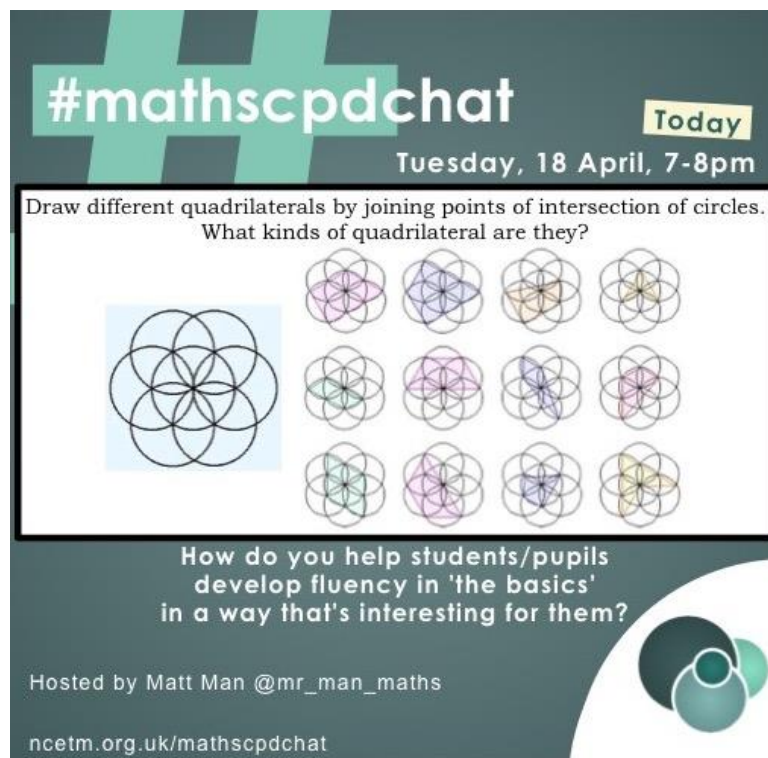


## #mathscpdchat 18 April 2023

How do you help students/pupils develop fluency in ‘the basics’  
in a way that’s interesting for them?

Hosted by [Matt Man](#)

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



#mathscpdchat Today  
Tuesday, 18 April, 7-8pm

Draw different quadrilaterals by joining points of intersection of circles.  
What kinds of quadrilateral are they?

How do you help students/pupils  
develop fluency in 'the basics'  
in a way that's interesting for them?

Hosted by Matt Man @mr\_man\_maths  
ncetm.org.uk/mathscpdchat

The links shared during this discussion were:

[Mathsbot Retrieval Starter manipulative](#) which is a manipulative that enables the user to create a set of short maths ‘questions’/tasks using a ‘Last Lesson’/‘Last Week’/‘Last Month’/‘Last Year’ format. It was shared by [Matt Man](#)

[Do it, twist it, deepen it - TES Maths Resource of the Week](#) which is a resource from Mr Barton described by him in a blog on his website. This resource, ‘which comes complete with a well-structured PowerPoint’, shows exactly how the idea works in the context of the area of a triangle. It was shared by [Matt Man](#)

[Just Maths: Bread and Butter](#) which are very short tasks designed to provide 'that regular "deliberate practice" needed' by students, of maths they have learned. It was shared by [Matt Man](#)

[The Teaching and Learning of Multiplication Bonds: A Position Statement](#) which is a Position Statement, presented as a short PDF document, that was composed by members of the Joint ATM/MA Primary Group. This statement arose from their meetings in which they frequently turned to discussing issues around the teaching of multiplication. It was shared by [Laurie Jacques](#)

[Mathematical Fluency WITHOUT Drill and Practice](#) which is an article by [Colin Foster](#) in *Mathematics Teaching 240*. The author asks, and addresses, how we can avoid letting 'practice' dominate the teaching of mathematics. It was shared by [Mary Pardoe](#)

[Developing fluency with procedures without using traditional exercises](#) which is a YouTube video in which [Colin Foster](#) introduces the idea of mathematical etudes. Mathematical etudes are tasks designed to generate extensive practice of important mathematical procedures within an interesting problem-solving context. It was shared by [Mary Pardoe](#)

[Mathematical etudes](#) which is a website devoted to the Mathematical Etudes Project instigated by [Colin Foster](#)'s ideas and work. This project aims to find creative, imaginative and thought-provoking ways to help learners of mathematics develop their fluency in important mathematical procedures. From this website you can reach very many useful related resources. It was shared by [Mary Pardoe](#)

[Notes On A Triangle](#) which is a short film by Rene Jodoin, owned by the National Film Board of Canada. This film, and others like it, have been used by maths teachers in their lessons in order to generate discussion, thoughts and reasoning, and to remind pupils/students of what they already know. It was shared by [Mary Pardoe](#)

[Focus on... short image sequences \(In Issue 59 of the archived NCETM Secondary Magazine\)](#) which is an article about using mental image sequences and short film sequences to generate mathematical learning. It was shared by [Mary Pardoe](#)

[SMRCHS MATH](#) which is the official maths channel of St Matthew's RC High School. It contains many videos in which a teacher works through maths 'questions'/problems/tasks. It was shared by [Joanne Green](#)

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

This was the host's welcome tweet:



**Matt Man** @mr\_man\_maths · 18h

Good evening everyone - hope that you all had a lovely Easter break. Welcome to this week's [#mathscpdchat](#) where we will be discussing on the topic of fluency. First question coming up!

There was a comment about one (not identified) of the three problems that had been shown in previous tweets (posted as early notifications of the topic, host, date and time of this [#mathsCPDchat](#)) about this discussion:



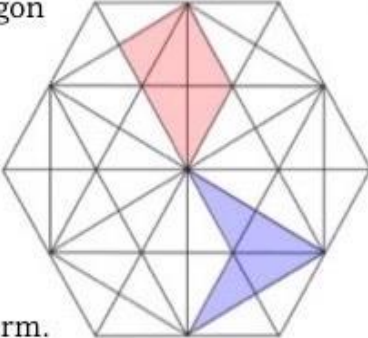
**Joanne Green** @MsJoanneGreen · 19h

@mr\_man\_maths [#mathscpdchat](#) Hello 😊 I've not had the time to have try at your puzzle even though it looks fab

The outer shape is a regular hexagon with side-length 2 units.

Find the perimeters of quadrilaterals within the image.  
(Two quadrilaterals are shown as examples.)

You can give perimeters in surd form.



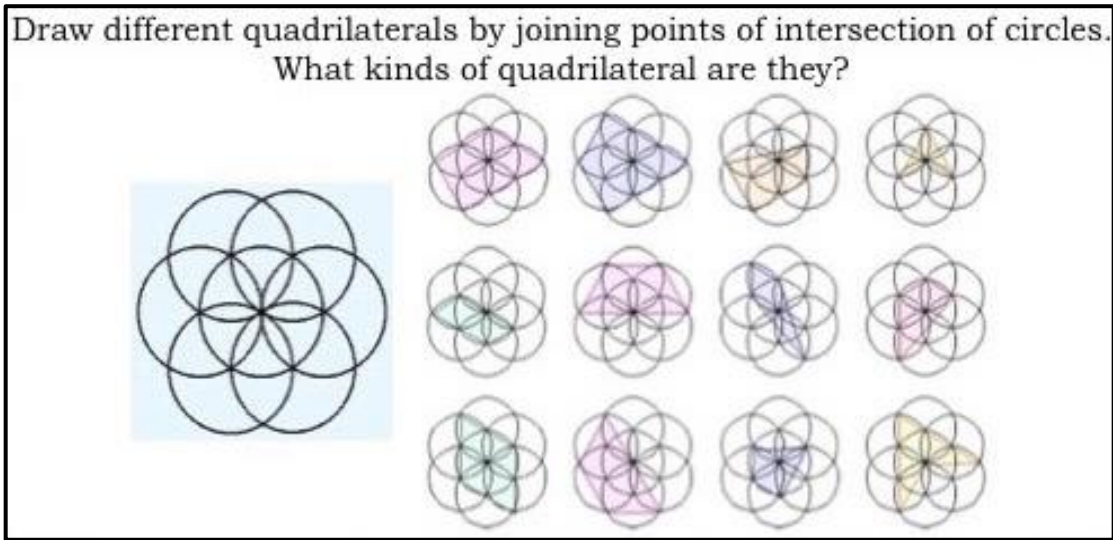
Find different numbers for the empty cell (that others may not think of) so that the product is 120 when rounded to the nearest ten.

5	×		=	120
---	---	--	---	-----

**rounded result**

Some of the numbers that students thought of were:

24.02,  $500/21$ ,  $\sqrt{600}$ , 23, 24.55, 23.05, 23.0001,  
 $4.9^2$ ,  $600/26$ ,  $\sqrt{550}$ , 24.96,  $2.9^3$ , 23.9,  $4.8^2$



**Matt Man** @mr\_man\_maths · 19h

They're not from me, but thanks to @mathscpdchat for sharing these.  
#mathscpdchat

Matt's first main question ...



**Matt Man** @mr\_man\_maths · 18h



Q1: How do you define fluency? Is it just by being able to complete basic number skills fluently by doing times table practice as an example?  
#mathscpdchat

... prompted a single reply ...



**Dr Laurie Jacques (she/her)** @SmartJacques · 14h

A nice think piece from @ATMMathematics and @Mathematical\_A joint primary group: [m-a.org.uk/resources/1mul...](http://m-a.org.uk/resources/1mul...)

**Fluency**

Flexibility and decision making are key elements of fluency. The aims of the National Curriculum (2013) describe fluency as a combination of conceptual understanding and automaticity, developed side by side, and that all pupils:

*become fluent in the fundamentals of mathematics, including through varied and frequent practice with increasingly complex problems over time, so that pupils develop conceptual understanding and the ability to recall and apply knowledge rapidly and accurately p. 3*

... and three conversations. This one includes a link to another recorded discussion:





**Maryse** @AllThingsMaths · 18h

...

I think I'd include recall, speed, accuracy.

Speed doesn't mean just to be fast, but to work through a skill without having to stop and think too much.

[#mathscpdchat](#)



**Matt Man** @mr\_man\_maths · 18h

...

I'm guessing defining speed is different to every pupil. Not necessarily meaning a race to getting 100 times table calculations completed.

[#mathscpdchat](#)



**Maryse** @AllThingsMaths · 17h

...

Speed is different to each child. I was trying to find a different word for fluent, and failed 🤦

[#mathscpdchat](#)



**Matt Man** @mr\_man\_maths · 18h

...

Could this be a misconception of what is defined as mastery and what is defined as being fluent on an area of Maths? Or would that be classed as working at an elite level. This reminds me of something that @EmathsUK shared in one of @atulrana's #MathsChatLive

[#mathscpdchat](#)



**Mark McCourt** @EmathsUK · 17h

...

Fluency: The point at which one no longer finds it necessary to attend in order to perform with skill.



**Matt Man** @mr\_man\_maths · 17h

...

A lovely concise definition on fluency Mark! Thank you. [#mathscpdchat](#)



**Matt Man** @mr\_man\_maths · 19h

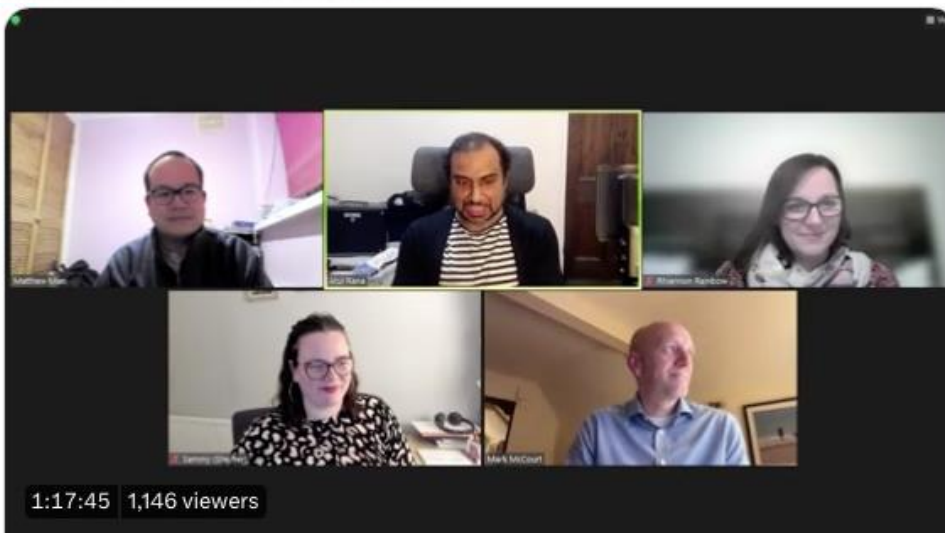
Listen to the first section or so where Mark @EmathsUK talks about working at an elite level. Would fluency count as part of this? Is that what we mean when we talk about fluency - to work at an elite level?

#mathscpdchat



**Atul Rana** @atulrana · Mar 1, 2022

#MathsChatLive with @EmathsUK on all things maths education. Featuring guests @WhatTheTrigMath @Kieran\_M\_Ed @Noni\_Rainbow @mr\_man\_maths Get involved! Reply to this tweet or use hashtag #MathsChatLive to comment or ask us anything. Please RT, thanks :-)  
twitter.com/i/broadcasts/1...



**Atul Rana** @atulrana

#MathsChatLive with @EmathsUK on all things maths education. Featuring guests @WhatTheTrigMath @Kieran\_M\_Ed @Noni\_Rainbow @mr\_man\_maths ...

This quoted tweet from [Atul Rana](#) with the recorded discussion is [here](#).

The following conversation also included discussion about speed as an aspect of fluency, and ended with an interesting question ...



**Jenny Hill-Parker** @JennyHillParker · 18h

I suppose fluency implies an ease and speed at retrieval of needed facts and procedures #mathscpdchat



**Maryse** @AllThingsMaths · 18h

I've just tweeted similar 🤔

#mathscpdchat



**Matt Man** @mr\_man\_maths · 18h

Yes can you give some examples of this? #mathscpdchat



**Jenny Hill-Parker** @JennyHillParker · 18h

...

A simple example could be a mental calculation ie  $4 \times 17$  #mathscpdchat



**Matt Man** @mr\_man\_maths · 18h

...

Yep, agreed. My mind is now suddenly going back to when I was a pupil and completing all the mental arithmetic tests for the KS2 and KS3 SATs. Does that test solely on fluency? #mathscpdchat

... and the other response to Matt's first main question ('How do you [maths teachers] define fluency in maths?') drew attention to some useful resources:



**Mary Pardoe** @PardoeMary · 18h

...

@colinfoster77 doesn't think so ...  
[foster77.co.uk/MT240-14-01.pdf](http://foster77.co.uk/MT240-14-01.pdf)  
#mathscpdchat

## MATHEMATICAL FLUENCY WITHOUT DRILL AND PRACTICE

Colin Foster asks how can we avoid letting 'practice' dominate the teaching of the new mathematics national curriculum



**Mary Pardoe** @PardoeMary · 18h

...

This is a more recent exposition by @colinfoster77  
[youtube.com/watch?v=OSrnbf...](https://youtube.com/watch?v=OSrnbf...)  
#mathscpdchat



youtube.com

Developing fluency with procedures without usin...  
In this video, I introduce the idea of mathematical etudes <http://www.mathematicaletudes.com/>, ...



**Matt Man** @mr\_man\_maths · 18h

...

Definitely will give this a watch! It's on my "Watch later" playlist.  
#mathscpdchat

The host's second main question ...



**Matt Man** @mr\_man\_maths · 19h

...

Q2: How do you plan your starter tasks in your Maths lessons? Are these mainly focused on fluency? #mathscpdchat

... and invitation to share examples ...





**Matt Man** @mr\_man\_maths · 19h

Do share some examples of what works in your starter tasks with the focus on fluency. #mathscpdchat

... was an opportunity for Matt to share some resources (all the links shared are provided above):



**Matt Man** @mr\_man\_maths · 19h

For me, the Bread and Butter starters by @Just\_Maths are brilliant especially with the focus on getting the fluency basics right for the students. There are versions for "Working Towards", "Crossover" and "Working Above" and are sequenced based on topics taught.

#mathscpdchat



**Jenny Hill-Parker** @JennyHillParker · 20h

I'd forgotten about the Bread and Butter starters, thanks for the reminder!

#mathscpdchat



**Matt Man** @mr\_man\_maths · 20h

Link: [justmaths.co.uk/2015/10/04/bre..](https://justmaths.co.uk/2015/10/04/bre..)

These are the earlier versions of @Just\_Maths Bread and Butter.

#mathscpdchat



justmaths.co.uk  
**Bread and Butter 9-1**  
With our year 9 and 10 this year we are following the Edexcel 2 and 3 year schemes work (it seeme...



**Matt Man** @mr\_man\_maths · 19h

And for other groups, the "Skills checks" by @mathsbox1 are brilliant. Ten questions, randomly generated, and you can also do it based on topics that students are weaker at. #mathscpdchat

The host's invitation to share 'starter' tasks also prompted the following single reply ...



**Heather Pehrson** @pehrson\_heather · 18h

We made a whole set of the first 5 questions of every F and H paper. We do F for all Y10. Then in Y11 we do H for those doing H and redo F for those doing F. These get us up to the spring mocks. Afterwards we use starters as mini-lessons to re-teach weak topics. #mathscpdchat



... and the sharing of another idea:



**Mary Pardoe** @PardoeMary · 19h

...

I have used short films ... for example 'Notes on a Triangle' by Rene Jodoin, here: [youtube.com/watch?v=1ztfo5...](https://youtube.com/watch?v=1ztfo5...)

[#mathscpdchat](#)



youtube.com

Notes On A Triangle

Another great creation by Rene Jodoin. Look for his other film "Dance Squared". This film is owned by...



**Matt Man** @mr\_man\_maths · 20h

...

Wow, haven't seen that yet! Again on my "Watch later" list.

[#mathscpdchat](#)



**Jenny Hill-Parker** @JennyHillParker · 19h

...

It's mesmerising! How did you use it in the classroom Mary?

[#mathscpdchat](#)



**Matt Man** @mr\_man\_maths · 19h

...

I'm intrigued to know too Mary! [#mathscpdchat](#)



**Mary Pardoe** @PardoeMary · 3h

...

Aim to stimulate discussion ... learning to explore situations. Show all, show again, pause at sig views ... what do they see? what can they deduce? what would happen if? their questions? Wrote re this:

[ncetm.org.uk/media/z3gp4eek](https://ncetm.org.uk/media/z3gp4eek). (scroll to 'Focus on image sequences')

[#mathscpdchat](#)

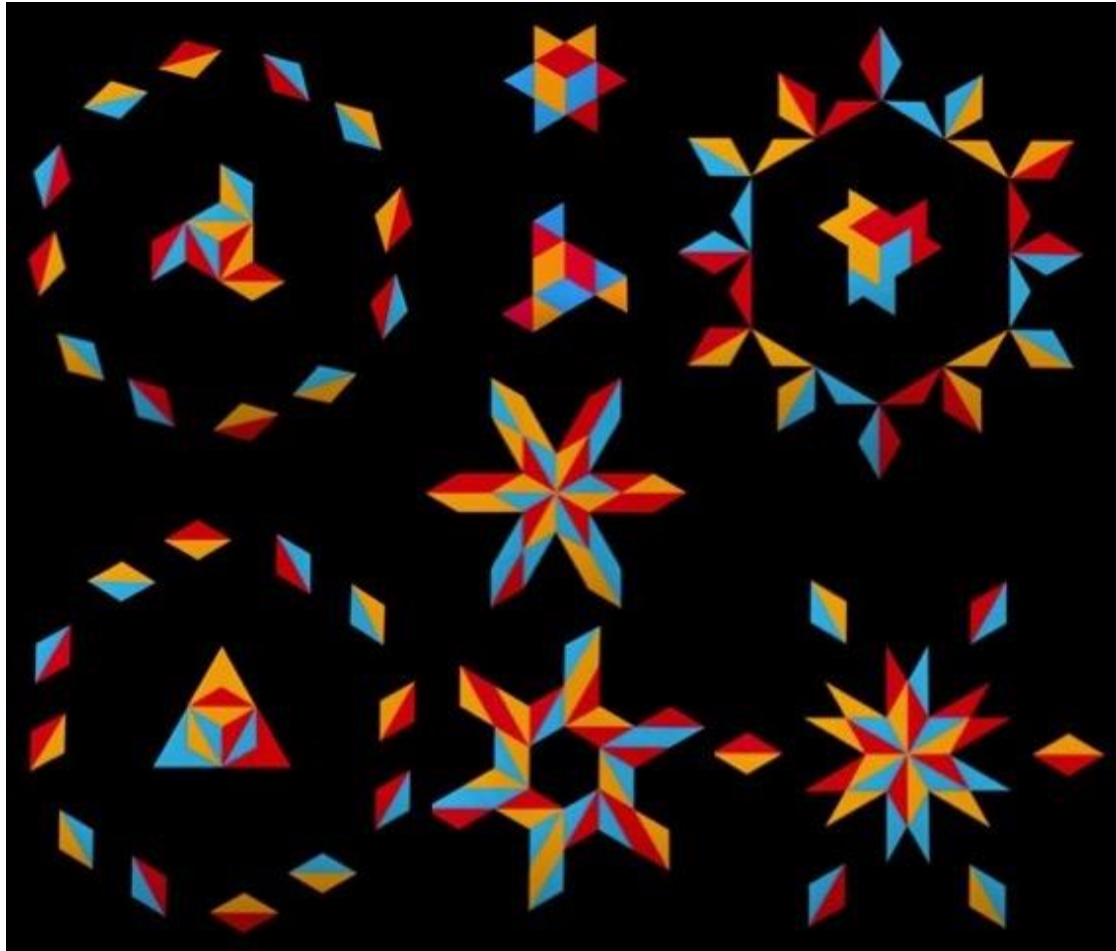


**Mary Pardoe** @PardoeMary · 19h

...

These are some screen-shots from it ...

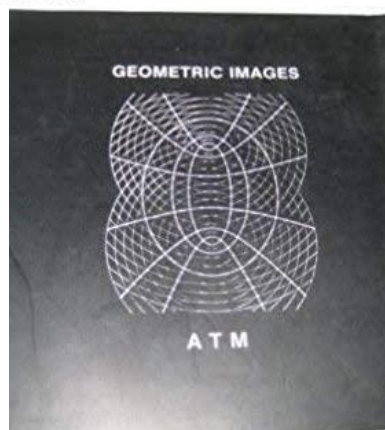
[#mathscpdchat](#)





**Matt Man** @mr\_man\_maths · 19h  
Beautiful! #mathscpdchat



**Mary Pardoe** @PardoeMary · 3h  
[@ATMMathematics](#) what has happened to 'Geometric Images' by Roger Beeney, Dick Tahta et al?



The following conversation was generated by a tweet which, although it was a reply to the host's second main question, was not tweeted AS a reply:

- Joanne Green**  @MsJoanneGreen · 20h ...  
@mr\_man\_maths #mathscpdchat The starters are always mixed ability without that being stated. It's always 6 questions and 6 minutes to answer. If all are answered then the pupil speed is correct for exams.
- Jenny Hill-Parker** @JennyHillParker · 20h ...  
I'd love to see these resources if possible #mathscpdchat
- Joanne Green**  @MsJoanneGreen · Apr 18 ...  
@JennyHillParker #mathscpdchat @mr\_man\_maths  
[youtube.com/@smrchsmath786...](https://youtube.com/@smrchsmath786...) I've looked at Years 7, 8, 9
- Jenny Hill-Parker** @JennyHillParker · Apr 18 ...  
Wow! Were these lessons written as lockdown lessons? #mathscpdchat
- Matt Man** @mr\_man\_maths · 20h ...  
Any particular order of questions? Or just 6 random topics?  
#mathscpdchat
- Joanne Green**  @MsJoanneGreen · 21h ...  
@mr\_man\_maths #mathscpdchat At a glance, they look random, but they are not. They are always within the last few lessons. None are calculator, so it helps with methods. No two methods are the same for the 6 questions.
- Matt Man** @mr\_man\_maths · 21h ...  
Would something like:  
Last lesson  
Last month  
Last term  
Last year  
potentially work?  
Such as this link from @StudyMaths: [mathsbot.com/starters/retri...](https://mathsbot.com/starters/retri...)  
#mathscpdchat

Retrieval Starter	
New Questions	
<p><b>Last Lesson</b></p> <p>Random <input type="text" value=""/></p> <p>Search Keyword <input type="text" value=""/></p> <p>Difficulty: <input type="text" value="5"/></p>	<p><b>Last Week</b></p> <p>Random <input type="text" value=""/></p> <p>Search Keyword <input type="text" value=""/></p> <p>Difficulty: <input type="text" value="5"/></p>
<p><b>Last Month</b></p> <p>Random <input type="text" value=""/></p> <p>Search Keyword <input type="text" value=""/></p> <p>Difficulty: <input type="text" value="5"/></p>	<p><b>Last Year</b></p> <p>Random <input type="text" value=""/></p> <p>Search Keyword <input type="text" value=""/></p> <p>Difficulty: <input type="text" value="5"/></p>



 **Joanne Green**  @MsJoanneGreen · Apr 18 ...  
@mr\_man\_maths #mathscpdchat I've seen these in different formats. In theory yes, but, pupils who go of class regular: intervention, music lesson, isolation, truant, illness; then they are often unable to answer any Qs, so their confidence goes. iPad Sparx is best, takes longer.

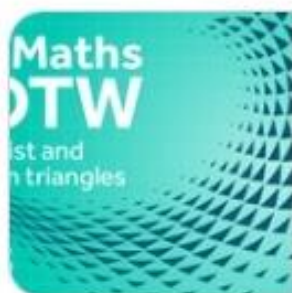
 **Matt Man** @mr\_man\_maths · Apr 18 ...  
Fair point made! I tend to avoid doing these because of the reasons you discussed. But it all depends on your own school and the context where it is at. #mathscpdchat

The host's third main question ...

 **Matt Man** @mr\_man\_maths · Apr 18 ...  
Lovely to see the responses coming in. Let's continue with the next question:  
Q3:  
How do you link fluency into setting reasoning and problem solving tasks for your students?  
#mathscpdchat


... was followed by a reply to it from Matt himself:

 **Matt Man** @mr\_man\_maths · Apr 18 ...  
One example that I have done is from this link below:  
[mrbartonmaths.com/blog/do-it-twi...](http://mrbartonmaths.com/blog/do-it-twi...)  
@mrbartonmaths explains it in more detail. This topic is on area of triangles. #mathscpdchat



mrbartonmaths.com  
Do it, twist it, deepen it - TES Maths Resource of ...  
A free area of a triangle resource with a difference from TES Maths

... and then this next reply from Jenny generated a discussion including the sharing of some more examples:

 **Jenny Hill-Parker** @JennyHillParker · Apr 18 ...  
Use goal free problems, and ensure the students have a toolkit of procedural knowledge and vocabulary so that they can 'play' with the problem #mathscpdchat



**Matt Man** @mr\_man\_maths · Apr 18

The "Tell me what you know" tasks - I love these.

When I was at my previous school, @HowWeTeachIt and I shared many of these tasks. #mathscpdchat

(Below is a screenshot of the Twitter account that Matt mentioned in the tweet above.)



**Jenny Hill-Parker** @JennyHillParker · Apr 18

I'll take a look - sounds great #mathscpdchat



**Matt Man** @mr\_man\_maths · Apr 18

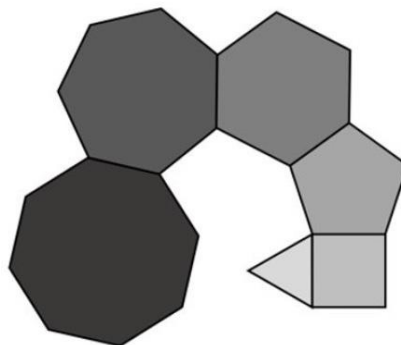
This is one example that @HowWeTeachIt and I planned together after getting the pupils completing the fluency tasks on perimeter and regular shapes. #mathscpdchat

**How We Teach It** @HowWeTeachIt · Mar 20, 2019  
Aimed at Y7 - perimeter, regular shapes etc - but what maths could other year groups do with this pic?

**PROBLEM SOLVING**

This pattern is made from regular shapes.

The area of the square is  $16\text{cm}^2$ .



Tell me what you know.



**Matt Man** @mr\_man\_maths · Apr 18

And this one from @HowWeTeachIt is brilliant too on reasoning after doing fluency tasks on length measurements and unit conversions. [#mathscpdchat](#)



**How We Teach It** @HowWeTeachIt · Feb 11, 2021

Trying to encourage working out and a bit of reflection on what pupils are doing when solving a problem...

**REASONING**

Jim is 1.56m tall. Kim is 5 feet and 7 inches tall.

What do these numbers represent?

1	5	67	5
156	12	11.5	62.4
60	167.5	1.56	6



**How We Teach It** @HowWeTeachIt · Apr 18

Oh I like using these ones. Think they helped with comprehension too - what does this new number I've calculated actually mean?!



**Matt Man** @mr\_man\_maths · Apr 18

That's really cool. It is interesting how stripping back the words can lead to interesting maths discussions. [#mathscpdchat](#)



**Matt Man** @mr\_man\_maths · Apr 18

And another example of a "Goal free" problem converted from a GCSE question to stripping back the words. Something that might be useful to do @MsJoanneGreen? [#mathscpdchat](#)



**How We Teach It** @HowWeTeachIt · Mar 9, 2019

Replying to @MikeAEdu4 @mr\_man\_maths and @LaSalleEd  
An example of what we can get our KS3 pupils to do...



**PROBLEM SOLVING - EXAMPLES**

\*3 Ami and Belinda are in a gymnastics competition.  
Here are their scores.

	floor	vault	bars	beam
Ami	13.2	15.3	14.7	16.0
Belinda	14.3	13.8	15.9	15.1

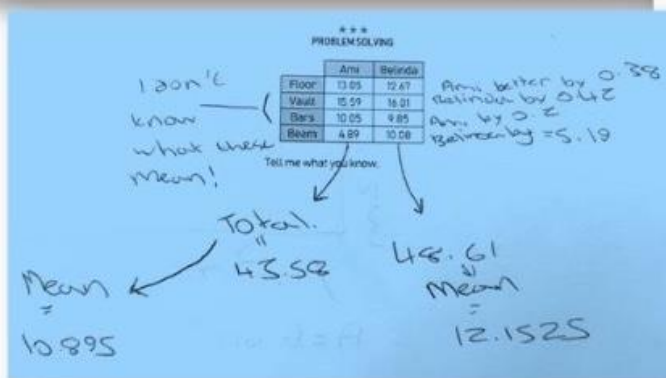
Who got the higher total score, Ami or Belinda?  
You must show your working.

Edexcel 5MB3F/01 November


★★★  
**PROBLEM SOLVING**

	Ami	Belinda
Floor	13.05	12.67
Vault	15.59	16.01
Bars	10.05	9.85
Beam	4.89	10.08

Tell me what you know.



Handwritten student work on a blue background. It shows a table with Ami and Belinda's scores, calculations for totals (43.58 and 48.61), and mean scores (10.895 and 12.1525). Handwritten notes include "I don't know what these mean!", "Ami better by 0.38", "Belinda by 0.12", "Ami by 0.2", and "Belinda by 5.19".

 @HowWeTeachIt @mr\_man\_maths **HOW WE TEACH IT**

**Joanne Green** @MsJoanneGreen · Apr 18  
@HowWeTeachIt #mathscpdchat @mr\_man\_maths I like 'tell me what you know' because if you don't know the vocab - or the vocab is dated - then pupil answers can update and revise maths. I like the boxes too as too much space can confuse pupils.

**Matt Man** @mr\_man\_maths · Apr 18  
And another example of a "Goal free" problem converted from a GCSE question to stripping back the words. Something that might be useful to do @MsJoanneGreen? #mathscpdchat  
twitter.com/HowWeTeachIt/s...

**Matt Man** @mr\_man\_maths · Apr 18  
It is interesting to see how some questions can get dated really quickly. My thoughts go to the questions involving statistics. #mathscpdchat

The host's third main question also prompted the sharing of the following resource (link provided at top of this summary) which is a website with links to very many other related resources:



**Mary Pardoe** @PardoeMary · Apr 18

...

This is a very helpful site with links to great resources ...

[mathematicaletudes.com](http://mathematicaletudes.com)

[#mathscpdchat](#)

## MATHEMATICAL etudes

*"Colin Foster is designing etudes that develop mathematical fluencies with style and flair, not to mention an afterglow of insight."*

Phil Daro, lead author of the mathematics Common Core State Standards, used by most states in the USA

The **Mathematical Etudes Project** aims to find creative, imaginative and thought-provoking ways to help learners of mathematics develop their fluency in important mathematical procedures.

Procedural fluency involves knowing when and how to apply a procedure and being able to perform it "accurately, efficiently, and flexibly" (NCTM, 2014, p. 1). Fluency in important mathematical procedures is a critical goal within the learning of school mathematics, as security with fundamental procedures offers pupils increased power to explore more complicated mathematics at a conceptual level (Foster, 2013, 2014, 2015; Gardiner, 2014; NCTM, 2014). The new national curriculum for mathematics in England emphasises procedural fluency as the first stated aim (DfE, 2013).

But it is often assumed that the only way to get good at standard procedures is to drill and practise them *ad nauseum* using dry, uninspiring exercises.

The **Mathematical Etudes Project** aims to find practical classroom tasks which embed extensive practice of important mathematical procedures within more stimulating, rich problem-solving contexts (Foster, 2011, 2013, 2014, 2017, 2018). Recent research (Foster, 2018) suggests that etudes are as good as exercises in terms of developing procedural fluency – and it seems likely that they have many other benefits in addition.

The video below introduces the idea of mathematical etudes, and presents the findings from Foster (2018).

[The article for teachers that I refer to is [here](#) and the full research paper is [here](#). The lesson plans for the tasks are [here](#), [here](#) and [here](#), and the worksheet for the enlargements task is [here](#). The slides from the presentation are available [here](#).]



**Matt Man** @mr\_man\_maths · Apr 18

...

Awesome link Mary, thank you! [#mathscpdchat](#)

Matt's third main question also prompted the following comment and reply:



**Joanne Green**  @MsJoanneGreen · Apr 18

...

[@mr\\_man\\_maths](#) [#mathscpschat](#) I let the children answer questions on the board. If they get stuck, then I ask them 'what do you think could be done. It's ok if you're wrong as we'll do it together as a class.' Then, some1 else improves it, etc., until it's correct.



**Matt Man** @mr\_man\_maths · Apr 18

...

Replying to [@MsJoanneGreen](#)


That is an excellent point made. I do that every now and again. Sometimes, I would pick a random pupil's book and show it on the visualiser and discuss if they are correct or not, or how to improve, etc.

[#mathscpdchat](#)




The two following conversations were both generated by tweets to this #mathsCPDchat, but they were not replies to, or directly related to, any of the host's three main questions. There was this report ...

 **Joanne Green** ✓ @MsJoanneGreen · 20h ...  
@mr\_man\_maths #mathscpdchat In a maths assessment today, a couple of pupils who continually chat didn't understand the question vocab. The pupils have exceptional spoken language talent, so I asked them to define the vocab in their own words. They could.

 **Matt Man** @mr\_man\_maths · 20h ...  
Ah that's interesting - so is this to do with literacy? So is fluency focused on just the mathematical calculations and not the words around it?  
#mathscpdchat

 **Joanne Green** ✓ @MsJoanneGreen · 20h ...  
@mr\_man\_maths #mathscpdchat it's both. But, the school has just moved onto Sparx this week, so the pupils will have bespoke homework soon and after the classroom session has occurred. That's definitely needed in the school due to behaviour and mixed ability.

... and this:

 **Joanne Green** ✓ @MsJoanneGreen · Apr 18 ...  
@mr\_man\_maths #mathscpdchat Special schools have pupils build with blocks. It takes a while, but helps pupils. This is in mainstream primary where a special school teacher come in to school for their PhD. They assessed pupils for special needs in lessons during teaching class.

 **Matt Man** @mr\_man\_maths · Apr 18 ...  
Blocks are such a key resource - that's where the concrete part comes in. I still use occasionally even with my Year 11 higher pupils when discussing tree diagrams without replacement! #mathscpdchat

 **Joanne Green** ✓ @MsJoanneGreen · Apr 18 ...  
@mr\_man\_maths #mathscpdchat I've not seen that with tree diagrams. I think you could do that as a @LaSalleEd workshop one Saturday online! Think about it please please please 😊

 **Matt Man** @mr\_man\_maths · Apr 18 ...  
The next one will be on simultaneous equations, but will take your point to consideration. #mathscpdchat



This was the host's closing message:



**Matt Man** @mr\_man\_maths · Apr 18



And there is the hour! Thank you all for your contributions on the topic of fluency. Please do feel free to carry on with responses to the questions. Stay tuned next Tuesday at the same time where we will discuss a very topical issue that has been on the news! [#mathscpdchat](#)