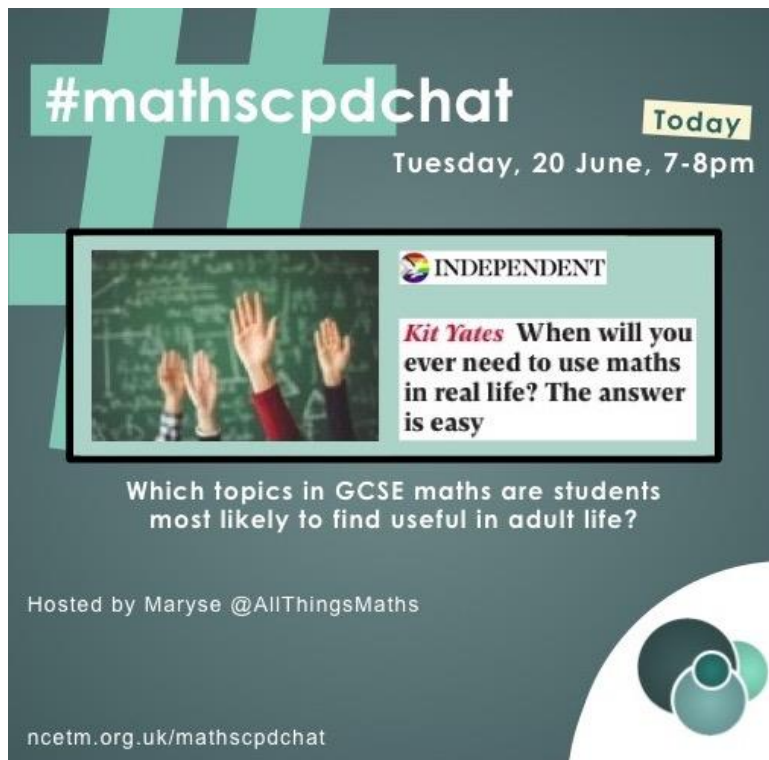# #mathscpdchat 20 June 2023

Which topics in GCSE maths are students most likely to find useful in adult life?

Hosted by Maryse

*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:

Teaching about climate change in the maths classroom which is an NCETM podcast episode. Two authors, Alistair Bissell, AMSP Level 3 Maths Professional Development Coordinator, and Tom Rainbow, AMSP National Coordinator for Core Maths Professional Development, talk to Gwen Tresidder about their resources, and suggest tips for addressing social issues through maths. It was shared by Maryse

10 reasons for studying algebra which is an article by Hazel Lewis on the MathsCareers website of the Institute of Mathematics and its Applications. It was shared by Maryse

Real Life Maths which is an article by Craig Barton on his website in which he describes what some educational research 'had to say about the use of real-life contexts in mathematics'. It was shared by Maryse

When will you ever need to use maths in real life? which is an article in the *Independent* by Kit Yates, who is a senior lecturer in the Department of Mathematical Sciences at the University of Bath. The author explains why we should be responding to the question of the title with the counter "When will you not?". It was shared by Maryse

Real life maths is a place on the STEM Learning website where you will find resources about people who use maths in their careers. It was shared by Maryse

Using Maths in Your Everyday Life: 4 Real-Life Situations That Rely on Numbers which is a blog on the Casio Education website. The blog explores 'some of the ways we use maths in our everyday life'. It was shared by Maryse

Why Maths Matters: application of mathematics in the modern world which is a blog by Superprof. It was shared by Maryse

Using maths storybooks to engage children which is an article on the NCETM website. It looks at how 'stories' can be an effective way to reveal mathematical structure. It was shared by Maryse

How can you integrate careers learning into your maths lessons? which is the summary of a #mathsCPDchat on 21 February 2023 hosted by Rachel Beddoes. It was shared by Mary Pardoe

What is the point of studying maths at GCSE? which is an illustrated article on the Maths Careers website. It was shared by Mary Pardoe

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

Before the discussion began the host tweeted a reminder about this #mathsCPDchat. She included the link to the article featured in the image on page 1 of this summary. That article is by Kit Yates, a senior lecturer in the Department of Mathematical Sciences at the University of Bath:

Maryse @AllThingsMaths · 15h

10 minutes to go. Grab a cuppa and here's the article from @Kit_Yates_Maths if you fancy a read through

#MathsCPDChat

independent.co.uk/voices/maths-e...

When the chat started, this 'welcome' message …

Maryse @AllThingsMaths · 15h

Welcome to #MathsCPDChat this evening where we will be discussing the topics in GCSE Maths that students are most likely to find useful in adult life.

… was followed by the host's first main question …

Maryse @AllThingsMaths · 15h

To start this evening, are you asked "why" or "when will we do this in real life" during your lessons? If so, which topics trigger the question?

#MathsCPDChat

… which generated five conversations. The longest of them prompted discussion about ideas for effective ways of engaging students in explorations involving the maths on which you want them to focus:

MrHawesMaths @HawesMaths · 15h

I mainly get it when covering angle work #mathscpdchat

Maryse @AllThingsMaths · 15h

What's your response?

MrHawesMaths @HawesMaths · 15h

Navigation mainly use of angles and bearings to avoid collisions (ships and planes) and then orienteering and bearings #mathscpdchat

Maryse @AllThingsMaths · 15h

Oooh I love a bit of bearings. Nicking the compasses from DoE or geography and getting outside is fab.

#MathsCPDChat

MrHawesMaths @HawesMaths · 15h   ···

Love introducing parallel lines at this stage too using north lines seems to make it 'stick more' #mathscpdchat

Maryse @AllThingsMaths · 15h   ···

Thinking on my feet here... it's showing the need for the skill/knowledge prior or during the learning of it, rather than the other way round.

#mathscpdchat

Mary Pardoe @PardoeMary · 15h   ···

Great strategy ... getting students to feel the need to know ... (wanting to find out how to ...) before focussing on something! #MathsCPDChat

MrHawesMaths @HawesMaths · 15h   ···

My favourite part is when they discover the angles between point A and point B. And a straight line joined between them. We then translate this to OS maps of the local area. Students using their houses as reference points. #mathscpdchat

Maryse @AllThingsMaths · 15h   ···

Fabulous! Scales and all sorts start coming in, so embedding ratio and number sense too.

#mathscpdchat

MrHawesMaths @HawesMaths · 15h   ···

Could probably spend a whole half term doing work with OS maps. Maybe one for Summer term next year. #mathscpdchat

Maryse @AllThingsMaths · 15h   ···

DO IT!!!! I love 'em. Collect 'em. Use 'em. Give older versions that I've discovered in dusty shops to people for Christmas.

#mathscpdchat

Jenny Hill-Parker @JennyHillParker · 15h   ···

That's such a lovely idea! #mathscpdchat

Maryse @AllThingsMaths · 15h   ···

I've got about 2 left from a job lot I picked up for next to nothing about 20 yrs ago. People get one of their home or a place special to them. I love maps. Brings me closer to wherever I am.

Jenny Hill-Parker @JennyHillParker · 15h

Great way to connect to the local environment. I like using local takeaway menues and bus timetables too #mathscpdchat

Maryse @AllThingsMaths · 15h

A simple but fabulous idea!

I ask students to work out how far away certain local landmarks are to give them a sense of distance. #mathscpdchat

Jenny Hill-Parker @JennyHillParker · 15h

That's a great plan. They could estimate and then measure it out on a map. Loads of Maths! #mathscpdchat

The next two short threads prompted by the first question, also focussed on student engagement, this …

Lizi Pepper @mathspeptalk · 16h

Constructions!! I can see they lend themselves to loci which are very 'real world' but I think constructions on their own, they think computers can just do it easily!

Maryse @AllThingsMaths · 16h

Yes! And the questions about buying a house are a bit abstract, and also, who's going to be able to buy a house?? I like a bit of outdoor people maths for Loci

… and this:

JustMaths @Just_Maths · 16h

TBH … depends on the group. Higher performing groups rarely ask this .. IME they are more likely to voice these kind of things when the going gets tough #mathscpdchat

Maryse @AllThingsMaths · 16h

I think this leans into something I was thinking about prior to this evening's session. I intro-ed calculus with Y10 this week and they loved it for what it is. The 8s who asked about circles today struggle with the challenge. #MathsCPDChat

The following conversation shows an example of how teachers sometimes use effectively experiences derived from their (and their students') outside-of-school interests …

Jenny Hill-Parker @JennyHillParker · 16h

Bearings for anyone in charge of a plane or a boat.. it's fascinating looking at the bearings on runways #mathscpdchat

Maryse @AllThingsMaths · 16h

There's a whole lesson there! It could be extended by looking at wind/current too - nice intro to some mechanics.

#mathscpdchat

Jenny Hill-Parker @JennyHillParker · 16h

Have you seen resources for that lesson anywhere? #mathscpdchat

Maryse @AllThingsMaths · 15h

No, unfortunately. I was lucky enough to learn to fly courtesy of the @RoyalAirForce and so I pop in some of the basics sometimes. And we're near to Gatwick so many students have parents who work there.

#mathscpdchat

Jenny Hill-Parker @JennyHillParker · 15h

That's so interesting. My dad was a RAF fighter pilot, as was my brother. They both went into the commercial sector afterwards. I talk about them both when I teach bearings and negative numbers #mathscpdchat

Maryse @AllThingsMaths · 15h

I hadn't considered negative numbers. I do the "history" bit and temperature etc but it'd be good to raise the bar a bit. #mathscpdchat

… and this is about responding positively to 'Why are we doing this?' student-attitudes by using a [current news story](#) imaginatively:

Maryse @AllThingsMaths · 16h

I had it just today when we were working out areas of compound shapes, involving mainly circles.

Timely!

#MathsCPDChat

Maryse @AllThingsMaths · 16h

We looked at the search area for the submersible.

bbc.co.uk/news/world-us-...

#MathsCPDChat

CANADA

St John's

NEWFOUNDLAND

Atlantic Merlin
heading to site

18 June:
Polar Prince arrives
Titanic wreck site

Wreck site
4.6km
2.8 miles
Deep
Energy
vessel
Polar Prince
on 20 June

200km
200 miles

Google

Source: Seasearcher 12:35 GMT, 20 June

BBC

Titan submersible

Porthole
window

Length: 6.7m (22ft)
Capacity: 5 people for 96 hours
Depth: 4,000m (13,123ft)

Source: OceanGate Expeditions

BBC
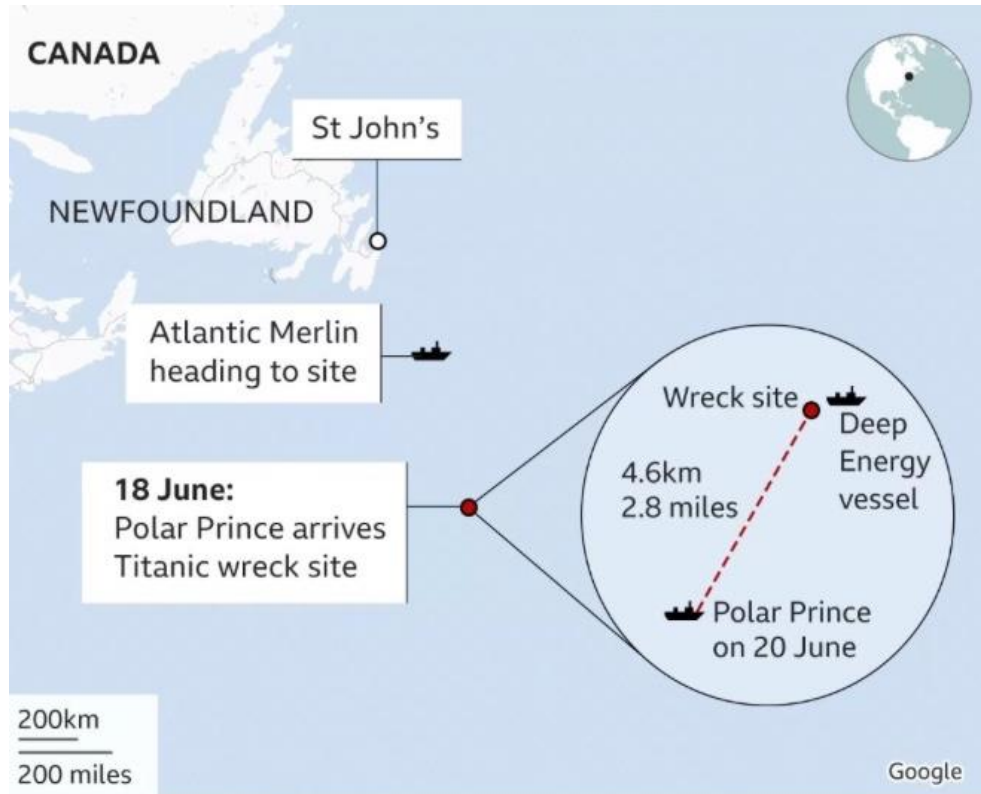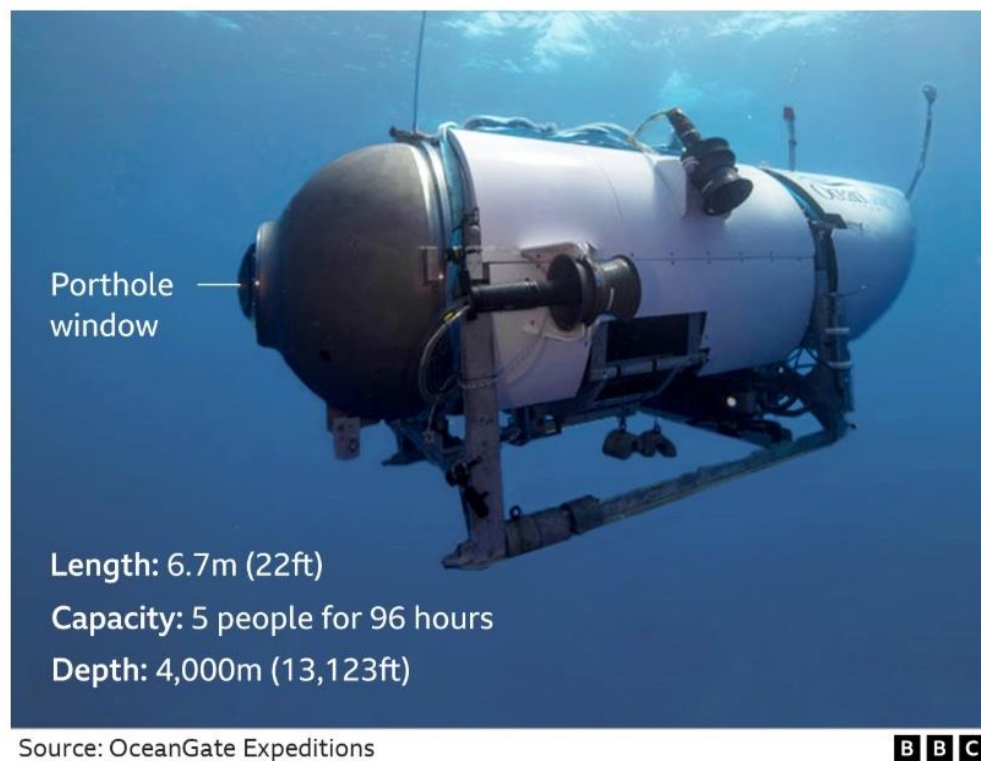
There were also two single replies to the first question, which was <u>are you asked "why" or "when will we do this in real life" during your lessons? If so, which topics trigger the question?</u>:

David F @DagsMaths · 13h
Any topic that someone is finding a challenge

Joanne Green @MsJoanneGreen · 18h
@AllThingsMaths Algebra triggers those Qs! Experiment renditions incentivise pupils especially if they know they can do them by utilising STEM sets. Higher pupils don't ask. Perhaps they believe they'll use algebra one
day. #mathscpdchat @NCETM

The host's second main question …

Maryse @AllThingsMaths · 17h
I'm not a fan of shoe-horning in "real life" but there are some topics that are easier than others. e.g. using ingredients in ratio. Does anyone have any less obvious contexts for topics?

#mathscpdchat

… prompted the following 'discussion' in the form of a branching thread of tweets:

Lizi Pepper @mathspeptalk · 17h
#mathscpdchat I agree completely, hate shoe horning it in. Sometimes I think best to be honest, sometimes we study maths for the joyous academic subject that it is, it might not always have obvious real life examples. They may use it depending on what they choose to do with life!

Maryse @AllThingsMaths · 17h
I'm with you on this for sure. The article I shared prior to the chat touches on this, and how maths is sometimes held to a higher level somehow, in that we have to justify our subject where others don't.

#mathscpdchat

Mary Pardoe @PardoeMary · 17h   ···

Sometimes the need to understand maths can't be avoided? There are some nice (but possibly predictable?) examples here for percentages: mathscareers.org.uk/uses-of-percen...

#mathscpdchat

| 11-16 | 16-19 | I love Maths |

Uses of Percentages in the Real World

30th May 2022

Inflation

Did you know that a pint of milk only cost 25p in 1990? Now you will need to pay more like 50p and by the time you read this article it may well have gone up again. What has happened is called inflation – since 1990 this pint of milk has doubled in price which has been caused by prices rising on average by 2% per year. A body called the Office for National Statistics looks at a typical 'basket' of goods each month and works out what percentage the goods have gone up by. This is called the Consumer Prices Index (CPI) which is a measure of inflation. If your trainers cost £50 in January and then £55 in February your trainers have gone up by $\frac{(55-50)}{50} \times 100 = 10\%$. Inflation is critical to the economy and to daily spending power.

Grades and Exams

You have just received your latest test results – but what percentage did you get? You will need to be able to work this out when you are a student and also if you become a teacher or lecturer. For example, if you score 22 out of 27 in a test, then you need to calculate $\frac{22}{27} \times 100 = 81\%$.

Mary Pardoe @PardoeMary · 16h

... and here (fractions): mathscareers.org.uk/uses-of-fracti...
#mathscpdchat

11-16   16-19   19+

11-16   **Business & Money**   **Environment & Heath**   **I love Maths**   **Sport & Entertainment**

Institute of mathematics

Uses of Fractions in the Real World

14th October 2021

How is GCSE maths used in everyday life?

Here are 10 examples of where people use fractions in everyday life or in their careers. This is a small snapshot of where fractions are used in the real world, as they are essential in almost every career and in many different areas of everyday life.

Pharmacy and Nursing

Fractions are very important for pharmacists and nurses, particularly because errors can have serious consequences.

For example, nurses need to be able to use the following stock equation in order to know how to dilute a solution.

$$\text{Amount of Stock Required} = \frac{\text{Strength Required}}{\text{Stock Strength}} \times \text{volume required}$$

They could then be asked to solve a problem such as:

Question: How much stock is required to make 3 litres of 1 in 80 solution from a stock strength of 1 in 40?
Answer: The basic equation gives

$$\text{Amount of stock required} = \frac{\frac{1}{80}}{\frac{1}{40}} \times 3 = \frac{1}{2} \times 3 = 1.5 \text{ litres}$$

These examples are taken from the Mathcentre information on Dilution of solutions for nurses.

Time

Understanding fractions will make it much easier to calculate with real life time problems. Most people now use digital watches, but still talk about time in terms of fractions – a quarter of an hour, half an hour and so on. What if a beautician has 45 minutes to see each client and a half hour lunch break. How many clients can they fit in during an 8 hour day? Take off the half an hour, leaving $7\frac{1}{2}$ hours. 45 minutes is $\frac{3}{4}$ of an hour, meaning we can calculate $7\frac{1}{2} \div \frac{3}{4} = 10$ time slots.

Maryse @AllThingsMaths · 16h · · ·

I often explain that it's not my job to close down opportunities or choices. It's to open them up. They may not use a lot of what we do but by learning it then they have far more choices ahead.

#mathscpdchat

Maryse @AllThingsMaths · 16h · · ·

It's also about being empowered by knowledge and skills. E.g. % and tax/income/loans etc. #mathscpdchat

Jenny Hill-Parker @JennyHillParker · 17h · · ·

My husband has to make a 64% profit as a head chef, so I tell the students about that when relevant. I think that the extra bits of story-telling can build relationships and create a nice bit a stick ability with what you are teaching #mathscpdchat

Maryse @AllThingsMaths · 16h · · ·

Funny you should mention stories. I bookmarked this earlier!

ncetm.org.uk/features/using...

@NCETM #mathscpdchat

> ncetm.org.uk
> **Using maths storybooks to engage children**
> Mini 'stories' can be an effective way to reveal mathematical structure and are a common feature...

Mary Pardoe @PardoeMary · 17h   •••
Can't resist …
#mathscpdchat

Baking and Recipes

Cooking is full of fractions. What if you have a recipe for four people which contains $\frac{1}{2}$ teaspoon of vanilla extract and you want to make your cake for six people? You will need to perform the calculation $\frac{1}{2} \times \frac{6}{4} = \frac{6}{8} = \frac{3}{4}$ teaspoon. On the Great British Bake Off Paul Hollywood once asked the contestants to "take $\frac{2}{5}$ of your dough and divide it into six biscuit balls". How much should each biscuit ball weigh? For further uses of maths in baking read this article on the maths used in the Great British Bake Off.

Maryse @AllThingsMaths · 17h   •••
We trialed teaching this in the Food Tech classrooms and actually cooked!
It really did work! #mathscpdchat

Maryse @AllThingsMaths · 19h   •••
I guess we could always show a few clips from @bbcapprentice to show
why maths is useful ;)

#mathscpdchat

The following statement, rather than question, from the host …

Maryse @AllThingsMaths · 19h   ···

I came across this from a previous #mathscpdchat
Careers fall under all of our subjects and may make links for some of our topics.

Advanced Mathematics Support Programme®

Q What are you looking for   >   **CONTACT US**   **MENU ≡**

Linking curriculum learning to careers

Home > Teachers > 11-16 Maths > Resources > Linking curriculum learning to careers

The resources and materials linked below have been created by the AMSP and partners we've worked with to support you and your school in achieving Gatsby Benchmark 4 in particular – linking

padlet.com

Linking maths curriculum to the world of work

1. Very easy – no preparation, 2. A little bit of preparation and some lesson time needed 3. More preparation and lesson time required

… generated a short conversation:

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

Does the padlet have any content yet or is it just headings? Or it might be my internet is awful! #mathscpdchat

Maryse @AllThingsMaths · 19h   ···

It looks like this on mine and the links work. Maybe one to bookmark for tomorrow!

Year 7	Year 8	Year 9	Year 10
1. Tell students and parents about STEMettes	1. Tell students and parents about DigData online career challenges and live career panels	1. Play WHY MATHS video (2 mins) 'When will I ever need this?'	1. Ask students to explore Mathigon Applications of Mathematics
stemettes.org	digdata.online Data Inspiration Group programme	Advanced Mathematics amsp.org.uk †Programme® WHY MATHS Video collection - AMSP	mathigon.org Applications of Mathematics - Mathigon
Welcome, Girls & Non-Binary Young People - Stemettes ®	Live online career challenges – Digdata – a Data Inspiration Group programme		
Social enterprise working to inspire and support girls, young women and non-binary people in STEM and STEAM	2. Show filmmaker world of work video (5 mins) and use finance or maths in	2. Show regeneration world of work video (5 mins) and	2. Stream Which Career? online panel event in your lesson

Maryse @AllThingsMaths · 19h

And also this: ncetm.org.uk/podcasts/teach...

#mathscpdchat

ncetm.org.uk
Teaching about climate change in the maths classr...
Two authors talk about their new resources and suggest tips for addressing social issues through ...

Mary Pardoe @PardoeMary · 19h

... and there was this: ncetm.org.uk/media/3yyfwz12.
#mathscpdchat

#mathscpdchat (On this occasion with #CoreMathsChat) **21 February 2023**

How can you integrate careers learning into your maths lessons?
Hosted by Rachel Beddoes

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

#mathscpdchat **Today**
Tuesday, 21 February, 7-8pm

Susie Hamilton My pathway into...
URBAN REGENERATION
Advanced Mathematics Support Programme

A levels: ■ Geography
■ Economics
■ History

University:
■ **Geography**, University of Aberdeen
■ **Urban Design**, Queens University

"Maths skills are really important for making sense of the world....I use Core Maths every day in my job"

How can you integrate careers learning into your maths lessons?
(with #CoreMathsChat)

Hosted by Rachel Beddoes @GirlsCount_2

ncetm.org.uk/mathscpdchat

The host's next main question …

Maryse @AllThingsMaths · 19h   •••

We've touched on angles and some lovely ideas have come through. Once marking is done I'll turn my mind to some lesson plans. Do you use REAL real life examples for trig? E.g. make clinometers?

#mathscpdchat

… received no replies, being near the end of the chat. But at spaced intervals throughout the chat Maryse had been posting the following single tweets in which she made observations, and gave information and links to resources:

Maryse @AllThingsMaths · 20h   ••

One thing we've looked at this year is linking more to Science and then building on that with other subjects. Using those links to show how our subjects synthesise and can then be used in other ways.

Maryse @AllThingsMaths · 19h   •••

Another blog on "real life maths":

education.casio.co.uk/blog/support-u…

#mathscpdchat

education.casio.co.uk
Using Maths in Your Everyday Life: 4 Real-Life Situations That Rely o…
Have you ever wondered when you will need to use Maths outside of school? Truth is, we use Maths as a foundation to make hundreds of …

Maryse @AllThingsMaths · 16h ···

I came across this resource while reading up. You need a (free) account to access:

stem.org.uk/resources/comm.

Maryse @AllThingsMaths · 16h ···

I came across this blog from @mrbartonmaths while reading up. Lots to ponder.

mrbartonmaths.com/teachers/resea...

Maryse @AllThingsMaths · 19h ···

Another blog I book marked while reading up prior to this evening:
superprof.co.uk/blog/maths-and...

#mathscpdchat

superprof.co.uk
The Importance of Mathematics in the Modern Wo...
Discover the crucial role of mathematics in our modern world and why it matters for both ...
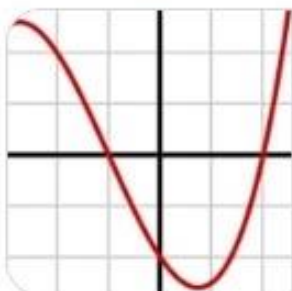
Maryse @AllThingsMaths · 19h ···

One aspect I want to look at more is algebra. I love maths for its beauty and challenge but we're not all the same! I use modelling examples from real life. Any other suggestions?

Another blog I found is here:mathscareers.org.uk/10-reasons-for...

#mathscpdchat

mathscareers.org.uk
10 reasons for studying algebra
Sometimes it can seem hard work studying algebra. Hopefully at least some of the reasons below will ...

Maryse @AllThingsMaths · 20h · · ·

Something else we've touched on is switching it round. Instead of teaching the skill then applying, starting with a problem and working backwards. Off the top of my head, this links to how I approach much of problem solving. #mathscpdchat

Maryse @AllThingsMaths · 20h · · ·

Where am i?
Where do we need to be?
What do I know that gets me there?

Playing around, finding links, taking a step at a time.

#mathscpdchat

This last question from the host, Maryse …

Maryse @AllThingsMaths · 20h · · ·

Does anyone else talk about the logic, the thinking and problem solving approaches as skills that are transferable?

My degree is in English and Mathematics and I found the logic developed in maths so useful in English.

#mathscpdchat

… prompted a reply:

JustMaths @Just_Maths · 20h · · ·

I also tell them that they may end up having a midlife crisis and in a moment of insanity decide teaching is a good idea and who knows? I dunno … maybe want to end up teaching maths? They'll need all this stuff then! #mathscpdchat

Maryse @AllThingsMaths · 20h · · ·

I think sometimes my lot look at me and think… nah!!! Although they loved our dabble into circumference of circle - circum of earth - time - Egyptians - base 12 - base 2 - binary - magic!!!! #mathscpdchat

The host closed this #mathsCPDchat with the following message:

Maryse @AllThingsMaths · 20h
That's it folks. Thank you for all your contributions this evening. I've certainly been inspired again in reading up in preparation. Taking the time to love the subject for what it is, and what it contributes to life and the universe! #mathscpdchat