

Maths Extension materials for KS3 (Y7 – Y9)

Here are some (free) suggestions for ways to stretch and advance your mathematical thinking. It is important to emphasise the need to spend time on the puzzles and not to rush: it is not about 'getting an answer', or 'How many can I complete?' but developing your reasoning. We recommend writing down a summary of how you approached the puzzle before beginning a new one.

Some prompts to ask yourself when investigating (or reflecting):

- What do I know?
- What do I want to find out?
- What would happen if...(change something about the problem/approach)?
- Are there any special cases where something different happens?
- Do your findings apply to other cases?
- I predict that...
- A better strategy would be.....because.....

Enjoy 😊 DJCS Maths Department

<https://nrich.maths.org/>

The nrich website (from Cambridge University) is densely packed with a huge variety of puzzles, games and investigations. The puzzles are categorised by age (Key Stage) and difficulty (1 star to 3 star). It can be an overwhelming website to navigate, so here are some possible start points:

- They have recently released some '[Solving Together](#)' puzzles that are aimed at Year 7 students and their parents/carers, but they are suitable for other year groups too. These puzzles include instructional videos and resources, so make a supportive starting point.
- For more independent work, for any age, there are a collection of [starter problems](#) that require little, if any, prior knowledge.
- For a 'quick fix' you can also try puzzles from their [short problems](#) collection. These activities are more limited in scope, but do make a good starting point – particularly if you have other nrich problems inaccessible.

<https://www.ukmt.org.uk/competitions>

UKMT (United Kingdom Mathematics Trust) run annual maths challenge competitions – you may have already taken part in some at school. Their website allows you to access past years challenges. The [Junior Challenge](#) is for Years 8 and below, the [Intermediate Challenge](#) is for Years 11 and below. There are also follow on rounds (Kangaroo and Olympiad) available that are significantly more difficult. All challenges only allow you to use a pencil and paper. The two challenges are multiple choice, and to echo their guidance: “The questions on this paper are designed to challenge you to think, not to guess.” Dr T’s challenge is to try the papers in [French](#)! (You’d be surprised what you can deduce – maths is an international language)

<https://www.transum.org/Software/>

This website (by John Tranter) has a good array of resources, including activities to support [times tables](#) and [puzzles](#). You could also set yourself the daily challenge of cracking the [‘starter of the day’](#)!

<https://sumaze.mei.org.uk/>

MEI (Mathematics in Education and Industry) have created some free apps for primary and secondary schools. They are designed to keep your mental arithmetic sharp, as well as develop some creative thinking. You also have the fun of solving a maze! Be patient with the initial levels, the difficulty does ramp up. (Remember to check with your parents before downloading anything onto any devices)

<https://www.cipherchallenge.org/>

For something a bit different, the University of Southampton run an annual Cipher Challenge that is launching on Wednesday 1st April. The challenge consists of solving roughly nine cryptograms (coded messages) of a variety of difficulty. You can register to take part on the site above from Monday 30th March, but at the time of writing the website remains ‘Coming soon!’, so check back later on if this is of interest to you.