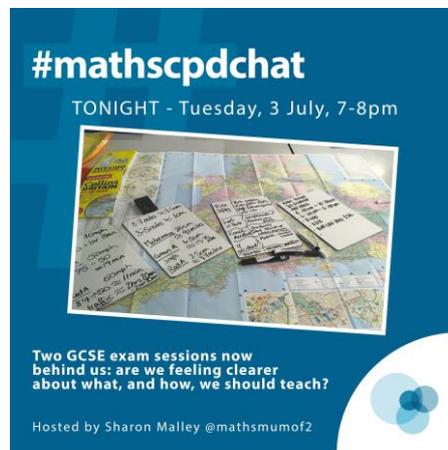# #mathscpdchat 3 July 2018

Two GCSE exam sessions now behind us: are we feeling clearer about what, and how, we should teach?
Hosted by @mathsmumof2

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

Some of the areas where discussion focussed were:

- students' **struggles to pick out key information from the presentation** and wording of questions; for example, information in the last line may be the starting-point;

- frequently students need to **draw on their understanding of more than one mathematical topic** in order to answer a single question;

- turning exam questions into **'goal free' tasks** … in this way students become used to tackling a problem even if the end goal is not yet in sight;

- the need to work on **students' written communication** of their mathematical reasoning;

- the emphasis on **ratio and proportion**; the need for students to become able to use **good proportional reasoning** in a wide variety of situations, for example when working algebraically, or with percentages or similarity;

- students' lack of ability to **link graphs and equations** … students seeing graphs and equations as separate topics … the need for this to be tackled at the introduction of work in both areas.

A particularly interesting sequence of tweets, about students' struggles to grasp what a question is asking, and the combination of different aspects of mathematics that students have to draw on in anwering it, followed from this tweet by Sharon Malley:

Sharon Malley @mathsmumof2 · 16h
Thaty's good everyone in it together. Is there anything your students have found particularly challenging? #mathscpdchat

including this one from Emily Cragg

Emily Cragg
@MissEmilyCragg

Follow

Replying to @mathsmumof2

I'd say it's more the wording of the questions! When I sat my GCSE's it was obvious what they wanted you to do because of the lack of 'words' I think it's the more comprehension of the tasks, what would you say? #mathscpdchat

this one from Sharon Malley

AQA June 2017 2F Examiners report

Question 18

This multi-step question proved to be a good discriminator. Students who understood that profit was the difference between income and cost often went on to give a fully correct solution. However, many students only worked out 28% of the income. Many of the percentage calculations were performed using a build-up method despite the availability of a calculator and this usually led to errors. Less able students were often only able to work out the bonus payment or the annual salary. Occasionally students worked out her total pay but did not make a conclusion. Sometimes working was so disorganised that students misread their own calculations.

18   Ellen works for a company that sells cars.

Her **monthly** pay is

- a salary of £1470
- 28% of the total **profit** the company makes from her sales
- a £250 bonus **if** she sells at least 15 cars.

The table shows information about the cars she sold last year.

Total cost to the company	Total income for the company	Number of months when she sold at least 15 cars
£464 500	£538 000	3

Was Ellen's total pay for the **year** more than £40 000?

You **must** show your working.

[6 marks]

and this one from Emily Cragg

and this one from Sharon Malley

Sharon Malley @mathsmumof2 · 16h

I worked through this question with some higher students and then listed every topic and subtopic of mathematics that it used. There was a lot! #mathscpdchat

AQA June 2017 1H Examiners report

Question 27

This question was not well answered, with many students not using the gradient of *OP* as the starting point of their working. It was common to see $\sqrt{17}$, either from the equation of the circle or from the application of Pythagoras' Theorem.

27      $P\,(-1, 4)$ is a point on a circle, centre O

Not drawn accurately
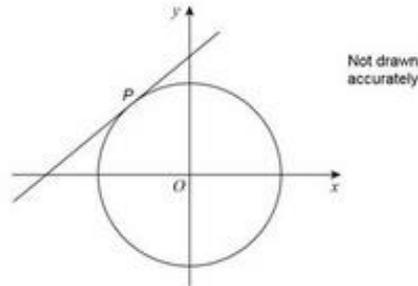
Work out the equation of the tangent to the circle at P.

Give your answer in the form $y = mx + c$

[4 marks]

and this one from Emily Cragg

Emily Cragg @MissEmilyCragg · 16h

I can only imagine! I think it's the requirement of more than one skill set that sometimes can throw students off! They get in the flow of what they know and sometimes don't want to sway away from the 'usual'. I know when I was 16 I would have been the same as them #mathscpdchat

and this one from Sharon Malley

Sharon Malley @mathsmumof2 · 16h

I think the diagram is a really good starting point to turn into either a goal free problem or 4 different variations a la SSDD #mathscpdchat

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

Among the links shared were:

Goal Free Problems which is a website where you can find and share goal free problems, shared by @mathsmumof2

Geometry and Measures Goal Free Problems which is where you can find 'a nice goal free problem involving two triangles', shared by @MrMattock

Addressing the Reasoning and Problem-Solving demands of the new GCSE which is an article in the NCETM Secondary Magazine 144, shared by @PardoeMary