



BECBC

Britain's Energy Coast Business Cluster

Cumbrian collaboration with global reach

BECBC – Social Value Delivery e-Group

“My STEM Story”

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Senior Technologist at Sellafield Ltd, Cumbria



Sellafield Ltd

Introduction

- Live in Carlisle, Cumbria
- Work at Sellafield for the Analytical Services Programme in the Strategy and Technical team as a Senior Technologist working in the field of nuclear analytical chemistry
- Alongside this role I am also a guest lecturer at the University of Cumbria, chartered chemist and ambassador of the Royal Society of Chemistry and a passionate STEM (science, technology, engineering and maths) ambassador with specific interests in the improvement of diversity, inclusion and equality in the nuclear industry and wider STEM areas



Image 1 - *"Salter's Festival of Chemistry"*
at the UoC, March 2020

Today's Discussion.....

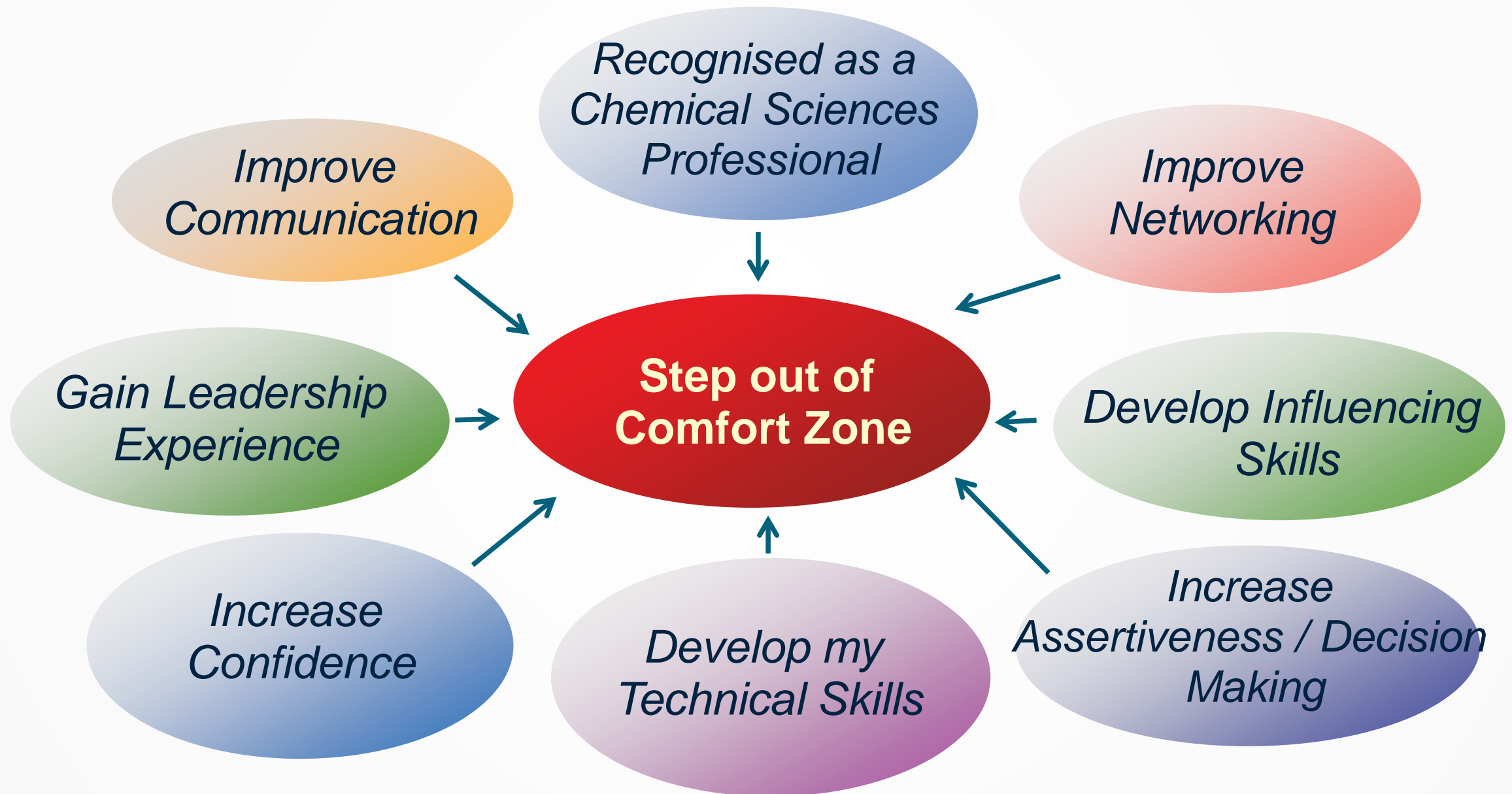
- Career path and my journey into the role of becoming a STEM ambassador
- My work to promote STEM subjects to children and young adults and the work I do to encourage the uptake of STEM apprenticeships / degrees and STEM careers in our community
- How the COVID-19 pandemic has impacted my work in this area



Rebecca Ballantyne - Career Journey

- **2007** – graduated with a degree in Forensic Science from UCLAN (elective modules in Analytical Chemistry, Toxicology and DNA analysis)
- **2007** – began working for a pharmaceutical company as a trainee analyst
- **2009** – began working for Sellafield Ltd, in the Nuclear Industry as an Analyst working in the Plant Control Laboratories
- **2014** – joined the Royal Society of Chemistry as MRSC
- **2015/16** – career break/part time working after maternity leave
- **2018** – achieved CChem award via portfolio submission and assessment
- **2019** – began working for the Strategy and Technical team, for the Analytical Services Programme
- **2020** – will shortly begin a new role at Sellafield

Self evaluation – “Identifying attributes to develop”



“Transferable skills or life skills”

- Under went two year Sellafield Ltd accredited Royal Society of Chemistry mentoring program to chartership
- The skills and experiences I gained during this process did not only equip me with competencies to develop my career – they are all transferable life skills. Gave me confidence to peruse other areas of interest outside work
- Regular self evaluation identified four main areas to build upon;

***Improve
Communication***

***Improve
Networking***

***Develop
Influencing Skills***

***Increase
Confidence***

Chemistry and STEM education



- Always enjoyed taking part in STEM sessions (although only in a supporting function at prearranged sessions)
- STEM involvement increased in 2018 when undertaking chartered chemist assessment
- Reflected on my own career journey...
 - what would I have done differently?
 - lack of visible women working in STEM
 - did I encounter any hurdles on my journey?
 - young daughter (would her choices be impacted?)

“We don’t learn from experience..... we learn from reflecting on experience”

John Dewey – an American philosopher, psychologist, and educational reformer

Working with children and young adults

- Already lots of great STEM support in and around West Cumbria
- Very little in the North of the County (Carlisle area)
- Keen to work with children / young adults who wouldn't normally receive external STEM support
- Wanted to ensure a lasting impact from any work undertaken
- Seek opportunities that challenge me in the three main areas I had identified for further development to continue improving my confidence (communication, networking and influencing skills)



Image 2 – “Salters Festival of Chemistry” at the UoC in March, 2020

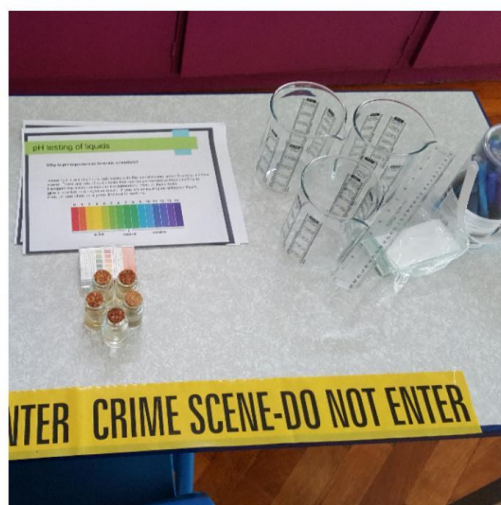
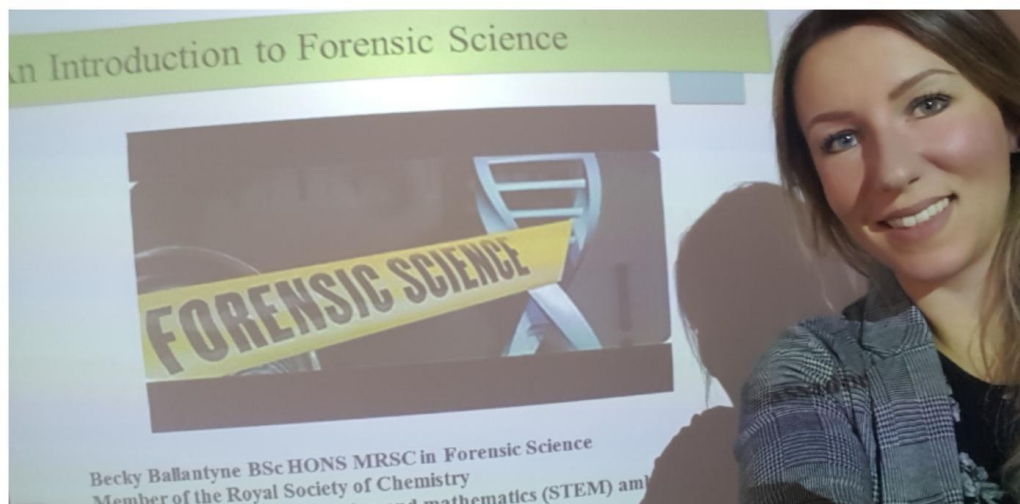
Starting small.....

- Working with younger children to develop an age appropriate interactive STEM session
- Using well known story tales to uncover the underlying STEM themes
- Encouraging creative thinking, problem solving, confidence and the natural curiosity of pre-school children
- Demonstrating how our new found skills can be expanded upon and providing feedback
- Reinforcing the importance of a questioning attitude – there are no “wrong” questions



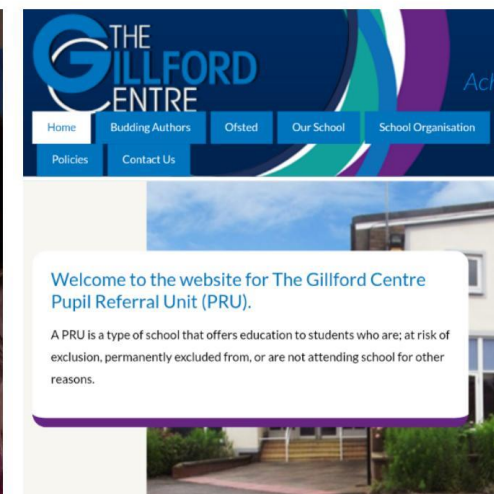
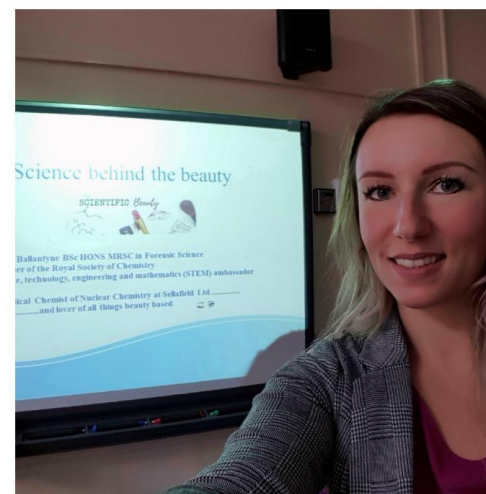
© Rebecca Ballantyne

Image 3 – “Goldilocks and the three bears”
(forensics with pre-school)



© Rebecca Ballantyne

Image 4 - Forensic sessions delivered to primary and secondary age (including children at a PRU with behavioural and learning challenges)



© Rebecca Ballantyne

Image 5 – “The science behind the beauty industry” delivered to a group of key stage4 girls that had become disengaged with science



© Rebecca Ballantyne

**Image 6 – Guest lecture delivered at the University of Cumbria
“Analytical Applications in Forensic Science
– an Introduction to HPLC and GC”**



“My goal is to challenge the gender-stereotype that scientists and chemists are often placed in.”

search for the evidence. They absolutely loved it.”

Rebecca has since delivered this

further developed the forensics theme by basing the session on a “who done it” concept. “The children thoroughly



© Rebecca Ballantyne

**Image 7 – Featured in “The Voice” RSC magazine, July 2019
in an article titled “Proactively Promoting Science”**

Awards and Achievements

November, 2019 – two UK national highly commended awards;

STEM Inspiration Awards – “*Outstanding Contribution to Improving Equality, Diversity and Inclusion in STEM*”

www.stem.org.uk

Women of the Future Awards - “*Outstanding contribution to Science*”

www.womenofthefuture.co.uk

February, 2020 – International list of women in science

Top 20 – “*Globalshakers International list of Inspirational Women in Science to know*” www.globalshakers.com



© Rebecca Ballantyne

Image 9 – Women of the Future Awards, Hilton Park Lane, London



© Rebecca Ballantyne

Image 8 – STEM Inspiration Awards, House of Lords, London



© Rebecca Ballantyne

Image 10 – GlobalShakers top 20 females in Science

Encouraging others.....

- Long term strategy – STEM graduate pipeline
- Teaching styles / techniques included in the curriculum
- Working with teachers to discuss creative STEM applications in the classroom
- Collaborating with the UoC to promote Cumbria
- Building upon the success of the awards to encourage other STEM professionals to become “visible”



© Stanwix Primary School, Carlisle

Image 11 – Filmed interviews, encouraging other STEM professionals to visit schools / promote their industry

Then COVID-19 happened.....



Image 12 – “Who do I want to be during COVID-19?”

Ref: <https://ipinclusive.org.uk/newsandfeatures/who-do-i-want-to-be-kindness-sharing-during-covid-19/>

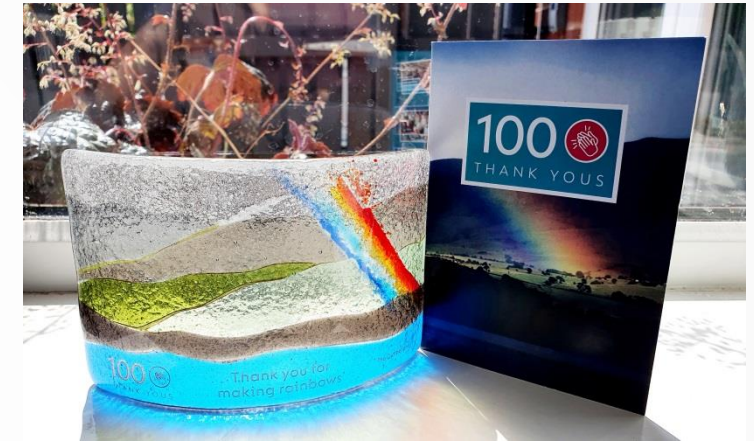
Kreative Kidz Cumbria – a free STEAM (Science, Technology, Engineering, Arts and Maths) home schooling hub



© Kreative Kidz Cumbria, Logo Heading 2020



© Jac Addison
Image 13 – “Jacqui Ridley Art”



© Kreative Kidz Cumbria
Image 14 – Kreative Kidz Cumbria – 100 thank you award

- Identified a need for additional support for parents home schooling / WFH
- Available on various social media platforms (primarily Facebook)
- Designed to use minimal equipment, items that are readily available in the home (kitchen cupboard / recycling)
- Followed themes (supporting #clapforourcarers, nature, plants, birds, space to name a few)
- Short sessions (around 30 minutes) activities based on creative STEM principles

Here comes the Pesky Caterpillars!

Can you believe there's a rainbow caterpillar?

They live in Brazil.

Let's make one!

Roll up any scrap paper or soft plastic wrap into a small ball - cover in tape - paint - cut a strip of plastic from carrier bag approx 30 cm, tape to secure.

Paint or colour in loo roll holders - cut into sections - pass plastic strip through and tape at end. Add some eyes and antennae - off he goes!



Or use sections from an egg box, paint - push string or plastic strip through and tape secure



Look out tasty plants - here we come!



Let's help our birds fly over the rainbow by making fabulous feathers!



how many types can you make?



Let's all go on a Measure Hunt!

We're going on a Measure Hunt, we're going to make a ruler, we're not scared!

Hello my mini mathematicians! Today we are going to explore some numbers and learn about measurement. You will need, some card (any colour) a tape measure/ruler, some pens or pencils to decorate your ruler and some imagination!

Firstly ask your grown up to help you cut a piece off your card along the long edge (around 4/5cm wide). Then use the tape measure to mark cm spaces along the card (for older ones add in some decimal spaces & mm if you are feeling adventurous!). See picture 1 for guidance.

Then number your ruler and feel free to decorate your creation however you wish!

Your then ready to begin your measure hunt!

This activity can take place in the house or in the garden, so if the weathers dry I'd suggest performing the next part outside.

Key points to remember and other things to try;

- ✓ ensure you line your ruler up correctly before you begin measuring
- ✓ ask your grown up to make a ruler of their own then you could also race to see who can complete their measure sheet first!

All ready?? Then lets begin!!



Butterfly Sculpture

Another cool idea!



Paint or colour in with felt tips a kitchen roll holder or toilet roll holder

press in the top, over a pipe cleaner to make the antennae

attach your suncatcher butterfly

or design and colour in your own butterfly using the printout - then attach to the back.



Fabulous!



Let's go Camping this Easter weekend

Who doesn't love a den?

Have a look around your home for places that may make a good support. Bunk beds, under tables and chairs are a good starting point.

at Home!

With sheets, duvet covers or throws, cover the structure - make sure nothing will topple over - all dens will be different - try lots of ways and think where the entrance will be.

Clothes pegs, parcel or gaffer tape are good for securing - or big paperclips - or a few books - you may even have some building clips in the shed?

Think about who you will let in! Is it big enough for grown ups? Will they be allowed in? Check it's all safe then make it cosy. Add some cushions - then we are off....

this is when the fun starts! Let's go camping!

Using our imagination - where have we gone? Seaside? Lake District? Near a river? Our favourite campsite?

Take yourselves there in your imagination and play 'I spy'!

or think of where you would like to go camping or think of a number - say 100 covert to miles and check out what is 100 miles from your home and what attractions are there - you never know you can go there for real in a few months!

Take your favourite games inside to play - then when it gets dark, take in a torch, cover with red or orange material, pretend it's a campfire to sit round and share your favourite stories!

Have fun!



Let's buildwith what we can find in our recycling!



start with a strong base - a square, rectangle or triangle is good - then built onto top



just cut slits in card to secure pieces together - tricky but fun!

use whatever we have!



this one started to look like a ship!

what does yours look like?



Shine a light!

cut out and stick using glue stick

glue thin tissue using pva glue then paint and let dry

ready to light



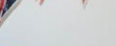
cut rectangle or triangle shapes focus on red, white and blue areas

choose bags with red, white and blue - one even had a union jack on!

sellotape

carrier bag bunting!

one layer of loo roll tissue works too! then painted when dry!



how to

cover in yellow tissue stick on drawing pre cut add glitter finish with pipe cleaner

cut out silhouette and stick to outside cover rest in white tissue finish with felt tips when dry

carefully cut out dinosaurs glue stick face down to INSIDE cover outside with green tissue

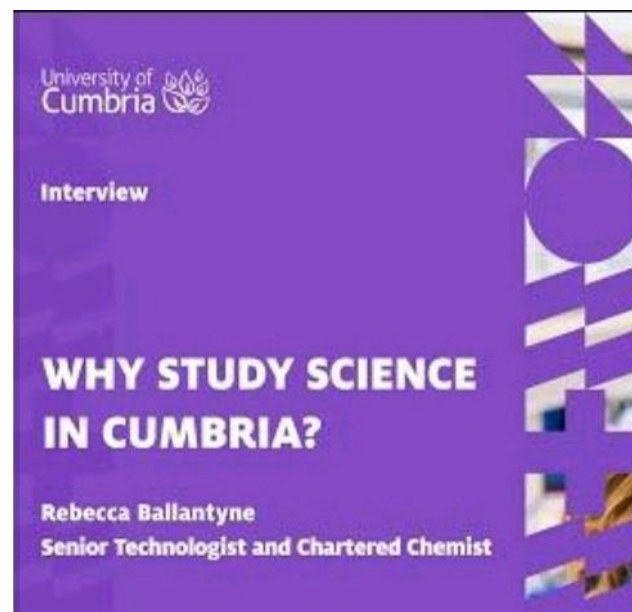
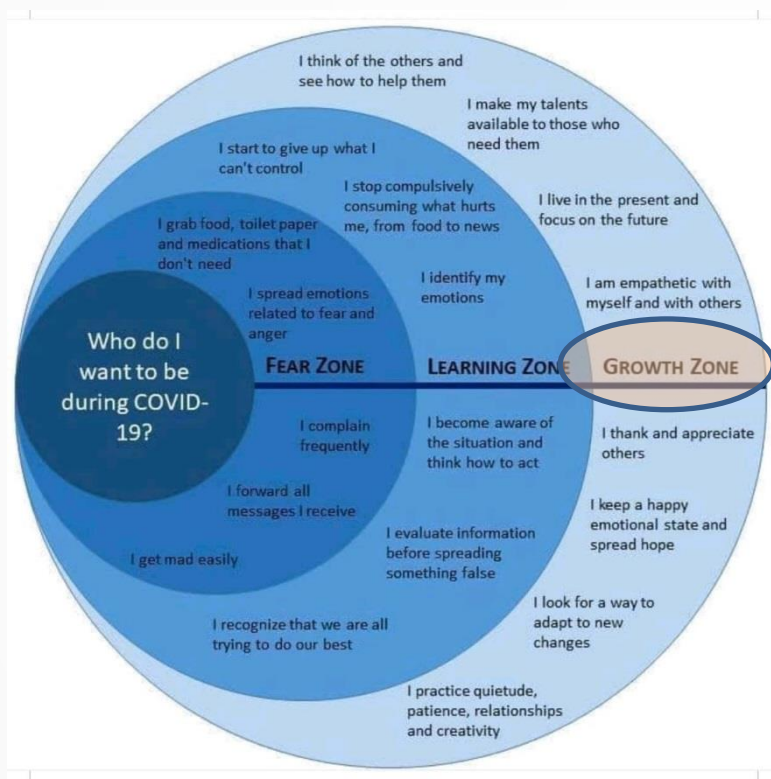
one layer of loo roll tissue works too! then painted when dry!

use safety tea lights



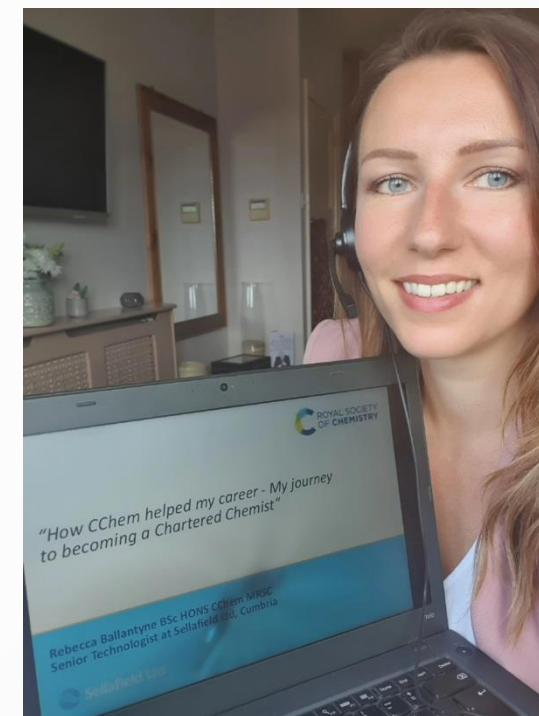
Supporting others to develop professional skills

- Changing situation has moved face-to-face engagement onto virtual platforms
- Requires flexibility and creativity to adapt to new ways of working
- Continuing to challenge, grow and develop



© University of Cumbria

Image 15 – Promoting Cumbria as “the go to area to study STEM and pursue STEM careers” in conjunction with the UoC



© Rebecca Ballantyne

Image 16 – Guest Speaker for the Royal Society of Chemistry

Thank you



@RebeccaBallantyne



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For more information;

<https://www.stem.org.uk/stem-ambassadors>

<https://womenofthefuture.co.uk/>

<https://www.wisecampaign.org.uk/>

<https://www.nuclearinst.com/Women-in-Nuclear-UK>