

AUTUMN 2017

Dear All

Welcome to the Autumn edition of our Maths Hub newsletter. In this edition, you will find lots of information about the projects that we are working on this year. There is very much more a national focus to maths hubs this year and, with recent announcements in the budget, there is a strong commitment to their continuation, especially on developing teaching for mastery across primary and secondary. There will be additional funding to support the appointment of Secondary Mastery Specialists in particular.

We are currently working alongside the following numbers of schools across the Hub.

Secondary: Devon 42.9%, Cornwall 71.8%, **Overall 59.7%**

Primary: Devon (Torbay 28.6%, Plymouth 60.3%, West 51.9%) Cornwall 63.9%, **Overall 58%**

TOTAL OVERALL REACH: 58.3%

As ever, communication is a real focus for us, so if you have any ideas as to how we can reach more people, please let me know.

We are hoping to be able to announce the projects we will be supporting in the next academic year with more advance notice this year, so please do keep a look out for this information in our Spring newsletter.

Have a great Christmas!

Chris



CHRIS GOULD
Maths Hub Lead



COLIN BACON
Senior Maths Hub Lead

COMING UP IN 2018...

Challenge Days

Shanghai Live Lessons

Subject Leader Work Group

Local Leaders in Mathematics Education

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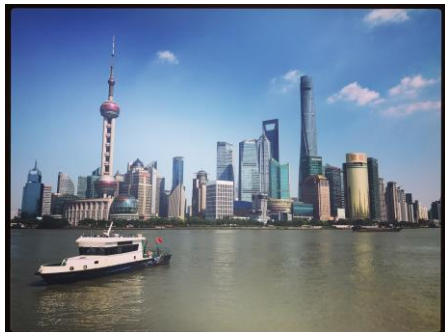
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My Experience on the Shanghai-England Exchange Laura Warren, Beechwood Primary School, Mastery Lead

I was incredibly fortunate to gain a place on the Shanghai Exchange Programme this year. Having returned in September, I have been reflecting on what I have learned and observed during my time there. I can only describe my experience as inspiring and life-changing. I felt incredibly privileged to be invited in to the classrooms of our Chinese colleagues and to share and evaluate their practice with them through post-lesson discussions. For me, this was one of the most valuable parts of the exchange. During our time in Shanghai, I learned many lessons that have instantly influenced my own pedagogy in my classroom.



Collaboration is at the heart of the teaching practice in Shanghai. Whilst there, we visited the largest primary school in Shanghai: 6400 children, 499 teachers, 74 maths teachers across four campuses all working together with the same aim: to ensure **ALL** children succeed. This was a strong message throughout our time there; **ALL** children were expected to succeed and it was the teacher's responsibility to ensure their teaching enabled this. They work closely with their colleagues by observing each other's lessons on a regular basis and participating in weekly Teacher Research Groups to ensure they continually develop their practice. Each TRG we participated in began with the statement: "Please give me feedback on how to improve." With this research based approach to teaching and the constant desire to improve their practice, it was evident that our Chinese colleagues provide the best outcomes for all students. This discussion has been the most valuable professional development I have taken part in.

During the TRGs, the teachers discussed the 'chronology' of their lessons discussing the successful parts and the sticking points for the children. Following on from this, colleagues were invited to ask questions and make comments to support and develop the teaching. This 'craft' of the lesson was truly inspirational. Before visiting Shanghai, I thought I had developed my small step planning pretty well. How wrong I was. The

clear, coherent journeys through the lessons we observed enabled **ALL** children (sometimes 58 in a class) to move through the lesson content at the same pace. The depth of understanding demonstrated by the children simply 'wowed' us every lesson. Due to the small steps, careful questioning and explicit modelling by the teachers, the children were able to apply their learning to



incredibly abstract contexts. This ability for all children to understand concepts is primarily due to the constant refining/crafting of lessons which is something we can definitely learn from and embed in our own teaching practice.



It was reassuring to see some Shanghai 'myths' dispelled whilst I was there. Having heard that children sat at individual desks and worked in isolation throughout the duration of the lesson, I was pleased to see this was not the case at all. Desk partners were commonly used across the city and children were encouraged to work in collaboration on concepts. Desk partners are carefully chosen and we consistently witnessed 'peer teaching' taking place throughout lessons. Children are positioned so they are always facing the front to ensure maximum learning takes place and the children strive to succeed. One child told us: "I have to work hard in order to stand out as the population in China is so vast."

This attitude towards learning and hunger for success was inspirational. During lessons, the children were focused and ready to learn but during 'down time' they are very much children. The ten minutes between each lesson was spent laughing and playing in the corridors.



The collaboration of learners is something I have been developing in my own classroom and have truly seen the effectiveness of peer teaching; not only does it support learners, it also deepens the understanding of others as they are having to



articulate their understanding to enable someone else to understand the concept.

During my exchange I observed many things that are easily transferrable to our education system; particularly the collaborative approach to teaching and learning with the aim for ALL children to succeed. Adapting our lesson structure and planning clear, coherent, journeys in each lesson, is definitely something we can achieve. Working closely with our colleagues to craft and refine lessons through TRGs should become a natural part of our practice as this has the greatest impact on teaching and learning.

I am excited for the upcoming return visit and am incredibly grateful for the experience.

Mathematical Thinking at GCSE Matt Weeks, Richard Lander School, Work Group Lead

Having been a part of Robin Penrose's workgroup last year, which focused on KS3 reasoning, I was really pleased to be asked to run a workgroup this year on 'Mathematical Thinking and the new GCSE'. Our group involves teachers from five centres spread throughout the county; Richard Lander School, Treviglas Community College, Brannel School, Mounts Bay Academy and Launceston College.



Our primary aim is to look into how to provide students with opportunities to develop their mathematical fluency and reasoning skills.

However, what does good reasoning from a student look like? Or perhaps more importantly, what does a good lesson for developing reasoning look like?

Within each of the work group schools a pair of teachers will work together performing a lesson study. From planning, to delivery, to evaluation, the outcomes of each lesson will be analysed and then brought back to the group where we can reflect on what worked well and what had the potential to be improved. This process will then be repeated where ideas can be refined or new approaches attempted, all the while focusing on the development of pupil reasoning.

We hope that those taking part will increase their understanding of the role of problem solving and reasoning in the new curriculum, be confident in what teaching and learning approaches can support current KS4 pupils and return to their departments to share their experiences, hopefully embedding some new approaches into the everyday teaching of the department.

Developing Mastery, Buckfast Abbey Conference Centre Jody Trayte, High View School, Mastery Specialist

This term saw the first joint venture between teaching schools and the Cornwall and West Devon Maths Hub, when CODE joined the Plymouth Teaching School Alliance (PTSA) and Torbay Teaching School Alliance (TTSA) to host a primary maths conference at Buckfast Abbey Conference Centre. The day got off to a flying start with a keynote speech from Debbie Morgan, Primary Director for the NCETM, which unpicked some of the key features of teaching for mastery with helpful examples.



The rest of the day was jam-packed with workshops, exploring different aspects of teaching for mastery from Mastery in the Early Years to Differentiation through Depth.

The conference was a sell-out and there was a definite buzz around the venue. Watch this space for information about

next year when it is sure to be bigger and better!

2018 Dates for your diary...

- **10 January** Fluency Through Reasoning: Making the Best Use of No Nonsense Number Facts *EY Teaching Centre, 13:30-16:00*
- **13 January** Boolean Maths Hub Conference, *Bristol Metropolitan Academy (£20.00 per ticket, please contact booleanmathshub@clf.cabot.ac.uk for further info)*
- **18 January** Use of Technology in 2017 A-Level Maths: Geogebra Work Group *CODE Maths Hub, Truro College, 13:30-17:00*
- **24 & 25 January** Live Shanghai Lessons, *CODE Maths Hub, St Stephens Community Academy, Launceston 08:30-11:30*
- **1 February** First Subject Leaders Work Group meeting, *CODE Maths Hub, Truro College, 14:00-16:00*
- **2 February** Making Sense of Mastery in Mathematics at KS2, *Tiverton Hotel, 09:30-15:30*

Check the CODE website at <https://cornwallwestdevonmathshub.org/> and Twitter at <https://twitter.com/CODEMathsHub> for further updates.



Debbie Morgan addressing delegates in her keynote speech



Using manipulatives to support Teaching for Mastery



Chris Gould, CODE Maths Hub Lead, talking about the work of the Hub

Early Years Research Project Dr Helen J Williams, Work Group Lead

It has been extremely stimulating to lead the Early Years Research Group. Pairs of Reception and Y1 teachers from the following 6 schools took part this year: Trevithick, Mount Charles, Sandy Hill, Illogan, St Agnes and St Stephen Churchtown (St Austell).



The group meets at Truro College once each term and in between participants are expected to engage in reading, discussions and classroom research. This is a collaborative, research-based, non-judgmental professional development group for R and Y1 teachers with a focus on the development of young children's number knowledge in particular. Participants are supported in undertaking paired classroom research and report back on their observations as the group proceeds. The initial research questions for the group are:

- In what ways might international research on effective early year's mathematics inform our practice?
- What do we mean by 'big ideas' in early years mathematics and how might these be a useful tool in planning for learning?

We have been delighted to welcome Dr Sue Gifford, Principal lecturer, School of Education, University of Roehampton, early years mathematics specialist and author, to speak to us and she has given us much to think about!

This group will continue to be supported over the next year, and we have just recruited 6 schools to take part in the 2nd cohort. Both years we have been oversubscribed, which is both pleasing and challenging! We are planning to hold an information meeting near the end of the 2017-18 school year for these schools, by which time we will know if we are able to bid for funding for a further group next year.

Shanghai Live!

A unique opportunity to observe and discuss lessons taught by maths teachers from Shanghai

At St Stephen's Community Academy

Roydon Road, Launceston

PL15 8HL

8.30 to 11.30am

24 & 25 January 2018

The sessions will include pre and post-lesson discussions to reflect 'What's the same? What's different?' between teaching for mastery in the UK and Shanghai

To reserve your place email CODEMathsHub@truro-penwith.ac.uk



Regrettably, whilst there is parking available in Launceston centre, it is limited around the school. Please car share where possible.

First CODE Hub Level 3 Mathematics Conference Debbie Bland, CODE Hub Level 3 Lead

Over 37 teachers and lecturers from Cornwall and Devon met at Truro College for the first CODE Maths Hub A level Mathematics all day conference on 3 November.

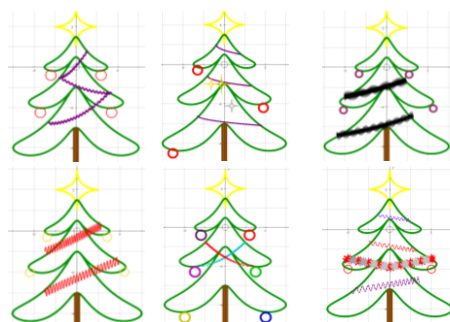
Margaret Harding from the Further Mathematics Support Programme led sessions introducing Geogebra and its application in the A level Maths classroom and showing how it could be used to help teach large data sets and the binomial distribution.



Janet Dangerfield showed how to teach proof to A level students whilst Jamie Nevill and Alex Wyld showed some activities they used for inspiring students in the run up to Christmas and over the holidays involving Geogebra, functions, Christmas trees, Facebook and integrals!



In his sessions Ted Graham demonstrated resources from Underground Maths as well as showing how to teach the Mechanics elements of the syllabus using some practical examples involving planks of wood, metre rules and cars.



Year 5 – 8 Continuity Development Work Group, Susanne James, King Charles School, Falmouth

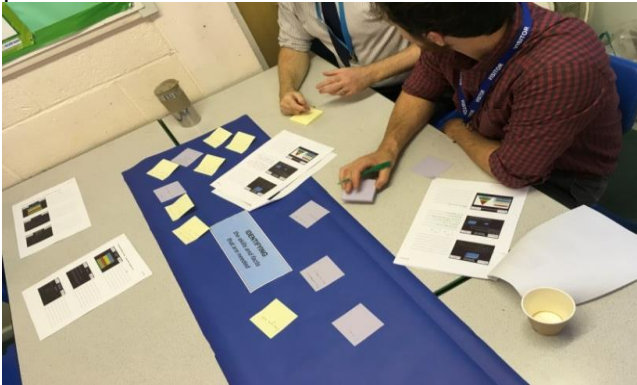
The Falmouth Learning Network has been meeting for over ten years. During this time, it has focused on Maths, English and Science with successful outcomes, including shared calculation policies and cpd opportunities. Currently, our work group involves all Y5-8 teachers from the following schools: Falmouth Primary, King Charles, St Mary's, St Francis and Falmouth School with the Maths Lead from each school meeting half termly to move the project forward.

For the past year, the group has focused on reasoning and transition from Key Stage 2 to Key Stage 3. Our project began with surveying all Y5-8 teachers about reasoning. As a result, it was decided that we would share good practice by carrying out a series of learning walks across the schools to observe lessons in Years 5 to 8. Each lesson observation focused on looking for reasoning.



These observations and other feedback gave us our next steps: to produce a document to support the teaching and learning of reasoning skills.

The project is also enabling us to develop strong links between the Key Stages – sharing pedagogy and subject knowledge by working in a cross-phase partnership whilst continuing to focus on reasoning and its development across both phases.



The project has been given a boost this year as it has now become a Y5-8 Continuity Project linked to NCETM. As the Work Group Lead for the project, I went to Birmingham in November for the first NCETM workshop and will return in July with the outcomes of our project.

We met for the first time as a whole group in November. After a presentation on the project so far, from the Maths Leads, we worked in small cross-phase groups to generate question and answer sentence stems that can be used to develop reasoning skills. These stems will become a shared resource that can be used in both Key Stages – to plan for questioning in teaching and learning, to create reasoning displays within the classrooms and to support pupils' skills in reasoning.

Group members are now following up their research projects in cross-phase partnerships back at school. They will be working together to think about how they will apply the sentence stems and evaluate their impact – through book scrutinies, lesson studies and pupil conferencing. We will gather the evidence by the end of February

CODE Maths Hub

Use of Technology in 2017 A-Level Maths: Geogebra Work Group

This work group will give participants

- time to discuss how technology can be used to enhance students' learning
- examples of using Geogebra to teach the new A level
- support to develop their skills using Geogebra
- opportunities to share experiences and findings.

Work Group Sessions run by Ben Sparks

Thursday 18 January 2018,

Thursday 1 March 2018

Wednesday 18 April 2018

All sessions are from 1.30pm until 5pm at Callywith College,
Old Callywith Road, Bodmin, PL31 2GT

If you want to join in please email deborahb@truro-penwith.ac.uk by 10 January 2018 or for further information, please see our website at <https://cornwallwestdevonmathshub.org/>

More exciting projects!

Subject Knowledge Enhancement for Primary Teachers

The group is being led by Josh Lury, Maths Hub Deputy Lead and an independent maths education specialist and writer.

The group will meet for the first time in January 2018 and will be working on improving their knowledge of primary mathematics content with a particular emphasis on mathematical structures in key areas. Participating teachers will be able to design lessons that include better questioning and more opportunities for mathematical talk. They will also gain a deeper understanding of the principles underpinning teaching for mastery and a belief that all children can succeed.

Subject Knowledge Enhancement for Teaching Assistants

The group will meet for their initial session in January where Josh will be helping teaching assistants to better support children in the classroom and during small group or individual intervention.

Over the course of the Spring and Summer terms, participating TAs will be delivering 12 sessions with a Year 3/4 child, as an out-of-class intervention, to support that pupil in their understanding of addition and subtraction. Each session with the pupil will last 30-45 minutes and TAs will gain a greater understanding of how children think and where their misconceptions stem from. There is to be particular reference to the three aims of the National Curriculum – fluency, reasoning and problem solving.

Teaching for Mastery: What Makes an Excellent Lesson Design?

Josh will focus on refining teachers' understanding of lesson design.

Teachers in this work group will work together to plan exemplar lessons, drawing on new Mastery Professional Development materials produced by the National Centre for Excellence in the Teaching of Mathematics and Maths Hubs.

Some of the topics covered in the research meetings will include –

- Understanding the key elements of lesson design
- Becoming familiar with the Mastery Professional Development materials
- Agreeing planning format

- Discussing and reviewing progress
- Evaluation of the project

In between these meetings, teachers will work in pairs to plan and deliver lessons, and then observe each other where possible, with a focus particularly on the small steps required in teaching for mastery.

Teaching for Mastery (Primary): Researching and trialling models of intervention to support pupil progress

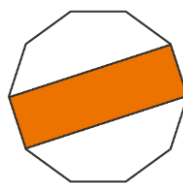
A project led by Mathematics specialists from Babcock International, Dr Ruth Trundley and Helen Edginton.

The focus of the group is to further explore the use of pre-teaching and assigning competence to support vulnerable children to be active and influential participants in maths lessons. This builds on a jointly funded project (Devon County Council, Jurassic and CODE Maths Hubs) which ran during 2016/17 and is running in parallel to a second project currently funded by Devon County Council and the Jurassic maths hub.

The group met for the first time at Callywith College in Bodmin in November 2017. Teachers involved were asked to identify three focus children each and run at least two pre-teach sessions a week with these children plus use assigning competence during maths lessons throughout the rest of the year. The research behind and understanding of pre-teaching and assigning competence was explored at the launch; for further information <http://www.babcock-education.co.uk/ldp/PTAC>

The participating schools will work in two geographical clusters, meeting with Helen four times during the year to share findings and support further development. A final meeting in the Summer term will lead to a report which will be shared nationally.

Puzzle Corner, Jan Dangerfield



What percentage of the area of this regular decagon is shaded?

What are the next three numbers in this series?
4, 6, 12, 18, 30, 42, 60, 72, 102, 108, ???
Answers in the next edition or email if you can't wait!