STEM AMBASSADORS ILLUMINATING FUTURES

Nationally coordinated by STEMNET

REAL LIFE MATHS
STEM AMBASSADOR CASE STUDY

DR KAREN DAWE
STEM AMBASSADOR

💼 My job

Day-to-day role: I am in charge of data quality for the 'Focus on Mothers' clinic which is gathering data on the mums of the 'children of the 90s'. I write monthly reports on quality and accuracy of data and I advise fieldworkers (the nurses that work with the mums) on how to improve and maintain data quality. I am also part of a team of 'data buddies' who create data files for our research collaborators around the world and advise them on how to get the best from their data. When I'm not doing any of those things I use our data for my own research into the relationship between depression during pregnancy and the health and development of the child.

Favourite part of my job: Doing my own research and going to conferences to talk about it. Conferences are always fun and I get to travel to really interesting places.

Most challenging part of my job: Working to short-term contracts, but they do mean I regularly get to change jobs or contracts so I'm never bored!

Motivation: Discovering new things. I love finding out how things work – especially humans.

📈 My career so far

Most exciting career moment so far: While I was doing my PhD I got invited to talk about my work at a conference in Athens as a 'hot topic' speaker. I got an all-expenses paid trip to Athens and all my work friends went too. It was a great thing for my career and a lot like an amazing holiday!

Project I wish I could have played a part in: Data from the ALSPAC study played a big part in the 'Back to Sleep' campaign of the early 90s. As a result of this campaign cot deaths were reduced by half. That's an incredible thing. And because cot death is relatively rare, it's only by doing complicated maths on huge sets of data that we are able to find out about the causes behind it.

STEM Ambassador Profile:

Name:
Dr Karen Dawe

Job title:
Research Associate

Location:
ALSPAC (Avon Longitudinal Study of Parents and Children aka 'Children of the 90s')

Education:
- GCSEs: Science, Maths, French, Art, Textiles, English Literature, English Language, Design and Technology
- A levels: Psychology, English Language, English Literature, General Studies
- Degree: Psychology BSc (First class hons)
- Other: Neuroscience MSc, Neuroscience PhD

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"I became a STEM Ambassador because I absolutely hated maths and science at school!"

Maths in action

How I use maths in my job: When I compile a data quality report I create a file containing all the data the clinic has collected up to that day. This contains around 180 different measurements on up to 3000 participants. Many of the measurements are duplicates as a way of ensuring accuracy. For example waist circumference, hip circumference and arm circumference are all measured twice – they should be the same so if there is more than 5mm difference between the measurements it is taken a third time. So the first thing I do is calculate the mean value for any measurements that have been taken in duplicate.

I then work out the minimum, maximum, mean and standard deviation of each measurement taken by each fieldworker. Although each fieldworker will see lots of different types of women, they should be normally distributed, that is, over all the women they see, on average they should be very similar – there's no reason why one fieldworker would get all the larger women and another all the shorter women.

So the next step is to use a statistical test (an Analysis of Variance or ANOVA) to calculate the probability that any differences between the fieldworkers are just due to chance.

How maths makes a difference in what I do, or how it helps me to make a difference for others: Because of the huge numbers of people we see, maths is vital to what I do. On any given day the women we see will vary hugely. But over a long period of time, on average they should be similar. Without using maths to look for patterns, differences and similarities in the data it would be impossible to check we were collecting data in a way that made sense. If I just sat in clinic and watched what the fieldworkers do all day it would be impossible to get a sense of the ways in which these women are similar or different. I need maths to do that. And in a larger sense we may uncover very important differences, for example why some women get high blood pressure or cardiovascular disease and others don't. That could eventually make a really vital difference in the lives of lots of people.

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> " Don't think for a second that hating maths and science means you wouldn't absolutely love a job that uses either. "

Being a STEM Ambassador

I became a STEM Ambassador because: I absolutely hated maths and science at school!

What has been your experience in schools as a STEM Ambassador?
I have been a Researcher in Residence, delivered a Cafe Scientifique talk and helped out at a careers event and 'Darwin Day'.

Words of wisdom to STEM students: Don't think for a second that hating maths and science means you wouldn't absolutely love a job that uses either.

? If I didn't do this…

If I didn't work in biology I would… be a photographer.

When I'm not at work I… watch films with my little boy, go to gigs, take lots of photos, watch lots of telly and read lots of books.