have been they did not know, but I think some are still not comfortable putting forward their thoughts. My thought is to give more 'solutions' where I have made

Mr Payne @Tom_does_maths · 17h
2/2 mistakes and they need to find the mistakes. I wonder if they may be happier about talking about my mistakes..?

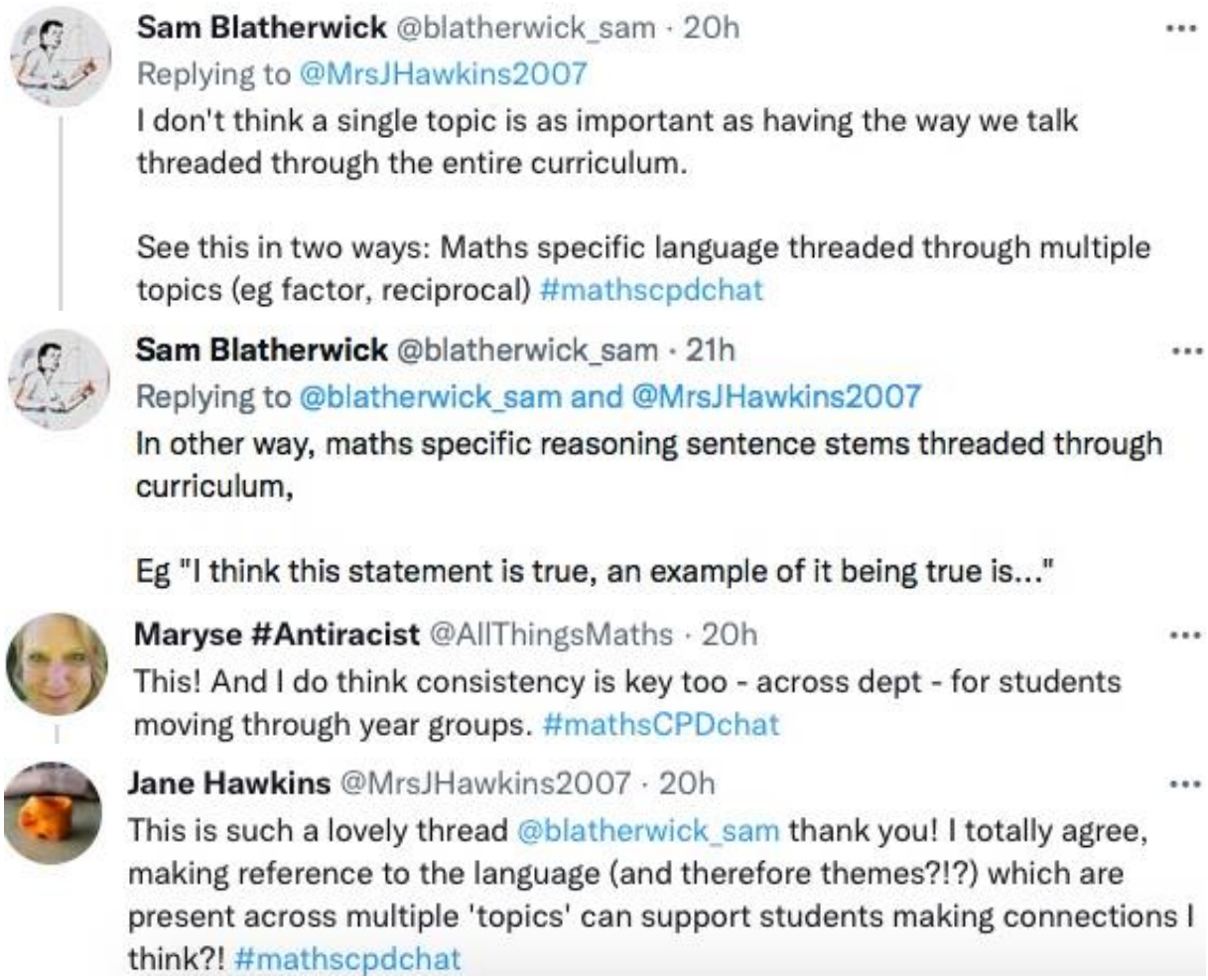
Jane Hawkins @MrsJHawkins2007 · 17h
Interesting! I have tried swapping the word 'could' into my questions, "what 'could' (the fraction of this shape) be?" A child said they like answering 'could' questions because they can never be wrong... 😂 #mathscpdchat

Mr Payne @Tom_does_maths · 16h
Neat idea. I plan on rewriting a lot of my first term (at least) resources with a lot more 'spot the mistake' activities. Some 'could' questions may work well also :-)

The screenshots below show conversations and single replies generated by Jane's second and third main questions. Teachers discussed whether or not 'accurate mathematical talk' is particularly important when students are talking about certain identifiable mathematical ideas/topics, and some kinds of prompts-for-mathematical-talk were mentioned. **Click on any of the following screenshots-of-a-tweet to go to that actual tweet on Twitter.** The following conversations were generated by two questions from Jane Hawkins, the first sequence of conversations being responses to her second question:



Q2 generated several conversations and a few 'single' replies. This conversation, between Sam Blatherwick, Maryse and Jane Hawkins, was not the only one in which no particular mathematical topics were discussed …



… unlike this discussion between Alice Ward-Gow, Jane Hawkins and Mr Hawes …

Miss Ward-Gow @mcwardgow · 20h
Replying to @MrsJHawkins2007
Dare I say it… negative numbers!!! 😬😬😬 #mathscpdchat "two negatives make a positive" 🙈🙈🙈

MrHawesMaths @HawesMaths · Mar 29
Replying to @mcwardgow and @MrsJHawkins2007

Jane Hawkins @MrsJHawkins2007 · 20h
Replying to @mcwardgow
a minus minus a minus?!?!? Q. do you use directional language when talking negative? #mathscpdchat

Miss Ward-Gow @mcwardgow · 20h
Not sure what you mean? 🙈 #mathscpdchat

Jane Hawkins @MrsJHawkins2007 · 20h
Up, down, left, right. Thinking of a numberline I think? Sorry, should have been clearer with my language! 😅 #mathscpdchat

Miss Ward-Gow @mcwardgow · 20h
I do use a number line sometimes or make references to temperature 🤦‍♀️ I could definitely do more on this topic though #mathscpdchat

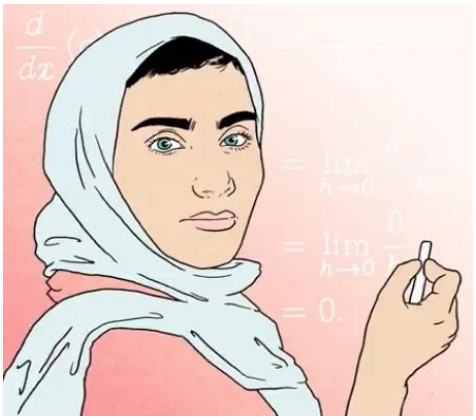
… and this comment from Simon Ball … in which he **also** mentions directed number:

Simon Ball @ballyzero · 20h
Replying to @MrsJHawkins2007
Oooooof! A huge question. Of course, maths is rooted in accuracy at all times! On the other hand, topics that spring to mind include inequalities, directed number (there's a particular phrase I'm thinking of, and oh boy does it cause problems!), and percentages. #mathscpdchat

In these linked comments (also generated, along with all the present conversations, by Jane's second question which is shown again as a reminder) from Lucy Rycroft-Smith, Margaret Anne Clark and Mary Pardoe the focus is again not on any particular mathematical topics …

Q.2 What topic is it most important for teachers and students to talk about accurately? #mathscpdchat

Lucy @honeypisquared · 20h
Replying to @MrsJHawkins2007
Themselves as mathematicians #mathscpdchat



Margaret Anne Clark @maclark35 · 20h
Replying to @honeypisquared and @MrsJHawkins2007
Oh yes!! THIS!!

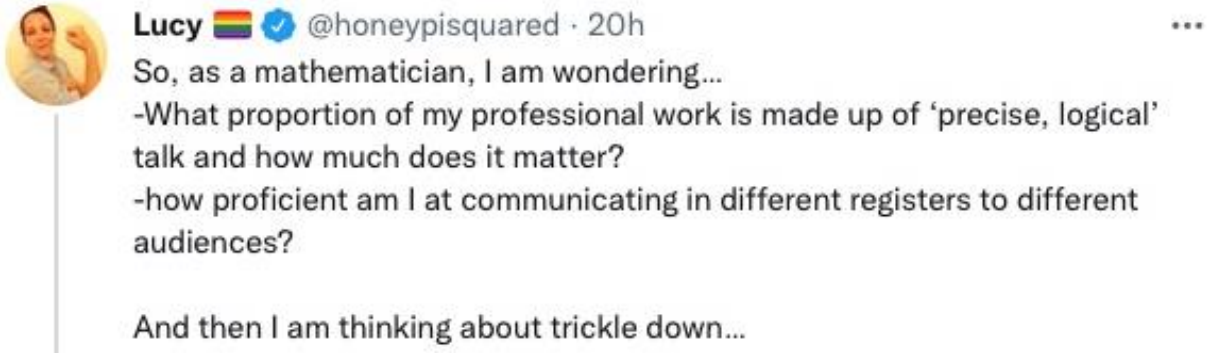
Mary Pardoe @PardoeMary · 21h
Replying to @honeypisquared and @MrsJHawkins2007
What a student says to other students can have much more impact than what their teacher says. Your comment prompted me to think about that! #mathscpdchat

… and reasons for not indicating particular mathematical topics are discussed in this conversation between Susan Whitehouse, Lucy Rycroft-Smith, Richard Dare and Jane Hawkins:

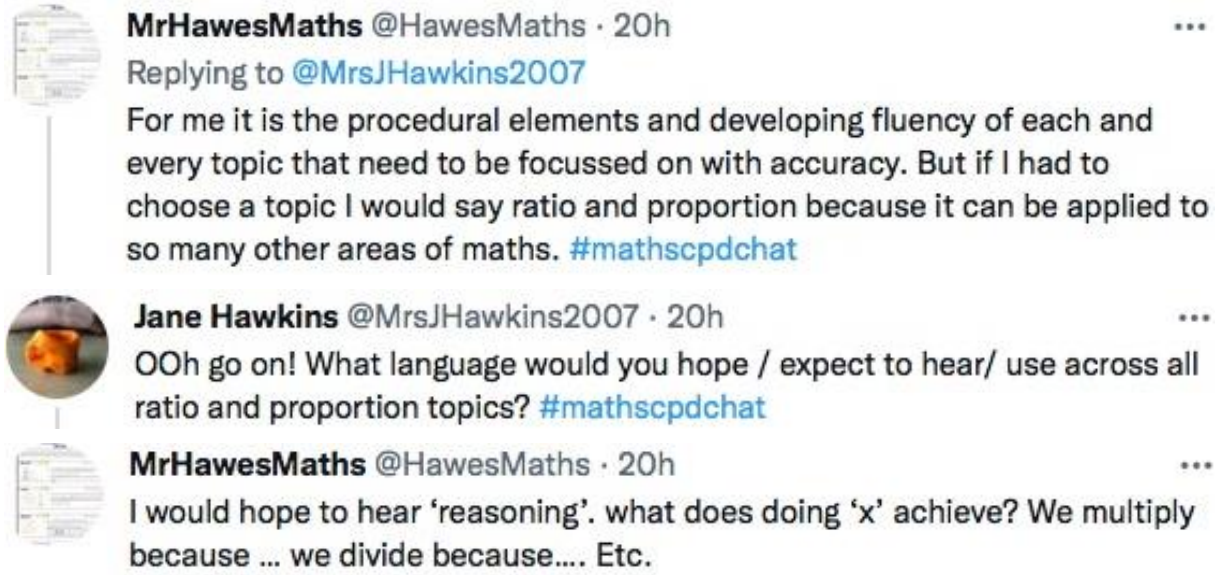
Susan Whitehouse @Whitehughes · 20h
Replying to @MrsJHawkins2007
I don't want to choose a topic because I fear that would detract from the idea that it must permeate all of our teaching; it must be the way we teach Maths #mathscpdchat

Lucy @honeypisquared · 20h
I'm going to push back on this one a little and ask what does 'talking accurately about' mean? And also: where is the place of mathematical sense-making here? #mathscpdchat

Richard Dare @dare_richard · 20h
Precision, logic and mathematical vocabulary?



But, in contrast, ratio and proportion was the mathematical topic of this short conversation between Mr Hawes and Jane Hawkins …



… and geometry was discussed by Martyn Yeo and Jane Hawkins:

Martyn (He/Him) @martynyeouk · 20h

I just think it is an area where language has to be very precise as there are so many different elements #mathscpschat

As had occurred during a previous #mathscpdchat about students' abilities to communicate in maths, a reference to Frayer models was included in this interchange between Tom Oakley and Jane Hawkins:

Tom Oakley @ThatMathsMan · 20h

Replying to @MrsJHawkins2007

2. I think all topics contain technical language which is loaded with meaning. So it's important that children understand the meaning, the context in which the word can be used in or applied to, and examples and non-examples of it. Frayer models can help with this.
#mathscpdchat

Jane Hawkins @MrsJHawkins2007 · 20h

I think this about the word 'area' sometimes, 'protect their AREA on a football pitch' no problem, but in maths area/perimeter often confused, I doubt they would only protect the painted lines on a football pitch!
#mathscpdchat

The 'single' replies shared in response to Jane's second question were from Maths at the Marist School …

Maths | The Marist School @Marist_Maths · 19h

Replying to @MrsJHawkins2007

I'm battling laziness in talking about half when you just mean 2 pieces, and square when it's rectangular.

… and Margaret Anne Clark:

Margaret Anne Clark @maclark35 · Mar 29

Mindset - and dismantling these:
a) maths is too difficult
b) maths is boring
c) maths isn't creative
d) maths is only for brainy people.

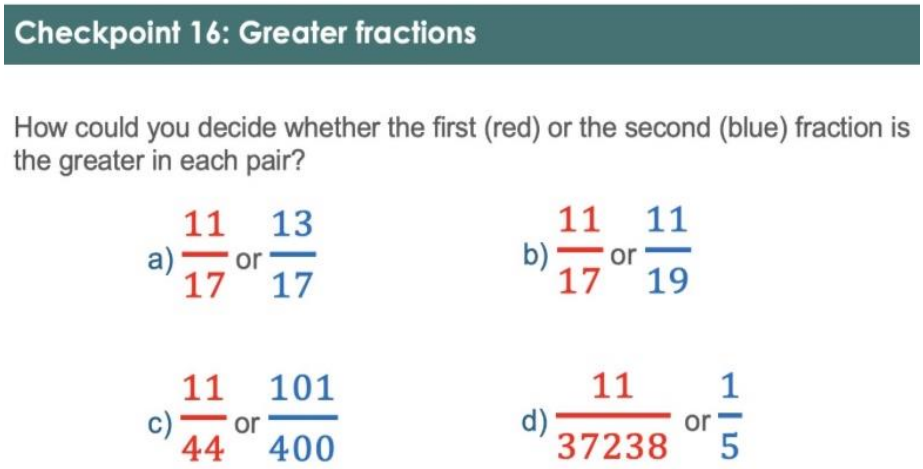
I checked out of maths in P5 (9yrs old) and hated it for years. My teacher goal is none of my learners experience that.

This last question (Q.3) from the host, Jane Hawkins …

Jane Hawkins @MrsJHawkins2007 · 21h

Sorry, I'm getting so distracted with all the great stuff! Definitely going to have to read through again tomorrow and compile all the gems for trying out!

Q.3 (not a question) some maths from @ncetm, I LOVE this, accompained by 'and how do you know?' #mathscpdchat



… generated this response from Leona Saker…

Leona Saker @leona_saker · 21h

Replying to @MrsJHawkins2007 and @NCETM

Love this! #NCETMcheckpoints supporting and developing Oracy between the pupils. Promoting reasoning rather than calculations to compare the fractions in this example.

… and was followed by another question from Jane Hawkins …

Jane Hawkins @MrsJHawkins2007 · 21h

Replying to @MrsJHawkins2007

If you have a favourite conversation stimulus, please add it here!! #mathscpdchat

… which generated this interchange between Tom Oakley and Jane Hawkins:

Tom Oakley @ThatMathsMan · 21h

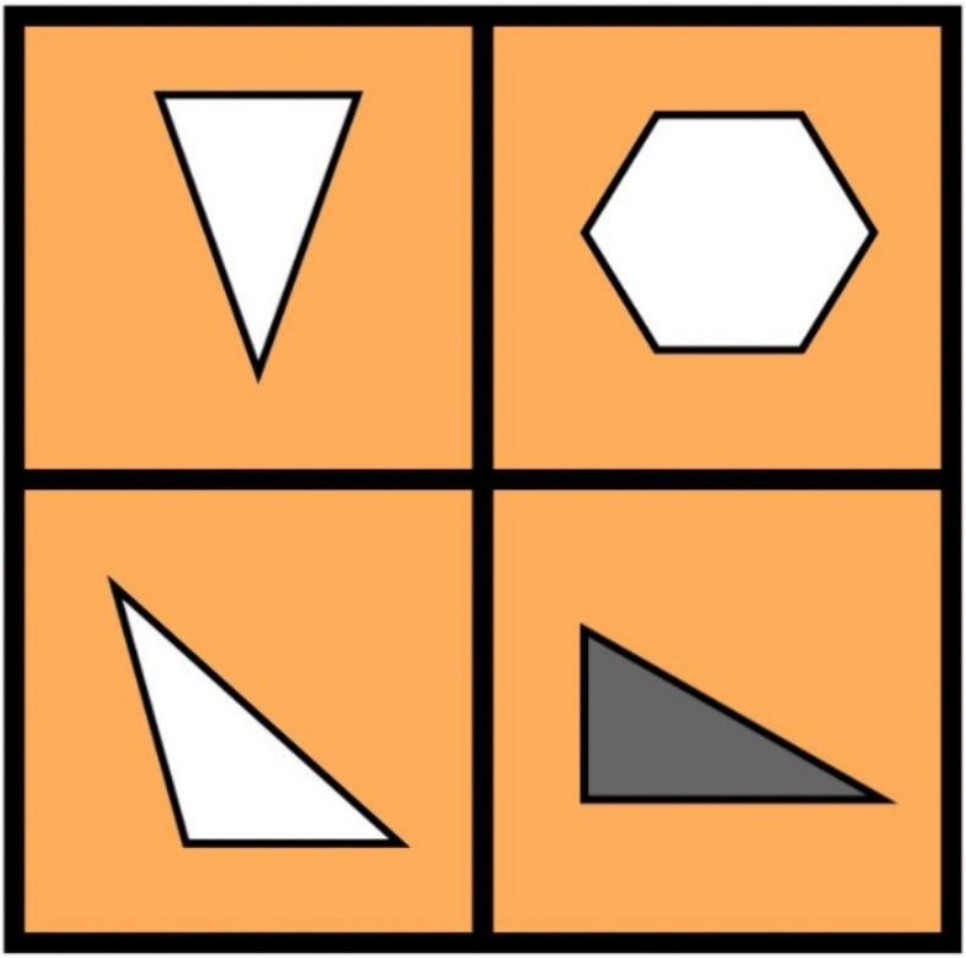
Replying to @MrsJHawkins2007

Favourite conversation starters/routines include
- odd one out, or WODB?
- Maths Eyes
- Number Talks
- Barrier games
- Agree, expand or challenge?
- Always, sometimes, never
- Concept cartoons

#mathscpdchat

Jane Hawkins @MrsJHawkins2007 · 21h

Yes, love WODB, I had one for this evening (incase no-one replied much) totally not necessary, everyone has been amazing! wodb.ca/index.html #mathscpdchat



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