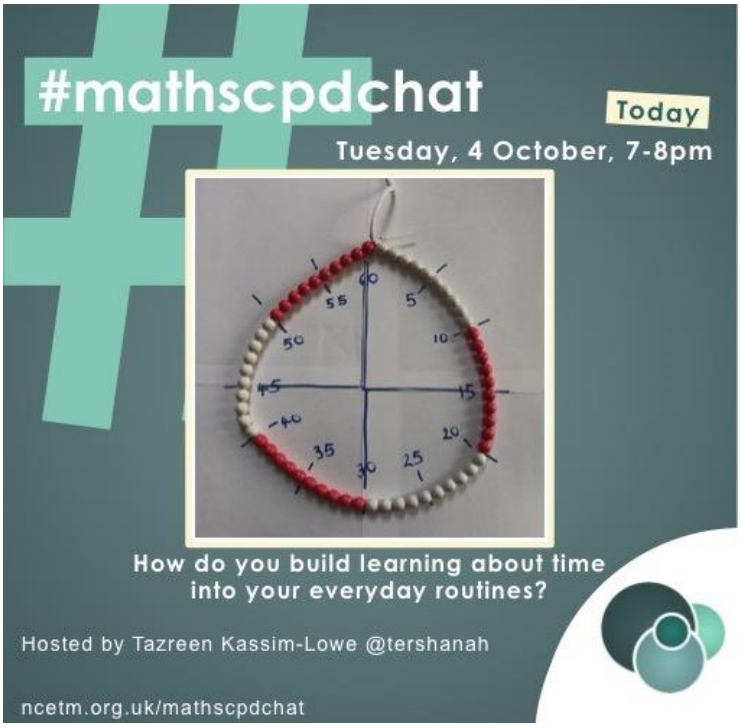
#mathscpdchat 4 October 2022

In your maths teaching what will you soon be trying that is new for you?
Hosted by Tazreen Kassim-Lowe

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:

Time and Elapsd Time which is episode 118 in Pam Harris's *Math is Figure-Out-Able* podcast. The participants discuss three simple ways teachers can help students internalise time and elapsed time. It was shared by Tazreen Kassim-Lowe

Take Your Dog for a Walk which is an interactive task from NRICH. As learners use arrow keys to move Pat and the dog (shown on a screen) a graph is drawn showing how far Pat is from the gate as time passes. Learners are challenged to move Pat so as to reproduce some given graphs. It was shared by Tazreen Kassim-Lowe

Time KS2 which is an NRICH webpage providing links to a variety of NRICH tasks about time. It was shared by Mary Pardoe

A Dozen Dials. A Book About Sundials Connected with Mathematics and Its History which is a book by Peter Ransom. It was shared by Mary Pardoe

Jiffy (time) which is a Wikipedia page providing interesting information about the origins and uses of the word 'Jiffy', with links to other sources of information, for example about 'thieves' cant', 'gliff', 'Gothic words' and 'Teutonic words'. It was shared by Mr Hawes

An illustrated summary of the discussions in this #mathsCPDchat follows.

This was the host's introductory message …

… and this was her first question …

… which prompted the following conversation about aspects of time-related learning in the secondary years …

Director of Maths @DirectorMaths · 15h

Replying to @tershanah

Secondary for me and students convert between units of speed in Year 7 and then minutes to decimal hours etc in Year 8. Visited again on compound measures at key stage 4. #mathscpdchat

Director of Maths @DirectorMaths · 15h

Replying to @DirectorMaths and @tershanah

Students receiving intervention will look at telling the time, time differences etc in their support sessions #mathscpdchat

Tazreen Tershanah @tershanah · 15h

Replying to @DirectorMaths

#mathscpdchat Thanks for this. So they look at both time (marking a point on a clock) and elapsed time (measuring how much time has passed).

Director of Maths @DirectorMaths · 15h

Replying to @tershanah

Yes so for elapsed time we might look at bus timetables for example #mathscpdchat

Tazreen Tershanah @tershanah · 15h

Replying to @DirectorMaths

Thank you. #mathscpdchat So it seems as though conversion and time as measure (elapsed time) features heavily.

Director of Maths @DirectorMaths · 15h

Replying to @tershanah

Yeah, particularly in a proportional context. That being said being able to "tell the time" isn't necessarily a prerequisite for this #mathscpdchat

Tazreen Tershanah @tershanah · 15h

Replying to @DirectorMaths

#mathscpdchat. Tell us more about the proportional contexts students might come across in relation to time, if you are happy to.

Director of Maths @DirectorMaths · 15h

Replying to @tershanah

So we would start off by saying that 1km/hr is the same as 1000m/hr etc and then "so how far would you be going each minute? Second? Etc #mathscpdchat

… and the first mention of controversial issues in teaching/learning involving the analogue clock:

A teacher offered to share material created and used by him …

… and another secondary teacher provided information:

Catherine Edwards @Edwards08C · 15h

Replying to @tershanah

Secondary ranges from sequencing events and time telling (nurture and entry level) to dealing with units of time in context and converting units of time for calculations #mathscpdchat

There was this 'conversation', largely conducted by means of quote retweets:

Joanne Green @MsJoanneGreen · 16h

@tershanah **#mathscpdchat** Today I used the school times in the substitution that we were doing. For example, 2x+5=? where the lesson hours are x and the 5 is number of breaks. I then said the school hours change on other days, so x has a different value.

Tazreen Tershanah @tershanah · 16h

Replying to @MsJoanneGreen

#mathscpdchat Excellent use of time as a variable. So important to relate it to real life/tangible situations. What age group did you use this excellent learning with?

Joanne Green @MsJoanneGreen · 16h

@tershanah **#mathscpdchat** we have nurture lessons for all years and groups that occur 3 days a week after school. Plus, one day that has another lesson for everyone. That's 8 lessons + 4(7 lessons) per week.

Joanne Green @MsJoanneGreen · 16h

@tershanah **#mathscpdchat** At High school, we have a two-week rota whereby all lessons are on the same day, yet different times. Also, two-bells to get into class AM and PM. Pupils expected to be lined up when 1st bell sounds - so pupils self-regulate.

Joanne Green @MsJoanneGreen · 18h

Times Tables Rockstars @tershanah **#mathscpdchat** is used each day. This allows the pupils to choose which song to listen to whilst they do their operations.

Joanne Green @MsJoanneGreen · 18h

#mathscpdchat @tershanah today the pupils did MathsWatch after having completed their nurture maths questions.

Tazreen Tershanah @tershanah · 18h

Replying to @MsJoanneGreen

@MsJoanneGreen #mathscpdchat Would you be happy to tell us more about mathswatch and how time fits in for those of us who are unfamiliar with it? Thanks!

The host's (Tazreen Kassim-Lowe's) second question …

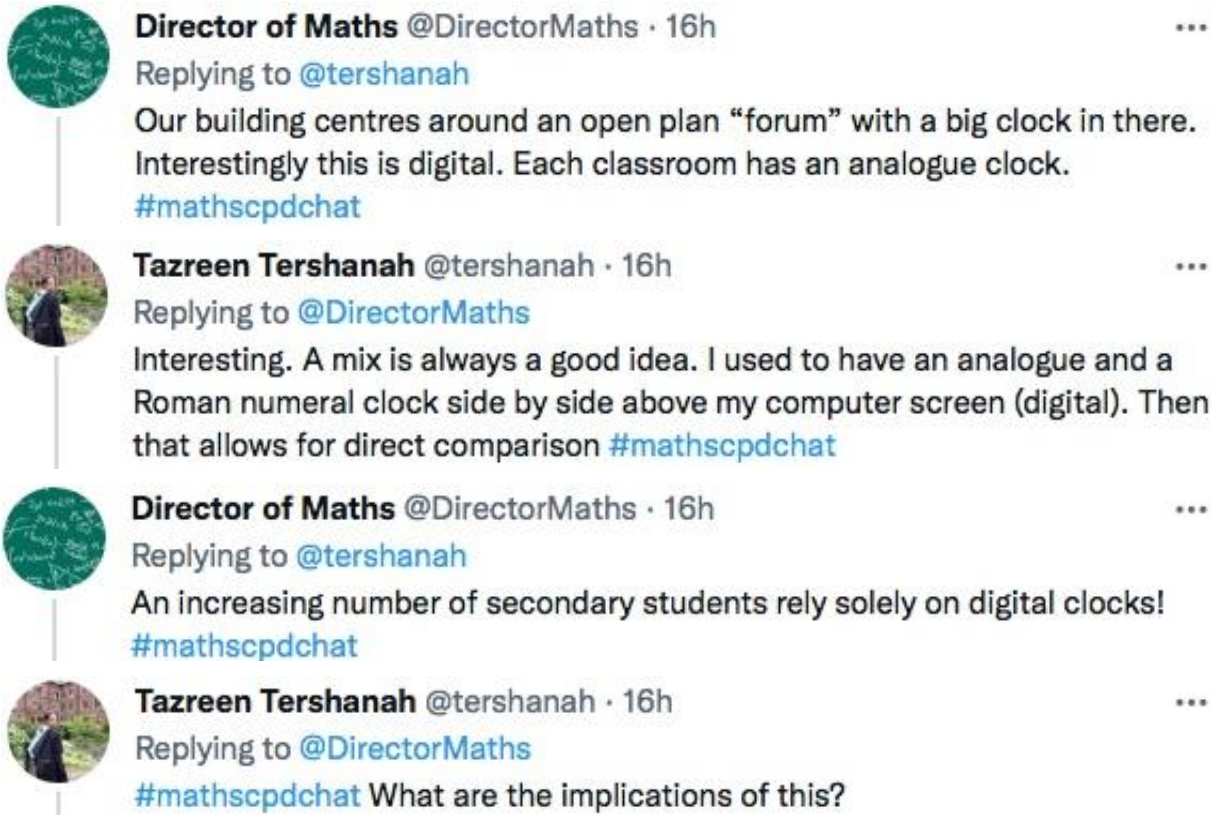
… generated several replies and conversations. The (linked-to-Twitter) screenshots below show the discussions that evolved in response to it.

In those replies and conversations **only** you can **click on any screenshot-of-a-tweet to go to that actual tweet on Twitter.**

The host herself tweeted a reply to her second question …

(link provided above)

… and a reply from Gemma Scott ('DirectorMaths') generated a long conversation in which sundials were discussed, and the future role of analogue clocks in life and in maths was 'debated'. In addition to Gemma, the participants in this long conversation were Tazreen Kassim-Lowe, Mr Hawes, Mary Pardoe and Catherine Edwards:



Director of Maths @DirectorMaths · 16h

Replying to @tershanah

Maths qualifications wise, very little. Life wise? Well I guess in the modern world that's very little too? #mathscpdchat

MrHawesMaths @HawesMaths · 16h

Replying to @DirectorMaths and @tershanah

I wonder if analogue will get removed from the curriculum as it is so. Outmoded. Given that digital is so prevalent, it is the easiest and most efficient way to tell time. #mathscpdchat

Mary Pardoe @PardoeMary · 16h

Replying to @HawesMaths @DirectorMaths and @tershanah

Analogue clocks are all around us when 'out and about'! #mathscpdchat

MrHawesMaths @HawesMaths · 16h

Replying to @PardoeMary @DirectorMaths and @tershanah

So are sundials but that is not on the curriculum. We have 3 at school and no student can fathom it. I get that they still exist but it is fading in terms of its use. #mathscpdchat

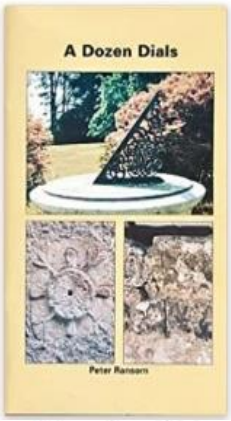
Mary Pardoe @PardoeMary · 18h

Replying to @HawesMaths @DirectorMaths and @tershanah

Sundials can prompt interesting maths learning!

E.g ...amazon.co.uk/Dials-Sundials...

#mathscpdchat



A Dozen Dials. A Book About Sundials Connected with Mathematics and Its History.

Paperback – 1 Jan. 1998

by Peter Ransom (Author)

See all formats and editions

Paperback
£9.00

Mary Pardoe @PardoeMary · 18h

Replying to @PardoeMary @HawesMaths and 2 others

Btw Peter is a Maths Association past President.

#mathscpdchat

MrHawesMaths @HawesMaths · 18h

Replying to @PardoeMary @DirectorMaths and @tershanah

Oh it can and as a concept it is fascinating to discuss. We have a HUGE one outside of my classroom and we do talk about it in depth. From a curriculum point of view it is extinct. I fear that analogue will be headed this way. #mathscpdchat

Mary Pardoe @PardoeMary · 18h

Replying to @HawesMaths @DirectorMaths and @tershanah

NRICH have some nice tasks and games involving analogue clocks.
nrich.maths.org/9027
#mathscpdchat

Time KS2

Watch the Clock

Age 7 to 11
Challenge Level ★★★

During the third hour after midnight the hands on a clock point in the same direction (so one hand is over the top of the other). At what time, to the nearest second, does this happen?

How Many Times?

Age 7 to 11
Challenge Level ★

On a digital 24 hour clock, at certain times, all the digits are consecutive. How many times like this are there between midnight and 7 a.m.?

Wonky Watches

Age 7 to 11
Challenge Level ★★

Stuart's watch loses two minutes every hour. Adam's watch gains one minute ery hour. Use the information to work out what time (the real time) they arrived at the airport.

Clocks

Age 7 to 11
Challenge Level ★

These clocks have been reflected in a mirror. What times do they say?

The Time Is ...

Age 7 to 11
Challenge Level ★★

Can you put these mixed-up times in order? You could arrange them in a circle.

5 on the Clock

Age 7 to 11
Challenge Level ★★★

On a digital clock showing 24 hour time, over a whole day, how many times does a 5 appear? Is it the same number for a 12 hour clock over a whole day?

Two Clocks

Age 7 to 11
Challenge Level ★★

These clocks have only one hand, but can you work out what time they are showing from the information?

Approaching Midnight live

Age 7 to 14

Here's a strategy game with lots to explore. Can you find out enough to guarantee a win, no matter what the settings? This game is part of our creativity project, which you can read more about here.

Tazreen Tershanah @tershanah · 16h

Replying to @HawesMaths @PardoeMary and @DirectorMaths

#mathscpdchat 'Light' is taught in year 3 science and the opportunity to create a sun dial is there but as you say the mechanics of it is almost unfathomable and changes dependent on the year. Opens up conversation about sunset/sunrise times and longer and short days.

Catherine Edwards @Edwards08C · 16h

Replying to @tershanah @HawesMaths and 2 others

Whole lesson was sidetracked the other week talking about sundials with my entry level class. The idea of the shadow moving with the sun took a long time to puzzle out #mathscpdchat

Director of Maths @DirectorMaths · 16h

Replying to @HawesMaths and @tershanah

Being secondary trained I wouldn't necessarily feel confident in how to teach a full class to tell the time on an analogue clock despite considering myself an experienced teacher? Individually is easier #mathscpdchat

Tazreen Tershanah @tershanah · 16h

Replying to @DirectorMaths and @HawesMaths

#mathscpdchat Individually children have different mathematical experiences, takes and conceptions of time. I think the first step is noticing important clock times that are already part of the classroom routine e.g. lesson start and end. Any other thoughts, colleagues?

MrHawesMaths @HawesMaths · 16h

Replying to @DirectorMaths and @tershanah

We have invested in lots of clocks that students can use to tell the time so we can ask qs like set the time to x:x maths is 3 hours and 20 mins long today. What time will you finish? Having the manipulative is so helpful. Even at year 8 level. #mathscpdchat

Tazreen Tershanah @tershanah · 16h

Replying to @HawesMaths and @DirectorMaths

#mathscpdchat I think the power to alter the time of a clock is actually quite exciting for pupils.

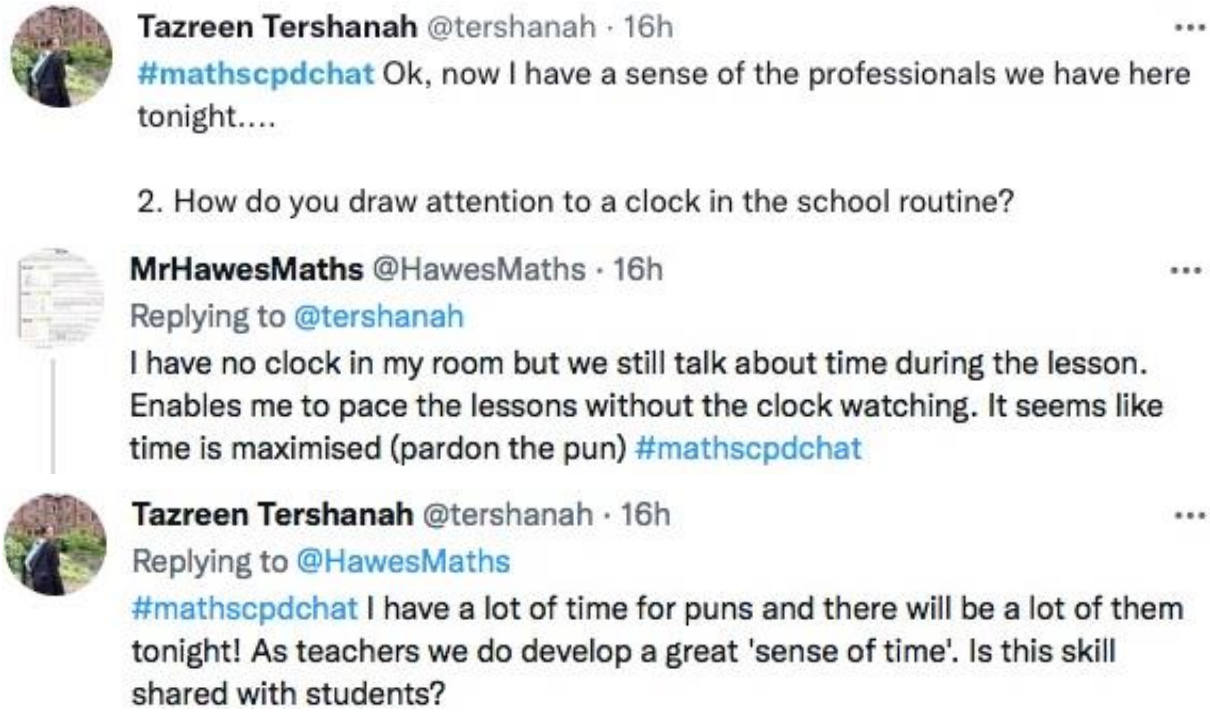
Tazreen Tershanah @tershanah · 16h

Replying to @tershanah @HawesMaths and @DirectorMaths

#mathscpdchat e.g. who gets to alter the analogue school clocks when the time changes in Oct/March. How marvellous would it be if it were a pupil or a teacher supported by pupils? Often digital clocks will change on their own.

A quote-retweet from Joanne Green, of a comment during the discussion above, received a reply from Mr Hawes …

… and there was a direct reply to the host's second question (which is repeated here as a reminder) from Mr Hawes, to which Tazreen Kassim-Lowe replied:



The host's next question …

Tazreen Tershanah @tershanah · 19h

#mathscpdchat

Thanks for your thoughts on clock reading. What about this…

3. Elapsed time: the feeling of how much time has passed.

How do you draw attention this?

was followed by a reply from herself …

Tazreen Tershanah @tershanah · 19h

Replying to @tershanah

#mathscpdchat I used ask children to close their eyes and raise their hand when they felt X seconds had passed. Or clap every 5 seconds before the 'tidy up' countdown got to 0 (also reinforced multiples of 5).

… and this conversation:

Catherine Edwards @Edwards08C · 19h

Replying to @tershanah

This is a real issue, I find especially at break and lunch. A lot of the students seem to have no feeling for how much time has elapsed. Not sure how you teach this though? #mathscpdchat

Mary Pardoe @PardoeMary · 19h

Replying to @Edwards08C and @tershanah

Do an experiment … whole class tries to estimate say 5 mins … put up hands when think it has passed … collect data … explore data using stats knowledge?

#mathscpdchat

Catherine Edwards @Edwards08C · 19h

Replying to @PardoeMary and @tershanah

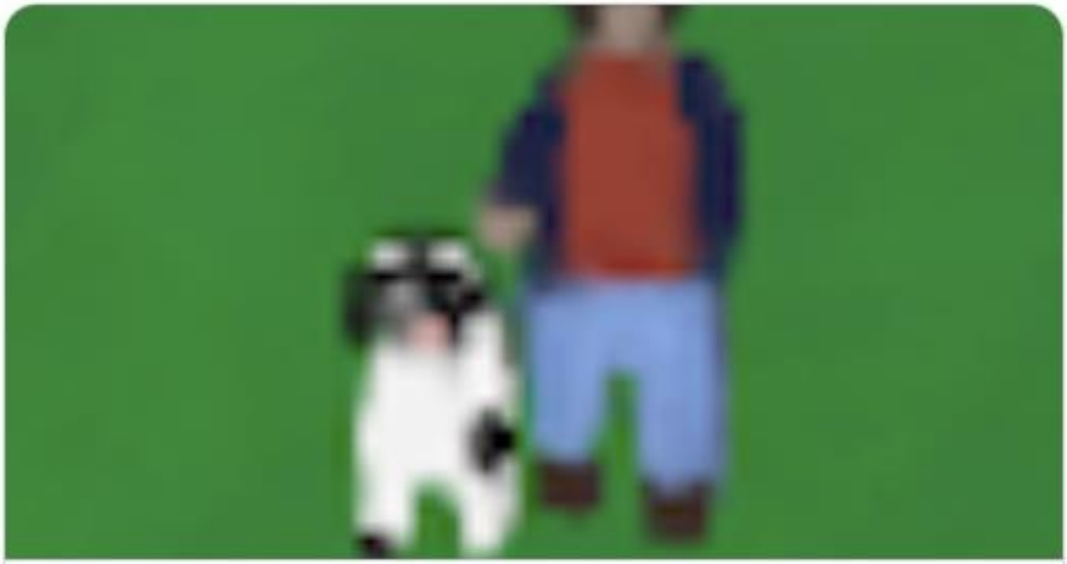
I did that last week , but only one minute, they were more accurate than I thought they would be. Will have to try it with longer time periods

#mathscpdchat

Tazreen Tershanah @tershanah · 19h

Replying to @PardoeMary and @Edwards08C

#mathscpdchat Data handling is an excellent way for pupils to get a sense of time. By analysing how it factors in the every day. Like this excellent @nrichmaths interactive



nrich.maths.org

Take Your Dog for a Walk

Use the interactivity to move Pat. Can you reproduce the graphs and tell their story?

The host's question 3 had also prompted a teacher to try something the next day:

MrHawesMaths @HawesMaths · 20h

Replying to @tershanah

I have at times created a challenge where students try and count to 10s, 30 sec and 1 min,2 min, amazing how inaccurate they get the longer you go. I might try tomorrow to get them doing a five minute task.And when they think 5 mins is up they raise their hand. #mathscpdchat

Tazreen Tershanah @tershanah · 20h

Replying to @HawesMaths

#mathscpdchat I love that you are thinking about something you might try tomorrow. It is so tricky because when experiencing elapsed time pupils are so often doing so many other things at once!

Thoughts generated by Tazreen's fourth question …

Tazreen Tershanah @tershanah · 20h

#mathscpdchat

Here is a question that will really get us thinking:

4. What role does everyday language play in the teaching of time?

Language around time (idioms, colloquialisms etc) can be really 'fuzzy'.

… included, in the following conversation, reflection on how representing the passage of time on a straight line is probably more helpful/natural than on a circle (analogue clock) or as a column of numbers (digital clock):

Catherine Edwards @Edwards08C · 20h

Replying to @tershanah

I have a high proportion of EAL and NTE learners, It makes you really conscious of your language choice. Teaching time with my Y9 at the moment, we spent nearly a whole hour on language of time and sequencing. It not simple when you think about it #mathscpdchat

Tazreen Tershanah @tershanah · 20h

Replying to @Edwards08C

#mathscpdchat You are right. It is not simple. Simple phrases we use all the time are loaded with connotations and complexities. What kind of time related phrases are the most tricky to grasp mathematically?

Catherine Edwards @Edwards08C · 20h

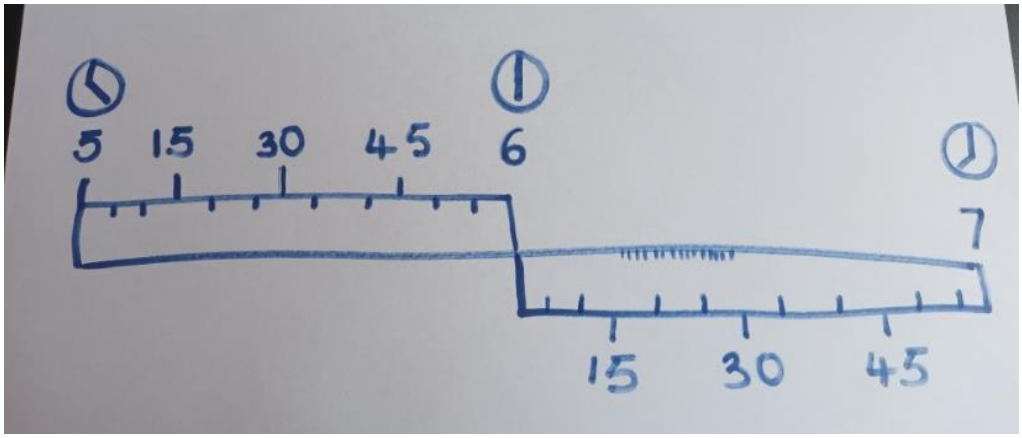
Replying to @tershanah

The thing that threw them most was for example “today is Wednesday what day was it yesterday?” And questions like that, deciding if they needed to go forwards or backwards in the sequence of the days. Same with time e.g. what time was it an hour ago #mathscpdchat

Tazreen Tershanah @tershanah · 20h

Replying to @Edwards08C

#mathscpdchat. Interesting. I think it is easy to forget that time is linear as it is represented in a circle (clock) or in columns (timetables/calendars). Here is an utilising a number line to demonstrate the linear nature of time. Perhaps could be used for days of the week?



Mary Pardoe @PardoeMary · 20h
Very interesting! **#mathscpdchat**

> **Catherine Edwards** @Edwards08C · 20h
> Replying to @tershanah
> The thing that threw them most was for example "today is Wednesday what day was it yesterday?" And questions like that, deciding if they needed to go forwards or backwards in the sequence of the days. Same with time e.g. what time was it an hour ago #mathscpdchat

Catherine Edwards @Edwards08C · 20h
Replying to @PardoeMary
I do wonder if it's literacy as much as anything, the average reading age for the class is about 7 #mathscpdchat

Tazreen Tershanah @tershanah · 20h
Replying to @Edwards08C and @PardoeMary
#mathscpdchat Definitely a connection there. Recently I was support a child with a reading passage about a sequence of events. I wonder if representing it mathematically or at least spatially would have helped?

Catherine Edwards @Edwards08C · 20h
Replying to @tershanah
We did have a very interesting chat about the seasons, they weren't happy with the year starting in January but Winter being December, January, February #mathscpdchat

Tazreen Tershanah @tershanah · 20h
Replying to @Edwards08C
#mathscpdchat. Sounds like a great chat. Talking about time is often talking about things that we can't control! I recently had a conversion about why we have leap years with a student. 🤯

Catherine Edwards @Edwards08C · 20h

Replying to @tershanah

That lead to a conversation about people born on the 29th and if they aged at quarter of the speed of the rest of the population as their birthday only occurred once every four years . Never a full moment 😂#mathscpdchat

Catherine Edwards @Edwards08C · 20h

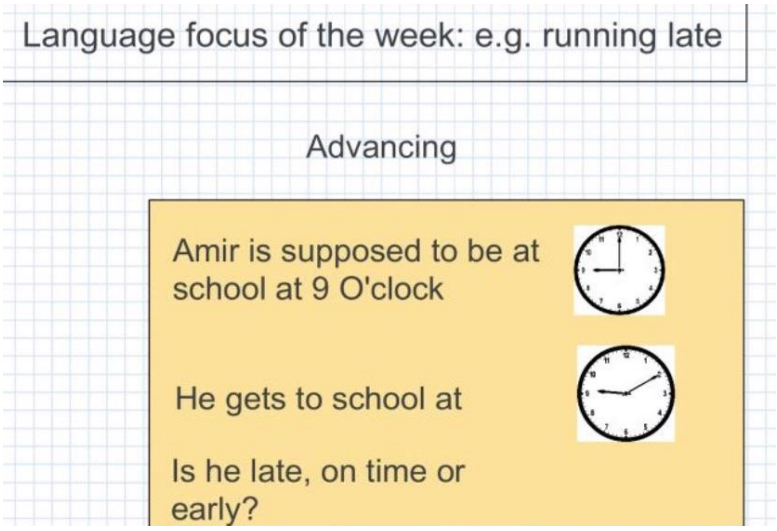
Replying to @Edwards08C and @tershanah

Dull moment!

Tazreen Tershanah @tershanah · 20h

Replying to @tershanah and @Edwards08C

#mathscpdchat Here is an example of using a phrase and exemplifying it mathematically.



… and colloquial phrases such as 'in a jiffy' were mentioned:

MrHawesMaths @HawesMaths · 20h

Replying to @tershanah

I love that when I hear someone say it'll be done in a jiffy. I have to point out that it is an actual unit of time.

Tazreen Tershanah @tershanah · 20h

Replying to @HawesMaths

Tell us more #mathscpdchat . This reminds me of the term 'dog years' or 'rabbit years'. Spoken about so casually but the actual underlying mathematical conversion is sometimes fuzzy for some of us.

MrHawesMaths @HawesMaths · 20h

Replying to @tershanah

en.m.wikipedia.org/wiki/Jiffy_(ti... lovely read about the jiffy. Many applications too.

en.m.wikipedia.org
Jiffy (time) - Wikipedia

(link provided above)

Perhaps there will be opportunities for retrospective replies to Tazreen's last question during future #mathsCPDchats?

Tazreen Tershanah @tershanah · 20h

#mathscpdchat

How time flies!

Before we finish up our #mathscpdchat.

5. What have you learned from today's chat about teaching and learning about time? What will you try?

Finally, time required the host, Tazreen Kassim-Lowe, to fly off to … … …

Tazreen Tershanah @tershanah · 20h

#mathscpdchat It's time to say goodbye, colleagues. I must express my gratitude for such quality contributions today centred around teachable moments and time.
Together we have built a great bank of ideas, resources and conversation starters. Summary available soon from @NCETM.