



Maths Week Scotland 2019 30 September – 6 October 2019

Maths Week Scotland is a celebration of the importance of maths in our everyday lives. Now in its third year, people from across Scotland once again got involved with hundreds of events and activities in their local area and online.

Maths Week Scotland aims to provide the opportunity to engage with maths in new ways, regardless of age, interests or ability. This year, schools, adults and families engaged with aspects of maths including measuring, problem solving, mathematical modelling, statistics, and code breaking. Events were delivered all over Scotland bringing the wonder of maths into classrooms, community centres and even pubs across Scotland. There were online challenges, social media activities and national competitions for schools, created by well-known organisations such as 'Maths wi nae Borders' and 'Sumdog'.

In April 2019, the partnership between the Scottish Government and National Museums Scotland was formally announced, with the creation of a dedicated Maths Week Scotland Coordinator based at the National Museum of Scotland. Working closely with the National Profile-Raising Group for Mathematics, Education Scotland and many universities, science centres and experts, this partnership has enabled Maths Week Scotland to grow in reach and scope. With a new look, new website and more collaborators, Maths Week Scotland was able to reach more people and showcase a broader range of maths than ever before.

Maths Week Scotland would like to extend a huge thank you to all who created, led and supported activity. Although we could not fit everyone or everything into one report, here we have outlined some highlights from the week.



Maths fun at Aberdeen Science Centre

Maths Week Scotland in Schools and Early Years Education



Schools across Scotland took part in Maths Week Scotland activity

Pupils and teachers from schools in every local authority celebrated Maths Week Scotland with creativity and enthusiasm.

Teachers embedded maths throughout the curriculum with maths games in PE, maths in outdoor play, Maths Week Scotland songs, maths in cooking and much more! Schools were able to pin themselves on a new map on the website, showing the wide variety of schools from across Scotland who got involved this year.

schools tested their maths skills under pressure with simulated disaster relief response. Pupils planned, designed and budgeted for the resources required to be loaded onto planes and help those in need. At Sprouston Primary School pupils collected weather data throughout the week and presented their own weather forecasts to meteorologist Heather Reid.

Maths Week Scotland combined creativity and maths in a range of contexts. Science Ceilidh created three new resource packs using dance and music to explore data collection, symmetry and fractions. In East Renfrewshire, Woodfarm High School created a giant Sierpinski Pyramid out of 1024 cards. As well as the creation of the final structure, pupils prepared by calculating nets of 3-D shapes, powers of 2 and the dimensions of the pyramid. The pyramid proved a popular selfie spot for visitors and pupils in the entrance of the school! Cedarbank School invited pupils from additional support needs schools in the region to join them for an enjoyable day of problem solving and board games which brought to life the maths behind strategies and logical thinking.

Pupils and families at Early Years Centres also took part in celebrations. In Clackmannanshire, pupils got out in nature and used maths to identify and size autumn leaves. Numerous early learning centres used their small grants funding to hold parental engagement sessions, complete with take home resources for families to engage with maths together.

Pupils also used maths to tackle real world problems this year. In Argyll and Bute,



Pupils in Dumfries and Galloway enjoy Bubbly Maths

Schools also invited special guests into schools and early years centres to deliver talks and workshops.

In Dumfries and Galloway, over 1,900 primary school pupils delved into Bubbly Maths sessions with Caroline Ainslie at three locations across the region. This gave pupils from smaller rural the opportunity to take part in special Maths Week Scotland events.

In Inverness, Tom Crawford shared tales of his storm chasing adventures in Antarctica all in the pursuit of mathematical modelling. His work in fluid dynamics helps us to understand our oceans and creates mathematical models to help us predict the climate of the future. He shared stories of Ancient Greece and one mathematician's radical ideas.

Kjartan Poskitt returned to Maths Week Scotland for the third time, amazing over 800 pupils and parents of the Western Isles with his Murderous Maths show. Some pupils even saw the show twice, returning in the evening with their families!



Deputy First Minister John Swinney speaks at teachers event

On the east coast, Ben Sparks travelled from Angus to the Borders with his mathematical magic show, organised by the International Centre for Mathematical Sciences.



Teachers at Edinburgh University teachers event

Santander and National Numeracy brought their Numbers Roadshow to Scotland, spending the day at Stirling High School. Pupils discovered how football teams use maths to develop their skills and track progress. They also got the chance to test out their football skills with top football freestyler Dan Magness.

Escape rooms were once again a popular aspect of Maths Week Scotland. Eleven schools received

funding to create their own escape rooms and put their pupils problem-solving skills against the clock!

Elsewhere teachers took maths out of the classroom with trips to Aberdeen Science Centre, Glasgow Science Centre, National Museum of Scotland and local businesses. The new *Castle Quest* trail and accompanying teachers notes launched at Edinburgh Castle for pupils to explore how maths shaped the architecture of the castle and those living within it

Teachers also took the opportunity to try out new activities and learn about cutting edge mathematical research at teacher events. Edinburgh University hosted an evening with guest speakers Deputy First Minister John Swinney and

Darren McKinnon from Edinburgh Council. Teachers got hands-on with mathematical challenges, discussed new qualifications and exchanged ideas. At the Glasgow 'Teachmeet', teachers shared good practice, practical innovations and personal insights.

The weekend was not quite the end of the school week for teachers attending the Mathematical Association Annual CPD day. Teachers tried out escape rooms, mathematical magic tricks and engaged with maths demos.

Teachers found inspiration and resources for their schools, as well as details of special events online during Maths Week Scotland. Social media was buzzing with a wide range of creative activities and themes shared by schools and nurseries with the hashtag #MathsWeekScot.

Schools can continue to use resources created specifically for Maths Week Scotland, all available and free to download on the dedicated website. Online resources have also been contributed by Scottish Book Trust, Institute and Faculty of Actuaries and University of Edinburgh including Bookbug sessions for libraries and videos on maths in careers. On GLOW, teachers can share and download their own resources in the Maths Week Scotland section with over 2000 views to date.

Maths Week Scotland and Universities



Strathclyde Science Scouts visited schools in and around Glasgow

Maths engagement teams from nine universities created and delivered activities for Maths Week Scotland including school workshops, teacher events, family activities and talks. Undergraduates and postgraduates combined their passion and knowledge of mathematics to showcase the breadth of mathematical topics.

The Open University delivered codebreaking workshops in the Highlands and the University of Edinburgh created a series of problem

solving videos for P5-S3 on the topic of transport networks.

Strathclyde Science Scouts run a programme of activity throughout the year and, during Maths Week Scotland, delivered their maths workshops to 1,567 pupils. These workshops engaged pupils with maths in real world contexts such as immunisation, encryption and mathematical research.

These teams, and others, will continue to work year-round with Maths Week Scotland to create more events and opportunities to open the world of maths to their local communities.

Maths Week Scotland for Families and Adults

This year's public programme was the biggest and broadest yet with activities in cities across Scotland.

Families and adults took part in over 20 different events and activities spanning topics from code-breaking to climate change.

In Inverness, Dr Tom Crawford explored how maths can help Scotland win penalty shoot outs. Meanwhile, Glasgow residents were putting that into action with the Santander Numbers Roadshow bus in George Square complete with penalty shoot-out zone.

Aberdeen Science Centre hosted two maths extravaganza weekends with maths activities and workshops across the whole centre for all ages. Families got hands on with packing problems, hieroglyphics and aerodynamics.

At the National Museum of Scotland, families and adults used their mathematical and logical thinking skills to tackle a cryptography trail and simulated enigma boards to crack codes.

Families also had the opportunity to engage with maths at their own pace with trails and at home activities. At Dynamic Earth, families became *Mathstronauts* as they solved puzzles round the exhibition.

Adult events in Edinburgh looked at maths in topical issues such as healthcare, transport and renewable energy. The Royal Statistical Society hosted a discussion on how statistics can help us evaluate the impact of offshore renewable energy on ecosystems. Focusing on dry land, Ilze Ziedins looked at how we are affected when networks go bad, from traffic jams to hospital waiting times. In Glasgow, Holly Kreiger took attendees on a journey through the beautiful world of Mandelbrot sets. Meanwhile, David Acheson impressed the audience in St Andrews with live guitar demos and precarious pizza box towers.



Photo: Young people in a workshop at Aberdeen Science Centre

Maths Week Scotland and Supported Family Engagement



Family engage with enigma board at National Museum of Scotland

Maths Week Scotland offers the perfect opportunity for parents, grandparents and carers to engage with maths with children, both through school and public events.

In schools, family engagement sessions involved showcasing children's learning, enjoying maths trails, treasure hunts, board games and encouraging positive attitudes to maths and learning at home and out-and-about.

Parent councils received funding from the Small Grants Fund; the

Anderston Primary School Parent Council created a Maths Trail in the school and community and Escape Games designed and delivered by Parent Council and Moffat Academy Parent Council launched their Big Mathematical Board Game Initiative.

Carers also got involved in the school day, sharing with classes how maths plays a part in their lives – either at work, or at home through things like baking, DIY, budgeting and managing money.

At family events activities were designed for families to solve puzzles and problems together in a supported environment, building confidence for families and children.

Maths Week Scotland and Careers

The 2016 'Making Maths Count' report highlighted a need to focus on how maths is used in every career. This year, Maths Week Scotland highlighted the role of maths in all areas of life, through downloadable posters and social media campaigns.

A pilot scheme of training with STEM ambassadors took place in August in Ayr, Glasgow, Edinburgh and Aberdeen. These sessions focused on curriculum levels, science capital, how to talk about maths in your role, example activities and how to support schools and community groups. Attendees showed amazing creativity in developing ideas to showcase maths in careers such as geological research, chemical engineering and farming.



Selection of Maths Week Scotland promotional posters

These training sessions are planned for more locations throughout 2020. STEM Ambassadors supported Maths Week Scotland school and public activities and will continue to do so year-round.

Schools also arranged for industry professionals to join them in class and talk about how maths is used in sectors such as policing, transport and biomedical sciences.

Maths Week Scotland and Community events

An important development in 2019 was the increase in the number of community groups getting involved, organising events for local people and families.

In Greenock, participants looked at the economic and social impact of alcohol pricing and units with GRASP (Greenock Recovery Alcohol Support Group). Meanwhile over in Cowdenbeath knitting by numbers helped beginners and experts develop their skills and creations! South Lanarkshire Council Youth, Family and Community Learning Service organised a 'Game, Set Maths!' event for schools and adult learning to use maths and strategy when playing board games. This open event was enjoyed by pupils and adults alike whilst learning new number skills!

Youth groups in East Dunbartonshire used maths skills to create clocks and during Maths Week Scotland, parents and carers had the opportunity to view progress. These groups will be working collaboratively to create a giant clock to be donated to a new community centre.

Maths Week Scotland and Competitions

Five national competitions form a core part of the Maths Week Scotland programme: The Deputy First Minister's Daily Challenge, Maths wi nae Borders, Maths Inside, Sumdog and Mangahigh.



Combination Lock

A lock relates to a sequence of numbers, a pattern, a code. Codes are all around us, in computers, daily life even people. We all have a code. This lock, is maths inside.

— Rachel Heatherill (Sa)



Maths Inside Category Winner entry

Sumdog and Mangahigh brought out the competitive side in classes up and down Scotland with their special Maths Week Scotland competitions. Again this year we saw incredible participation levels in the Sumdog contest with 40% of all schools taking part, and 75,042 pupils answering over 16.4 million questions! The winning class and highest-performing pupil are visiting Sumdog HQ in January 2020 to receive their trophy from the Deputy First Minister, John Swinney.

The Deputy First Minister tweeted his daily maths challenges, created by the Scottish Mathematical Council, and hundreds of people took them on. These challenges are quick puzzles for classes, families, groups or individuals to use their logical thinking skills. The challenges were brought to life through BBC Scotland Learning videos featuring teacher Chris Smith and pupils of Grange Academy.

Maths wi nae Borders had another successful year with 4500 pupils taking part from locations as far away as California! The winning team will be also be presented with their award by Deputy First Minister, John Swinney, in December 2019.

Over 300 competitors got creative with this year’s Maths Inside challenge, finding maths in this year’s themes of *in the wild*, *in your town* or *complete the pattern*.

In addition to the national competitions, schools, local businesses and organisations created their own puzzles to share on social media and even in the windows of local businesses!

Maths Week Scotland and Digital

Launched in April 2019, the new branding and website made its Maths Week Scotland debut this year.



People shared their celebrations on social media

The website brings events, activities and ideas under the Maths Week Scotland banner for the first time. Schools are also able to share their activities on the interactive map. In addition to the website, people engaged on Twitter @MathsWeekScot with over 2,400 mentions sharing celebrations.

Maths Week Scotland Small Grants Fund

Now in its second year the Maths Week Scotland Small Grant Fund continued to support innovative ideas and initiatives. Funding and administration is jointly provided by the Scottish Government Curriculum Unit, Edinburgh Mathematical Society and Glasgow Mathematical Journal Trust.

Overall, the Fund awarded £70,000 to support 110 organisations and individuals; £23,000 was awarded during the first tranche of funding and £47,000 in the second tranche of funding.

Funding was awarded to support early learning centres, schools, colleges, universities and councils. Additional funding also enabled informal learning through community groups, science centres and organisations.

Full details of successful application bids can be found on the Edinburgh Mathematical Society website.

What next?

Maths Week Scotland will be hosting and supporting events over the coming year - follow @MathsWeekScot or visit www.mathsweek.scot for more information.

We will also be back next year! Dates will be announced via twitter and the website.

To get involved in year-round activities or Maths Week Scotland 2020, email info@mathsweek.scot.

Collaborators and contributors

Maths Week Scotland's success is down to the hard work, innovation and support of collaborators, contributors and the education sector throughout Scotland. In particular, we saw incredible dedication and creativity from teachers, schools and early learning centres to make Maths week Scotland special for pupils.

Thank you to:

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University of Aberdeen
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University of Highlands and Islands
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Open University
University of St Andrews
Strathclyde University

Aberdeen Science Centre
Dundee Science Centre
Dynamic Earth
Glasgow Science Centre
Historic Environment Scotland
Regimental Museums in Edinburgh
Royal Botanic Gardens Edinburgh
Science Ceilidh

BBC Scotland Education
Enterprising Maths in Scotland
Fun Palaces
GRASP (Greenock Recovery Alcohol Support Group)
Historic Environment Scotland
K'nex
Leverhulme Research Centre
Mangahigh
Maths Inside
Maths Wi Nae Borders
Midlothian Science Festival

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