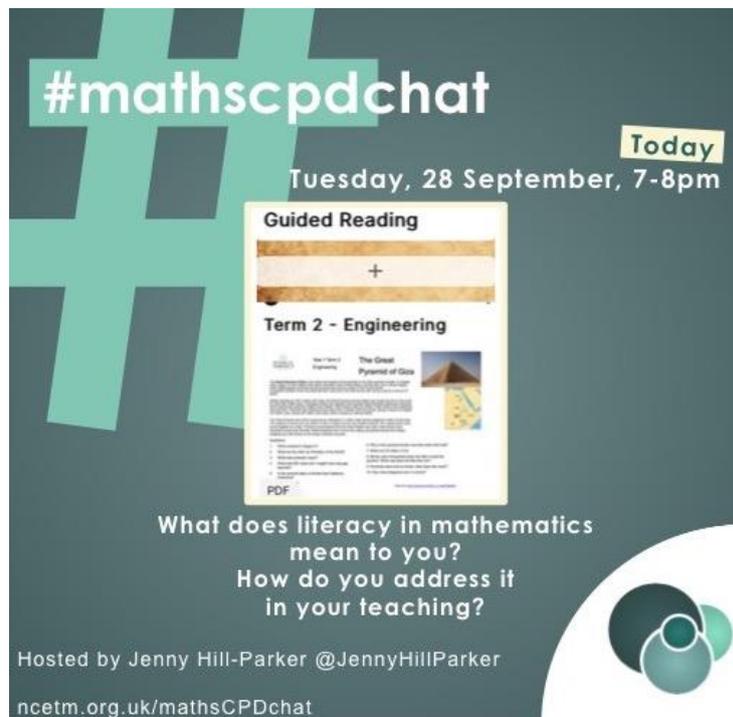


#mathscpdchat 28 September 2021

What does literacy in mathematics mean to you? How do you address it in your teaching?

Hosted by [Jenny Hill-Parker](#)

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



#mathscpdchat

Today
Tuesday, 28 September, 7-8pm

Guided Reading
+
Term 2 - Engineering
The Great Pyramid of Giza
PDF

What does literacy in mathematics mean to you?
How do you address it in your teaching?

Hosted by Jenny Hill-Parker @JennyHillParker
nctm.org.uk/mathsCPDchat

Among the links shared during the discussion were:

[Literacy in Mathematics](#) which are educational resources created by [Jenny Hill-Parker](#) to support literacy in Mathematics. The 'Guided Reading' resources are organised in themes such as 'Famous Mathematicians'. Each resource consists of a few paragraphs of text about the topic, followed by ten comprehension questions, and can be downloaded as a PDF file. It was shared by [Jenny Hill-Parker](#)

[Disciplinary Literacy](#) which is an online article from the Durrington Research School by Fran Hayes, Assistant Director of the school. The author provides initial guidance to support teachers who are considering how they can begin to establish disciplinary (subject-specific) literacy as embedded practice across their school. It was shared by [Jenny Hill-Parker](#)

[Cracking the Academic Code](#) which is a blog post by [Alex Quigley](#) in which he describes 'strategies to help pupils 'code-switch' between everyday talk and its academic counterpart, and to support academic reading and writing'. It was shared by [Jenny Hill-Parker](#)

[Frayer Models](#) which is a website from which you can download editable Frayer Models. A Frayer Model is a simple five-section structure, in which some (general) thing (usually an idea or an object, such as 'square number' or 'insect') is named in a central section, with the other four sections providing respectively a definition of that thing, some 'characteristics' of it, a few examples of it, and a few non-examples. It was shared by [Jenny Hill-Parker](#)

[Understanding Mathematics for Young Children](#) which is a book by Derek Haylock and Anne Cockburn. The authors' intention is to help primary maths teachers 'understand mathematical concepts and how children come to understand them', and thereby develop their 'own confidence with mathematical activities'. It was shared by [Jennifer Read](#)

[The Whetstone of Witte](#) which is a Wikipedia entry about the mathematics book, written by Robert Recorde and published in 1557, of which those words are a shortened version of its twenty-nine word title. According to the article, it contains the first recorded use of the equals sign, and the first book in English to use the plus and minus sign. It was shared by [Atul Rana](#)

[Brahmagupta's Brahmasphutasiddhanta Vol 1](#) which is an online representation by the Indian Institute of Astronomical and Sanskrit Research of a book written c 628 in Sanskrit. The English translation of the title is 'Correctly Established Doctrine of Brahma', and it includes 'a good understanding of the mathematical role of zero, and rules for manipulating both negative and positive numbers'. It was shared by [Atul Rana](#)

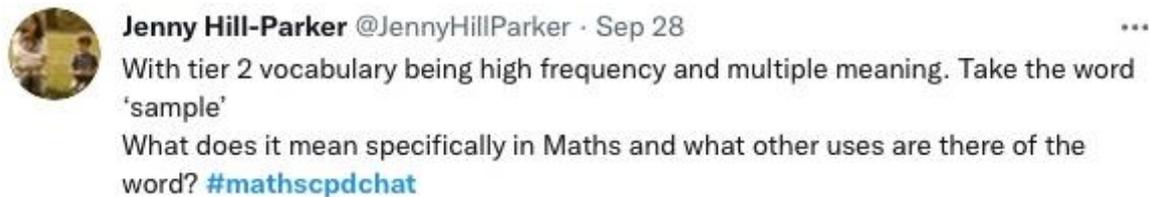
[The Secret History of Writing](#) which is a YouTube video that reveals all sorts of fascinating facts and links associated with the history of human permanent-record-making-in-visual-form behaviour. It was shared by [Atul Rana](#)

[Recommended Books](#) which is a list of books from NRICH, that are recommended for young people who are interested in mathematics. Each book is described briefly, and they are presented in ascending order of the youngest age of people for whom the book is thought to be suitable (from 7+ to 17+). It was shared by [Mary Pardoe](#)

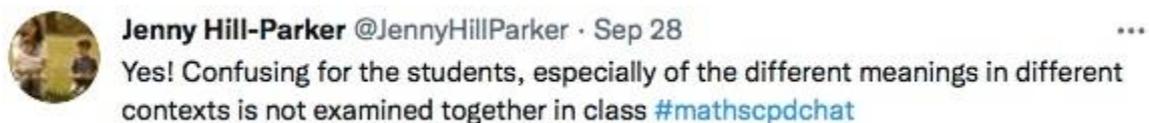
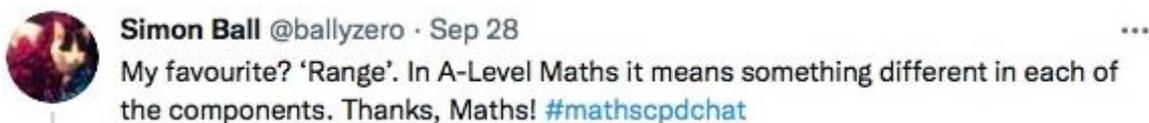
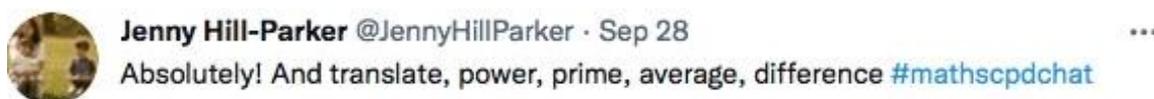
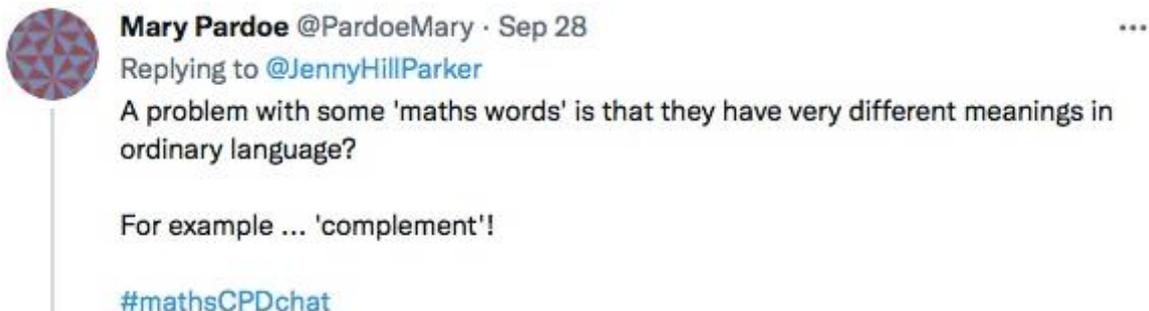
[The Avonwood maths library](#) which is a thread on Twitter. It was shared by [Mr Hawes Maths](#)

The screenshots below, of chains of tweets posted during the chat, show parts of a conversation about challenges presented by words that do not have the same meaning in maths as in ordinary language, or have different meanings when used in different branches of maths. **Click on any of these screenshots-of-a-tweet to go to that actual tweet on Twitter.**

The conversation was generated by this tweet from [Jenny Hill-Parker](#):



and included these from [Catherine Edwards](#), [Mary Pardoe](#), [Jenny Hill-Parker](#), [Simon Ball](#) and [Sudeep](#):

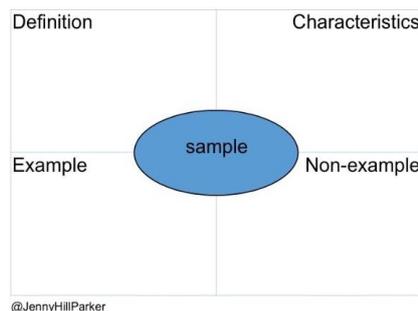


 **Jenny Hill-Parker** @JennyHillParker · Sep 28 ...
Replying to @boss_maths and @Edwards08C
And imagine the minefield it is for students who have EAL, or a low reading age!
[#mathscpdchat](#)

 **Catherine Edwards** @Edwards08C · Sep 28 ...
This is the reason for our focus on literacy, huge proportion of our cohort are EAL, new to English and/or low reading age. Along with area of high deprivation and high level of SEND we really need to support them every way we can. Literacy focus is an easy choice [#mathscpdchat](#)

The following screenshots show parts of a conversation about ways of using Frayer models. Again, click on any of these screenshots-of-a-tweet to go to that actual tweet on Twitter. The conversation was generated by this tweet from [Jenny Hill-Parker](#):

 **Jenny Hill-Parker** @JennyHillParker · Sep 28 ...
We're in the process of writing Frayer models in order to gain an understanding of the different meanings of the tier 2 words as staff first. Will fill these in together:
[#mathscpdchat](#)



and included these from [Catherine Edwards](#), [Jenny Hill-Parker](#), [Alice Ward-Gow](#) and [AC](#):

 **Catherine Edwards** @Edwards08C · Sep 28 ...
Replying to @JennyHillParker
I love them, but spent 40min with Y8 last week filling one in for 'half' it was valuable, but I don't know if it was 40min of valuable [#mathsCPDchat](#)

 **Jenny Hill-Parker** @JennyHillParker · Sep 28 ...
Yes! I think this needs some thought. Should they be on display and referred to briefly and often? [#mathscpdchat](#)

 **Miss Ward-Gow** @mcwardgow · Sep 28 ...
When we use Frayer models, sometimes we give students the definition and ask them to come up with examples and non examples. I think this can help with students' understanding of the vocab more than if we just shared the completed Frayer model with them 😊 [#mathscpdchat](#)

 **Jenny Hill-Parker** @JennyHillParker · Sep 28 ...
I agree! Otherwise their role is necessarily more passive



AC @eymaths · Sep 28

...

Replying to @mcwardgow @JennyHillParker and @Edwards08C

Yes! This is how I do mine too! We interchange technical language and everyday language too and talk a lot about etymology. I'm a bit obsessed with literacy in maths this year - so glad you've done this as [#mathscpdchat](#) 🤗

The following screenshots show two conversations about ways of generating etymological explorations that can help students grasp more firmly the meanings of mathematical words that they encounter. **Again, click on any of these screenshots-of-a-tweet to go to that actual tweet on Twitter.** Both conversations were generated by this tweet from [Jenny Hill-Parker](#):



Jenny Hill-Parker @JennyHillParker · Sep 28

...

And finally; etymology.

One of my favourite things to do in the Maths classroom is explore the roots of words

[#mathscpdchat](#)



and included these from [Alison Hopper](#), [Jenny Hill-Parker](#), and [Sudeep](#):



Alison Hopper @AlisonHopperMEI · Sep 28

...

Replying to @JennyHillParker

This is a favourite of mine too - a different sort of hook for memory for some. They got very upset about quad bikes after one discussion 🤔 [#mathscpdchat](#)



Jenny Hill-Parker @JennyHillParker · Sep 28

...

Replying to @AlisonHopperMEI

Ooh, I need to know more! [#mathscpdchat](#)



Alison Hopper @AlisonHopperMEI · Sep 28

...

I think we had probably been discussing either the roots of quadrilateral or looking at prefixes in English and they queried the fact that a 4-wheeled vehicle had the words for 4 and 2 in the name and not 4 and wheel [#mathscpdchat](#)

 **Sudeep** @boss_maths · Sep 28 ...
Replying to @JennyHillParker

One of my favourites too. Even the ones that may not love maths always seem to show genuine interest when we look at etymology. Lifts the energy levels in the room. Then it's just a question of trying to capitalise on the now more attentive group! #mathscpdchat

 **Alison Hopper** @AlisonHopperMEI · Sep 28 ...
Replying to @JennyHillParker

The anomalies are fun too - four (from German) and then a quarter (from French) - perhaps we should go with fourths although it makes me wince a bit!
#mathscpdchat

and these from [Mary Pardoe](#), [Atul Rana](#), [Jennifer Read](#), [Catherine Edwards](#) and [Nathan Day](#):

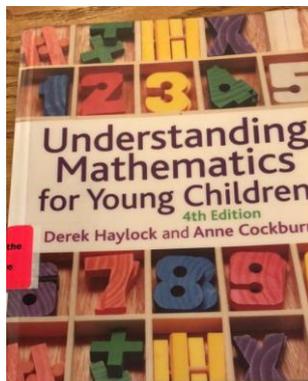
 **Mary Pardoe** @PardoeMary · Sep 28 ...
Replying to @JennyHillParker

I seem to remember that in the past @atulrana has posted some interesting tweets re the etymology of words encountered in maths?
#mathsCPDchat

 **Atul Rana** @atulrana · Sep 28 ...
Equals is a fairly important one! Not just the etymology but understanding what the = symbol stands for. #MathsCPDchat

 **Atul Rana** @atulrana · Feb 9
Equals : From the Latin word "æqualis", as meaning "uniform", "identical", or "equal", from aequus ("level", "even", or "just"). twitter.com/LaSalleEd/stat...

 **Jennifer Read** @JenniferRead6 · Sep 28 ...
Literally just been reading about that in: @derek_haylock





Atul Rana @atulrana · Sep 28

...

Replying to @Edwards08C and @JennyHillParker

Between Sanskrit, Ancient Greek, Latin and Arabic, I reckon most of the maths etymology is covered! #MathsCPDchat



Atul Rana @atulrana · Sep 28

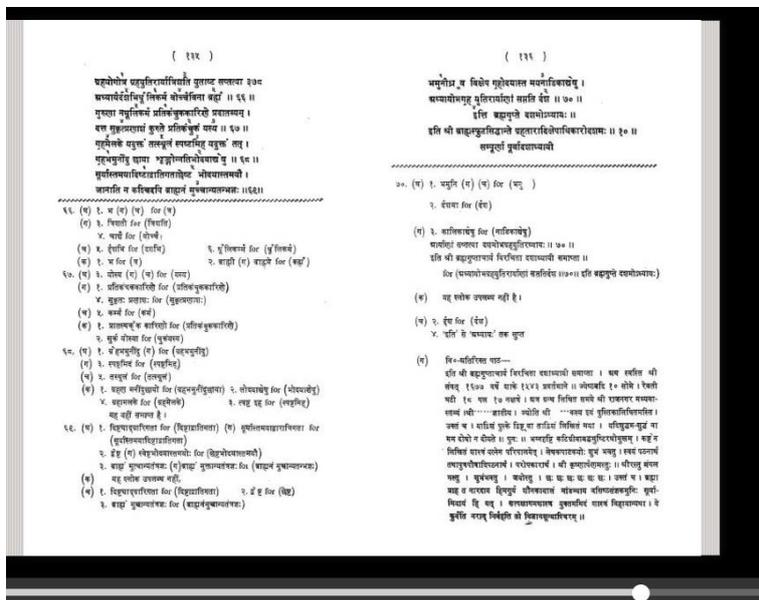
...

One day I hope to read Brahmagupta's Brāhmasphuṭasiddhānta in Sanskrit. Maths was written in continuous prose then!

"pati-ganita ("mathematics of procedures," or algorithms) and bija-ganita ("mathematics of seeds," or equations)"

archive.org/details/Brahma.

#MathsCPDchat



 **Brahmagupta's Brāhmasphuṭasiddhānta VOL I (Also Brahmasphutasiddhanta Brahmasphuta-siddhanta)**

by Indian Institute of Astronomical and Sanskrit Research

Publication date 1966
Topics Brahmagupta, Brahmasphutasiddhanta, Sanskrit,



Catherine Edwards @Edwards08C · Sep 28

...

Replying to @atulrana and @JennyHillParker

That will be epic!



Atul Rana @atulrana · Sep 28

...

I studied Sanskrit at school in India but dropped it as soon as it wasn't compulsory 😊 Reading mathematics written in continuous prose is fascinating. So much detail it, even for example when Robert Recorde decided on the = sign.

Nowbeit, for easie alteration of equations. I will prou-
poude a fewe examples, because the extraction of their
rootes, maie the moze aptly bee wroughte. And to a-
uoidz the tedious repetition of these woordes: is e-
qualle to: I will sette as I doe often in woorkes else, a
paire of paraleles, or Gemowe lines of one lengthe,
thus: —————, because noe. 2. thynges, can be moare
equalle. And now marke these numbers.

The passage in *The Whetstone of Witte* introducing the equals sign^[1]



Nathan Day @nathanday314 · Sep 28

I love getting pupils to attempt to read/understand that section of *The Whetstone of Witte* at the start of lessons on equations.

Nathan Day @nathanday314 · Apr 18

Here's some slides I've been working on for (re-)introducing equations.

Based on:

1) *The Whetstone of Witte* by Robert Recorde (1557)

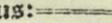
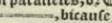
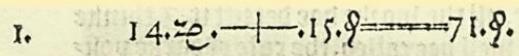
You can read it here: library.wales/digital-exhibi

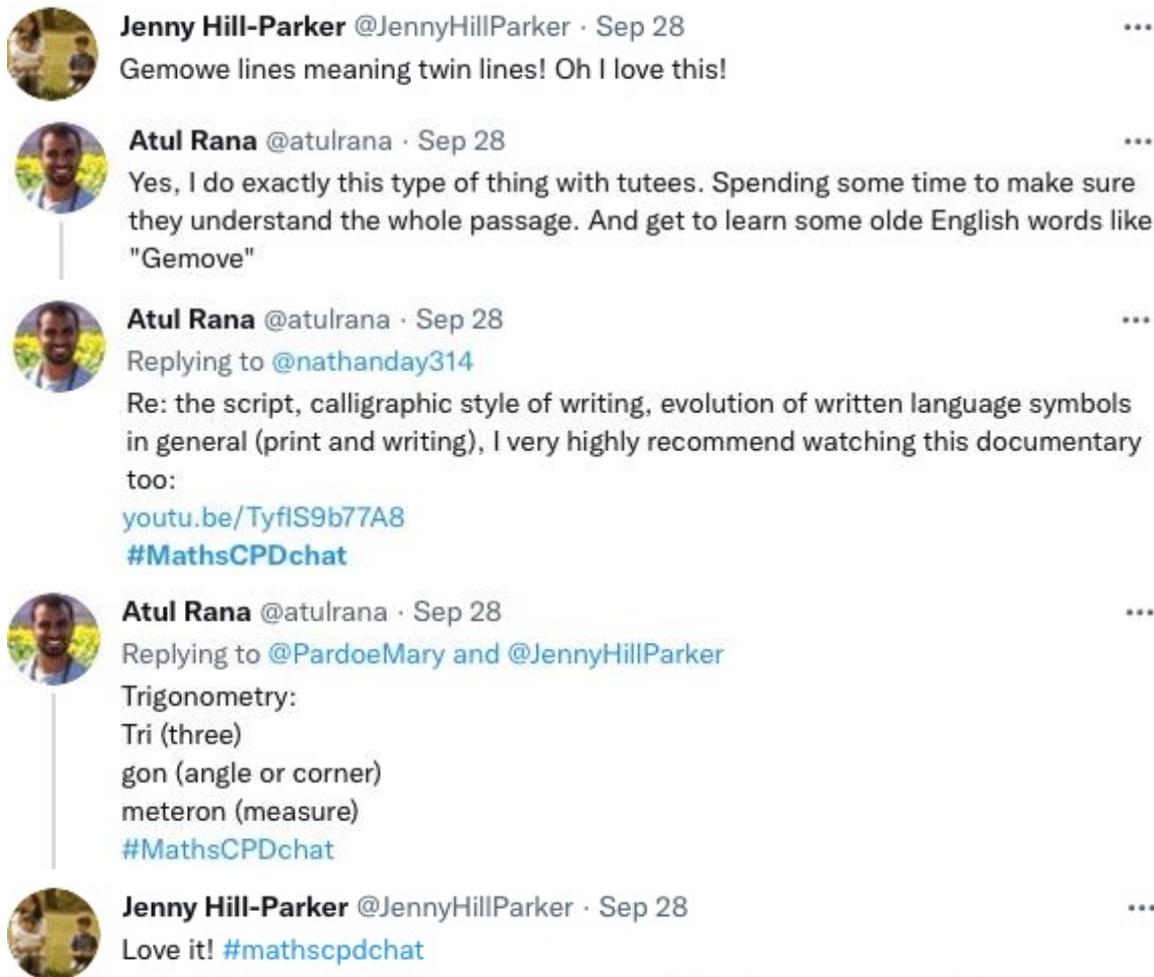
The juicy bit starts on page 242.

[Show this thread](#)

π		
	The Whetstone of Witte, by Robert Recorde (1557)	
←		→
3	Mr Day	18/04/2021 π

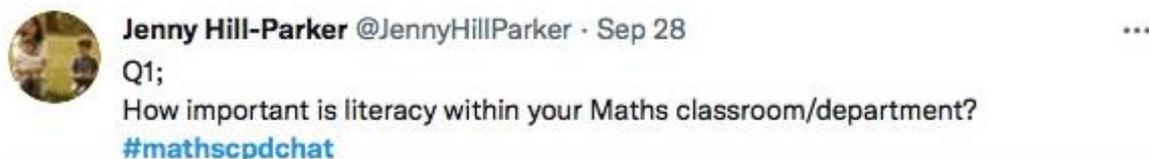


π		
	<p>Howbeit, for easie alteration of equations. I will propounde a few examples, because the extraction of their roots, maie the more aptly bee wroughte. And to avoide the tedious repetition of these wordes: is equalle to: I will sette as I doe often in worke use, a paire of paralleles, or Gemowe lines of one lengthe, thus: , because noe. 2. thynges, can be moare equalle. And now marke these numbers.</p> <ul style="list-style-type: none"> ∞ What is this saying? ∞ What language is it written in? ∞ Are there any words you recognise? ∞ Are there any words you can guess the meaning of? 	→
1	Mr Day	18/04/2021 π
π		
	<p>Howbeit, for easie alteration of equations. I will propounde a few examples, because the extraction of their roots, maie the more aptly bee wroughte. And to avoide the tedious repetition of these wordes: is equalle to: I will sette as I doe often in worke use, a paire of paralleles, or Gemowe lines of one lengthe, thus: , because noe. 2. thynges, can be moare equalle. And now marke these numbers.</p> <p>Howbeit, for easie alteration of equations. I will propounde a few examples, because the extraction of their roots, maie the more aptly bee wroughte.</p> <p>And to avoide the tedious repetition of these wordes:</p> <p><i>And to avoid the tedious repetition of these words,</i></p> <p>is equalle to: I will sette as I doe often in worke use,</p> <p><i>'is equal to', I will write as I do often when working,</i></p> <p>a pair of paralleles, or Gemowe lines of one lengthe, thus: ,</p> <p><i>a pair of parallel lines like this: ,</i></p> <p>because noe 2 thynges, can be moare equalle.</p> <p><i>because no two things, can be more equal.</i></p>	→
2	Mr Day	18/04/2021 π
π		
	<p>1. </p> <p>$14x + 15 = 71$</p> <p><i>If you abate even portions, from thynges that bee equalle, the partes that remain shall be equall also.</i></p> <p><i>If you subtract equal amounts from things that are equal, what remains are equal also.</i></p> <p><i>If you adde. equalle portions, to thynges that bee equalle, what so amounteth of them, shall be equalle.</i></p> <p><i>If you add equal amounts to things that are equal, the amounts you get are equal.</i></p>	→
4	Mr Day	18/04/2021 π



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

The discussions shown in the sequences of screenshots of tweets reproduced above were generated by the last three questions tweeted by the host during the hour. Before those questions appeared other issues were discussed. Responses to the host's first question ...



... arrived rapidly, revealing that:

- the teachers in at least one school, having recently engaged in 'word power training', which they obtained by following a particular CPD programme, are consequently **planning to include 'explicit teaching of vocabulary and etymology' in some lessons;**

- mathematical literacy is featuring more and more prominently in many teachers' thinking and planning because they see a **need to help pupils overcome some language comprehension difficulties** that are hampering their mathematical learning ... for example, pupils are struggling to cope with 'new question formats that are wordy' ... 'the biggest hurdle that some of my students face is the unfamiliar names of people' ...



Catherine Edwards @Edwards08C · Sep 28

...

We get confusion over names, or unfamiliar ingredients in recipe questions, not knowing what an electricity meter is due to using cards, don't know about interest because it's Haram. The hinterland of vocab rather than the stuff that's explicitly maths [#mathsCPDchat](#)

- this **anecdote** was appreciated by teachers ...



MrMorganMaths @maths_morgan · Sep 28

...

Replying to [@JennyHillParker](#)

I once heard of students who couldn't understand a question about the area of a patio, because they read it to rhyme with ratio and thought it was a mathematical process they hadn't been taught. Sir, you never taught us patios, they said.

- teachers who regard the aim of improving the standard of mathematical literacy of their pupils as very important are **using various strategies** to try to achieve it ...for example:



Pete Atkinson @MrA_Maths · Sep 28

...

Replying to [@JennyHillParker](#)

Very - we are trying to develop students' reasoning skills through extended writing and discussion, we all took part in [@Mannermetics](#) SLAM CPD over lockdown to ensure we use consistent & accurate vocab across the Dept and encourage it in students too [#mathsCPDchat](#)

- this reminder that mathematical situations, relationships, actions, problems, ... and so on, may be represented in Concrete, Pictorial, or Abstract (CPA) forms, **or using spoken or written language**, was appreciated:



Alison Hopper @AlisonHopperMEI · Sep 28

...

Replying to [@JennyHillParker](#)

I think language needs to be seen as a representation in the classroom - we need CPLA perhaps (although I would like them to be in no fixed order and certainly not a linear journey) [#mathscpdchat](#)

less discussion was generated by the host's next question ...



Jenny Hill-Parker @JennyHillParker · Sep 28

...

Q2; does your Maths department have a literacy policy? If it does, what are the main features? [#mathscpdchat](#)

... and the replies that were tweeted were from teachers in maths departments that have not developed, or are not in the process of developing, a maths-specific literacy policy:

teachers who replied positively to the host's third question ...



Jenny Hill-Parker @JennyHillParker · Sep 28

...

Q3; do you give students specific opportunities to read in Maths lessons?
We have Guided Reading lessons six times a year; resources available here:

padlet.com/jhill_parker/7...
[#mathscpdchat](#)



WYVERK ST.
EDMUND'S
SCHOOL & SPORTS

Year 7 Term 4
Sport

Red Rum's third Grand National win



Red Rum (7 May 1965 – 18 October 1995) was a champion Thoroughbred steeplechaser. He achieved an unmatched historic treble when he won the Grand National in 1973, 1974 and 1977, and also came second in the two intervening years, 1975 and 1976. The Grand National is a notoriously difficult race that has been described as "the ultimate test of a horse's courage". He was also renowned for his jumping ability, having not fallen in 100 races.

The 1973 race in which Red Rum secured his comeback victory from 30 lengths behind is often considered one of the greatest Grand Nationals in history. In a 2002 UK poll, Red Rum's historic third triumph in the Grand National was voted the 24th greatest sporting moment of all time.¹⁵

The **Grand National** is a National Hunt horse race held annually at Aintree Racecourse in Liverpool, England. First run in 1839, it is a handicap steeplechase over an official distance of about 4 miles and 2½ furlongs (4 miles 514 yards (6.907 km)), with horses jumping 30 fences over two laps. It is the most valuable jump race in Europe, with a prize fund of £1 million in 2021. An event that is prominent in British culture, the race is popular amongst many people who do not normally watch or bet on horse racing at other times of the year.

An estimated 500 to 600 million people watch the Grand National in

Questions:

1. Roughly how old was Red Rum when he died?	6. The Grand National started in 1839. How many years ago was this?
2. He achieved an historic treble? What does this mean?	7. How long is a furlong? What fraction of a mile?
3. Why is it so impressive that he hadn't fallen in 100	8. How much money does the winner get? Write this out in

Literacy in Mathematics
Educational resources to support literacy in Mathematics
[padlet.com](#)

... were enthusiastic about such materials, which require students to read some text, and then respond to questions about or discuss what they have found out or learnt from their reading:



Catherine Edwards @Edwards08C · Sep 28

...

They are super, I used them a lot as starter activities during remote teaching.
[#mathsCPDchat](#)



Sudeep @boss_maths · Sep 28

...

I really like these. Used a couple of Nicola's before the summer with Ss in AP. Think it was valuable for them and quite eye-opening for me to appreciate how much they could comprehend.

when the host then asked whether teachers believe that reading in maths lessons is 'a good use of curriculum time', the responses from teachers acquainted with material designed specifically to improve mathematical literacy, or that is otherwise appropriate, were positive:

 **CantabKitty BSc** @CantabKitty · Sep 28 ...
Replying to @JennyHillParker
Read what? Novels? No. #mathscpdchat

 **Jenny Hill-Parker** @JennyHillParker · Sep 28 ...
Not novels. Short articles that involve The Maths of a real world event
#mathscpdchat

 **CantabKitty BSc** @CantabKitty · Sep 28 ...
Sounds like the old C4 comprehension. I thought they were great. I'd want to make the students answer some sort of questions after though. #mathscpdchat

 **MrHawesMaths** @HawesMaths · Sep 28 ...
Replying to @CantabKitty and @JennyHillParker
I'm in the process of developing a library of maths books for students to dip into when they have finished a task or even a quick five minutes at the end or start of a lesson. #mathscpdchat

in replies to the host's fifth question ...

 **Jenny Hill-Parker** @JennyHillParker · Sep 28 ...
Q5: how can a knowledge of disciplinary literacy aid high quality teaching and learning in the Maths classroom? #mathscpdchat

... teachers pointed out that 'looking at the meanings and derivations of words helps' students see links between topics and ideas ...

 **Catherine Edwards** @Edwards08C · Sep 28 ...
Replying to @JennyHillParker
Making links across and between topics can really help with the recall of information. Understanding the root behind words can reduce the amount of disparate facts/processes to learn #mathsCPDchat

 **Laura** @mathsteacher09 · Sep 28 ...
Replying to @JennyHillParker
Had a great moment today when year 9s had been looking at roots of words in literacy time in registration - fact had come up this morning and they'd found examples such as 'factory' which makes things. Then in maths we did factors and someone said they 'make numbers'. 🤔

... but if students can't spell words correctly ...

 **Catherine Edwards** @Edwards08C · Sep 28 ...
There are so many! The other thing I find is if they can't spell them they can't link them. When asking for words beginning with 'Equi' I was offered Aquarium. #mathCPDchat