

# WMG Outreach

2020/2021 Academic Year

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Final version prepared October 2021

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## WMG Outreach Activities in 2020/2021

### At a Glance

With the continuation of lockdowns and constantly changing rules, WMG Outreach's outputs were significantly impacted. Wherever possible, alternative solutions and innovative events were put into place. Some highlights from these innovative events will be kept going forwards, with a particular emphasis on the usefulness of recording streamed sessions to create content teachers and students can consume at a later date. Resource boxes that can be posted to schools for teachers to run our sessions themselves have also been successful and should be taken forwards beyond the end of Covid.

The end of the academic year saw promise for the return of face-to-face events, with a Covid-secure *Stitch In Time* event run by Margaret Low and Helen Luckhurst at the Herbert Art Gallery a particular highlight of the year.

Coventry City of Culture has provided opportunities for events such as a live Materials Science show streamed into schools (one for primary and one for secondary). The *Our Future Moves* exhibit at Coventry Transport Museum has provided a fantastic opportunity to showcase the work of student teams, research groups, and collaborative approaches to using engineering to shape the future world we want to live in.



Across the year the WMG Outreach pages achieved 155,000 website views. The number of students in attendance of events was estimated as 1053, based on numbers captured in the activity report. Note that this is based only on live attendance at an event or the first premiere of a recorded resource. 31 events with a live component were reported to us *via* our online form.

## Highlights of 2020/2021

The WMG Outreach team remains determined to deliver inspiring and educational content to local young people and take the engineering successes out of the WMG workshops and into the public, despite lockdowns and disruptions. To achieve this we have strengthened our partnerships with teacher-facing groups (to avoid overwhelming teachers during a stressful period) such as the University of Warwick Widening Participation Team or the Lord Bhattacharyya Engineering Education Partnership. We have innovated new methods of content delivery (remote lessons, pre-prepared video materials, posting resource boxes, webinars *etc.*). We have continued to deliver material to local, national, and international audiences.

### Local

#### Coventry Transport Museum – *Our Future Moves*

Between Margaret sitting on the strategy and engagement side meetings and Phil sitting on the curation meetings, alongside the support from WMG and HVM Catapult Marketing, we were able to support many additions to the *Our Future Moves* exhibit.

Phil was able to support research and technical staff (Rohin Titmarsh and Bethany Haynes, respectively) in building a robotic arm display using a Cobot arm straight from the workshop and using it to display battery pack assembly to the public. Given the strategic push for battery manufacture in the West Midlands, this contribution to the exhibit could prove invaluable in building the skills needed in the local area.

#### Materials Science Show for the Resonate Festival

##### *Primary Session*

14 teachers across 3 schools accessed the live event. We can presume that each of these teachers were showing the lesson to their class and given an ‘average’ primary class size of 27 students (Schools, pupils and their characteristics: January 2019, Department for Education, 2019) this would suggest an audience of 351 pupils.

*“Thank you so much for the session yesterday it was very much enjoyed by the children in Year's 4, 5 and 6! There were lots of 'Wow's!' and 'Cool!'”*

*“I have had lots of positive feedback from this morning's outreach with the Year 6 pupils at [school]. The children seem to have thoroughly enjoyed your show today and learned a lot. I just wanted to Thank You, and the University for working with us here at [school] and let you know how much we appreciate the offer and opportunity.”*

The recording of the session is available [here](#).

##### *Secondary Session*

2 teachers from 2 schools accessed the live event. We can presume that each of these teachers were showing the lesson to their class and given an ‘average’ secondary class size of 22 students (*Schools*,

*pupils and their characteristics: January 2019*, Department for Education, **2019**) this would suggest an audience of 44 pupils.

### **Ri Engineering Masterclasses**

This activity centred around students building a cardboard chassis to hold motors and a programmable control board to build a robotic vehicle. The kits were all prepared to be pre-programmed and work straight out of the box – because we did not know whether computers would be available or whether the students would be at home or at school.

Being able to send boxes of kit out to schools has provided opportunities to run events in schools even during lockdowns and restrictions, but it is not without its limitations. In person delivery would have improved this activity hugely. Regardless, students reported having an enjoyable experience with us and teachers provided positive feedback and suggestions for improvements. A pedagogical intern was also able to evaluate the entire project and suggest improvements for future use of this material.

In total, approximately 30 students were engaged across 2 schools for a total of about 6 hours (in each school). The [full resources for the activity and a report evaluating it are available here](#).

### **Stitch in Time**

A return to in person delivery was a welcome sight for all of us. Margaret Low and Helen Luckhurst were able to run workshops at Herbert Art Gallery as part of the Resonate Festival. The Stitch In Time Project links closely to Coventry City of Culture and allows families and schools to design patterns using simple algorithms and block-based coding – these codes are then used to instruct a digital embroidery machine to show the audience their code made into a tangible object. [A video shows the impacts this activity had on the families involved and the items they created](#).

The project also has international links, with collaborators from across the world working with Margaret to capture the traditional and cultural patterns into code. [Stitching in Time and Place was presented at Snap!Con 2021 and you can see Margaret in action here](#).

Bridging the gap between culture and technology is a valuable angle to take with engagement and education projects as it makes the learning relevant to people's experiences. The Warwick Institute of Engagement focussed on [this project as part of one of their Spotlight pieces](#).

### **Computing at Schools**

Margaret continues to co-host the Computing At School Coventry community. In 2021-22 the community met 4 times virtually. The virtual meeting format has increased attendances (now currently at 40 - 60 teachers per meeting), as anyone interested in the meeting topic can easily join.

### **Public Speaking and Presentations training for WMG Staff**

Phil has delivered public speaking and presentation workshops to WMG staff and to the new cohort of Graduate Trainee Engineers. These workshops have been well-received and it is hoped that by collaborating with the outreach team we can develop the skills of our staff to deliver engaging and exciting presentations no matter the audience they are speaking with.

These workshops and accompanying materials will be extended and repeated in the year to come and used as a way to build capability in staff while showcasing the opportunities available to staff to engage with outreach.

### **Warwick Institute of Engagement – Fellowships**

The newly formed Warwick Institute of Engagement aims to build a community of staff at Warwick who work with the public beyond traditional academic responsibilities. Both Margaret and Phil were awarded Fellowships of the Institute on its founding and have contributed towards Learning Circles working towards improving and innovating the public engagement offering of the university as a whole.

### **National**

#### **WMG Talks Relaunch Webinar**

For British Science Week 2021 a webinar session was organised with local schools for early career staff at WMG to share their own personal story with a young audience. The transition from in person previously seen for WMG Talks to a digital delivery model was challenging, particularly in terms of achieving the right visual look for the session.

On whether working with the outreach team has helped to develop new skills:

*Yes, particularly skills needed to present to a more general or less expert audience. Specific advice was particularly useful, such as framing (carrot versus stick) and closing off (e.g. call to action).*

**Katerina Gonos**

*Massively! Its great learning from Phil and Margaret on how the structure and delivery on the presentation is so different to what we are used to.*

**Amar Gohil**

On whether their approach to future presentations has changed after working with WMG Outreach:

*I would definitely put more preparation in for the next presentation I do [compared with presentations before WMG Talks]. From putting [thought] into the 'story', to actually running through the presentation multiple times. Previously, once the slides [had] been created, that was the extent of my input to the material. The fact I was overall better prepared, meant I could work more on the presenting style to complement the slides.*

**Ben Hunt**

On whether the outreach team's coaching changed the material they were expecting to present:

*There was more work completed that I could bring into the talk than I originally thought.*

**Kevin Couling**

### **Grads Summer School – Fully Electric Challenge**

A summer school programme was developed and run by members of the Graduate Trainee Engineering programme: Ben Hunt, Lauren Cooper, Joshua Wallis and Irma Houmadi. WMG and HVM Catapult funded places for 16 students, with 39 students attending the event in total. The students were from a variety of schools with 4 coming from the Lord Bhattacharyya Network (LBN).

This was the first year the course was run, both virtually or in person, and the course received a welcome overall **feedback rating of 87%**.

*“The Fully Electric Challenge was a virtual course based around electrification that was created from scratch and brought together by the WMG with The Smallpeice Trust supporting. The Year 11 students that attended were treated to lectures and activities to understand electrification and its future.”*

*One student said “I enjoyed building the car kit the most as it allowed lots of creativity and helped us to get hands-on and generate more ideas about our car brand,”*

*Another student said, “It was interactive and extremely informative. I am specifically interested in the environmental science and this course involved an expansive outlook on electric cars and future dilemmas we will face”. To inspire the next generation of engineers invested in creating a cleaner future of transportation this course was a huge success for the WMG and The Smallpeice Trust.*

### **Rachel Jenkinson, Education Officer, The Smallpeice Trust**

*“The Fully Electric Online Programme was a fantastic way for young people to discover the array of exciting STEM career options available as we seek to solve the multiple challenges involved in electrification and creating a sustainable future. At the heart of the success will be creating a dynamic and diverse pool of talent for the fields of battery technology and energy storage, who can find pioneering solutions.”*

### **Fran Long, Education and Training Lead, The Faraday Institution**

#### **International**

#### **Global Science Show**

[WMG Experiments](#) was set up as a landing page to host any video content made by the WMG Outreach team in our attempts to respond rapidly to the Covid-19 situation in 2020. Producing video content for young people and their families to try science experiments at home was a valuable outlet at the time and received a lot of attention through events like the Global Science Show – an event run through social media to promote public engagement work and provide education and entertainment to a public audience.

Phil has produced content for several Global Science Show sessions and written up guides on how to do the experiments at home through the [WMG Experiments](#) webpage. Phil also arranged for a Warwick Takeover session of the September 2020 Global Science Show, featuring several WMG staff sharing their research. The June 2021 Global Science Show [featured a 15 minute live science show with Phil](#).

### **Conferences and Professional Webinars**

Not only do we aim to make our own resources of the highest quality, we also aim to support other members of the education and outreach communities to improve their own materials by sharing our approaches, hints, tips, failures and successes through international conferences. Here are some of our highlights:

*British Computing Society – Webinar – 30<sup>th</sup> January 2021*

TurtleStitch: A Different Kind of Physical Computing

Margaret Low, Helen Luckhurst, Phil Jemmett

<https://www.bcs.org/events/2021/january/webinar-turtlestitch-a-different-kind-of-physical-computing/>

*Mozilla Festival (Mozfest) 8th to 19th March, 2021*

Coded Embroidery Workshop

Multiple presenters from UK, Ireland, Netherlands, USA, Austria, China

<https://sites.google.com/view/exploring-coding-stitching-cul/the-project/mozfest-2021-turtlestitch-workshops>

*Scratch Conference 22nd July 2021*

Presentation: Approaches to Physical Computing, Phil Jemmett

Presentation: Teaching Maths and Computing with TurtleStitch, Helen Luckhurst

*Snap!Conference 2021 29th July to 1st August 2021*

Presentation: Stitching in Time and Place.

Margaret Low, Susan Ettenheim (New York), Max Musau (Nairobi)