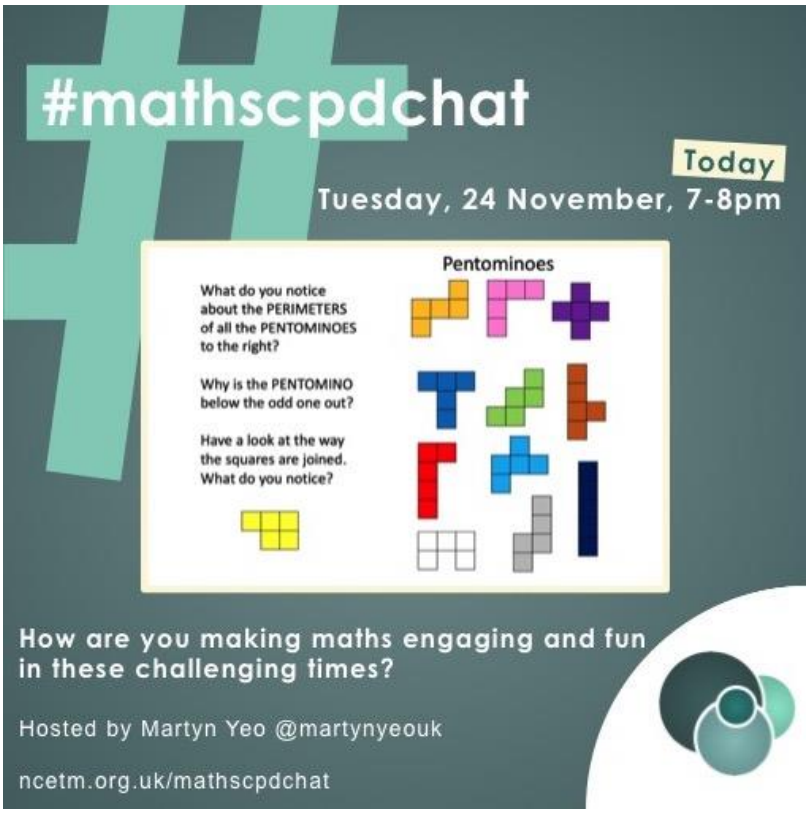
# #mathscpdchat 24 November 2020

**How are you making maths engaging and fun in these challenging times?**
Hosted by Martyn Yeo

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




The **results of a poll,** tweeted by the host at the start of the chat, were:

Some of the areas where discussion focused were:

**how teachers are making tasks, presented in the classroom or online, engaging for pupils:**

- **some teachers 'like to inject passion and enthusiasm' into all their maths teaching**, creating 'a nice atmosphere' and making 'links to 'real world' maths so they can perceive applications' … that 'it can be exhausting keeping up the enthusiasm' … having to 'ask parents to be more positive about maths … when one of them exclaimed the usual "I was never good at maths so it's beyond me"' … putting 'all boardwork, notes/exercises online' so that parents 'know what is going on' … using the *Tiny Scanner* application (link provided below) 'to turn my board into a PDF and then upload';
- some teachers believe that **'keeping things (lessons?) pacy (upbeat and positive)'** is a key strategy in engaging pupils … generating **lots of pupil-teacher and pupil-pupil interaction using mini-whiteboards**;
- **encouraging pupils to visualise ('see in your mind' – 'create mental images of') examples, procedures and relationships,** some of which images may be dynamic, ('use your eyes as a camera') … some discussion followed, prompted by the assertion that some people are unable to do 'picturing in their minds', and that this is a human condition 'known as 'aphantasia' – my husband has it' … counter-assertions included the statement that 'the human brain has the natural ability to connect with images';
- some teachers believe that pupils love there to be a **'competitive element'** in their mathematical learning and practice;
- some **children have loved making 'perimeter robots'** (2D objects composed of shapes, such as rectangles, which they have drawn on squared paper, cut out and joined together) … it was also reported that **pupils of various ages enjoy making/drawing tiles (that may be square)** possibly composed of simple shapes such as equilateral triangles and rhombuses, **and exploring different tessellations that can be created** by placing the tiles together in different systematic ways;
- it was reported that **during the recent *Maths Week UK* pupils loved doing 'some great problem solving'**, such as measuring the height of the school using homemade clinometers and completing some *Yohakus* (link provided below);

**websites and resources recommended by contributors to the chat:**

- many teachers and pupils like using the **manipulatives on the *MathsBot* website** (link provided below);
- some teachers like using the ***Bowland Maths* assessment tasks** 'as engaging problem-solving tasks' (link provided below);

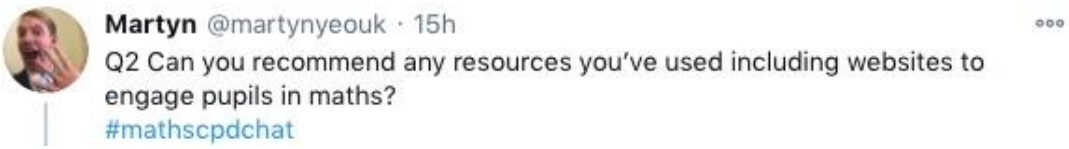
- it was reported that 'students become very engaged when they try to **solve problems together by acting them out**';
- it was also reported that pupils can become engaged when **'catchy' music** accompanies prompts for mathematical exploration, that are possibly presented in videos (links to *Roman Numerals* and *Dance Squared* provided below);
- it was pointed out that when students are trying to solve a problem or puzzle, the **success of just one student in a group** can inspire the others to persevere;
- some teachers have found that ***Transum* puzzles** (link provided below) help students **'develop problem solving skills**';
- it was reported that higher-attaining students (students working towards Higher level GCSE) love doing GCSE maths past-papers … they **enjoy spending one lesson per month doing past Intermediate-level GCSE papers**;
- it was also reported that students of all ages enjoy **'Which One Doesn't Belong?' challenges**;

**attempts to engage students that did not succeed in so doing:**

- a teacher's **first attempt to get students to position themselves (in an outdoor place) so as to 'model straight line graphs' was not successful** … students 'were all over the place – I may even have lost some';
- at least one teacher would love to have **'a great big coordinate grid in the playground … it could be used for so much maths**' … that the **mathematics of many 'topics' could be taught outside** … that now (during these Covid months) may be a good time (weather permitting) to experiment with maths teaching and learning that makes effective use of having students in an outdoor place.

In what follows, click on any screenshot-of-a-tweet to go to that actual tweet on Twitter.

This is a part of a conversation about resources and websites that teachers enjoy teaching with and pupils enjoy learning from. The conversation was generated by this tweet from Martyn Yeo:




and included these from Heather Scott, Martyn Yeo and MrHawesMaths:

**Heather Scott** @MathsladyScott · 15h

#mathscpdchat Transum puzzles are a great source for students to use to develop problem solving skills. I usually set a choice of 3 or 4 once a month transum.org/Software/Puzzl...


**Martyn** @martynyeouk · Nov 24

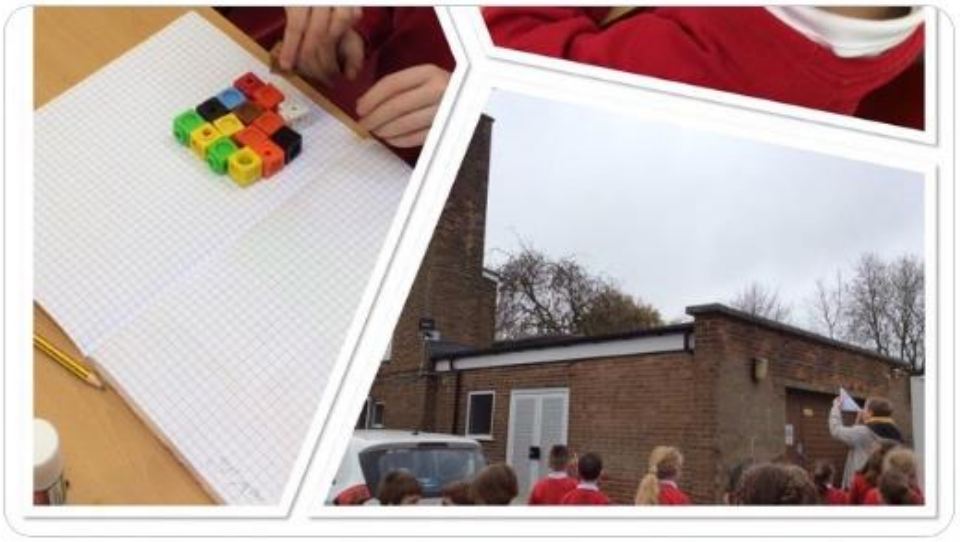
Replying to @MathsladyScott

That's one ive just saved to my list!
Thanks! #mathscpdchat

**Martyn** @martynyeouk · 15h

During Maths Week UK we did some great problem solving at school and the children loved it!
We measured the height of the school and completed some Yohakus.
#mathscpdchat

Did anyone else do anything from @maths_week



**MrHawesMaths** @HawesMaths · 14h

Replying to @martynyeouk @maths_week and 3 others

Saw this and it was brilliant. We're they homemade clinometers?
#mathscpdchat

**Martyn** @martynyeouk · Nov 24

Had to google what clinometer was, and yes it is! #mathscpdchat

these from Heather Scott, Pete Atkinson and Priya Shah:

**Heather Scott** @MathsladyScott · 15h

#mathscpdchat Also I have found that top sets love doing past papers - we again spend one lesson a month looking at a past intermediate GCSE as this can be completed in an hour as long as you know your stuff 😍

**Pete Atkinson** @MrA_Maths · 14h

Replying to @martynyeouk @NCETM and @mathscpdchat

We used Kahoot a lot when we were remote teaching last year. Kids loved the competitive element and it gave us quite a lot of info on misconceptions if Qs and As were structured well #mathscpdchat

**Priya Shah** @m4thi5beautiful · 14h

Replying to @martynyeouk

Q2) Really like using the manipulatives in mathsbot to demonstrate #mathscpdchat

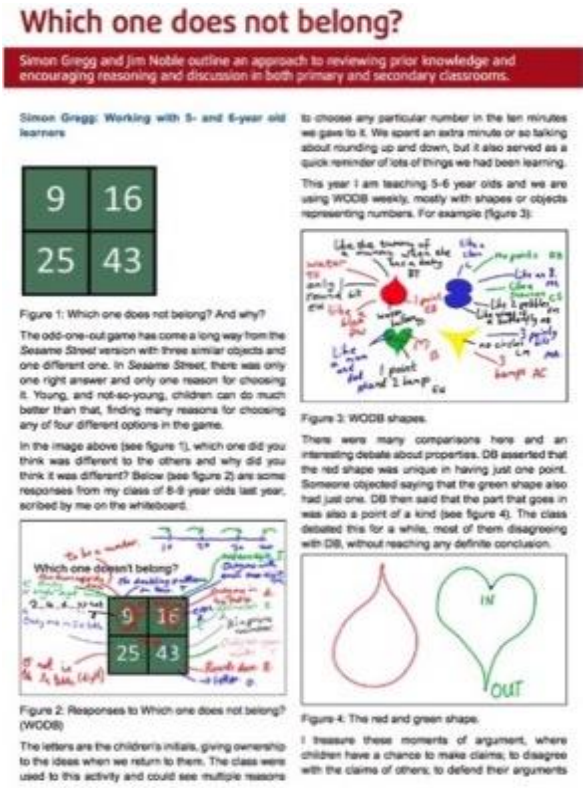
these from Mary Pardoe and Martyn Yeo:

**Mary Pardoe** @PardoeMary · 15h

WODB ... students love them!

atm.org.uk/write/MediaUpl...

#mathscpdchat



Which one does not belong?

Simon Gregg and Jim Noble outline an approach to reviewing prior knowledge and encouraging reasoning and discussion in both primary and secondary classrooms.

Simon Gregg: Working with 5- and 6-year old learners

9 16
25 43

Figure 1: Which one does not belong? And why?

The odd-one-out game has come a long way from the *Sesame Street* version with three similar objects and one different one. In *Sesame Street*, there was only one right answer and only one reason for choosing it. Young, and not-so-young, children can do much better than that, finding many reasons for choosing any of four different options in the game.

In the image above (see figure 1), which one did you think was different to the others and why did you think it was different? Below (see figure 2) are some responses from my class of 8-9 year olds last year, scribed by me on the whiteboard.

Which one doesn't belong?

Figure 2: Responses to Which one does not belong? (WODB)

The letters are the children's initials, giving ownership to the ideas when we return to them. The class were used to this activity and could see multiple reasons to choose any particular number in the ten minutes we gave to it. We spent an extra minute or so talking about rounding up and down, but it also served as a quick reminder of lots of things we had been learning.

This year I am teaching 5-6 year olds and we are using WODB weekly, mostly with shapes or objects representing numbers. For example (figure 3):

Figure 3: WODB shapes.

There were many comparisons here and an interesting debate about properties. DB asserted that the red shape was unique in having just one point. Someone objected saying that the green shape also had just one. DB then said that the part that goes in was also a point of a kind (see figure 4). The class debated this for a while, most of them disagreeing with DB, without reaching any definite conclusion.

IN
OUT

Figure 4: The red and green shape.

I treasure these moments of argument, where children have a chance to make claims; to disagree with the claims of others; to defend their arguments

**Martyn** @martynyeouk · Nov 24

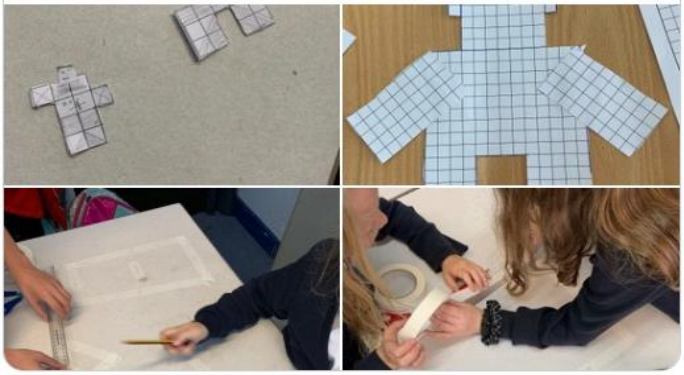
Love these! @WODBMath #mathscpdchat

**Martyn** @martynyeouk · 14h

This looks exciting and was sent in a bit before the chat started but wanted to share...

#mathscpdchat

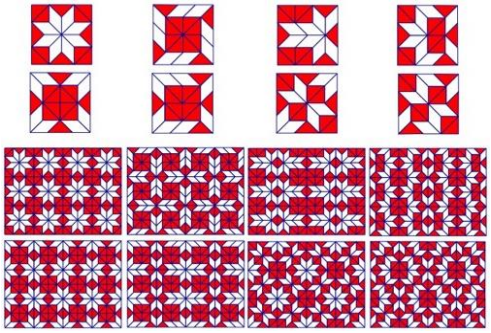
> **Chris Wearing** @ChrisWearing2 · 15h
>
> Can't remember where I saw this so apologies to the original source but my children loved making 'perimeter robots' and 2D shapes to measure. @CODEMathsHub @MathsHubs #mathscpdchat @OldwaySchool



**Mary Pardoe** @PardoeMary · 14h

Replying to @PardoeMary

Students can do a lot with square tiles ... identical ones placed together systematically ... like this one perhaps (triangles and rhombuses) ...

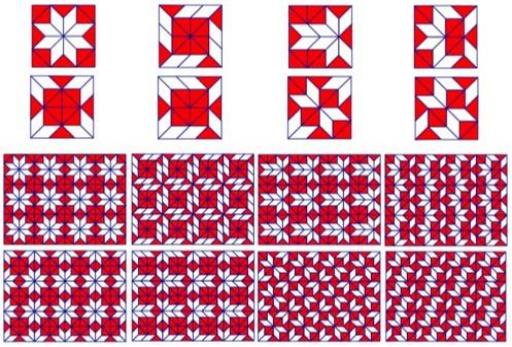


**Mary Pardoe** @PardoeMary · 14h

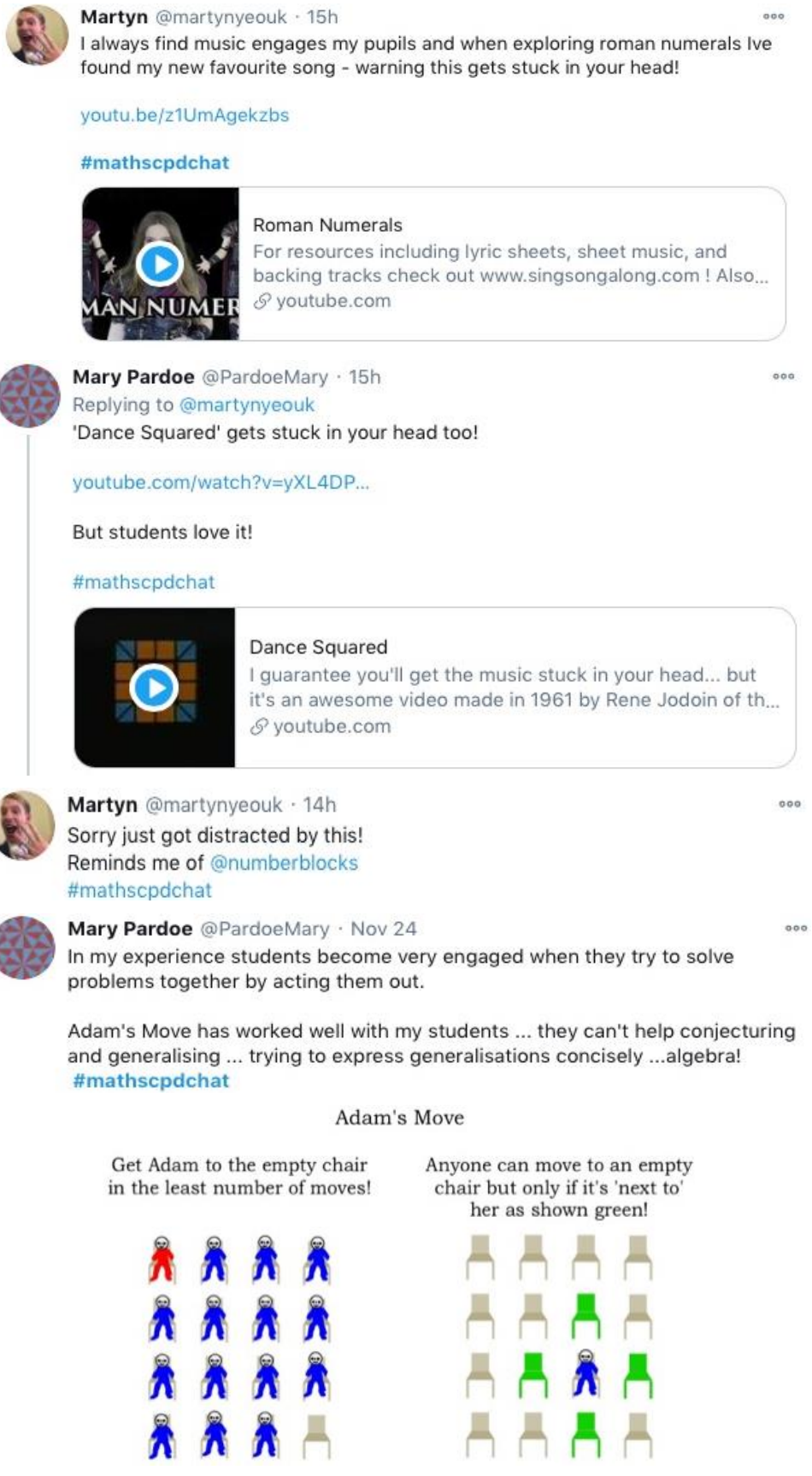
... or this ...

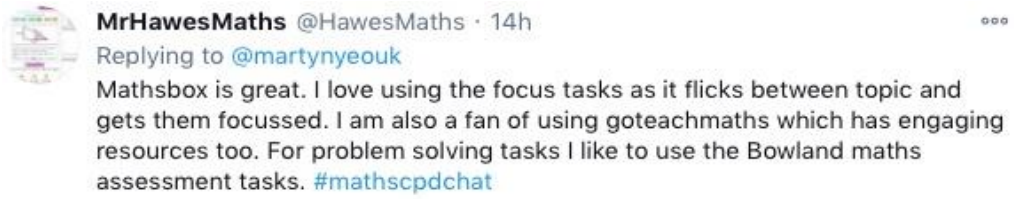
(spot the difference!)

#mathscpdchat



and these from Martyn Yeo, Mary Pardoe and MrHawesMaths:






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

Among the links shared were:

Roman Numerals which is a YouTube video that can generate exploration of Roman numerals. It was shared by Martyn Yeo

Andrew Jeffrey's website which is where you can find a range of unusual maths resources for primary and secondary teachers, including magic tricks and information about *Magic of Maths* shows. It was shared by Martyn Yeo

Yohaku which is where you can find a type of number puzzle which tests a pupil's number sense and problem-solving skills. It was shared by Martyn Yeo

Transum Maths Puzzles which is where you can very many attractive interactive puzzles that require students to reason in many different contexts and draw on their mathematical knowledge. It was shared by Heather Scott

GCSE Recall and Recap which is part of the MathsBot website where pupils can find out whether they can draw fluently on their mathematical knowledge and understanding by seeing themselves how they respond to clearly and attractively presented challenges. It was shared by Heather Scott

Virtual manipulatives which is part of the MathsBot website where teachers and students can enjoy playing and working with a very large range of different virtual manipulatives. It was shared by Priya Shah

Fun Maths - Games and Puzzles which is a free pdf document from the Association of Teachers of Mathematics (ATM). It contains ideas for mathematical activity that are taken from the ATM publication, *Fun Maths, Games and Puzzles* by Bob Vertes. It was shared by Mary Pardoe

Which one does not belong? which is a free PDF version of a useful article by Simon Gregg and Jim Noble in *Mathematics Teaching 260* from the Association of Teachers of Mathematics (ATM). It was shared by Mary Pardoe

Dance Squared which is a YouTube video that can generate ideas about ways of combining and splitting 2-D shapes, including to create squares. It was shared by Mary Pardoe

The Bowland Maths assessment tasks which includes over thirty interesting tasks designed to help teachers assess their pupils' achievements and progression against key processes normally addressed in Key Stage 3 mathematics. It was shared by MrHawesMaths

Mathsbox which includes very many ready to use resources, including starter tasks and challenges and GCSE resources for revision in the forms of bingo games and 'treasure hunts'. It was shared by MrHawesMaths

Tiny Scanner which is where you can find out what this scanner application can do, and how to get it to do it. It was shared by MrHawesMaths

Get this in your head which are videoed teacher presentation-and-explanation of aspects of mathematical topics usually 'covered' in Key Stages 3 and 4. It was shared by Pete Atkinson

Kahoot which are resources intended for teachers. It was shared by Pete Atkinson