

MATHS DEPARTMENT NEWSLETTER

Autumn 2022 (ISSUE 3)

Good Mathematics is not about how many answers you know. It's how you behave when you don't know. George Polya, a Hungarian mathematician (1887 –1985), once said *"It is better to solve one problem five different ways, than solve five problems one way."*

Mr Mohammed has previously written an article for White Rose Maths about using multiple methods in Maths. We encourage students to develop their mathematical thinking skills by exploring different methods.

<https://whiterosemaths.com/latest-news/why-multiple-methods-is-the-way-forward>



The students with the most positive points on ClassCharts in the Autumn 1 term for their readiness and contribution to their Maths lessons were:
KGH – 093
NBB – 091
RK – 095
Well done to all these students.



Welcome to Mr Hill –

Hello everyone, I am Mr Hill and I am a new Mathematics Teacher at Altrincham College.

I qualified as a Secondary Mathematics Teacher in September 2006. After two training placements in Blackburn and Blackpool and a short time working at Lancaster Farms YO1 I started my first full time job in a Rochdale school.

I worked at my previous school for over 15 years, I experienced such roles as a Second in Department in charge of Teaching and Learning and also Head of Department for five years. After 15 years in one place I was quite nervous about the move to Altrincham College however I have settled in well and I'm enjoying day to day teaching.

I like to get involved in extracurricular activities and already have a winning record coaching the year 9 football team.

In my spare time I like to run and swim. I completed my first triathlon this year. I'm also a huge fan of any live sport, I love a competition.



MATHS TEAM

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Welcome to the team Mr Hill
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Resilience in Mathematics – How do we get there?

Here at the Altrincham College Maths Department, we are committed to ensuring that every student develops not only great mathematical knowledge, but also the capability and skills to overcome barriers to gaining that successful knowledge.

Resilience is related to students' ability to understand and to overcome any barriers and challenges in learning, essentially turning these from a negative into learning opportunities that support and guide them. Mathematics is not just a set of rules and processes that must be learned without understanding; the mathematical knowledge we want our students to gain is powerful knowledge, which is developed by becoming fluent, while developing a deeper understanding of mathematics in a variety of contexts.



Within their lessons, students are exposed to tasks which allow for deeper thinking and 'struggle', rather than getting an answer straight away. Students are encouraged to form ideas and discuss approaches to tackling the problem. Over time, with regular practice, teacher guidance, parental/carer and peer support, students can build great mathematical resilience.

Students may initially feel challenged and uncomfortable with new learning and may need support with strategies to help them, but all students need opportunities to experience this struggle.

As they become comfortable with challenge and understand that it is part of learning, this will successfully develop a growth mindset which in turn supports their future endeavours as they progress in life.

'There are two key goals to problem solving. The first and most commonly emphasised, is to find the answer. The often ignored but truly more important goal, is to learn from the task.'

Craig Barton: Maths teacher, author and educational trainer

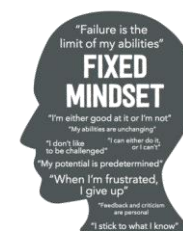


So...How can students build strong mathematical resilience?

- Be organised. Plan a regular and effective process outside of lessons to complete worked examples, revise/review and complete homework.
- Ask key questions to yourself first...What have I tried? What do I know? What am I trying to find out?
- Explain your thinking to yourself, what is your thought process and why? Then explain this to your friend.
- Refer back to previous examples and questions in your exercise book, how can this help?
- Attend the after-school clubs on a Tuesday and Wednesday (3.15pm to 4.15pm) to check in with your maths teacher and seek guidance on any maths topic.
- There are many websites that offer additional support and guidance. In particular, here at Altrincham College, we use:

Dr Frost Maths www.dr frostmaths.com
MathsWatch <https://vle.mathswatch.co.uk/vle/>

In addition, parents and carers can encourage regular maths chats outside of the school context, by noticing and talking about maths in everyday experiences. This can help students to develop a positive attitude towards maths from a young age.



© Big Change



Going beyond the classroom



The **UKMT Maths Challenge** competitions are the UK's biggest and most popular maths competitions. www.ukmt.org.uk/

Altrincham College participated in the Senior competition in October. The Senior Challenge is aimed at Year 12 and 13 students and we are incredibly proud of our excellent results. 8 of our students received an award



The challenges are full of mind-bending maths puzzles. **Why not have a go yourself with this question taken from this year's challenge:**

A light-nanosecond is the distance that a photon can travel at the speed of light in one billionth of a second. The speed of light is $3 \times 10^8 \text{ ms}^{-1}$.

How far is a light-nanosecond?

- A 3 cm
- B 30 cm
- C 3 m
- D 30 m
- E 300 m

(answer at the end of the newsletter)

Maths Department Extra-Curricular Timetable

When	Where	Who	What
ONLINE	Email	Year 7-11	Parallel Maths Project – see below
ONLINE	Dr Frost website	Year 7-11	UKMT Math challenge practice
MONDAY LUNCH	C0-12	Year 7-9	Homework support and maths challenges with the KS5 Maths Ambassadors
TUESDAY PERIOD 6	C0-09	Year 7-9	Mathswatch workspace and homework support
TUESDAY PERIOD 6	C0-09	Year 10-13	Exam Clinic
WEDNESDAY PERIOD 6	C0-09	Year 7-13	Strategy games club



If you are looking for resources to use at home, try the link below for a calendar of activities that can be used to support Maths development outside of school:

	MON	TUES	WED	THURS	FRI
Week 1	1.1 Find the perimeter	1.2 Cracking the code	1.3 Bank of numbers	1.4 Sum numbers	1.5 Labrador Eggs
Week 2	2.1 Clumps	2.2 Polygons Areas	2.3 Solve the Square	2.4 Angle Fit	2.5 Unmarked Cards
Week 3	3.1 Concentric	3.2 Coordinate messages	3.3 Chancey Grids	3.4 Board Order	3.5 Medians and Perimeters
Week 4	4.1 Calculator Classics	4.2 Introducing ratio	4.3 Percentage puzzles	4.4 Power Match	4.5 Squares, Cubes and More
Week 5	5.1 Julius Caesar	5.2 Masters	5.3 Number words	5.4 24/24 Times Tables	5.5 The 'Impossible' and 'Impossible'
Week 6	6.1 Mystery	6.2 How heavy?	6.3 Word Match	6.4 Find the shape	6.5 Yes No

<https://www.stem.org.uk/home-learning/secondary-maths>

or enjoy Maths videos & activities at

Numberphile

www.numberphile.com

Welcome to the Parallel Maths Project!
Be challenged, get curious, do maths.
Stretch your brain every week.

MathsWatch
One Minute Maths | Interactive Questions

Every week, a 15-minute task is set on parallel.org.uk. This is aimed at students who are seeking to try interesting, fun and challenging material that goes beyond school maths: mystery and history, activities and oddities, puzzles and problems.

Students can sign up using the Teacher Code **1r1wq0**.

Each Thursday at 3pm, you will receive an email, giving access to a new set of online mathematical challenges. For more information, please visit <http://parallel.org.uk/>

We encourage all students to work independently on a regular basis to boost the maths that they have learned at school that week.

MathsWatch Clip Reference Numbers help students to revise effectively for tests and assessments. We encourage students to revisit topics after the assessments to fill any gaps in knowledge or understanding.

All students have their own MathsWatch login, giving them access to videos, interactive questions that are marked online, and worksheets to complete.

www.mathswatch.co.uk

Please let your Maths teacher know if you have forgotten your password.



www.altrinchamcollege.com

Career in focus

What will your future career be?

At age 16 or less, you won't yet know exactly what you will do in the future. This means that you cannot predict what maths you will need. Many people will change careers multiple times, meaning that you need to have a wide understanding of maths to give you the best possible job options.

This terms careers focus is on **the sporting industry**. Whether in management, coaching or physiotherapy, maths is used across the whole sector. Being better at maths could give you the winning edge against your competition.

Career profile

<https://nationalcareers.service.gov.uk/job-profiles/athlete>

Athlete:

Athletes will use technology to assess your own performance. This can provide all sorts of statistical information, including: Heart Rate, Calories burnt, Average speed, Distance covered. Tracking your performance will give you the edge over your opponent.



Physiotherapy:

Physiotherapists use math related to ratios, percents, statistics, graphing and problem-solving. They need basic problem solving skills, group problem solving skills, inductive and deductive reasoning, and geometry skills. Geometry helps them understand how to manipulate angles to rehabilitate injured joints. They must administer assessment tests to determine a baseline of patients' abilities. Then continue administering these tests to monitor improvement. Such tests also feature a threshold that marks when a patient has shown maximum improvement.

Career profile

<https://nationalcareers.service.gov.uk/job-profiles/sports-physiotherapist>

University course

<https://www.mmu.ac.uk/study/undergraduate/course/bsc-physiotherapy/>

Sport scientist

Elite athletes around the world increasingly rely on sophisticated mathematical data to assess, enhance and improve personal performance and the performance of essential sporting equipment. From the analysis of human movement to the ways in which the body responds to exercise, a thorough understanding of applied mathematical techniques is essential.

Career profile

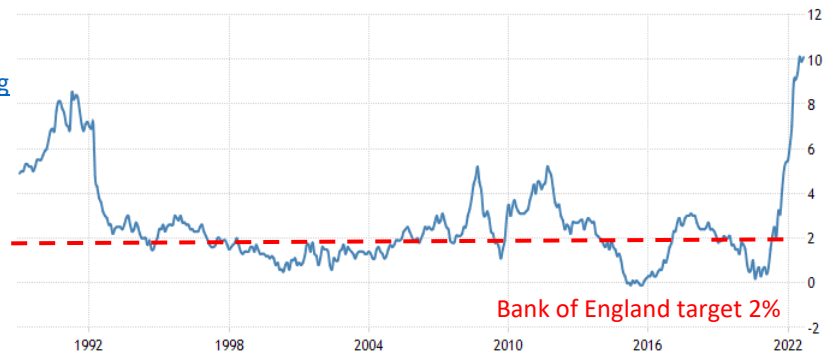
<https://nationalcareers.service.gov.uk/job-profiles/sports-scientist>

University course

<https://www.lboro.ac.uk/study/undergraduate/courses/mathematics-and-sport-science/>

Maths in the News

An update on inflation which was discussed in the [Spring Newsletter](#) and in the [Summer Newsletter](#). Inflation continues to rise, and in October the record-breaking figure of 11.1% was reported. This means that the average “basket” of goods and services cost 11.1% higher than they did exactly 12 months ago. The Bank of England’s annual target for inflation is 2%.



More recently it is the **rise in interest rates and the effect on loans, mortgages and saving** which has made the headlines. At Altrincham College, our Year 12 students have the option to study Core Maths, which includes Personal Finance. We have tried to keep up to date with all the changes in the news this term. They can be seen here reading different newspaper reports on the economy before discussing with the class.



Bank rates rise to head off spiralling inflation
Country facing longest recession since 1920s

Recession 'may last until 2024'
Bank warning as interest rate increases to 3%

What are interest rates?

Put simply: interest is the reward for saving – and the cost of borrowing.

Put money in a savings account, and you get paid extra money on top, known as ‘interest’. That’s because the bank pays you interest for allowing them to use your cash.

Interest is paid as a percentage of the money you put in the account. For example, if the interest on your £100 savings is 4%, you will receive an additional £4. The percentage is known as the interest rate, and the longer you leave money in your account, the more interest you earn. Good times!

However, interest works both ways. It’s great when you’re saving, but not so great if you’re borrowing, because then you have to pay someone interest for using their money.



Why did interest rates rise?

The bank of England raised interest rates because inflation is too high. Raising interest rates is the best way we have of getting inflation down.

Raising interest rates means many people will face higher borrowing costs. And some businesses will face higher loan rates. But the Bank of England needed to act to lower inflation. Low and stable inflation is vital for a healthy economy where people can plan for the future and where hard-earned money keeps its value.

Higher interest rates mean people borrow less and spend less. So, the economy slows down and companies can't put their prices up so quickly.

What does it mean for your own personal finances and the economy?

Mortgages

Just under a third of households have a mortgage, according to the government's English Housing Survey.

After a period of ultra-low rates, many homeowners are now facing the possibility of much more **expensive monthly repayments**.

When interest rates rise, about 1.6 million people on **tracker and variable rate** deals usually see an **immediate increase in their monthly payments**. Those on a typical tracker mortgage will pay about £73.50 more a month. Those on standard variable rate mortgages face a £46 jump.

Three-quarters of mortgage customers hold a **fixed rate mortgage**. Their monthly payments may not change immediately, but house buyers - or anyone seeking to remortgage - will have to **pay a lot more now than if they had taken out the same mortgage a year ago**.

Credit cards and loans

The Bank of England interest rates also influence the amount charged on things such as credit cards, bank loans and car loans.

Even ahead of the latest decision, the average annual interest rate in September was **20.83% on bank overdrafts** and **18.96% on credit cards**.

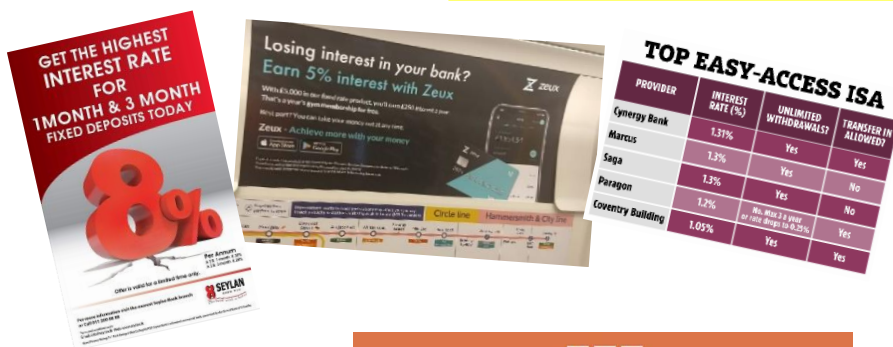
Lenders could decide to **put prices up further, in expectation of higher interest rates in the future**.

Savings

Individual banks and building societies usually pass on interest rate rises to customers. The deals being offered now are **better than anything seen for years**.

But although this means **savers get a higher return on their money**, interest rates are not keeping up with rising prices.

This means the value of cash savings is falling in real terms. EG If your savings could buy you a 5 star holiday last year. The same amount this year may only buy you a 3 star holiday.



BBC Radio 4 have made a series of economy podcasts you may find useful to help explain what's going on and how it can affect your finances. Here is **episode 2 on Interest rates and Mortgage rates**

<https://www.bbc.co.uk/programmes/m001dx5l?scrlybrkr=89541ab9>



Answer from page 3

B Using $\text{speed} = \frac{\text{distance}}{\text{time}}$ gives $3 \times 10^8 = \frac{d}{10^{-9}}$. Therefore $d = 3 \times 10^{-1} \text{ m} = 0.3 \text{ m} = 30 \text{ cm}$.