Pearson

Your future in STEM: A-Z

Where might **science** take you?

R

is for

Research Scientist

Please can you introduce yourself and tell us a bit about your job?

My name is Dr. Cathy Moore, I'm from Northern Ireland, and I currently live and work in London. I'm a research scientist (or postdoctoral research assistant to be exact) and have been one for eight years. So far, I have worked on liver parasites, malaria, tuberculosis, HIV, and plant biotechnology. My key interest is developing tools for diagnosing and treating diseases using new and exciting techniques.

It's difficult for me to describe a typical day because no two days are alike, which is something I really love about my job. I like a typical day to start off with a nice cup of tea in my office whilst catching up with the current scientific findings. Then I'd make a plan for the day and head into the lab. I particularly love molecular biology so any lab work involving DNA is always fun - growing up lots of DNA in bacteria and then extracting it all again is one of my favourite things to do! While I'm in the lab I often have students (from school students doing work experience up to PhD students) whom I teach and supervise with their projects. I love interacting with all the different students we get, especially when they're as excited by science as I am.

A huge part of what I do involves waiting for things to 'brew'. Very few experiments happen immediately in my job. I often have to set things up and then leave them for a few hours before they're ready. It's a bit like baking. You need to get all the ingredients weighed out just right, mix them together correctly, and then wait for it to bake. This means I get lots of breaks to do some background reading, writing, or hear about what other research scientists have been up to in their lab. Working for a university usually means you don't have set work hours so it's a very flexible work environment.

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How did you get into this line of work?

If you had asked the 17-year old me what job I'd like my answer would have been 'teacher'. That's all I'd ever wanted to do. I applied to do a biochemistry degree, despite not being a big fan of science, because I wanted to be a science teacher. There were lots of jobs available at that time and I thought I could try to make science more fun for my students than it was for me. However, between applying for and starting university, I did some work experience in a school... and it was nothing like what I thought it would be.

I continued to study the biochemistry degree anyway, but I still wasn't that excited about science. That is, until my third year when we got to do a research project in the lab and when I discovered that I loved scientific research! ▶

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It was so different to what I'd done at school. I loved having my own ideas and thinking of ways to test them myself, and then working out the results. After university I got a great job as a research technician, where I got to do experiments, however I didn't really get to understand the reason why I was doing them, like I did when I was doing my research project. I decided I was going to do a PhD and become a research scientist, because then I could be in charge of all my own experiments. I guess you could say I got into this line of work by accident, but what a great accident!

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What qualifications did you study, or what experience did you gather to enable you to become a Research Scientist?

My life sciences degree in biochemistry was great because it's a subject you really must understand rather than learn off by heart. If you can get your head around our incredibly complicated immune systems, for example, you can understand anything. When you spend three years getting the hang of figuring out complicated things, doing research is a lot simpler. The most important things I've ever learned was during my PhD, and they are:

a) never be afraid to make mistakes. That's how you learn. I have very much adopted Facebook's motto which is 'work fast and break stuff'. You don't really get to do that in school, but I do it all the time now. If I want to learn a new technique, I just take it for granted that the first attempt will be a disaster. I don't spend ages trying to pinpoint every exact detail. I just go into the lab and have a go, knowing full well it won't work the first time. I learn so much more from trying and failing than I ever would just reading about it. During my PhD I would get discouraged when things didn't work first time, but as time went on, I realised that I knew so much more about certain techniques than some of my colleagues who had always managed to get it right the first time.

b) if you're stuck on something don't be afraid to ask for help. Ask loads of people. All the people I work with know so much more, about so many different things, than I do. Science is all about working together with other people. You can learn so much from different people just by getting to know them and what they do, and if you're stuck, they are happy to help. Of course, sometimes they'll get stuck too and then you can help them. And the best part, if you're both stuck you can go get a coffee and complain about it together!

Are there any specific science practical's, teachers or moments in schools you fondly remember to this day?

I remember all my experiments in school not working, except one that worked too well and exploded in my hand. I never really enjoyed science class in school, and much preferred art and CDT (craft, design and technology). I liked subjects that involved creativity and working with my hands – which turns out is very much what research is about. It's all about thinking up creative solutions to problems and then testing them out.

I had a fantastic science teacher during my A-levels without whom I never would have been able to study biochemistry at university. She was so good at explaining complicated things and she had a great sense of humour. She made her classes fun by giving us projects to do so that we had to think about our results and come up with explanations for them. She'd done a PhD so I suppose that's why she taught us this way. She also probably knew it was a lot more interesting this way.

Were there any moments or events that inspired you and led you down this career path, either as a child, a student or since entering work?

I think getting to experience what working in research is like, during my degree, definitely made me realise this was the career for me. I really enjoyed it and I received a lot of encouragement from my supervisor who thought I had a flare for it. ▶

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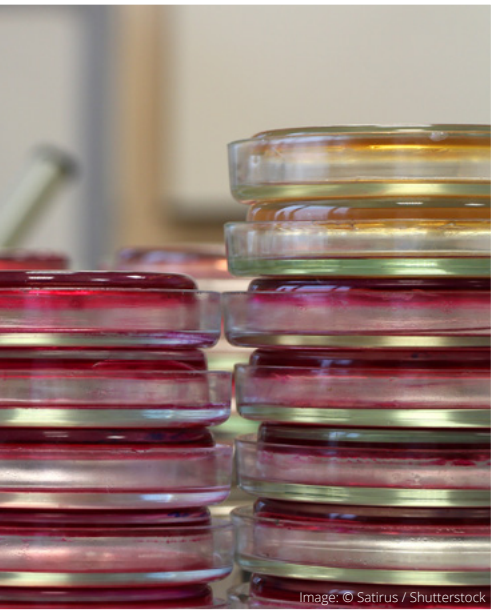
He was the one who suggested I take on a PhD. I told him 'there's no way I'd be accepted to do a PhD', and he said 'maybe, but you definitely won't if you don't even apply'. Good advice, that.

Were there any people who have inspired you into this line of work?

My mum would be one. She always told me that I need to hear both sides of any story or argument before I form an opinion on anything. That's very true in science. Scientists sometimes disagree on how something works (like how people get Alzheimer's disease, for example) and we need to look at all the evidence before making any decisions.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My older brother would be another reason, as he is an engineer and always got me science kits for Christmas and birthdays. Once I made a doorbell for my bedroom door with one of those kits. I regretted it though, as my mum stood in the hall ringing it non-stop because she was so impressed with it.

I'm also a huge fan of Professor Richard Feynman, a very famous physicist. I think his autobiography would make anyone want to rush into a research lab and start doing experiments – his enthusiasm is so infectious.

To be honest though, I work with people every day who inspire me. I know so many people who have such incredible minds that I'm always really pleased to get to spend time with them. I get great advice and recommendations from science to films and food, and I've made some life-long friends from all over the world which has really made holidays a lot more fun. I've gone to places I never thought I would go and had a fantastic time. I've learned so much from all the people I've worked with.

How has your line of work changed to when you first started as a Research Scientist to now?

The technological advances are incredible, to the point where I don't know how people could even get research done 20 years ago! Digital cameras, for example, have massively sped up research. A lot of my work involves taking pictures of things with specialised machines, but when I use them every image gets saved to a computer. Before that people had to spent hours in a dark room taking and developing one picture of their experiment whereas I can take dozens of pictures in minutes.

The biggest contribution I think has been the internet, though. When I was doing my degree, I had to go to the library, find the research journal archives, find the paper I needed, and photocopy it. Now I just google it. If I have a problem, I can


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just google that too, instead of hunting through textbooks. If I need to talk to another scientist who is half-way across the globe (say, the one who wrote the paper I just googled) I can email them and potentially have a response within the hour. The desired skillset is evolving because of the internet too, I think. Knowing things isn't a priority anymore; it's more important to know how to find out things.

Were there any obstacles or factors that put you off this route at any point?

Being a research scientist is a very competitive field and sometimes it's hard to get funding or move up the career ladder. Because of this, some postdoctoral researchers end up leaving research. I have around two years in a position before I have to move on, unless I secure more funding. You need to work very hard to stay in this job. Fortunately for me I love the work, so I don't mind! ▶

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What advice would you give to someone thinking about going into the same line of work as you?

If you're doing this job for any reason other than you're extremely passionate about it, you're going to be miserable. I have seen people start PhD projects for the wrong reason and they've been so unhappy because their heart wasn't in it. The two things that improve your success rate in this field is enthusiasm and a positive attitude. Also, if you're thinking you can't do it because you're not good/smart/talented enough, then you'll fit right in – every scientist I know feels that way about themselves!

What advice would you give to others thinking about a career in STEM?

There's more to STEM than research. There's such a huge range of careers out there in STEM with so many opportunities to really enjoy what you do for a living. I know people who build airplanes, people who make websites, people who invent tools for building guitars, and they all love what they do. All my colleagues in life sciences love what they do. I have colleagues who have studied bats, bees, bugs... you name it. I even know someone whose job is to travel all over the world collecting bacteria from different marine environments. Find out what your options are for careers in STEM. You might be surprised what sorts of jobs are available.

What is the reaction from friends and family when you shared your desire to become a Research Scientist?

Most people were surprised because they expected me to work in the arts. However, I get to be very creative in my job, so it's not that out of character, really. My parents were delighted!

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