

Engage

Teacher Conference

Including careers in the classroom to broaden career aspirations

This session will look at a range of resources that teachers can use to incorporate a diverse range of STEM careers into their classrooms.

Dr Carol Davenport, Associate Professor and Director, NUSTEM

Welcome, please be aware:

- Talks are recorded
- You can ask questions in the chat throughout
- There will be time for questions at the end



**Including careers in the classroom to
broaden career aspirations:**
a short introduction to why and how

Dr Carol Davenport
Northumbria University



**Northumbria
University**
NEWCASTLE

About NUSTEM

NUSTEM's vision is of a vibrant and sustainable STEM sector which meets the needs of learners and employers, reflecting the diversity of wider society.

♥
STEM!

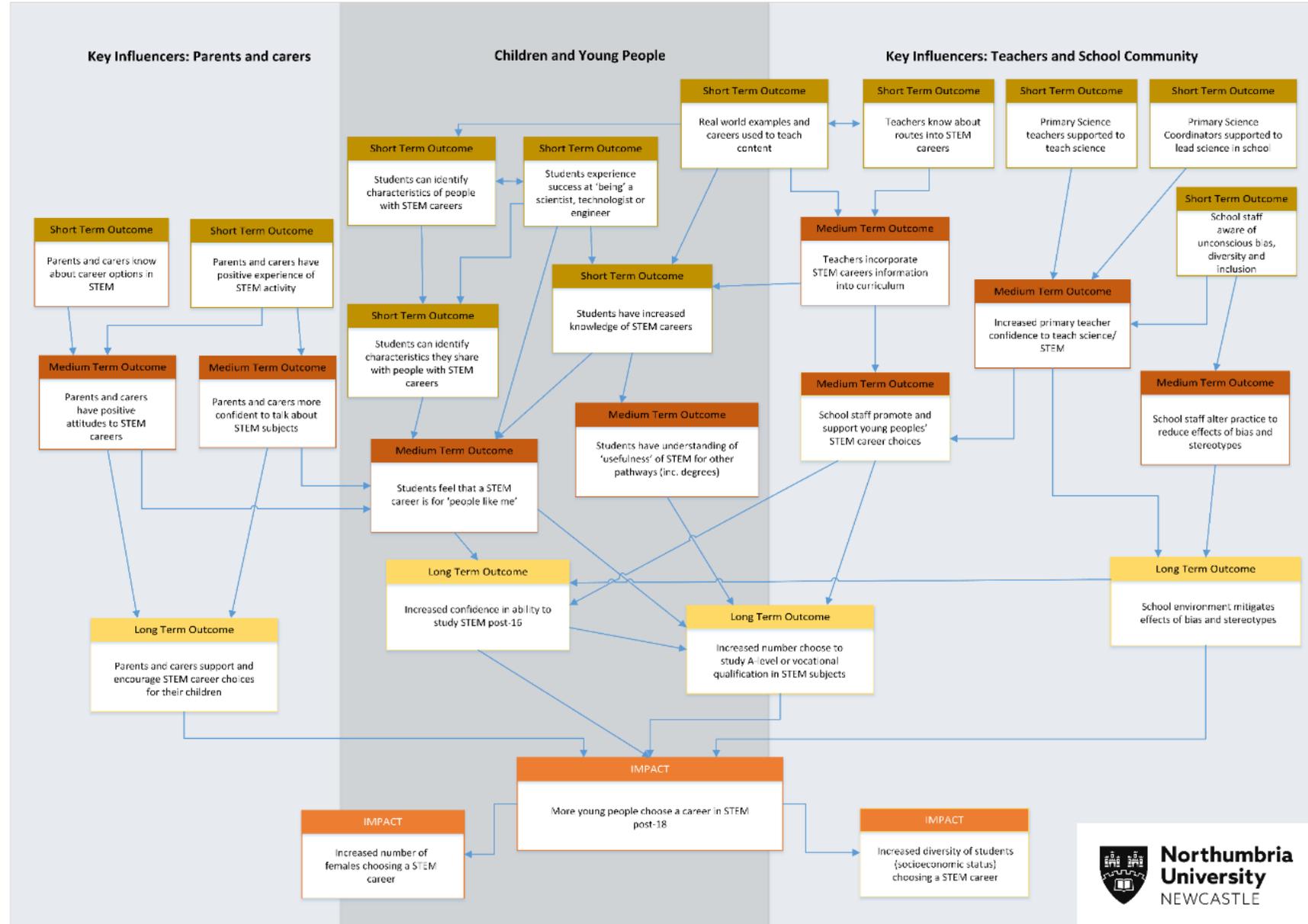


?
STEM

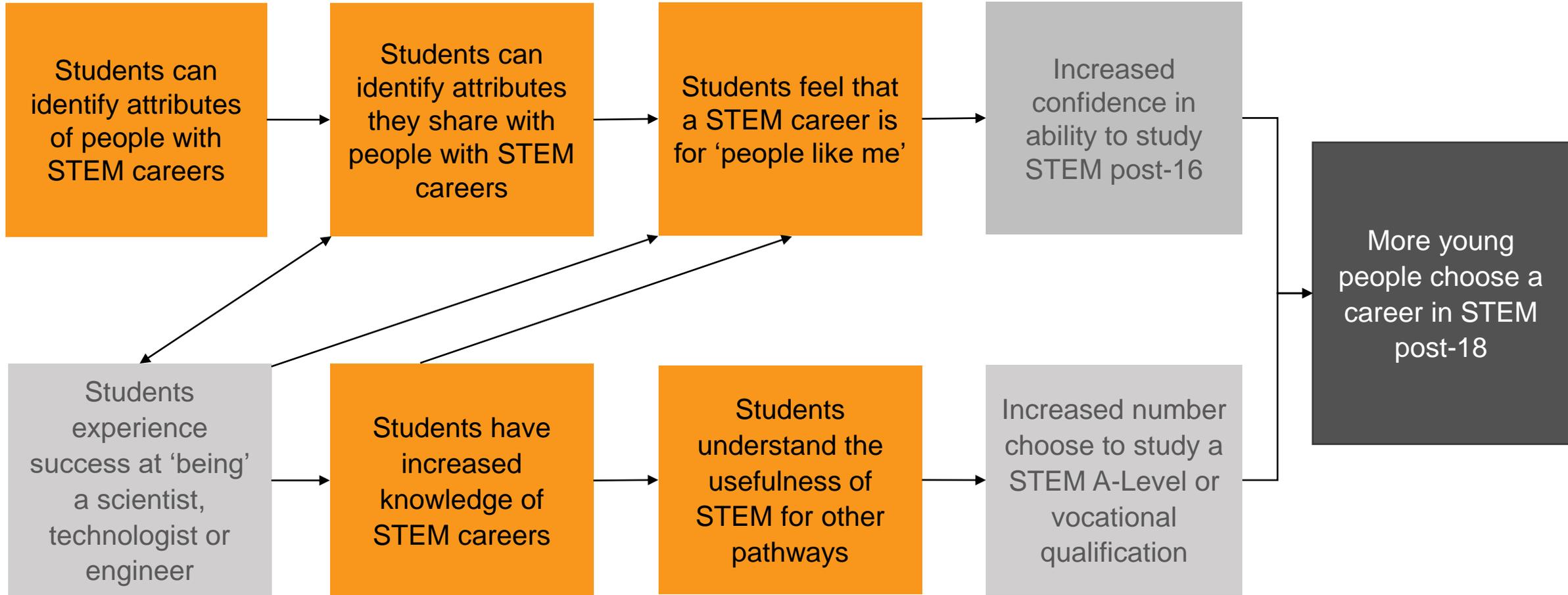


Theory of change

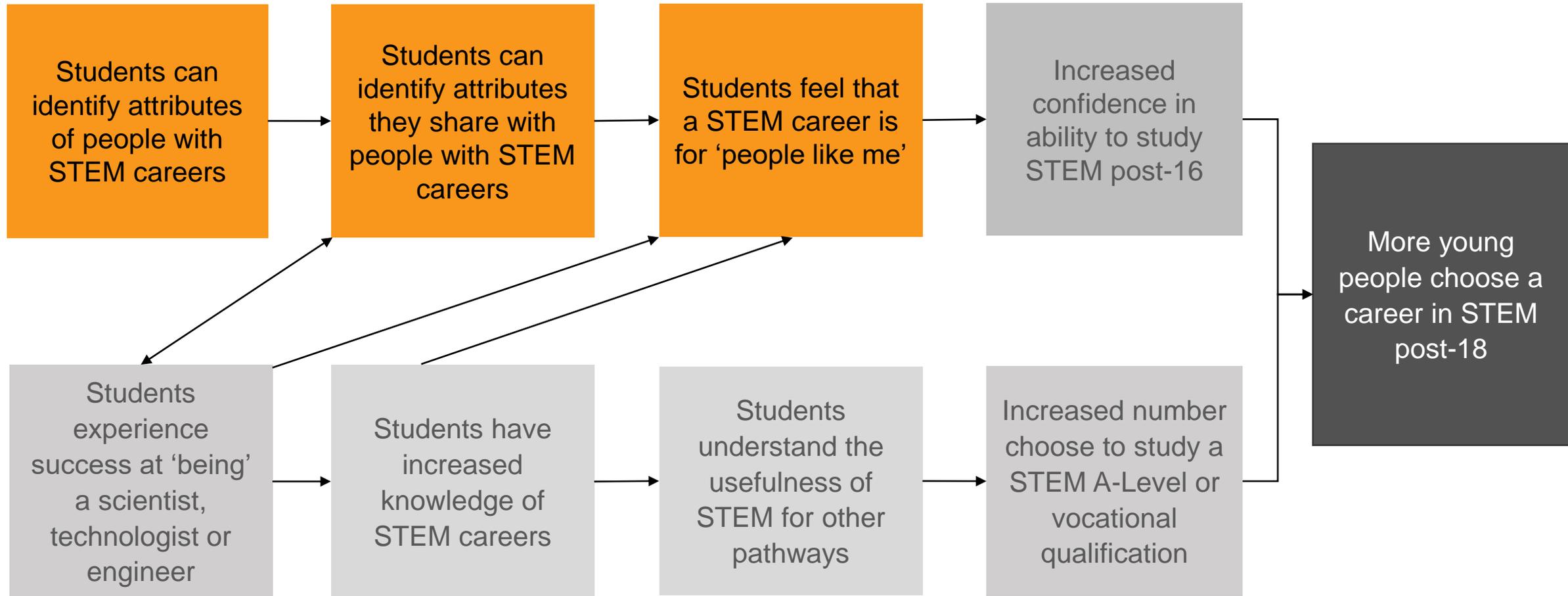
Outlines the pathways by which the diversity and number of young people choosing STEM might be increased



Today...



Attributes



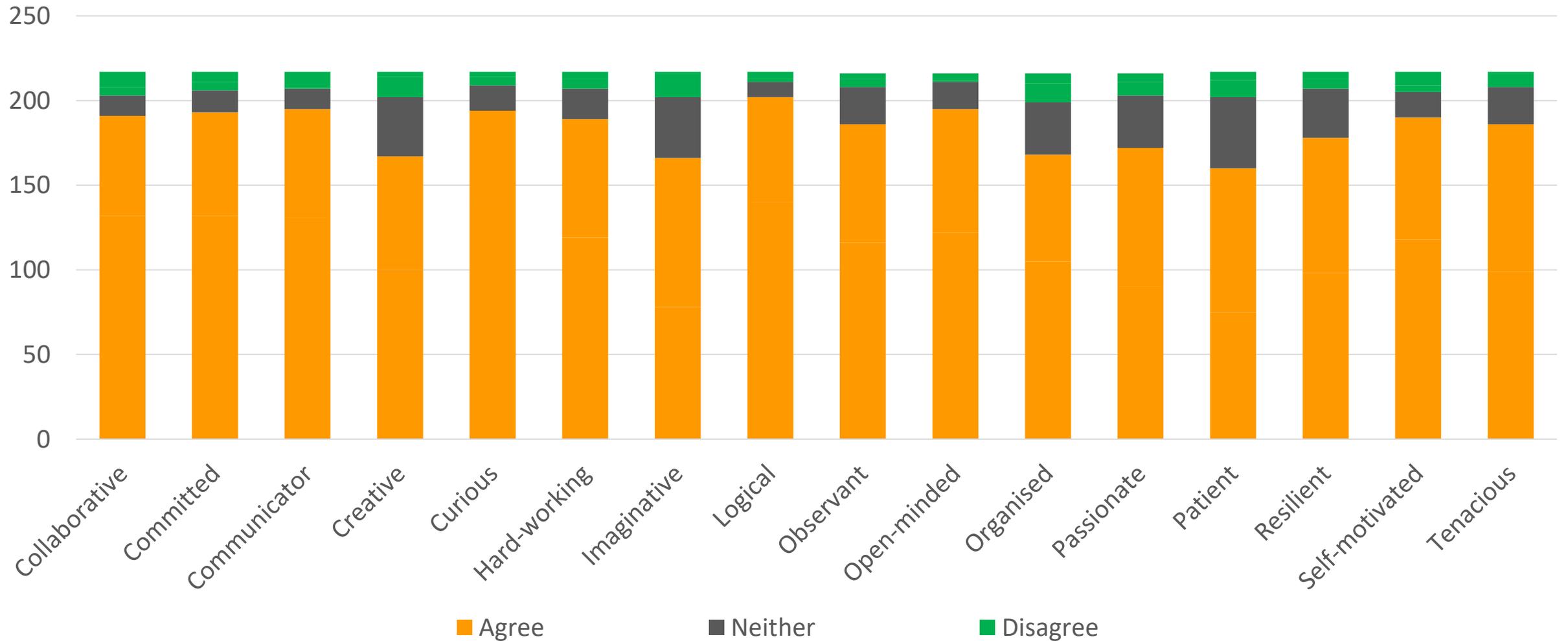
What are the attributes that children and young people might share with STEM professionals?

What are the attributes that STEM professionals actually have?

NUSTEM Attributes

Collaborative	Committed	Communicator	Creative	Curious
Hard-working	Imaginative	Logical	Observant	Open-minded
Organised	Passionate	Patient	Resilient	Self-motivated

NUSTEM attributes approach



Attributes in classroom teaching

- Talking about NUSTEM attributes can help pupils to think about how they might develop them in school and at home
- Using NUSTEM attributes can help those who are thinking about careers identify characteristics that they share with others who work in STEM careers.
- However, the attributes are broad enough that they don't limit choices for those who ultimately don't go into STEM

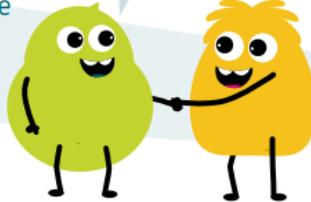
British Science Week Packs

UNLOCKING SKILLS



Collaborative

A fantastic way to encourage children to take an interest in STEM is to introduce transferable skills used by those working in STEM-related jobs.



These skills will strengthen positive attitudes and reduce stereotypes of those working in the field.

You could, for example, use the STEM Person of the Week activity from NUSTEM at Northumbria University or introduce a scientist from the British Science Association's Smashing Stereotypes campaign. Ask children

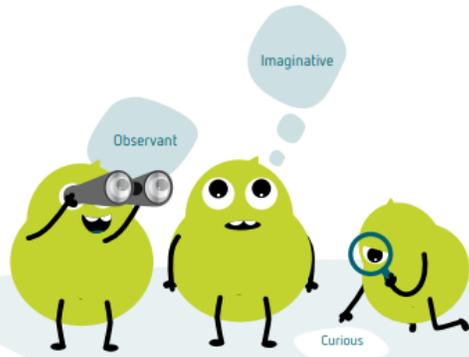
to identify what characteristics people working in STEM need. These might include being observant, creative, patient, good at communication, or curious. Look out for the skills unlocked tags for each activity in this pack.

The table opposite has a complete list of attributes developed by NUSTEM to use as a talking point or to share with other teachers.

Observant
Open-minded
Committed
Curious
Logical
Creative
Imaginative
Patient
Self-motivated
Collaborative
Resilient
Clear communicator
Passionate
Hard-working
Organised

Imaginative

Observant



Curious



Observant

Open-minded

Committed

Curious

Logical

Creative

Imaginative

Patient

Self-motivated

Collaborative

Resilient

Clear communicator

Passionate

Hard-working

Organised

Each activity has suggested skills that children might develop during the activity.

Innovating for the future Action on biodiversity

About this activity

You will gain practical skills through the challenge of monitoring biodiversity in your local area, and planning action to make improvements for the benefit of nature and people. This includes collecting and analysing data to identify trends and key findings, followed by writing up a report to communicate your discoveries.

Kit list

- ✓ Computer to access the following resources via www.wwf.org.uk/scienceweek2021
 - The Living Planet Report – Youth Edition
 - Our Planet Lab
 - Seek by iNaturalist App
- ✓ Access to What is Biodiversity? video www.youtube.com
- ✓ Access to What is Biodiversity? poster www.wwf.org.uk

Next steps

Seek by iNaturalist App
The free Seek app allows real-time identification of organisms through live image recognition when a plant, animal or fungus is scanned with the camera of a tablet or phone. As well as helping identify species, it provides a practical introduction to taxonomy and provides information about the species identified, helping to build understanding of the interconnected ecosystem explored through the activity. If connected to a free iNaturalist account (which can be set up through the app by anyone over 13) observations can be submitted to a global database, helping scientists monitor global biodiversity.

Our Planet LAB Toolkit

The Our Planet LAB Toolkit outlines the steps that a class or group can take to monitor, study and improve local biodiversity. It contains a wealth of digital and offline tools and techniques including mapping grids, observation sheets and tracking worksheets and

Instructions

- 1 Learn about biodiversity, what it means and why it is important by watching the *What is Biodiversity?* video and reading the biodiversity explainer poster.
- 2 Read the *WWF Living Planet Report (Youth Edition)* and consider how wildlife population data is collected and analysed.
- 3 Organise and run a bioblitz activity to take a biodiversity snapshot of your school grounds or chosen habitat. Collect biodiversity data using the *Seek* app and/or *Our Planet Lab toolkit*.
- 4 Analyse the data to draw out key findings.

- ✓ How can the data be segmented? i.e. the number of observations or the number of different species per habitat type
 - ✓ How do habitats vary and how does this influence what is found there?
 - ✓ How might human activity affect future results in a positive and/or negative way?
- 5 Report your findings and make recommendations on improvements that could be made to the habitat to encourage an increase in biodiversity.

- ✓ Why is biodiversity important to the local area?
- ✓ What are the key findings and recommendations?
- ✓ How can you create a report that is scientifically accurate but also engaging to an audience?

At home

- ✓ After assessing the level of biodiversity in your chosen area, create an action plan to improve it.
- ✓ Consider the meaning of the term 'citizen science' and learn about its importance in helping scientists identify problems, understand them and then find solutions.
- ✓ Use the free *Seek* app to identify your wildlife finds, and record and submit your bioblitz data to iNaturalist.
- ✓ Learn more about biodiversity and different habitats through WWF-UK's Learn to Love Nature programme: www.wwf.org.uk

Skills set

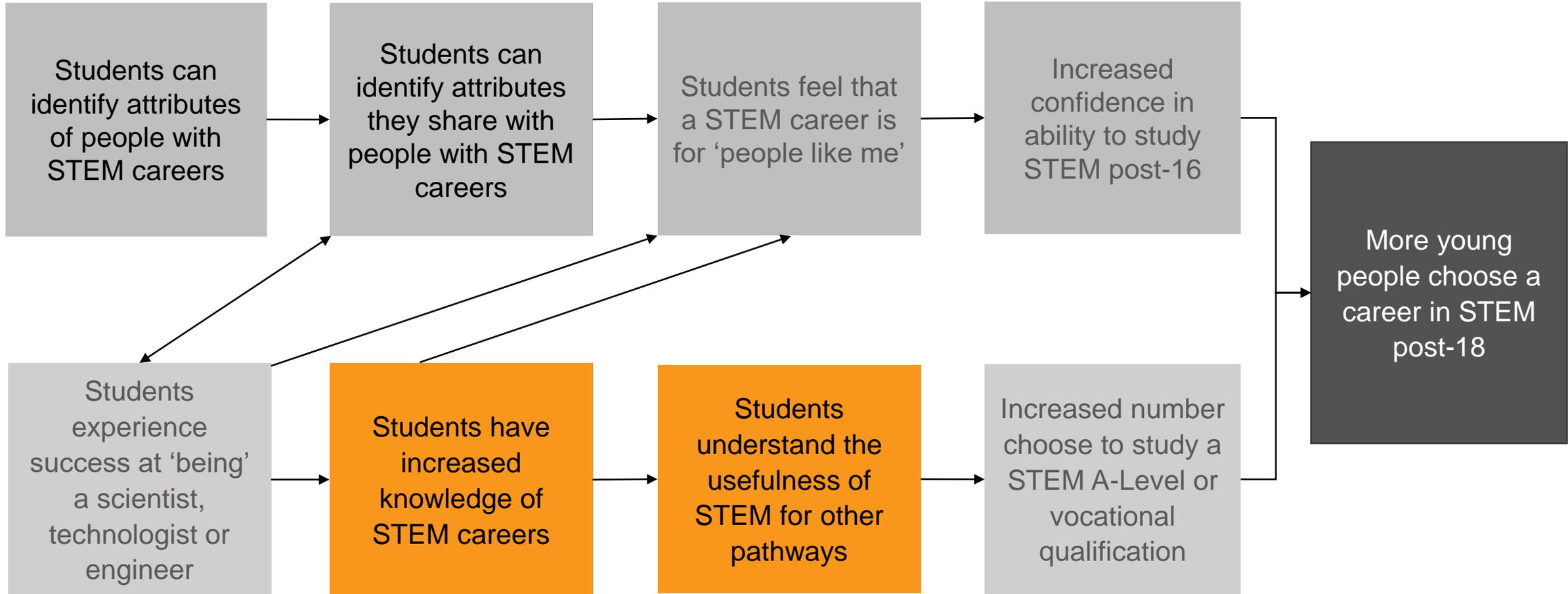
Observant, Committed, Organised

Career options

Biodiversity and Ecology Officers conduct field surveys and write reports and recommendation on habitat management and the impact of human activity on ecosystems. Data Scientist responsibilities include data integration, spatial data analysis and developing statistical techniques. Other careers include Research Assistants.



Careers



Career aspirations

What job would like to do when you are older? Why? List up to 3 jobs.

- 98% children actually had career aspirations
- 20 jobs accounted for 75% of the jobs named by the children
- 81% in highest categorisations of jobs in the Standard Occupational Classification system
- Children have aspirations simultaneously for STEM and not STEM fields i.e. scientist and a dancer

(622 children aged 7 – 11 from 5 schools in North East)

About 1/3 of children named a STEM based job but the types of STEM jobs boys and girls want to do to is different

Jobs Group	Number	%	% from girls	% from boys
Core STEM	110	36	16	84
STEM Skilled Trades	12	4	17	83
Medical STEM	182	60	81	19

Children and young people have a limited experience and knowledge of different careers.

The more careers that they can find out about, the more likely they are to find something that fits with them.

Teachers can use careers as part of their subject teaching to help broaden career knowledge and aspirations.

Finding out about different careers



STEM SECTORS



Infrastructures



Creative industries



Consultancy



Finance



Media



Entrepreneur



Transport



Communications and data



Energy



Entertainment



Medical



Law



Environment



Retail



Digital Technologies



Beauty & household



Materials



Food



Weather and Climate

<https://nationalcareers.service.gov.uk/explore-careers>

National Careers Service
Explore careers Skills assessment Find a course Contact us Action plans Careers advice

BETA Complete an independent survey to [give us feedback](#) about our website.

Explore careers

Find out what a job involves and if it's right for you.

Search job titles
Enter a job title

Explore by job category

Administration	Engineering and maintenance	Retail and sales
Animal care	Environment and land	Science and research
Beauty and wellbeing	Government services	Social care
Business and finance	Healthcare	Sports and leisure
Computing, technology and digital	Home services	Teaching and education
Construction and trades	Hospitality and food	Transport
Creative and media	Law and legal	Travel and tourism
Delivery and storage	Managerial	
Emergency and uniform services	Manufacturing	

healthcareers.nhs.uk/explore-roles

NHS Login / Register

Mobile menu

Home > Explore roles

Explore roles

There are over 350 different NHS careers and everyone makes a difference every day.

Whether you're still in education or thinking about changing careers, you'll get the information you need. You'll also find real-life stories and films of our staff and students.

You can also use our [compare roles tool](#) to compare bite-sized information on the skills and qualifications for a role, pay and conditions and where a role can take you in the future.



Northumbria University
NEWCASTLE

Linking careers to curriculum topics

Sometimes it's easy to think of different careers for science and maths topics but if it's not...

Curriculum Careers Tool



nustem [Read more](#) [What We Do](#) [Resources & Reference](#) [News & Programmes](#) [About](#) [Search](#) [Close](#) [Facebook](#)

- 🏠 Everyday Materials
- 🔗 Evolution & Inheritance
- ➡ Forces
- 🏠 Forces & Magnets
- ☀ Light
- 🌿 **Living Things & Their Habitats**
- 🌳 Plants
- 🪨 Rocks
- 🌞 Seasonal Changes
- 🔊 Sound
- 🔥 States of Matter

Neuroscientist Neuroscientists research and explore the brain, spinal cord and... Read more >	Meta researcher Meta researchers study research itself. They study research methods,... Read more >	Forensic genetics researcher Forensic genetics researchers work with DNA. They work in... Read more >	Epigenetics research assistant Epigenetics is the study of how experiences and environment can... Read more >
Deep sea ecologist Deep sea ecologists study the habitats, populations and interactions... Read more >	Biotechnologist Biotechnologists study the genetic, chemical and physical properties... Read more >	Biogeochemist Biogeochemistry is the study of how the Earth's systems (water, atmosphere,... Read more >	Atmospheric scientist Atmospheric scientists study the atmosphere of our planet. They... Read more >
Ecological entomologist Entomology is the study of insects which are the most abundant... Read more >	Immunologist An immunologist studies the immune system which protects the... Read more >	Water quality scientist Water quality scientists ensure water quality standards for safe... Read more >	Chemist Chemists study chemicals and matter on atomic and molecular level.... Read more >

Geologist

0 Comments / Categories: creative, curious, observant; Primary, Year 1, Year 2, Year 3, Year 4, Year 5, Year 6; Geography, Maths (Primary), Science (Primary); Everyday materials, Geography, Maths - Geometry - Position and Direction, Maths - Geometry - Properties of Shapes, Rocks; Everyday Materials, Geography, Geometry, Maths, Position and direction, Primary, Properties of shapes, Rocks, Science;

Geologists work to understand the history of our planet so they can understand Earth's history and can predict how events and processes of the past might influence the future. Geologists seek to understand the processes of landslides, earthquakes, floods, and volcanic eruptions well enough to avoid building important structures where they might be damaged. They prepare maps of areas that have flooded in the past in order to prepare maps of areas that might be flooded in the future. Geologists locate rocks that contain important metals, plan the mines that produce them and the methods used to remove the metals from the rocks. They also locate and produce oil, natural gas, and groundwater. Geologists study past climates of Earth and how they have changed across time. This provides an understanding of how our current climate is changing and what the results might be. They also study the age of rocks, attempting to piece together a chronology of events for the formation of our land masses and changes over time.

Attributes: observant, curious, creative

Useful links:

- <http://geology.com/articles/what-is-geology.shtml>
- <http://www.youtube.com/watch?v=zm3YMWWh4c>
- [Google Image Search link](#)

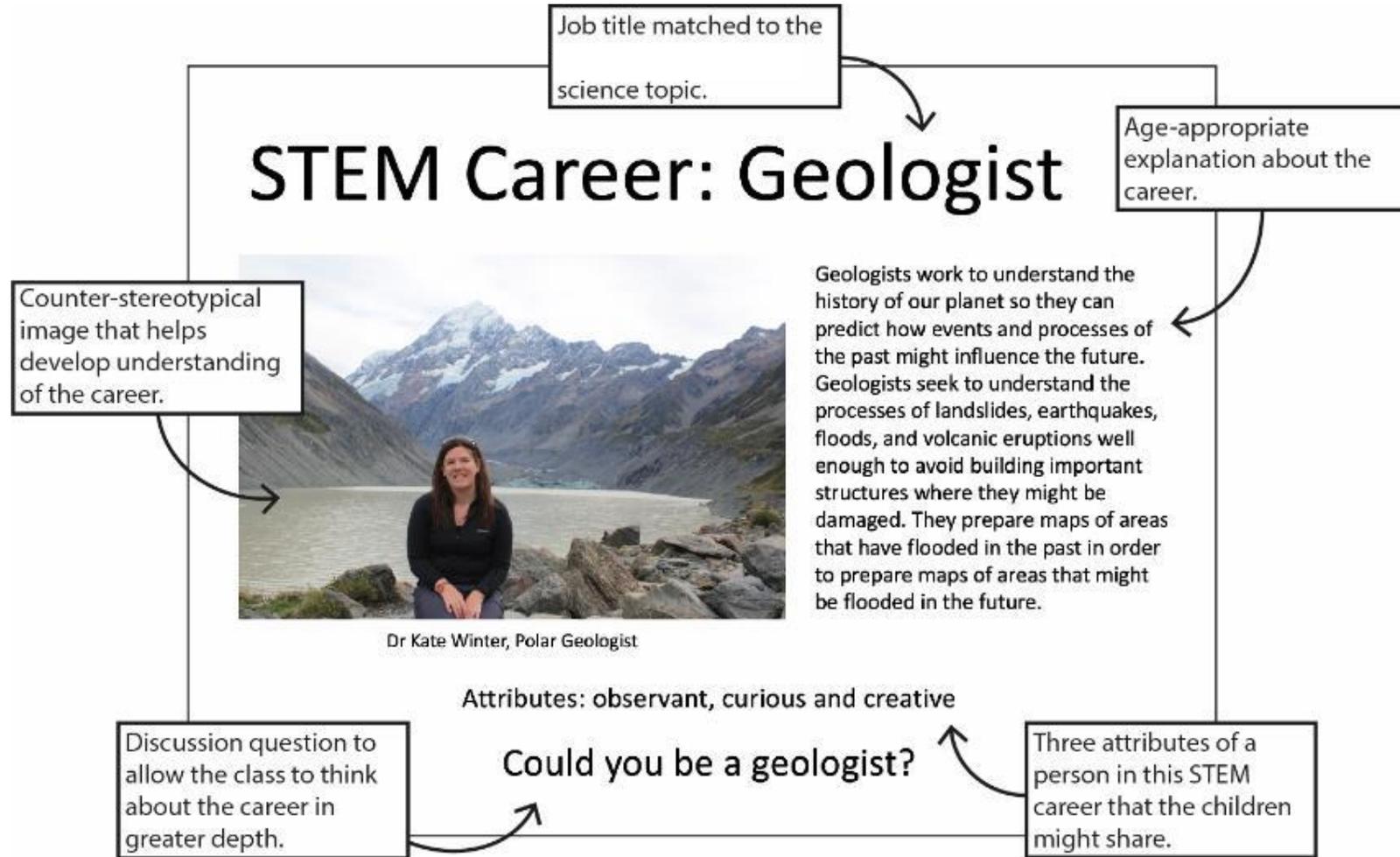
Counter-stereotypical image

Each career contains a link to an image search

The link is for a counter-stereotypical image search

Prompt questions:

- Could you be a ...?
- Why these attributes?
- Where have you shown these attributes?
- How can you develop these attributes?



STEM Person of the Week (SPOTW)



- The resource is designed to promote a counter-stereotypical view of the STEM profession through a series of 15 attributes.
- Each week, there are 3 new attributes for the children to think about.
- In science lessons, and across other subjects, praise could be focused for displaying these attributes.
- We want to show children that **they already have the skills that you need to work in STEM.**



STEM PERSON OF THE WEEK | **Farnoosh Farhad**
Mechanical Engineer

Farnoosh researches medical implants to understand they've failed, and how they can be improved. Her work focuses on the health and comfort of patients, helping them live normal lives. She is **organised**, keeping track of a wide range of projects. Farnoosh is **hard-working** and likes to learn and explore new areas of research. She is **committed** to finding engineering solutions that help people in the real world.

Organised **Hard-working** **Committed**

nustem 

STEM PERSON OF THE WEEK | **Farnoosh Farhad**
Mechanical Engineer

Like Farnoosh, I am...

Organised
I am good at planning to make sure I finish things.

Hard-working
I put all of my effort into finishing things.

Committed
I can stick with an activity and try my hardest to make it happen.

nustem 

Play, Be, C

- Supporting teachers and other adults in EYFS to provide high-quality STEM education.
- Linked to literacy development through a story book.
- Flexible and adaptable to your setting.
- Attribute focused



Structure of each unit

- Based around a career with three attributes highlighted
- Story book with STEM focussed questions
- Six activities
 - Three adult led
 - Three provocations
- STEM at home activity to share with families
- Career poster

Attributes

Curious
Collaborative
Creative
Observant
Resilient





The Meteorologist

Meteorologists use measuring equipment and make forecasts of what the weather is going to be like.

Meteorologists are: Curious, Observant, Collaborative.



Glaciologist

Glaciologists study glaciers - huge lumps of ice found on mountains or near the North and South poles.

Glaciologists are: Curious, Observant, Resilient.



Marine Engineer

Marine engineers make and fix boats and ships, submarines, oil rigs and drilling equipment.

Marine engineers are: Curious, Creative, Resilient.



Lighting Technician

Lighting technicians design the way lights are used in films, concerts and theatre or to light up buildings, statues and bridges.

Lighting technicians are: Observant, Creative, Collaborative.



Fluid Scientist

Fluid scientists are interested in what liquids and gases are like and how they move and behave.

Fluid scientists are: Curious, Observant, Resilient.



Robotics Engineer

Robotics engineers design, build and programme machines to do jobs more easily than a human could.

Robotics engineers are: Creative, Observant, Resilient.



Magnet Engineer

Magnet engineers design magnets or machines that use magnets.

Magnet engineers are: Curious, Creative, Observant.



Arborist

Arborists look after trees and make sure they are healthy. Arborists are sometimes called tree surgeons.

Arborists are: Collaborative, Observant, Resilient.



Civil Engineer

Civil engineers plan, design, build and manage buildings, roads, bridges, dams, water systems, railways, harbours...

Civil engineers are: Creative, Collaborative and Resilient.



Pause for thought...

How will you use the information from this session?

Questions?

Engage

Teacher Conference

Thank you

Contact Carol:

- carol.davenport@northumbria.ac.uk
- X/Twitter: @nustem_uk @DrDav
- LinkedIn: [linkedin.com/in/carol-davenport-88607216](https://www.linkedin.com/in/carol-davenport-88607216)
- Facebook: www.facebook.com/nustemUK/

 crestawards.org/engage

 crest@britishscienceassociation.org

Run by

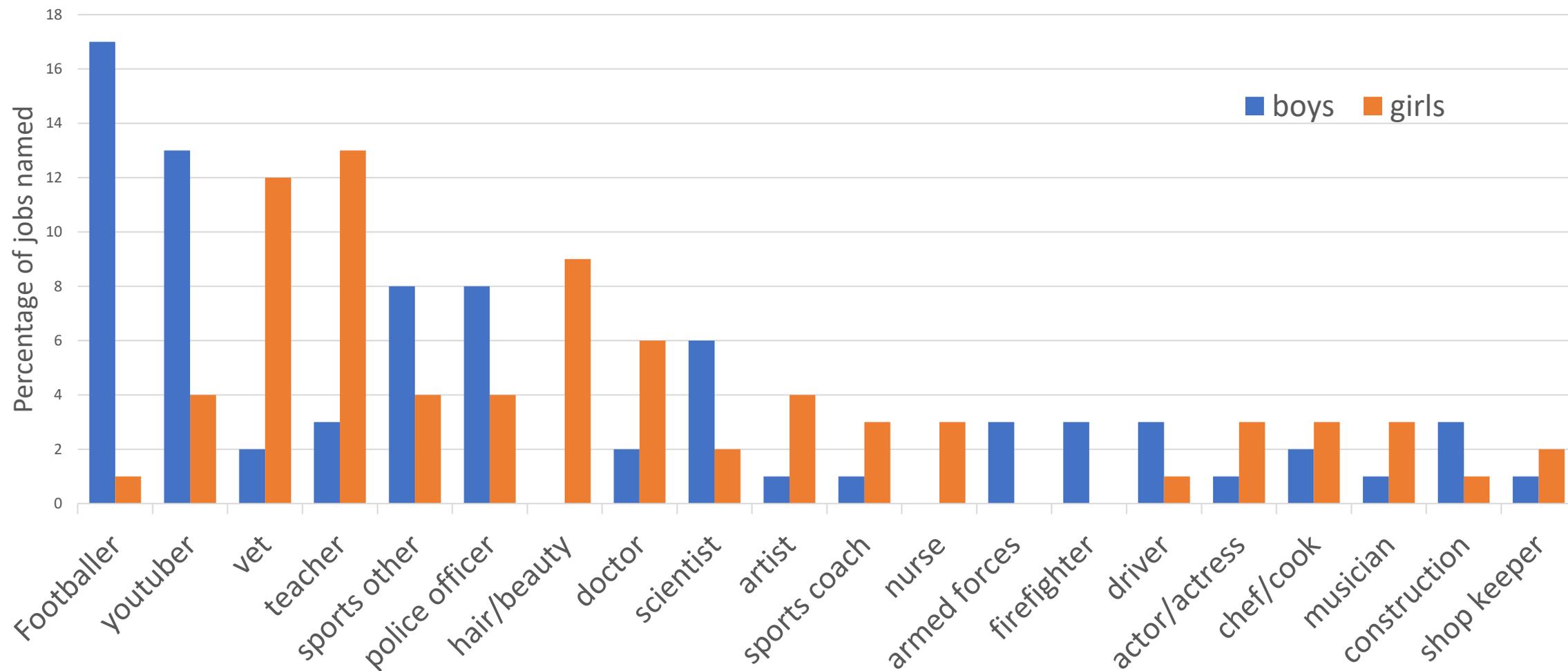


BRITISH
SCIENCE
ASSOCIATION

Managed by



Percentage of top 20 jobs named by boys and girls



Attributes as Employability skills

- Research project to look at how STEM professionals described the attributes that they felt helped them be successful in their career (218 participants).
- Short online survey distributed by member organisations and via LinkedIn and Twitter.



What did we find?

Thematic analysis gave 19 broad attribute themes.

1. Open minded
2. Communicator
3. Logical
4. Domain specific knowledge
5. Curious

6. Creative
7. Good colleague
8. Resilient
9. Collaborative
10. Tenacious

11. Hard-working
12. Self-motivated
13. Professionalism
14. Patient
15. Observant

16. Passionate
17. Organised
18. Imaginative
19. Committed