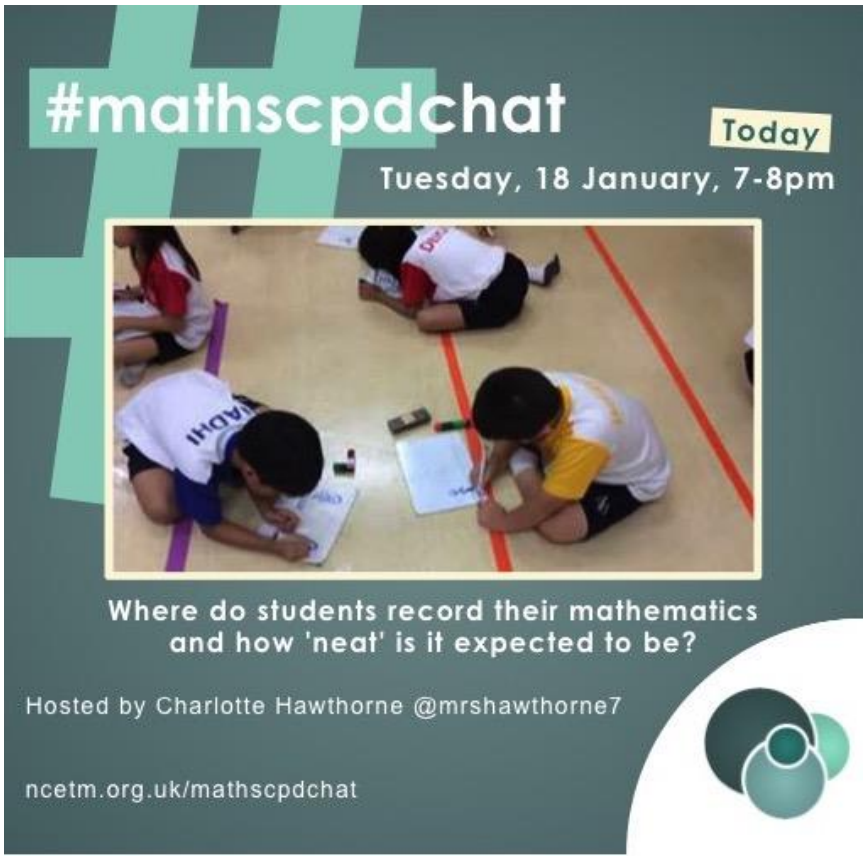
#mathscpdchat 18 January 2022

Where do students record their mathematics, and how neat is it expected to be?
Hosted by Charlotte Hawthorne

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

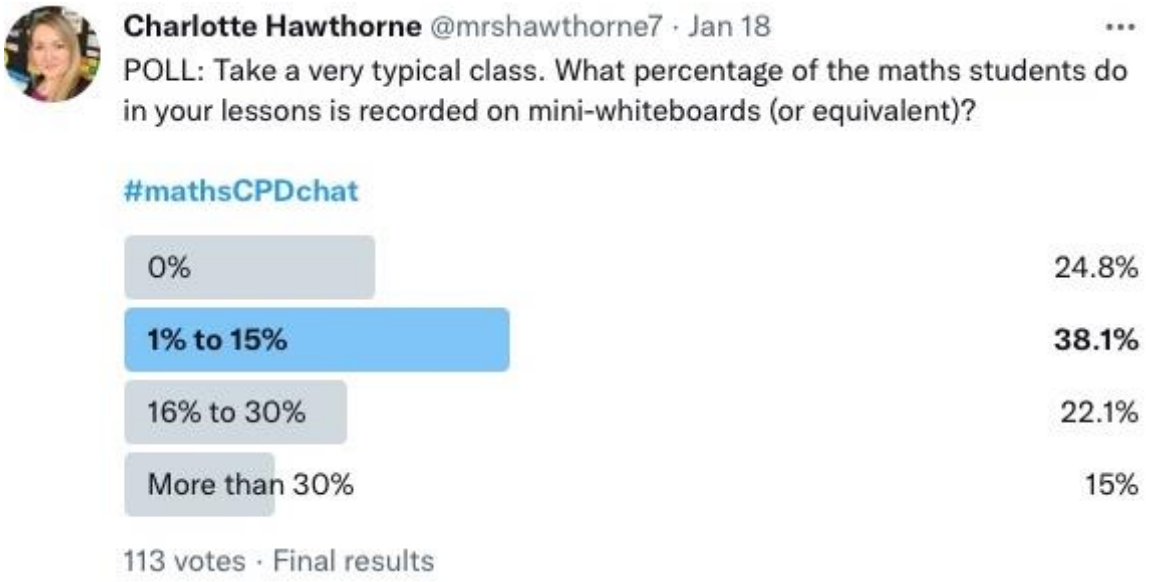


The only link shared during this discussion was:

Children's Mathematical Writing which is an article from NRICH by Bernard Bagnall. The author explains, with illustrated examples, how teachers can support pupils' learning by allowing them to record their mathematical ideas as they wish. It was shared by Mary Pardoe

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

At the start of the chat the host tweeted this poll:



The host's first question …

… prompted some discussion about ways of interpreting 'presentation' …

Peter Gates @petergates3 · 2h

This, though, is about organisation not neatness. Organisation is about logic, Visuo-spatial preparation, thinking ahead. My writing is untidy (I can't read a shopping list I have written myself!) but my shopping list mirrors the layout of the shop! Hence I can usually sort it.

… during which people shared various views about its importance. This tweet clearly expresses a common view …

rohlfo @heavymetalmaths · 14h

Replying to @mrshawthorne7

yes and no? if they're working on a puzzle in lessons and discussing and trying things out etc then be as messy as you like! if it's something for me to read, or a final solution to said puzzle, then I'd expect a certain (mathematical) standard of layout.

… which was modified by other comments …

Chris Honey @coldzampa · 14h

Replying to @mrshawthorne7

When I work on problems at the limits of my understanding of maths (recreationally) it can look like someone has puked numbers over the page, when I am scrambling to make sense of the problem. When I solve the problem to my satisfaction I won't then write it out neatly.

Chris Honey @coldzampa · 14h

I think students often have the same approach but they don't realise we might need to assess their solution and it makes our lives more difficult if it is not completed in an orderly fashion.

Catherine Edwards @Edwards08C · 14h

Replying to @mrshawthorne7

Their presentation needs to aid their ability to do the maths, but otherwise it's fine. Doing hard maths is messy, stuff gets crossed out/corrected etc.

#mathscpdchat

Miss Freeman @TeacherMsF · 14h

Replying to @mrshawthorne7

Try to encourage good habits with layout and structure of workings etc but some still see the book almost like a jotter pad. #mathsCPDchat

… and modified further:

Miss Ward-Gow @mcwardgow · 14h

Replying to @mrshawthorne7

Yes because we're not just teaching maths, we're teaching students how to approach different problems and they need to be able to show their steps/reasoning through clear presentation 🙂 #mathscpdchat

Some discussion developed from a comment about how too much emphasis on 'neatness' can hamper learning:

Amie @alcmaths · 14h

Replying to @mrshawthorne7

I think too much of a focus on presentation encourages students to care about the wrong things. So many students are afraid to try a question, as they may have to cross it out and have a messy book!

Jenny Hill-Parker @JennyHillParker · 14h

Could they get past this by working on a mwb, getting feedback and addressing misconceptions until they get a correct answer, and then transferring into their book. Can use this method to encourage weak and/or nervous students to engage in questioning too #mathscpdchat

Charlotte Hawthorne @mrshawthorne7 · 14h

Definitely, but I've heard of teachers being pulled up for lack of challenge if the students are getting everything correct in their books #mathsCPDchat

MrHawesMaths @HawesMaths · 14h

I curious to know how that shows lack of challenge. It could be that it took the student 30 mins to get those 4 questions correct through verbal communication, perseverance, diligence etc etc. context is everything. #mathscpdchat

Jenny Hill-Parker @JennyHillParker · 20h

Replying to @mrshawthorne7 and @alcmaths

Yep, there's a great quote somewhere about making progress and how this means making mistakes. Can't remember where I've seen it! 🤦‍♀️

Charlotte Hawthorne @mrshawthorne7 · 20h

Could they have made their mistakes on mini-whiteboards though? Or verbally? #mathsCPDchat

Karen @karenshancock · 19h

My year 9 students often work on MWB and just write the answer on the worksheet in class. At home they'll do the whole question.
But in lessons the MWB suits some of them better - especially if I don't give them enough room on the page. #mathscpdchat

Mary Pardoe @PardoeMary · 19h

So they can think calmly at home about how to present their reasoning clearly. I like that!
#mathscpdchat

Some teachers were thinking about students' exam 'performances' …

Mr B Maths @MrBMaths3 · 14h

Replying to @mrshawthorne7

I think there needs to be a certain level of presentation. When marking year 11 mocks in December was hard to tell what was going on for some of the answers. If we don't get that right in class, they won't do it in other environments #mathsCPDchat

MrN @neasham_a · 14h

Replying to @mrshawthorne7

Yes. Well structured work. Needs to be easy for me to follow. Or someone else (eg future examiner) to follow. Neatness tends to lead to more accuracy. Easy to encourage students to check their own working line by line in the future.

… which prompted some more general questions, ideas and discussion:

Charlotte Hawthorne @mrshawthorne7 · 14h

Have you got any tips for getting students to improve their presentation? Are you bothered about titles and underlined things or just the clarity of their maths? #mathsCPDchat

Peter Gates @petergates3 · 3h

Replying to @mrshawthorne7 and @MrBMaths3

Writing frames? I have used that idea quite a lot. Especially at A level.

Jenny Hill-Parker @JennyHillParker · 14h

I'm bothered about titles being underlined for the same reason I'm bothered about near uniforms. It's the constant reinforcing of the necessity of high standards #mathscpdchat

Mr B Maths @MrBMaths3 · 16h

Replying to @mrshawthorne7

Generally less fussed by underlining etc (although like many it is a school rule). I am also interested in students presentation across subjects. Scruffy presentation across all subjects is more acceptable then scruffy in maths yet neat in science (as an example) #mathsCPDchat

Replies to Charlotte's second question …

Charlotte Hawthorne @mrshawthorne7 · 15h

Q2: Controversial one (possibly)...What colour are your maths books and are they lined/squared...what size squares?
A4, A5, A4+ or have you gone full on booklet?

Do they have a separate book for rough work or homework?

#mathsCPDchat

… revealed that pupils' writing/drawing/recording is done in a variety of 'books'. Key Stage 3/4/5 students mainly use A4 books (which are orange-coloured in many schools) with 5 mm squares, although some schools provide A5 books for KS3 students. Primary pupils mainly do written maths on 7 mm squares, and at least one secondary school provides A4 and A5 books with 7 mm squares, and another provides A4 books with plain paper. Some teachers provide hole-punched books:

Lorraine Heather @lkheather · 3h

All books are hole punched so worksheets can be treasury tagged in the book at the relevant places. No glue!!!

There was a discussion between a primary and a secondary teacher about sizes of squares …

Martyn (He/Him) @martynyeouk · 15h

Replying to @mrshawthorne7

Yellow cover with squares that get smaller as go through year group. Same book for all maths
#mathscpdchat

Charlotte Hawthorne @mrshawthorne7 · 15h

Ah, so year 7 start with larger squares and transition to smaller ones... I can see the benefit in that! #mathsCPDchat

Martyn (He/Him) @martynyeouk · 15h

Actually im primary - so year 1 to 6 have different sizes :) #mathscpdchat

Charlotte Hawthorne @mrshawthorne7 · 15h

Ah yes, of course, sorry. I often find some y7 who could do with larger squares for longer though, IMO. #mathsCPDchat

Martyn (He/Him) @martynyeouk · 15h

How small do you go? #mathscpdchat

Charlotte Hawthorne @mrshawthorne7 · 15h

5mm #mathsCPDchat

… and some discussion between secondary teachers about lined paper:

Educator Supe @ShakinthatChalk · 15h

Replying to @mrshawthorne7

A4 lined books
Colour coded by year group

Virtually instant impact on quality of written work recorded.
Colours by year group make managing books a breeze.

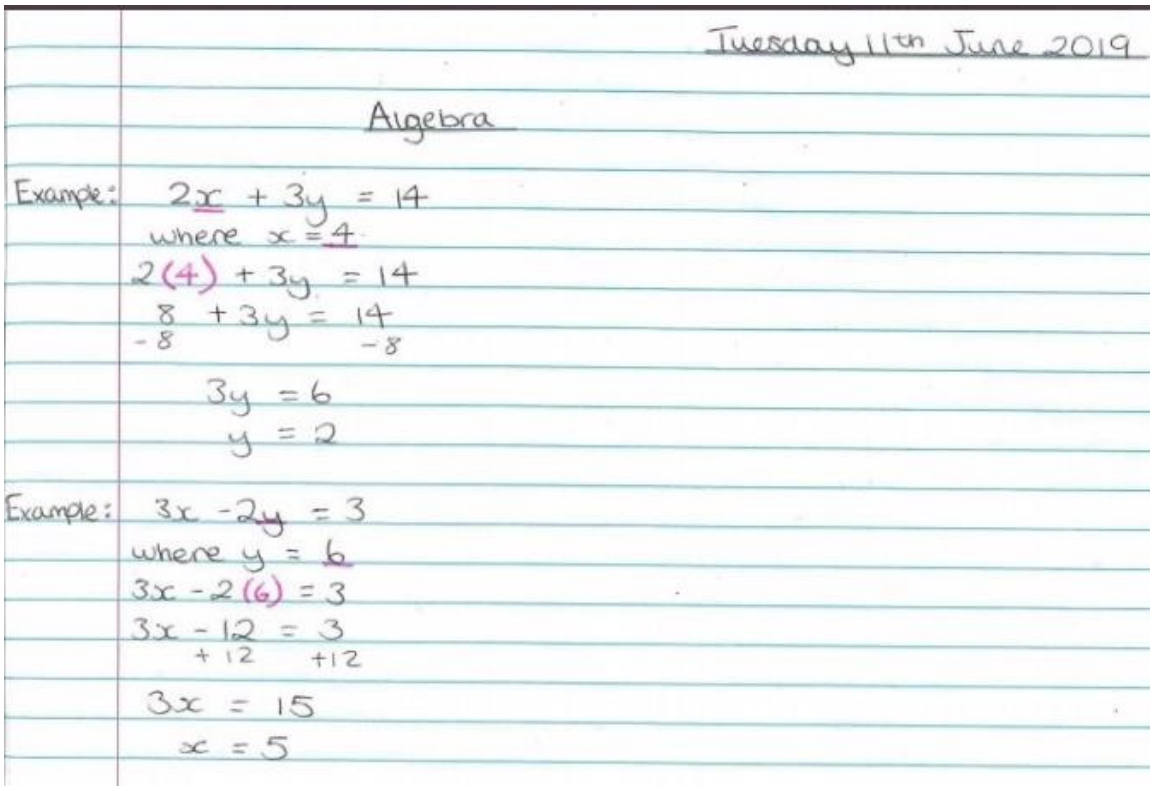
#mathsCPDchat

Charlotte Hawthorne @mrshawthorne7 · 15h

Was the quality improved by the switch to lined paper do you think?
#mathsCPDchat

Partridge Maths @ah_haMaths · 15h

Maths on lined paper looks lush. So much better than squares.



Graphic organisers were mentioned …

Catherine Edwards @Edwards08C · 15h

Replying to @mrshawthorne7

Mostly booklet
A4 5mm squares for assessed work
One class has A3 sketch books too as we're working on graphic organisers this year
#mathscpdchat

Catherine Edwards @Edwards08C · 19h

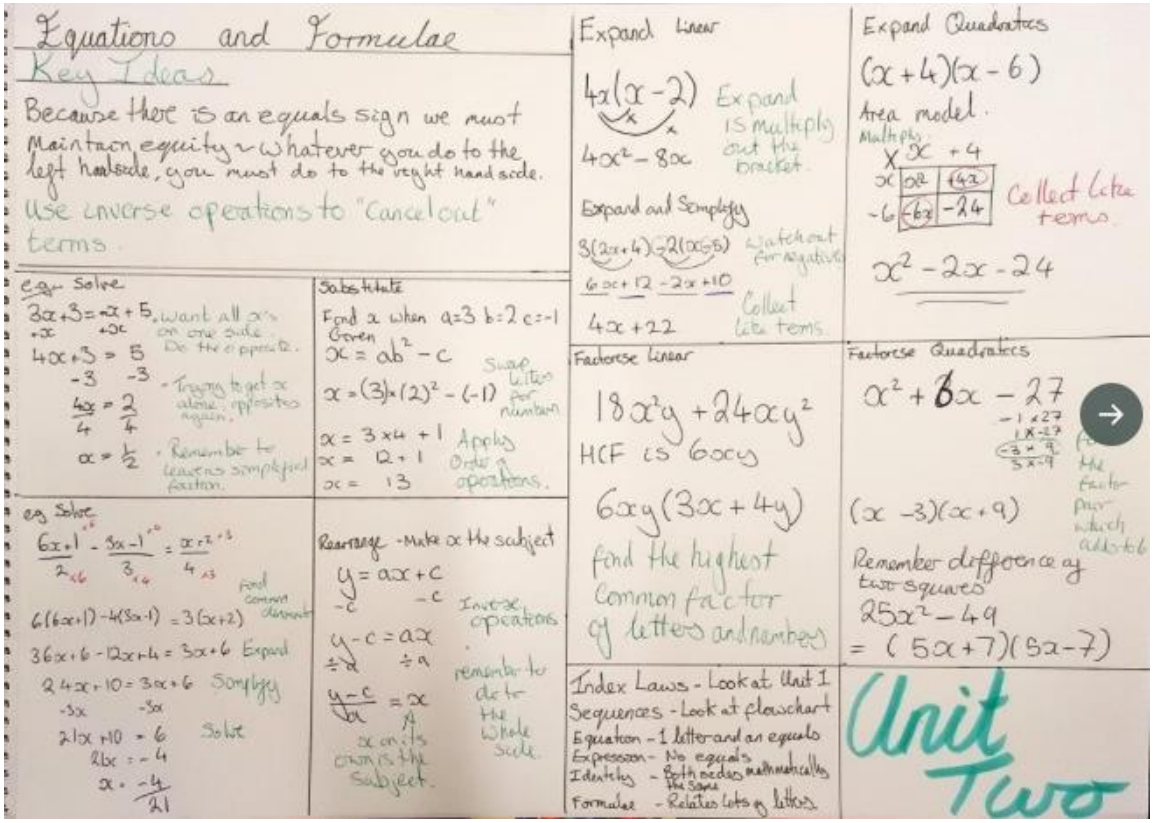
Replying to @mrshawthorne7

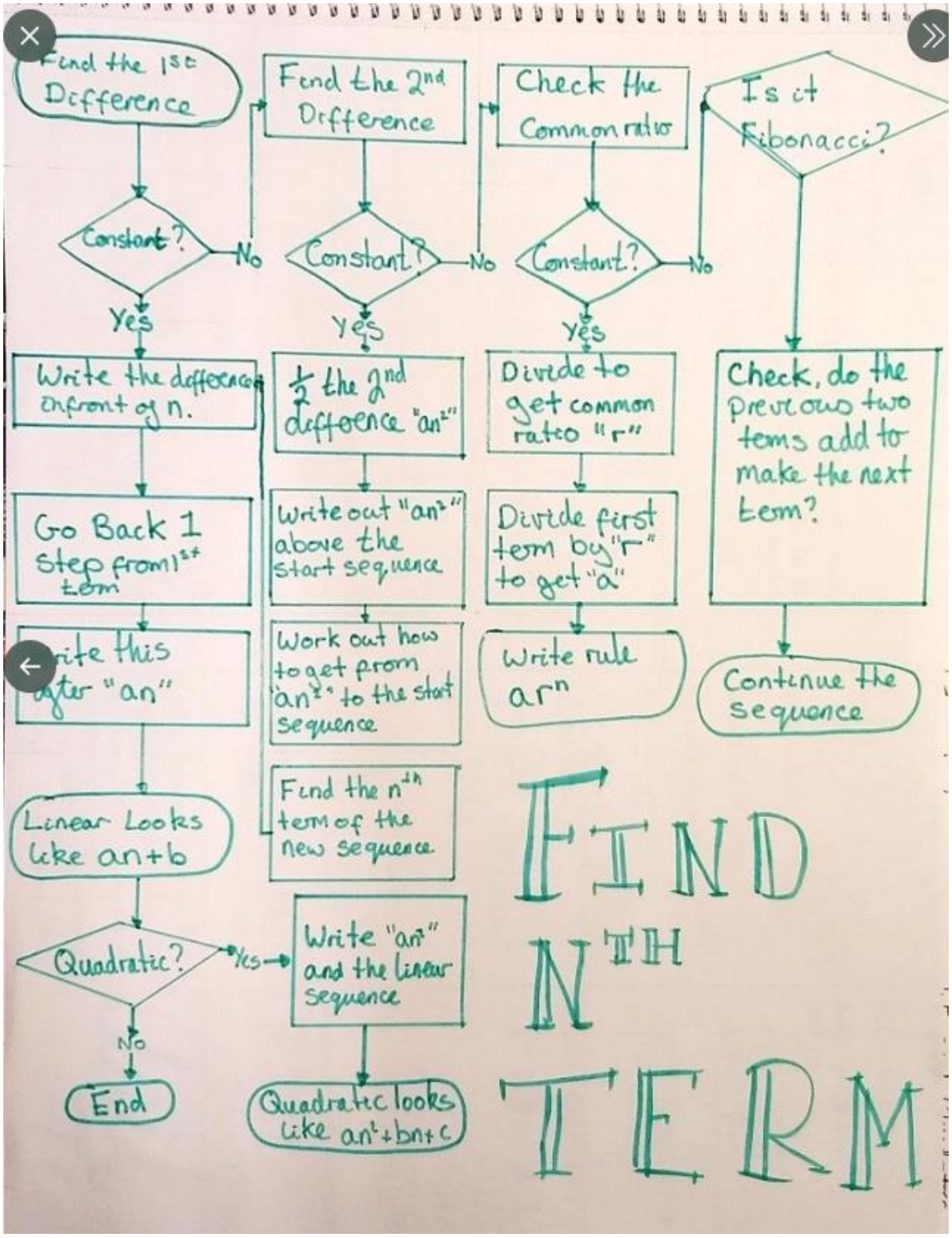
Fully creating from scratch
Initially collaboratively, working to more independence.
I'll see if I have an image on my phone
#mathscpdchat

Catherine Edwards @Edwards08C · 15h

#mathscpdchat

These are two we've done.
Graphs and averages up next, so we're going to try a matrix.
We also did a mindmap but I don't have that on my phone.





Mrs S @RuthStrudwick · 5h

Replying to @Edwards08C and @mrshawthorne7

Do the pupils construct these themselves or is it copied from the board?

… and whiteboard workbooks:

Martyn (He/Him) @martynyeouk · 15h

Replying to @mrshawthorne7

At my previous school I used to have whiteboard work books which were plain (same size as mini whiteboard) was great way to collect evidence of jottings. #mathscpdchat

The following tweet from rohlfo generated a discussion about 'notes', 'copying' … and about students 'generating their own notes':

rohlfo @heavymetalmaths · 15h

Replying to @mrshawthorne7

I have little say in the matter.....although I can choose number of books and how to use. I have adapted to the pupils at this school a bit, but have a "notes book" (for neat examples and to use as a revision aide essentially) and a "exercise book" which is for everything else

Charlotte Hawthorne @mrshawthorne7 · 18h

I've often wondered if this might be an option to use in maths. In maths so much of their book is them attempting and practising and this could be messy. Having a neat book for notes and definitions and things, what do people think? #mathsCPDchat

rohlfo @heavymetalmaths · 19h

Replying to @mrshawthorne7

in case there was any doubt for people reading, this is NOT a "rules book". I don't like that idea.
Pupils know that if I write in blue, it's "note book" and black "exercise book" (other colours used anywhere to highlight things or similar)

Educator Supe @ShakinthatChalk · 19h

Replying to @mrshawthorne7

I've tried separate books but quickly becomes difficult to manage ime.

A focus on the worked example and selected tasks where the objective is clarity of written communication, then tasks where it's ok to be messy.

#mathsCPDchat

Educator Supe @ShakinthatChalk · 18h

Would be an interesting action research or department research task.

Would a focus on pupils neat presentation of written solutions affect positively their messy workings during problem solving?

#mathsCPDchat

Mr B Maths @MrBMaths3 · 19h

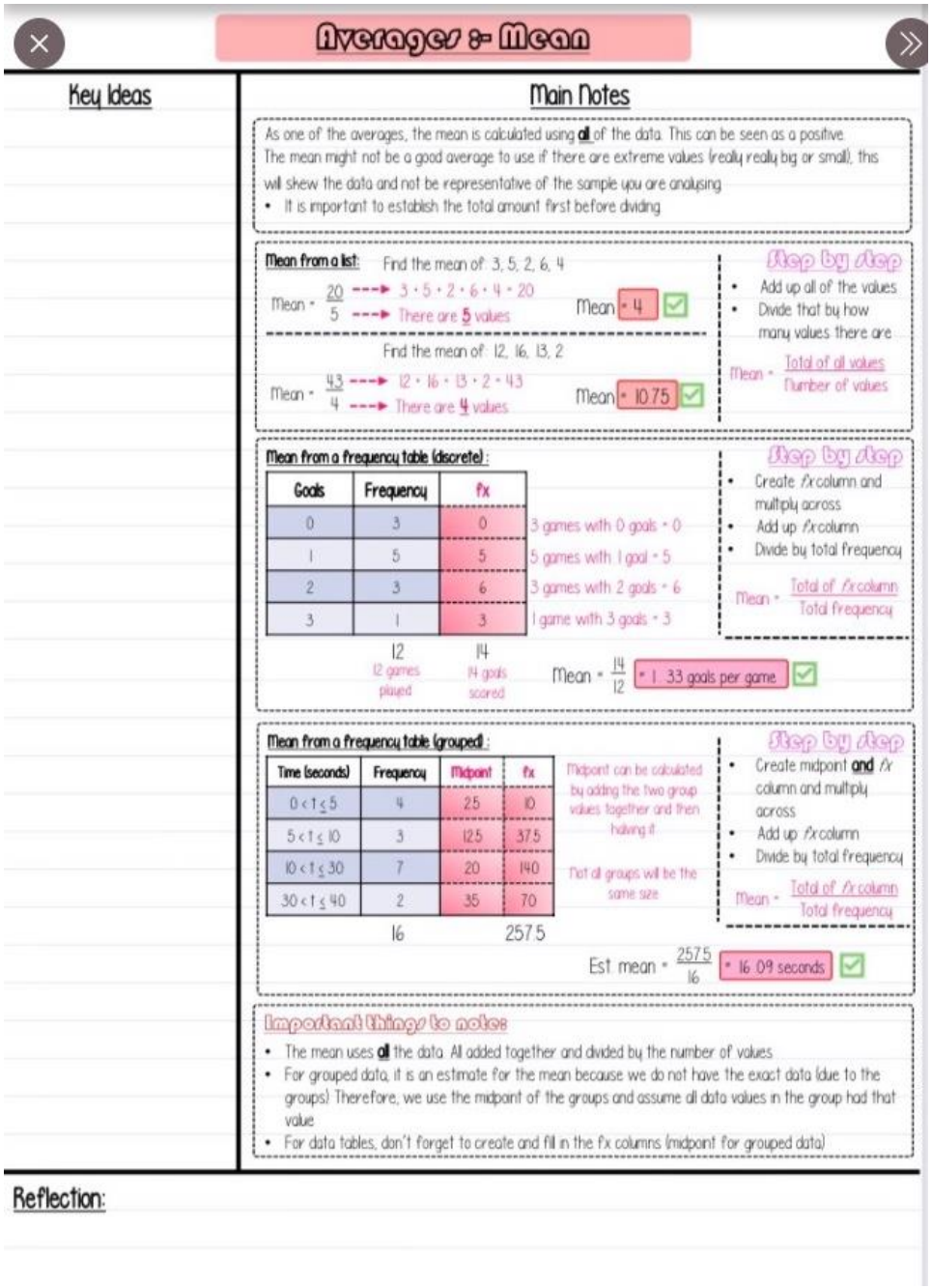
Replying to @mrshawthorne7

We have 'vocab' books which are used for key words / formulae etc.. In theory I like the idea! In practice we get collared on 'inconsistent' use of them. #mathsCPDchat

MrHawesMaths @HawesMaths · 18h

Replying to @mrshawthorne7

I don't have students write notes down at all. I put everything up on onenote for them and have some notes ready to annotate should students want to 'Cornell style' #mathscpdchat



Averages & Mean

Key Ideas

Main Notes

As one of the averages, the mean is calculated using **all** of the data. This can be seen as a positive. The mean might not be a good average to use if there are extreme values (really really big or small), this will skew the data and not be representative of the sample you are analysing.

- It is important to establish the total amount first before dividing.

Mean from a list: Find the mean of: 3, 5, 2, 6, 4

Mean = $\frac{20}{5}$ ---→ 3 + 5 + 2 + 6 + 4 = 20 ---→ There are 5 values

Mean = 4

Find the mean of: 12, 16, 13, 2

Mean = $\frac{43}{4}$ ---→ 12 + 16 + 13 + 2 = 43 ---→ There are 4 values

Mean = 10.75

Step by step

- Add up all of the values
- Divide that by how many values there are

Mean = Total of all values / Number of values

Mean from a frequency table (discrete):

Goals	Frequency	fx	
0	3	0	3 games with 0 goals = 0
1	5	5	5 games with 1 goal = 5
2	3	6	3 games with 2 goals = 6
3	1	3	1 game with 3 goals = 3
	12 (12 games played)	14 (14 goals scored)	

Mean = $\frac{14}{12}$ = 1.33 goals per game

Step by step

- Create fx column and multiply across
- Add up fx column
- Divide by total frequency

Mean = Total of fx column / Total frequency

Mean from a frequency table (grouped):

Time (seconds)	Frequency	Midpoint	fx
$0 < t \leq 5$	4	2.5	10
$5 < t \leq 10$	3	12.5	37.5
$10 < t \leq 30$	7	20	140
$30 < t \leq 40$	2	35	70
	16		257.5

Midpoint can be calculated by adding the two group values together and then halving it.

Not all groups will be the same size.

Est mean = $\frac{257.5}{16}$ = 16.09 seconds

Step by step

- Create midpoint **and** fx column and multiply across
- Add up fx column
- Divide by total frequency

Mean = Total of fx column / Total frequency

Important things to notice

- The mean uses **all** the data. All added together and divided by the number of values.
- For grouped data, it is an estimate for the mean because we do not have the exact data (due to the groups). Therefore, we use the midpoint of the groups and assume all data values in the group had that value.
- For data tables, don't forget to create and fill in the fx columns (midpoint for grouped data).

Reflection:

SG @SheilaGreenaway · 17h

How do you present these so nicely? My handwriting looks worse digitally.

MrHawesMaths @HawesMaths · 17h

These are typed but using a font called 'please write me a song' kids love them.

Claire @clairesaintee · 14h

Have always found copying notes in class time a poor use of time and often not done very accurately. This frees up more time for instruction & practice in class where the pupil can be helped by the teacher.

rohlfo @heavymetalmaths · 19h

Replying to @clairesaintee and @mrshawthorne7

agree to an extent. This was part adaptation to the pupils at this school who are well trained in copying off board and learning 😕
however, I use this to my advantage by applying mastery techniques. they do like seeing a teacher work through and explain an example thoroughly.

Catherine Edwards @Edwards08C · 14h

Copying is a pet hate of mine.
Either they need exactly what you've written, in which case print it and stick it in. Or they need to be generating their own notes. I'll do line by line working out together, but they have to do the line first, then check together

#mathsCPDchat

MrHawesMaths @HawesMaths · 14h

The only copying we do is the I go we go you go section of the lesson where we model our answers. #mathscpdchat

rohlfo @heavymetalmaths · 19h

Replying to @Edwards08C @clairesaintee and @mrshawthorne7

generating own notes is the ambition, but like with many things, they need to be told first and develop that note-taking skill.

Catherine Edwards @Edwards08C · 19h

It does take an enormous amount of support and training, and there are always ones who wait and copy .
I've found that getting them to make notes at the end of the lesson after they have practiced helps.
#mathscpdchat

rohlfo @heavymetalmaths · 18h

i wished kids at my school were more able. they're just so trained over years to take notes in all subjects....very backwards, but tough for me to go against it!

When replying to Charlotte's third question …

Charlotte Hawthorne @mrshawthorne7 · 16h

Some have said that the maths must be readable and communicate steps clearly.
Q3: Where do things like titles, underlining with a ruler, diagrams in pencil come in, are these important to you as a maths teacher or not?
#mathsCPDchat

… people agreed that diagrams should be in pencil.

The idea of students 'signposting' their solutions prompted some discussion …

Karen @karenshancock · 16h

Replying to @mrshawthorne7

Titles - pah! Underlining with a ruler - pah!
Diagrams in pencil - only if they are likely to screw up… Not fussed for straight line graphs, but insisted on it today for cumulative frequency curves to allow them to rub out poor attempts. #mathscpdchat

Karen @karenshancock · 16h

I'd much rather they learnt to SIGNPOST their solutions - this is my favourite word to use with students.
How do I know what you are doing?
#mathscpdchat

Dee Greig-Dunn @mcubedtuition · 3h

Replying to @karenshancock and @mrshawthorne7

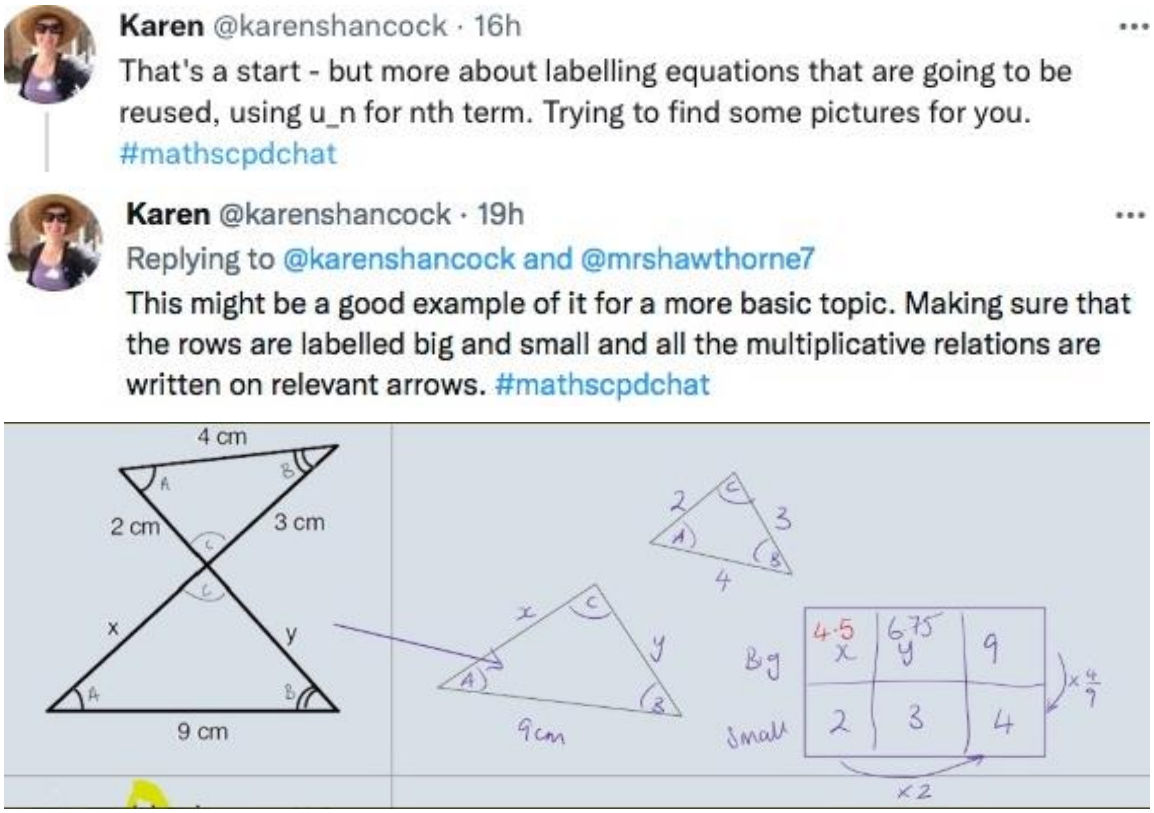
I call it "narrative". Make sure that both the reader and author can make sense of the mathematical story. This will help once the Ss gets to the end of a problem and can clearly follow their own thought processes

Kat @kathat42 · 2h

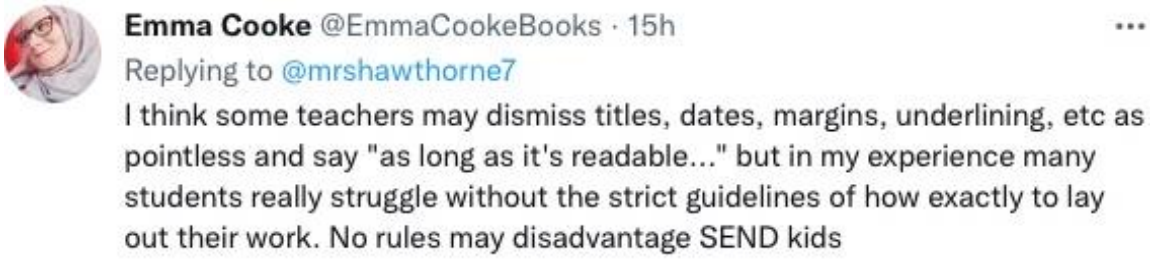
This is really interesting to read. I'm not a teacher, but someone who uses charts/data on a daily basis to tell stories so you're describing one of the key skills of my job (take a load of numerical information and help people navigate through it)

Charlotte Hawthorne @mrshawthorne7 · 16h

Oo, tell us more about this. Underlined final answers? #mathsCPDchat



… and there was a reminder that some pupils need more support than others:



The screenshots below show conversations generated by, and some single replies to, Charlotte's Question 4. Teachers discussed what can and cannot be deduced from 'scrutinising' pupils' written products. As usual, some tweets generated more than one thread (conversation). Wherever that happened, in this summary the screenshot of the generating tweet is repeated at the start of each new conversation generated by it. **Click on any of the following screenshots-of-a-tweet to go to that actual tweet on Twitter.**

The following conversations and replies were all generated by this fourth question from Charlotte Hawthorne

Charlotte Hawthorne @mrshawthorne7 · 18h

Q4: What can you tell about a student from their maths book?

#mathsCPDchat

… which generated this conversation between Karen Hancock, Charlotte Hawthorne and Jenny Hill-Parker …

Karen @karenshancock · 18h

Replying to @mrshawthorne7

Hmmm - As a teacher considerably more than an outsider.
But that's because I know what the tasks were and what I was expecting to see as written output. #mathscpdchat

Charlotte Hawthorne @mrshawthorne7 · 19h

Good point! As maths specialists what can we notice that others wouldn't? So if a secondary teacher of another specialism looked through your students books, what could they tell? #mathsCPDchat

Jenny Hill-Parker @JennyHillParker · 19h

Replying to @mrshawthorne7

They could tell about the routines in the clasroom, ie is there a starter, are there retrieval quizzes, is homework set, are the students doing lots of deliberate practice. Are they returning to incorrect questions to correct and address misconceptions #mathscpdchat

Charlotte Hawthorne @mrshawthorne7 · 19h

Playing devil's advocate, if homework is online and retrieval is built into current work (mixed practise, interwoven etc) could a non-specialist see that those things were still happening? #mathsCPDchat

Jenny Hill-Parker @JennyHillParker · 19h

No, but it could start a conversation about those areas, and that conversation would probably be valuable. #mathscpdchat

… and this conversation from Charlotte Hawthorne, Educator Supe and Miguel Pimentel:

Charlotte Hawthorne @mrshawthorne7 · 19h

Good point! As maths specialists what can we notice that others wouldn't? So if a secondary teacher of another specialism looked through your students books, what could they tell? #mathsCPDchat

Educator Supe @ShakinthatChalk · 19h

Replying to @mrshawthorne7

I've seen enough maths books in my time. Some of them are shocking.

I guarantee that a period of focus on pupil presentation (spatially organised solutions *not* neat handwriting) will improve pupil engagement and motivation in class, and general learning.

#mathsCPDchat

Miguel Pimentel @mrpimentelmaths · 19h

Replying to @ShakinthatChalk and @mrshawthorne7

Do you think a single period of making this a focus would be enough? I feel it has to do with creating a habit in the class by being explicit about what good maths communication looks like (by modelling, sharing other pupil's work) + praise of this when circulating #mathsCPDchat

Educator Supe @ShakinthatChalk · 19h

Yes. Needs to be an embedded expectation. Surprisingly quick to embed but does need a period of regular book checks preferably every night.

Charlotte Hawthorne @mrshawthorne7 · 19h

Bold statement :) As you've said a possible action research focus. #mathsCPDchat

Educator Supe @ShakinthatChalk · 19h

A statement borne out of years of in class investigation. 😉

and this discussion between Charlotte Hawthorne, Amie, Mr B Maths, MrHawesMaths and Alex J-W:

Charlotte Hawthorne @mrshawthorne7 · 18h

Q4: What can you tell about a student from their maths book?

#mathsCPDchat

Amie @alcmaths · 18h

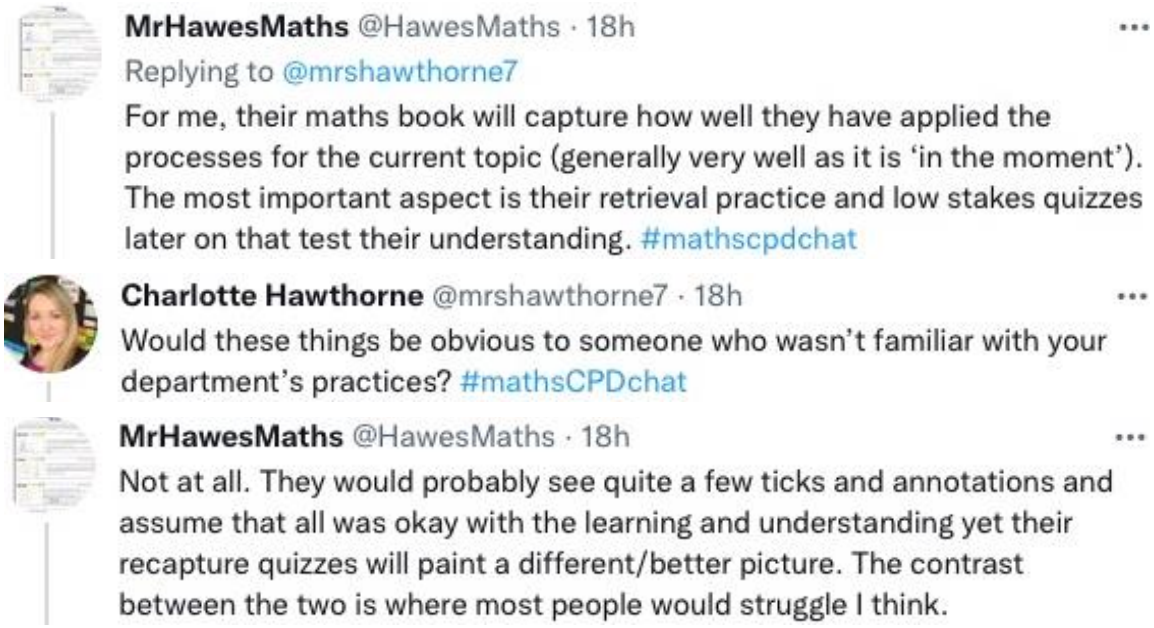
Replying to @mrshawthorne7

It's only a snapshot of what goes on in the lesson - you can't see the discussion, mwb practice etc...

Mr B Maths @MrBMaths3 · 18h

I think any work scrutiny should be done alongside learning walks to triangulate! So that they can see all aspects of learning, as you've mentioned above #mathsCPDchat

Charlotte's Question 4 also generated this interchange between MrHawesMaths and Charlotte Hawthorne:



A reply from Mr B Maths to Question 4 prompted Charlotte Hawthorne to ask a question …

Mr B Maths @MrBMaths3 · 18h

Replying to @mrshawthorne7

Sometimes very little… Even as a maths teacher. We don't get students to write questions out, so sometimes work looks easy, lack of challenge, repetition, but without seeing the task, impossible to tell. Yet still judged on it #mathsCPDchat

Charlotte Hawthorne @mrshawthorne7 · 19h

I imagine this is a common problem. How do you make sure that someone looking at the maths work your students do knows that are being challenged and making progress? **#mathsCPDchat**

… that generated several conversations and comments, including this between Alice Ward-Gow and Catherine Edwards:

Miss Ward-Gow @mcwardgow · 19h

Replying to @mrshawthorne7

Ask students to write down questions (when they're not too long) and there should be signs of students making mistakes (and hopefully making improvements later). A book full of ticks would suggest a lack of challenge? 🤦‍♀️#mathscpdchat

Miss Ward-Gow @mcwardgow · 19h

Also, hopefully the books are being looked at whilst the students are there. That way they can be asked how challenging the work is etc #mathscpdchat

Catherine Edwards @Edwards08C · 19h

Replying to @mrshawthorne7

Is challenge a curriculum question?
Our book looks check for curriculum adherence.
So if the content is too easy that is a curriculum issue?

#mathscpdchat

Miss Ward-Gow @mcwardgow · 19h

Does being able to provide the right level of challenge come from subject knowledge or the curriculum/schemes of work? #mathscpdchat

Catherine Edwards @Edwards08C · 19h

Some of it will depend on the rigidity of your SoW. I have a fair amount of latitude within a topic to differentiate as appropriate. However I know that isn't the case in all schools/departments.
I wonder how it falls then.
#mathscpdchat

and this between Alice Ward-Gow and Mr B Maths:

Miss Ward-Gow @mcwardgow · 19h

Replying to @mrshawthorne7

Ask students to write down questions (when they're not too long) and there should be signs of students making mistakes (and hopefully making improvements later). A book full of ticks would suggest a lack of challenge? 🤦‍♀️ #mathscpdchat

Mr B Maths @MrBMaths3 · 19h

Replying to @mcwardgow and @mrshawthorne7

Does there have to be mistakes for work to be challenging? 🤔🤦‍♂️ #mathsCPDchat

Miss Ward-Gow @mcwardgow · 19h

Not necessarily, but a page full of ticks would suggest a lack of challenge. If a student gets everything right in a lesson, were they challenged? #mathscpdchat

The question about mistakes from Mr B Maths prompted more questions and comments, including these from Jenny Hill-Parker and Anthony Shaw:

Mr B Maths @MrBMaths3 · 19h

Replying to @mcwardgow and @mrshawthorne7

Does there have to be mistakes for work to be challenging? 🤔🤦‍♂️ #mathsCPDchat

Jenny Hill-Parker @JennyHillParker · 19h

Replying to @MrBMaths3 @mcwardgow and @mrshawthorne7

Yes? Unless the mistakes are made elsewhere, ie verbally or on a mwb. Is there merit in working though a challenge and then asking a student to write out a 'perfect' written answer?

Anthony Shaw @ShawMaths · 19h

Replying to @mcwardgow and @mrshawthorne7

The mistakes bit is really important. I try to look for and share "interesting wrong answers" and reward the students who got them.

Sometimes I even ask for deliberately wrong but interesting answers. #mathscpdchat

Discussion generated by Charlotte's question …

Charlotte Hawthorne @mrshawthorne7 · 19h

I imagine this is a common problem. How do you make sure that someone looking at the maths work your students do knows that are being challenged and making progress? **#mathsCPDchat**

… continued with discussion between Anthony Shaw, Charlotte Hawthorne and Mary Pardoe:

Anthony Shaw @ShawMaths · 19h

Replying to @mrshawthorne7

I don't think we need to. The only person that book is for is the student. If anyone else wants context, ask them. #mathscpdchat

Charlotte Hawthorne @mrshawthorne7 · 19h

I once heard of 'pupil book talks' where the pupil talked through their book with the person looking. This seems more helpful, I think the teacher would add even more clarity too #mathsCPDchat

Mary Pardoe @PardoeMary · 19h

Yes. Know/discuss what the recording is/was for … these 'reasons' are interesting. From NRICH article here: nrich.maths.org/6296 #mathscpdchat

- If pupils leave their work - to go to toilet, lunch, sharpen a pencil etc. they'll know where they've got to on return.
- To help the child express his or her OWN thinking.
- To be able to see if - when applicable - he or she is doing unnecessary repeats.
- To give pupils opportunities to see any patterns that may be evolving.
- To get some extra idea of further work they could do - ones in a sequence that they have missed out - this might be applicable, for example, in Red Express Train and Tri.'s .
- To help them get into a system for working further.
- To aid working with a friend, sharing aspects of the work and discussing the progress so far.
- To guide conversation and explanation with classroom adults.
- To lead, later, to explaining to a group or the whole class what they have been doing.
- To lead, much later on, to being able to present some work to an adult, leave it with them and the adult fully understand what has been carried out - even in a test or examination!

… and single replies to this question …

Charlotte Hawthorne @mrshawthorne7 · 19h

I imagine this is a common problem. How do you make sure that someone looking at the maths work your students do knows that are being challenged and making progress? **#mathsCPDchat**

from Karen Hancock, Me Teach Maths and Mr B Maths:

Karen @karenshancock · 19h

Replying to @mrshawthorne7

Is this ever evident just by looking at paper? (Devil's advocate here) In any non practical subject? Sight of planning is needed, I would say.

Me Teach Maths @meteachmaths · 19h

Replying to @mrshawthorne7

If the person can not tell they should not be looking, or it should be part of triangulation. Especially as "challenge" and appropriate challenge is dependant on so many things

Mr B Maths @MrBMaths3 · 19h

Replying to @mrshawthorne7

We have to hope that someone involved in the process is aware / has a maths background etc. Definitely feel a maths specialist is important from that perspective #mathsCPDchat

and this tweet from Charlotte Hawthorne …

Charlotte Hawthorne @mrshawthorne7 · 19h

I once heard of 'pupil book talks' where the pupil talked through their book with the person looking. This seems more helpful, I think the teacher would add even more clarity too #mathsCPDchat

… generated comments from Karen Hancock, Matt Roberts and Anthony Shaw:

Karen @karenshancock · 19h

Replying to @mrshawthorne7 and @ShawMaths

Love this idea. #mathscpdchat

Matt Roberts @Mroberts90Matt · 19h

Replying to @mrshawthorne7 and @ShawMaths

Pupil book talks are excellent. Far more illuminating and give a clearer picture #mathscpdchat

Anthony Shaw @ShawMaths · 19h

Replying to @mrshawthorne7

I'm stealing this! #mathscpdchat

Other replies to Question 4 …

Charlotte Hawthorne @mrshawthorne7 · 18h

Q4: What can you tell about a student from their maths book?

#mathsCPDchat

… were from Jenny Hill-Parker, Alice Ward-Gow, Miss Franklin, Catherine Edwards and Alex J-W:

Jenny Hill-Parker @JennyHillParker · 18h

Replying to @mrshawthorne7

Lots I think. I know there's the train of thought that we shouldn't worry about neatness, presentation isn't the important thing etc but I think that we should be leading on high standards in all areas. Uniform, courtesy, punctuality, as well as neat books #mathscpdchat

Miss Ward-Gow @mcwardgow · 18h

Replying to @mrshawthorne7

How much pride they take in their Maths work. Whether they've made mistakes and then learnt from them. Attendance. Effort. #mathscpdchat

miss franklin @missfc_maths · 18h

Replying to @mrshawthorne7

Level of engagement with work, understanding of concept (level of work shown dependant). You can often tell about possible handwriting issues (over time). I think you can tell a lot about a student e.g. opt for easy or hard, full written workings or minimum details #mathscpdchat

Catherine Edwards @Edwards08C · 18h

Replying to @mrshawthorne7

Not as much as many people seem that think!

The extremes are easier to spot - so complete disengagement, or really conscientious.

You can see correctness? Does ten correct answers show more learning than 4 mistakes and 2 correct answers?

curriculum alignment?
#mathscpdchat

Alex J-W @Trudgeteacher · 7h

Replying to @JennyHillParker and @mrshawthorne7

How do you square the mistakes are made and neat books? A lot of work needed in this area? Also what about rough working and explanatory thinking? I guess its about whether the book is about presenting and communicating to others or exploring for yourself? Two books?

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