IMPERIAL

NERUPI STEM Working Group

Reach Out Makerspace

Workshop and Programme Overview

Dangoor Reach Out Makerspace

- Based in White City in The Invention Rooms
- Open since 2017
- Funded by Berkeley Foundation
- Creative vibrant workshop only open to participants on our programmes

The Dangoor Reach Out Makerspace is a state-of-the-art educational facility at our White City Campus. It is dedicated to hands-on activities aimed at engaging young people creatively in science, technology, engineering, and mathematics (STEM) subjects.

The Dangoor Reach Out Makerspace has a variety of tools such as 3D printers, electronics, soldering stations, laser cutters, woodworking equipment and much more. This unique immersive environment provides young people with a space to experiment, design and innovate. Below are the current programmes we offer to help you progress and develop in STEM and hands-on learning, prototyping and inventing.

Move-Up Maker Challenge

14-18 years old. Participate in programme upon successful completion of Maker Challenge. Open design and prototyping sessions to further develop and advance your making skills.

The Maker Challenge

14-18 years old. Participate in programme independently. This is a beginners - intermediate programme for makers that want to learn more prototyping skills and learn more diverse making skills.

The Proto- Maker Challenge

11-14 years old. Participate in programme with your school and teacher. This is the beginning of your invention and prototyping journey and is aimed at introducing you to the invention process and working in a team to come up with an innovative idea.


you don't have to worry about
the cost of the materials

Dangoor Reach Out Makerspace

- Access to materials
- Access to equipment
- Access to experts
- Build autonomy and resilience
- No costs to students – cover food, materials, transport
- Careers support and next steps
- Alternative education environment

What is the Maker Challenge?

Who?

- Design and making programme for 14-18 year olds

When?

- Term: After-school and some weekends
- Summer: weekdays, 9 days

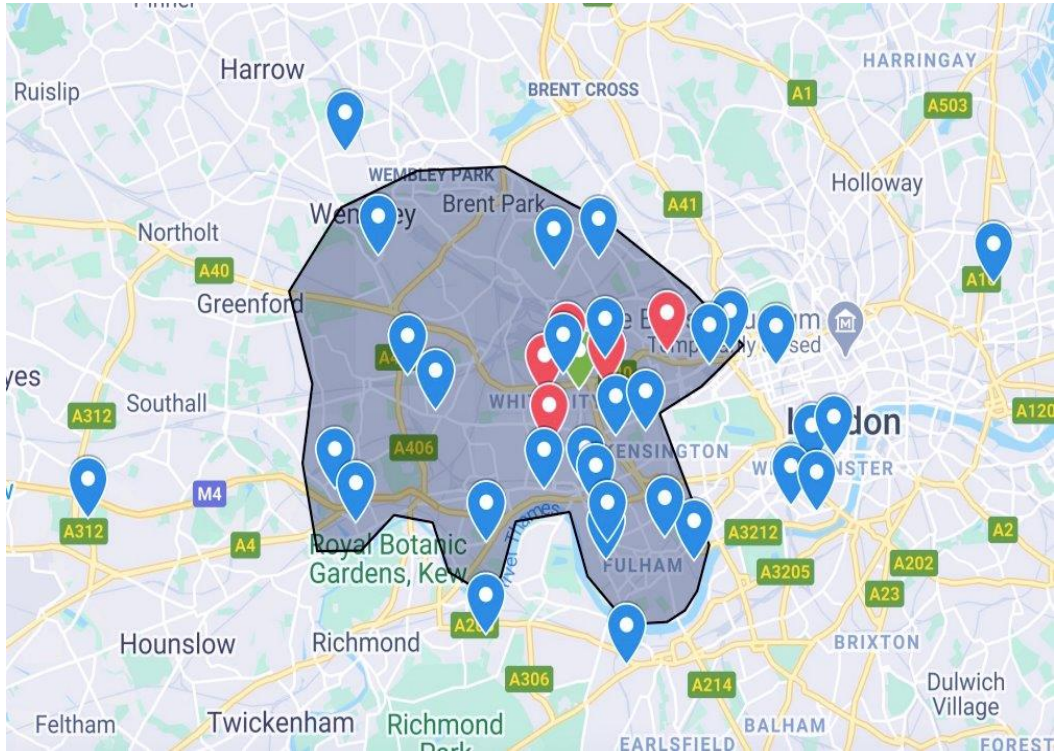
What?

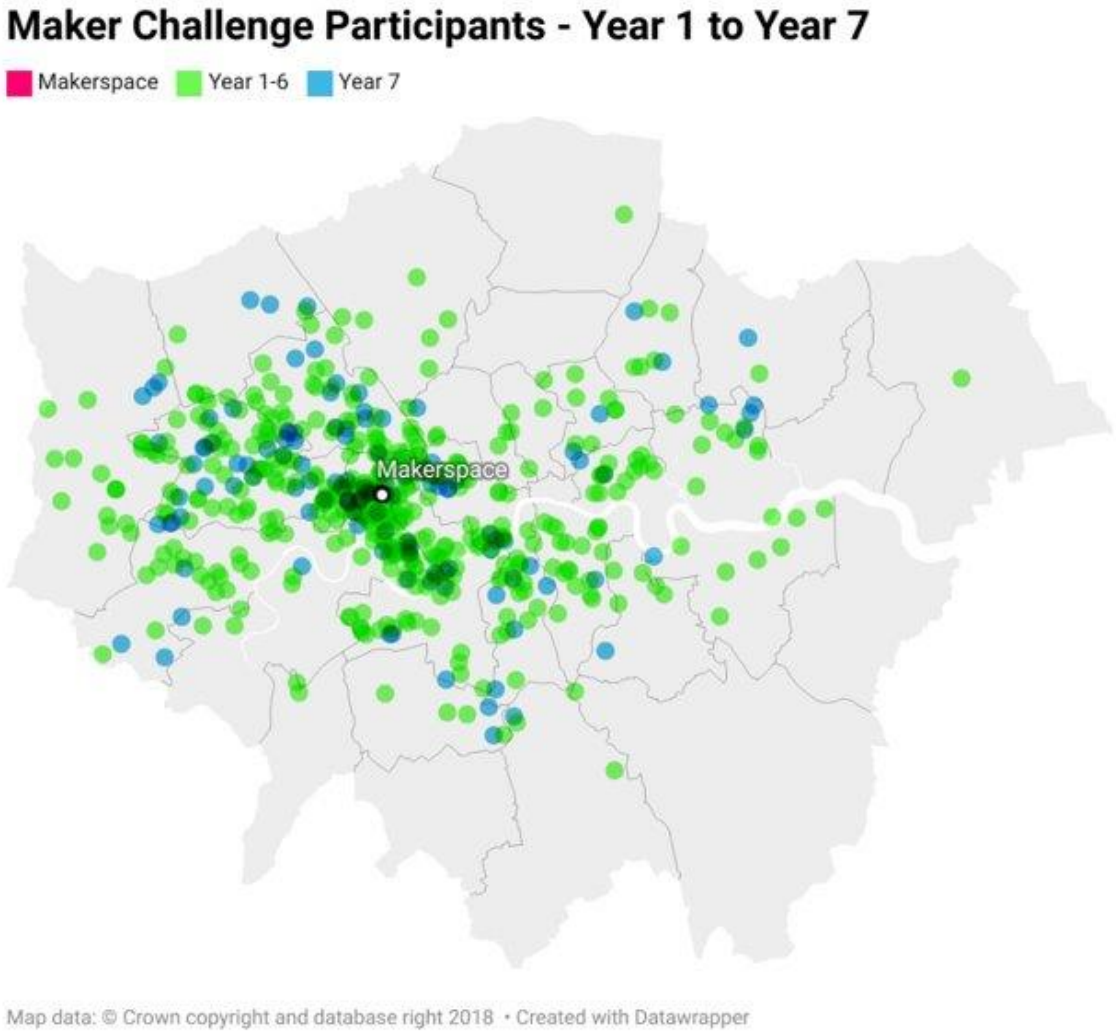
- Over 13 sessions, students learn a range of hands on and soft skills
- Make anything!
- Students use these skills to develop their own invention from idea to reality in our vibrant workshop.
- Led by leader (designers, PhD students), ambassadors
- Competition

Who is the Maker Challenge for?

- 14-18 year olds (Y9-Y13)
- Apply individually
- 120 participants per year - 20 per cohort
- Open to all London residents but local to White City prioritised
- Since 2017 - 755 young people have participated
- Holistic approach to selection – WP score, personal statement (interest levels), postcode and school, target schools. Don’t consider grades

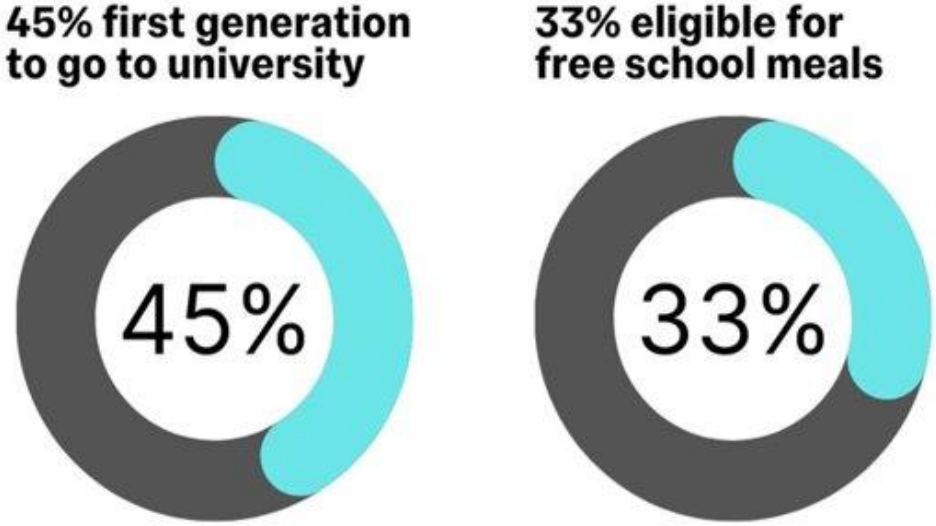
"Local"

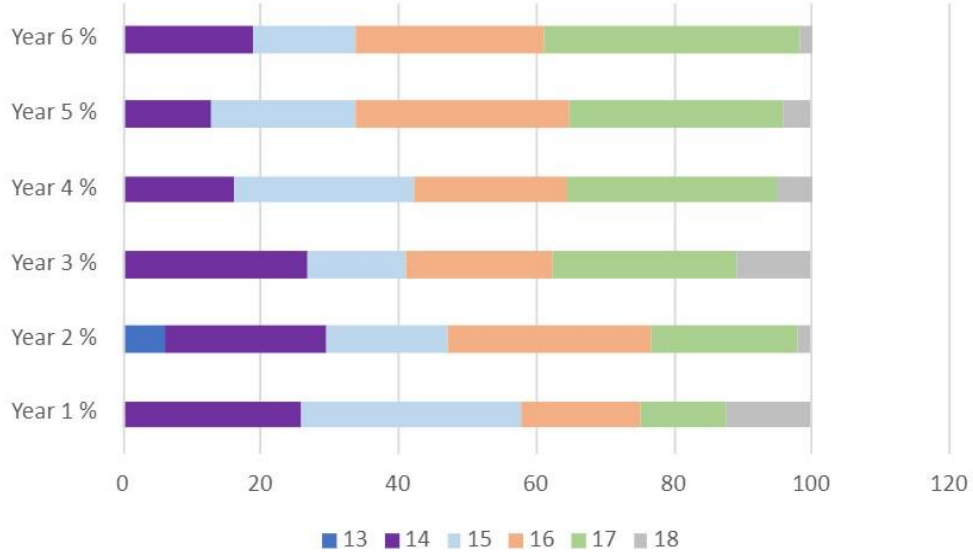

Harrow
Ruislip
BRENT CROSS
HARRINGAY
A1
A503
WEMBLEY PARK
Brent Park
Holloway
A41
Northolt
A40
Greenford
Southall
A312
A406
M4
A4
Royal Botanic Gardens, Kew
FULHAM
A3212
A3205
A202
A23
A2
Hounslow
Richmond
BRIXTON
A306
A214
Dulwich Village
Feltham
Twickenham
Richmond
BALHAM
EARLSFIELD


Maker Challenge Participants - Year 1 to Year 7
Makerspace
Year 1-6
Year 7
Makerspace
Map data: © Crown copyright and database right 2018 • Created with Datawrapper

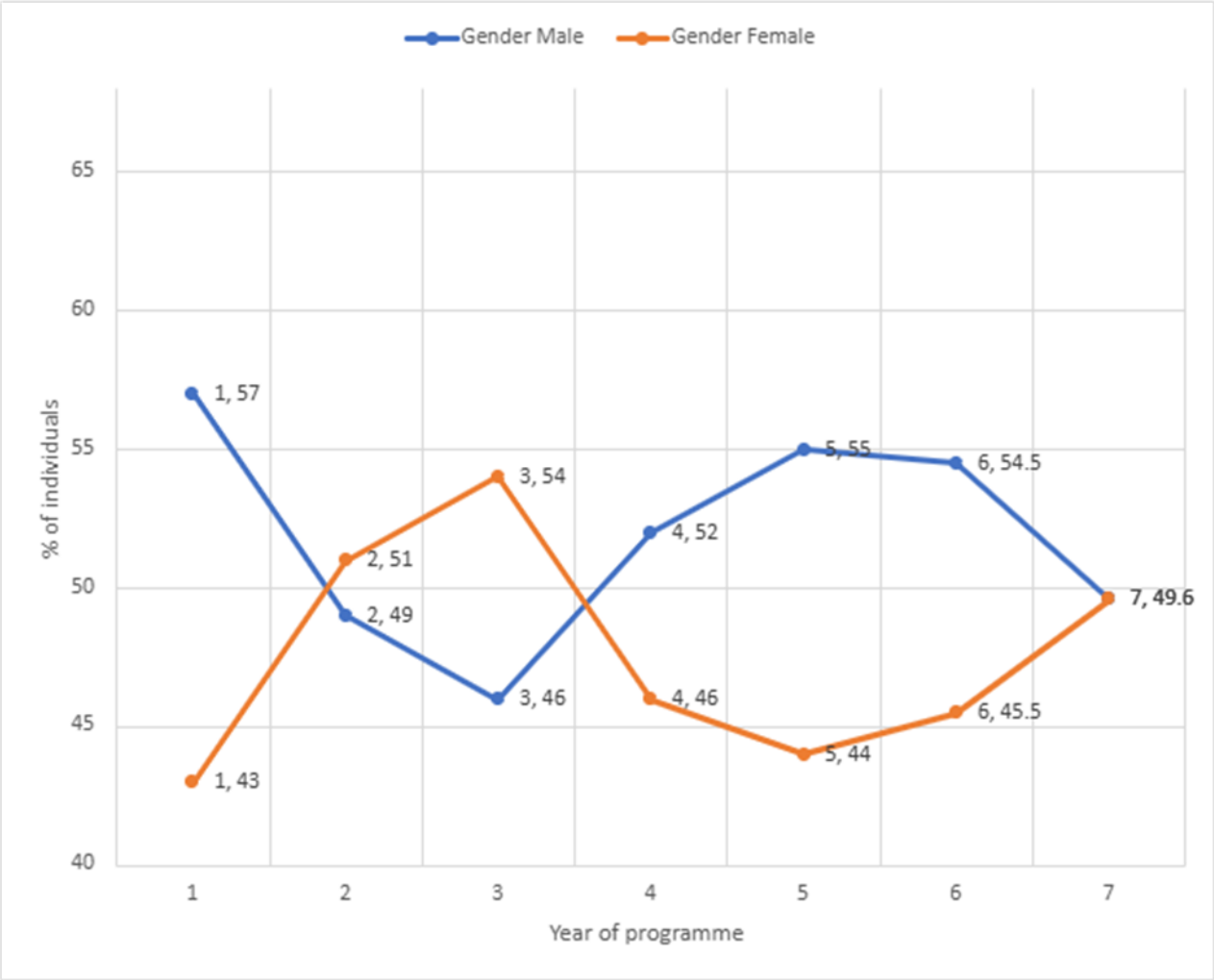
Stats

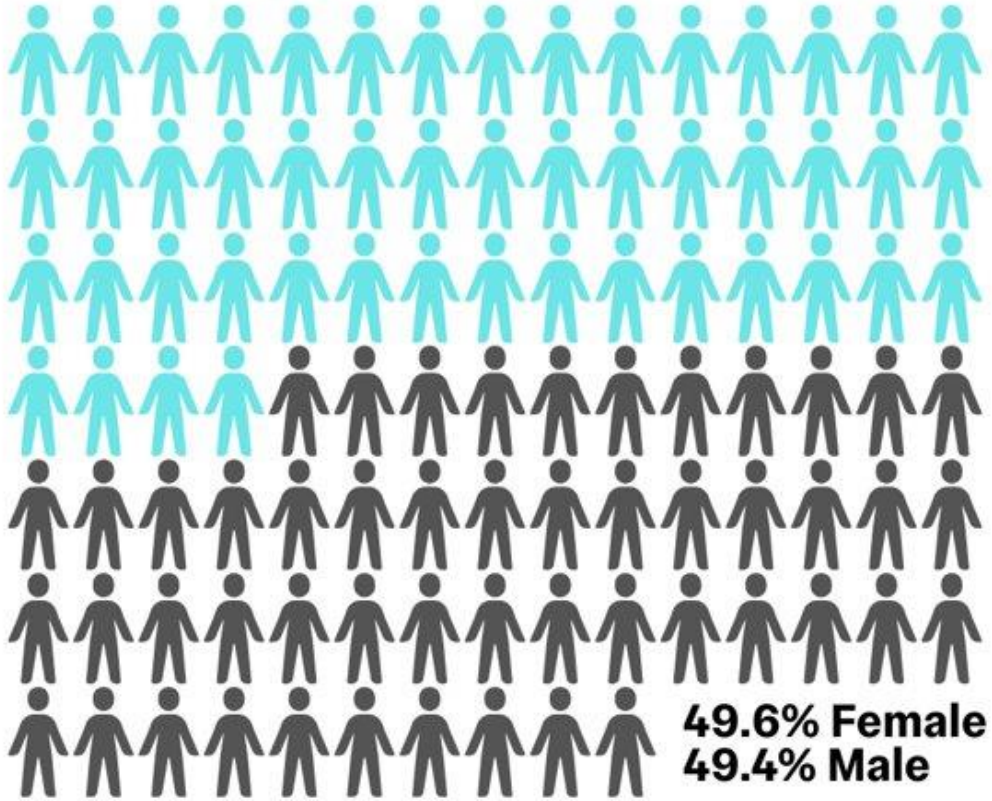
- Since 2017: 49% Female, 49% Male
- From Sep 2020-present, a third eligible for FSM and 45% first gen to HE





Gender


Gender Male
Gender Female
% of individuals
65
60
55
50
45
40
1
2
3
4
5
6
7
Year of programme
1, 57
2, 49
3, 46
4, 52
5, 55
6, 54.5
7, 49.6
1, 43
2, 51
3, 54
4, 46
5, 44
6, 45.5


49.6% Female
49.4% Male

Aims

Skills attainment

- Increase in confidence and ability in hard skills (e.g., using workshop equipment) and soft skills (e.g., teamwork, communicating)

Sustained long-term engagement

- Accessible software

Building agency, ownership and entitlement

- Ethos of failing fast, failing early – constructivist approach, not prescribed but individually-led learning

Future goals

- **Progression to university but also alternative routes** – degree apprenticeships, entrepreneurship, FE. Last year, 8 participants progressed to Imperial

Work experience and careers support

Word cloud


found
memories
working
engineering
chances
particularly
prototype
3d-printer
home
woodworking
box
practical
ambassador
project
3d-printing
cutter
laser-cutting
group
making
idea
essential
building
part
socialising
activities
equipment
network
free
dt
workshop
open-making
eye-opening
loved
meeting
interests
new
machinery
process
onshape
chance
create
enjoyable
fun
maker
challenged
opinion
people
challenge
expanding
techniques
tools
reality
projects
coding
share
business
advanced
express
makerspace
friends
use
learn
try
various
skills
keepsake
learning
around
specialists
different
using
learnt
final
processes
laser
perspectives
product
sessions
machines
arduino
design
everything
excited
electronics
best
similar
ambassadors
whose
putting
amazing
work
collective
minded
mechanisms
provided
terms
merge
designing
amount
materials

What our young people invent

Baby cradle that automatically rocks when it ‘hears’ crying

Levitating speaker

Headset visor with voice-assistant (e.g., Alexa), exercise-tracking and visual display

Annual Cycle of Activity

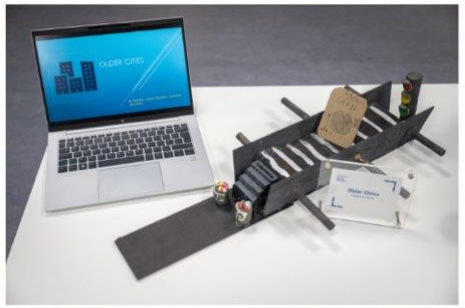
September	October	November	December
Applications for Autumn close			Maker Challenge Finale
Maker Challenge Autumn double cohort (weekly session)			
January	**February**	**March**	**April**
Applications for Spring close			Maker Challenge Finale
Maker Challenge Spring double cohort (weekly session)			
May	**June**	**July**	**August**
		Applications for Summer close	Maker Challenge Finale
		Maker Challenge Summer Intensive (9 days, double cohort)	
Proto-Maker Challenge (5-8 school groups)			

Life after the Maker Challenge

- Cindy won H&F's Young Innovator of the Year Award.
- Farheen gave a speech to 300 women at the WE Innovate Awards
- Anjukan is starting a business developing bespoke speakers
- It looks great on sixth form and university applications.
- Some go on to study at Imperial.
- Graduate Maker Sessions – you can keep on making!

What is the Proto-Maker Challenge?

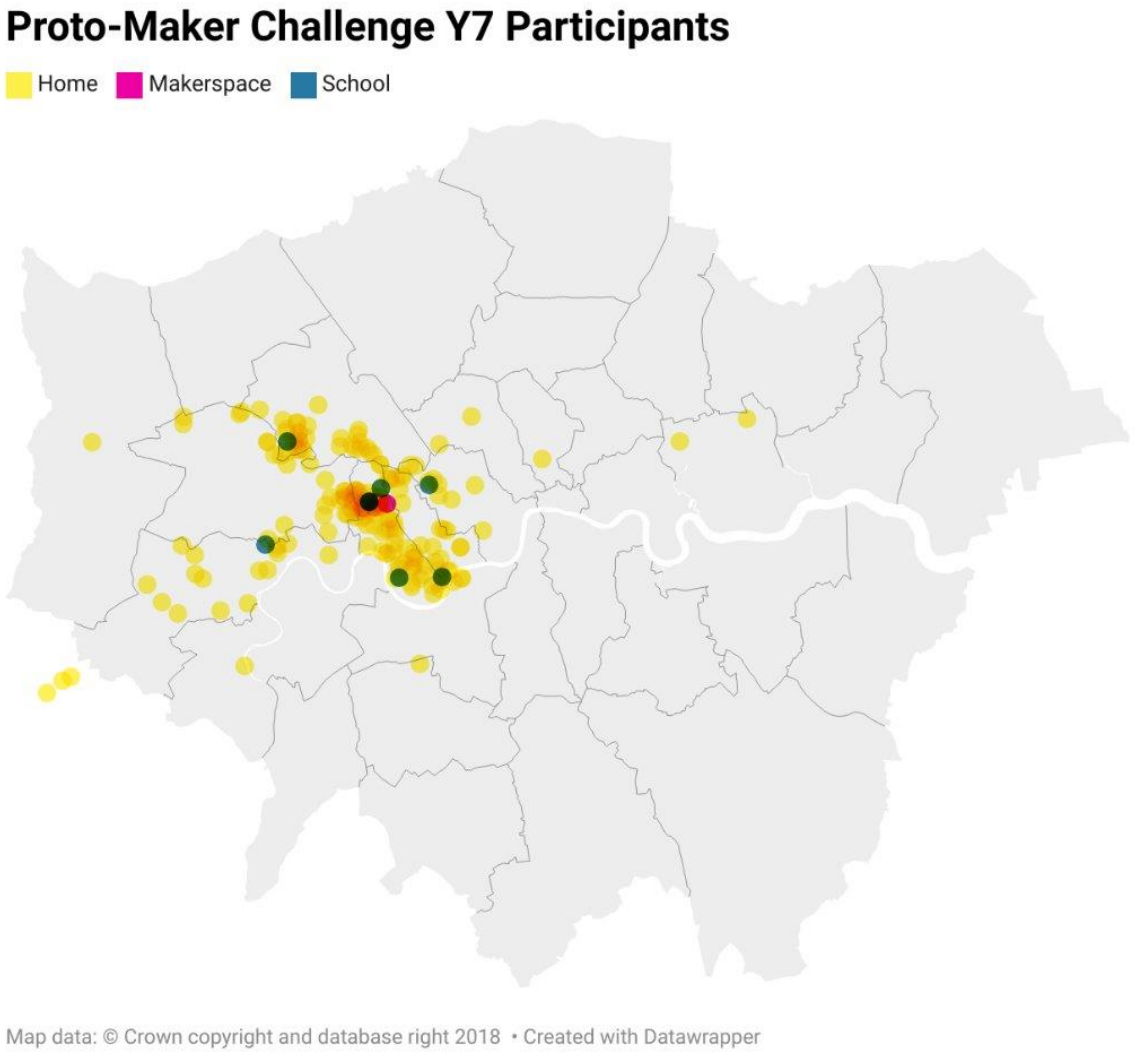
- For 11-14 year olds (Y7-Y9)
- Runs during school hours
- Spark a passion for STEM
- Role play STEM roles
- Pupils attend with teacher as a group and work in small teams
- Respond to real world problems
- Competition – sort of…





What is the Proto-Maker Challenge?



- Local schools
- High % PP
- Feeder programme to Maker Challenge
- Mixed groups

What is the Move Up Maker Challenge?

- Students who have completed the Maker Challenge
- Runs Saturdays and holidays (e.g., half term)
- For 14-19 year olds
- Students develop their skills, work on long-term projects – make anything!
- Masterclasses
- Led by leader (designers, PhD students), ambassadors
- Open ended

Careers Enrichment and Work Experience Placements

- Work placement for every Maker Challenge participant
- Industry placements in construction, STEM, and more
- Careers consultation 1:1s
- Career Insight shadowing days
- Job Fairs, in school career events, site tours

Other Highlights

- Online Maker Challenge
- Workshop in lockdown
- Makerspace Manual
- Making Great Designs
- Community programmes
- STEM Clubs
- Parent groups

White City school students innovate for life after COVID-19

by Martha Salhotra, Amna Siddiq
15 October 2020

Winners of the Maker Challenge 2020: Grace and twins Esui and Esugen

Three female students have won top prizes for innovation in this year's Maker Challenge.

Aaron
Cohort 7, 1st place winner

It’s been 3 years since my time at the Makerspace. I am currently working at Airbus Space on a **Degree Apprenticeship studying Electronic Engineering**. I’m just about to enter my second year after achieving a first for my first year.

During my Airbus interview I made sure to reference to my experience on the Maker Challenge as it **definitely affirmed my decision to pursue an engineering/design career**. I had originally intended to study Design Engineering at Loughborough, however when presented with the opportunity of 4 years of paid work experience in addition to having my degree paid for I had to go for it.

Continuing my passion for outreach I’ve made sure to join Airbus’ outreach team with the hope I’ll be able to spread my enjoyment of STEM with others.

My makerspace win along with the experience associated with it are all memories that will definitely remain with me for a long time. Thank you all.

Tamara, Cohort 14

I found out about the Maker Challenge through my Engineering Society in my sixth form. I applied knowing it would be a great programme to **understand the different Engineering fields** as well as learning new skills.

I was accepted in Autumn 2020. During the programme I had **lots of opportunities to ask the leaders and student ambassadors questions** about their experience at Imperial, their courses, and general questions about accommodation, food, expenses and travel/transport.

I got accepted to study Design Engineering at Imperial in September 2022. The Maker Challenge provided me with a **taster into CAD with Fusion 360 and Arduino**, and I got a **head start** in learning to operate equipment such as laser cutters and 3D printers, both of which have been **useful in my degree**.

I became an Outreach STEM Ambassador because I personally found asking questions to a student closer to my age less nerve-racking and a lot easier to understand. Hearing from students' experiences made me a lot **more confident** in knowing that Imperial was the place for me.

The future

Plans for Y8 Onward

- Access harder to reach students (e.g., care experienced) through social workers and youth groups
- Increasing visibility of programme through marketing, working closer with LBHF council
- Keep the content fresh, innovative and ahead of the curve
- Tighten processes and continuing improving the experience
- Case studies – where are they now
- Work placements for all Maker Challenge participants
- Listening exercise
- Working with a wider range of audiences

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Thank you