## **Underground Mathematics newsletter**

September 2017



#### In this newsletter:

Introduction

**New resources** 

Planning for the new A level

Free CPD with MEI

Contact details, social media and website updates

A thank you from the Underground Mathematics team

#### Introduction

# Written by Lynne McClure and Martin Hyland, directors of Underground Mathematics

We've just finished writing our final report for the DfE. It's been an opportunity to look back on our successes, on the things we could have done better, and on the lessons we have learned along the way. It seems a long time since the first year when we invited a few brave teachers to work with us here in Cambridge, to see what we were thinking of doing and to give us feedback about how our ideas might play out in the classroom. Over the last five years



we've worked with hundreds of teachers and their students and the relationship has been of mutual benefit and respect. We are incredibly grateful for all their engagement which has been essential to the success of the project.

What we set out to do was different from any other project. We focussed our attention on communicating the mathematics itself and the connections therein. The aims and principles we set for ourselves at the beginning still hold true for our work today. We believe that all students should be offered rich mathematical experiences and be



supported to understand maths for themselves. We believe that in order to do maths, learners need to question, discuss and share their thinking. And we believe that, given appropriate experiences, all students can grow in confidence and capability and become mathematicians. We hope that the teachers who already believe in and use our work will continue to share it with their colleagues so that more students can experience the sheer joy of thinking mathematically.

We're handing over the site to our colleagues in NRICH, whom we know will take very good care of it. We are optimistic that whoever is awarded the grant for the new Level 3 Support Programme will promote our resources in their professional development offer, and that in this way too, our resources will have an increasing impact.

The end of a project is never easy - projects are always time limited and so teams are disbanded and folks move on. As PIs, we reflect on how lucky we were to have recruited such an amazing group of people who believed so firmly in what they were doing and did it with good humour, integrity and hard work. On behalf of the teachers and students who will benefit from their work, we'd like to say thank you to them all, and wish them good luck for the future. They deserve it.

Martin and Lynne

#### **New resources**

Since our June newsletter we have published over 20 new resources.

#### Sort it out

This resource presents a collection of sequences and asks students to think about their properties and to sort them according to some classification. This is one of ten

Can you find the missing positive numbers a to d?

(1)  $\int_{1}^{a} \frac{1}{3x} dx = \ln 2$ 

(2)  $\int_{0}^{3} axe^{2x} dx = be^{6} + 2$ 

(3)  $\int_{1}^{3} \frac{cx}{\sqrt{25 - x^2}} \, dx = 4\sqrt{6} - 4c$ 

resources now available at the Sequences station.

#### Integral chasing II

You might have enjoyed the original Integral chasing. This sequel features integration by substitution and by parts.

#### How does your rectangle grow?

This resources offers a visual representation of the Product Rule which students might find a help for understanding and remembering how it works. What is the rate of change of area of this rectangle?

#### Invertibles

Students are asked to match up the functions in pairs, each with its inverse, and then to complete the corresponding graphs. We look at domain and range and touch on self-inverse functions.

#### Planning for the new A level

To help you plan rich resources into your A level lessons, we have recently updated our spreadsheet offering resource suggestions for each of the content statements in the specification of the new A level. The document can be downloaded from the Prepare for the new A level page of our site.



#### Free CPD with MEI

This one day course focuses on using our resources to support the overarching themes in the new mathematics A level: proof, problem solving and modelling. The course, including refreshments, lunch and resources, is free of charge to A level Mathematics teachers from state-funded schools and colleges. It will continue to run at venues throughout the country until March 2018.

To find out more and to book a place on one of these courses please click here.





#### Contact details, social media and website updates

To support NRICH taking over the hosting of the website, we've made a few minor changes to the website and our social media strategy.

The email info@undergroundmathematics.org will remain the main point of contact and will be monitored by NRICH. The phone number has changed to +44 1223 766 839.

We do not expect to tweet from @UndergroundMath any more - we encourage you to follow @nrichmaths for relevant news. Similarly, we don't expect to update our Facebook page. We also don't plan to add any more blog posts to our blog.

We expect that this will be our final newsletter. We suggest you sign up to the NRICH newsletter for relevant news.

Minor site updates include the removal of the discussion facility and simplifications to the Hub page. Note that you are still encouraged to register and login in order to make use of the resource bookmarking facility.

#### A thank you from the Underground Mathematics team

Finally, we would like to say thank you from the Underground Mathematics team for using our resources and we hope you will continue to do so.



### **Contact Details**

Centre for Mathematical Sciences University of Cambridge Wilberforce Road Cambridge CB3 0WB

01223 766839 info@undergroundmathematics.org https://undergroundmathematics.org Underground Mathematics is funded by a grant from the UK Department for Education and based at the University of Cambridge.





You are subscribed to Underground Mathematics Newsletter. To unsubscribe, visit: https://WWW.JISCMAIL.AC.UK/cgi-bin/webadmin?SUBED1=UNDERGROUNDMATHEMATICS&A=1