

A close-up photograph of grass blades covered in a thin layer of white frost. The background is a soft, out-of-focus bokeh of light blue and white, suggesting a bright, sunny day. The overall mood is serene and natural.

Women can be scientists too

Megan Button and Helen Tiplady

AGENDA

- Welcome and Introductions
- Background to the research
- Research outcomes and impact
- Reflection and take-aways



Your presenters at today's session



Megan Button

Primary School teacher and
Science Lead



Helen Tiplady

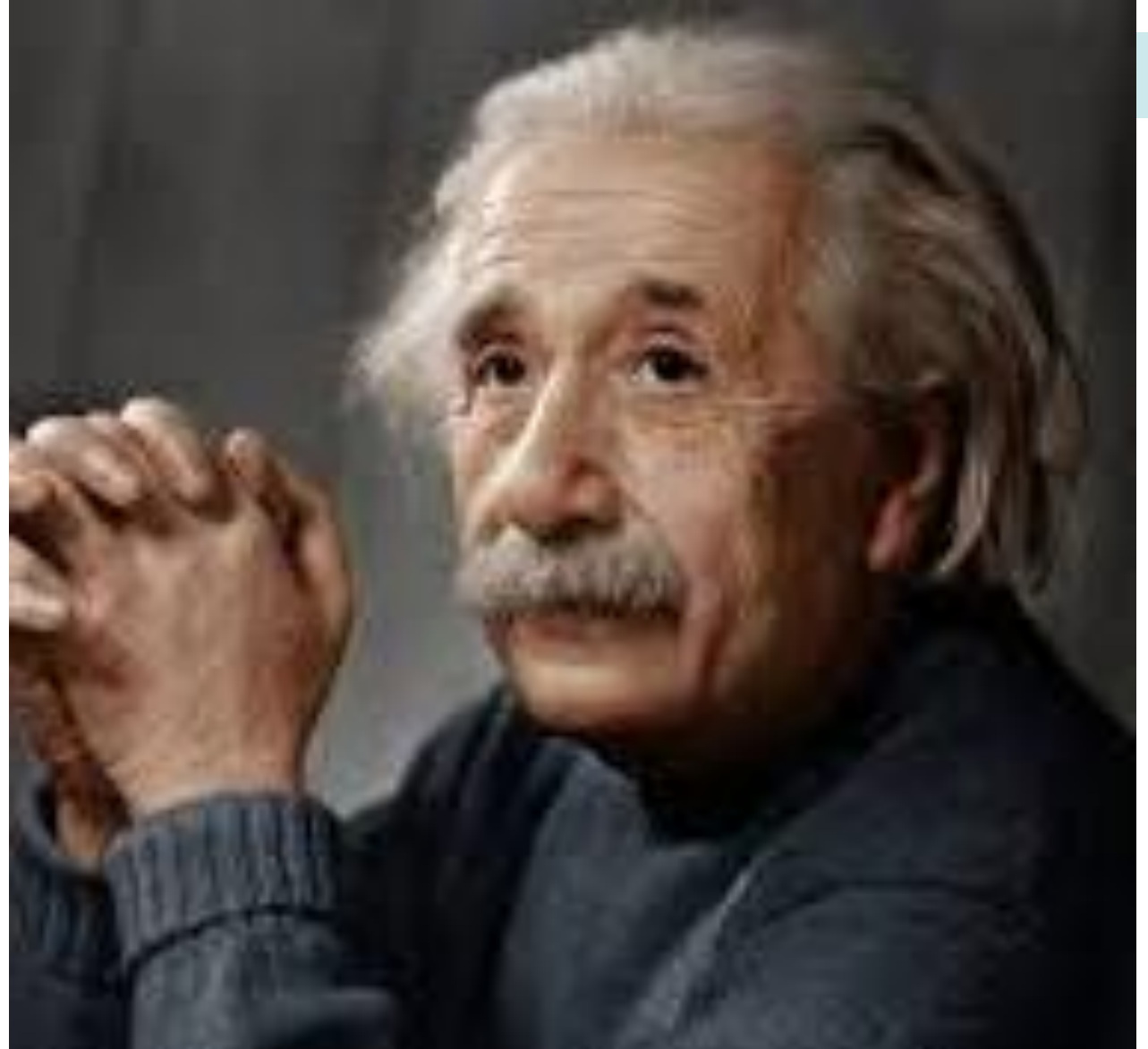
Senior Lecturer at UON



Year 3 in BA Primary Education – Module
ITT3061 Enhancing the Expert Primary School
Teacher

“The important thing is not to stop questioning. Curiosity has its own reason for existing.”

Albert Einstein



Ruth Benerito



Jane Goodall





Mary Anning

Ichthyosaur fossil



Famous scientists mentioned in the Primary Science National Curriculum

Padlet

Helen Tiplady + 7 • 3mo

Group 3 Famous scientists mentioned in the science primary National Curriculum

Made with the strength to succeed

KS1 - scientists mentioned in Year 1 NC

+

KS1 Scientists mentioned in Year 2 NC

+

- John Dunlop, Charles Macintosh, John McAdam**
Created new inventions such as the first practical tyres, waterproof raincoat, and more suitable process for building roads.
- John McAdam 1756-1836**
Inventor of the Macadam road surface. He noted that the local highways were in poor condition. At his own expense he undertook a series of experiments in road making.
- Charles Macintosh 1766-1843**
Born in Glasgow. devoting his spare time to research science. he created new processes. Became a Scottish chemist.

KS2 - scientists mentioned in Year 3 NC

+

KS2 - scientists mentioned in Year 4 NC

+


KS2 - scientists mentioned in Year 5 NC

+

- David Attenborough and Jane Goodall (in non-statutory section)**
Famous biologist and famous primatologist and anthropologist.
- Spencer Silver and Ruth Benerito (in non-statutory section)**
Chemist who invented adhesives and chemist developed wash and wear cotton fabrics.
- Ptolemy, Alhazen and Copernicus.**
Geocentric Model of the Solar System.
- Galileo and Newton**
Helped to develop the theory of

KS2 - scientists mentioned in Year 6 NC

+

- Mary Anning - Year 6 (in non-statutory section)**

She was the first to discover the complete skeleton of a documented dinosaur in 1823. There were rumours that the fossil



Ada
Lovelace

Paula
Hammond

<https://www.bbc.co.uk/news/uk-51399835>


:Padlet

Helen Tiplady • 39 • 2yr

Year 3's epic scientist nominations for a new science National Curriculum

Made with team spirit and a bit of coffee


If not sure where to go....here's a good place to start... :)




bbc.co.uk

Seven female scientists you may not have heard of.

Marie Curie



Alan Turing



In 1936, he created the Universal machine. Ten years later he broke the enigma code which enabled him to decode secret ciphers in the 2nd world war.

Mary Anning

Anning is known as one of the greatest fossil hunters of all time. At the age of 12 she discovered the skull of a

Rosalind Franklin

Rosalind Franklin was an English scientist born July 25th 1920. She is famous for her contributions in discovering the double helix structure in DNA. Four years after he death her male colleagues received a Nobel Prize for the work, she was not given any recognition. She dedicated her life to science, as well as her investigations into DNA she also contributed to the chemical understanding of coal, graphite and viruses.

Ada Lovelace

She is known to be the world's first computer programmer. She wrote the world's first algorithm for an early computing machine that existed only on paper. Her notes described how codes could be created for the handling of letters, symbols and

Katalin Kariko

She is a Hungarian scientist who dedicated her life to science from the age of 23 and began researching RNA for 40 years. She collaborated alongside Drew Weissman later on in her career. Afterwards, during the height of the pandemic her work was used as the backbone of the Pfizer and BioNTech vaccines by other scientists to prevent the spread of coronavirus. And both her and Drew Weissman are being considered for a Nobel Prize.

Thomas Edison

He deserves to have a place in the National Curriculum for science because of work with electricity and many other scientific areas. He had many life


Elizabeth Garrett Anderson

Elizabeth Garrett Anderson was the first woman in the UK to qualify as a doctor, she attended the university of Paris and obtained her medical degree, however the British Medical register refused to recognise her qualification. In 1872, Anderson founded the New Hospital for women in London, which was to be staffed entirely by women. She was determined to pave the way for women in medicine and in 1872 an act was finally passed that permitted women to enter the medical professions. Elizabeth Garrett Anderson is someone that should be apart of the National Curriculum as she is not only a female in the science sector, so shows more diversity, but she shows the importance of perseverance when reaching your goals. She used her rejection to motivate her to make change.


Elsie Widdowson

Elsie Widdowson was a dietician, and she devoted her life to improving people's diets in Britain and overseas. In 1940 when food was being rationed during World War 2, she published a book called The Chemical Composition of Foods. I think she deserves to be put into the national curriculum because she is inspiring to the children. She wrote a guide to help people with something they may be struggling with during a very hard time in history. She wanted to help improve people's diets and she did that by being involved in overseeing the addition of vitamins to food during World War 2 rationing.

Elizabeth Garrett Anderson



Hidden Figures at NASA: Katherine G. Johnson, Mary W. Jackson and Dorothy Vaughan



blog.tham.ac.uk

Women's History Month - Hidden Figures at NASA: Katherine G. Johnson, Mary W. Jackson and Dorothy Vaughan

Katherine Johnson, Mary Jackson and Dorothy Vaughan, three women who until recently were relatively unknown, but their work drew a path for future generations of women at NASA. Originally known as 'human computers', they were responsible for calculating complex maths equations for various airplanes and space flights, but all three went on to play a significant role in the Space Race.

Their story has recently been brought to light by Margot Lee Shetterly's book *Hidden Figures: The Untold Story of the African American Women Who Helped Win the Space Race*.

Recommendations for a future national curriculum

<https://uon1.padlet.org/helentiplady1/uon-yr3-ase-2024-scientist-nominations-for-a-new-science-nat-5t5jopypvbt2x3id>

EDUCATION JOURNAL MAGAZINE

“Scientists can be women” – A case study on perceptions of gender in science at a rural primary school in England

Megan Button - University of Northampton Graduate 2021 & Primary school teacher

Sarah Cave – Senior Lecturer in Education, University of Northampton

Helen Tiplady – Senior Lecturer in Education, University of Northampton

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<https://www.bcu.ac.uk/education-and-social-work/partnerships-and-collaborations/education-journal-magazine>

Methodology

Aim	Ethics	Methods	Timeline	Analysis tool
To examine perceptions of gender in science from the viewpoint of the children and teachers.	UON ethics approval obtained. BERA compliant. Consent forms from all participants and parents/guardians.	Small-scale Case Study using a mixed methods approach. Interviews & questionnaires.	Research took place in Spring 2020. For purpose of Dissertation Module in Year 3.	Open coding used to create tables of qualitative data. Qualitative DAST results were converted to quantitative data.

Main findings

Key Finding 1

- Gender stereotypes of scientists are considerably less prominent in comparison to ideologies presented in previous research.
- Children mostly drew their representation of a scientist as their own gender.
- Stereotypical interpretations of scientists remained prevalent.

Key Finding 2

- Interviews found that *"most children are highly engaged"* and that despite having such a high number of girls in the class, engagement is good and they *"have a positive attitude"*.
- This was reinforced by the interviewee explaining that the school had a visit from a female scientist and *"the children didn't make any comment that it was a woman in any surprise"*.

Key Finding 3

- The most consistent finding from the interviews was the promotion of ensuring learning is specifically tailored to the children.
- Teaching should begin with *"where their interests...confidence...ability is and develop these"* and learning should be given a context to *"make children conscious of the world around them"*.

From theory to practice...

Key question 1:

Do children perceive scientists and predominantly male or female?



Key question 2:

Do teachers perceive gender stereotypes in science to be a prevailing issue in modern day primary schools?



Key question 3:

What strategies do modern day primary schools use to overcome gender stereotypes in the teaching of science?



From theory to practice...

'Same-gender role models are significant in impacting attitudes, achievements and interest' (Button *et al.*, 2021, p.34)

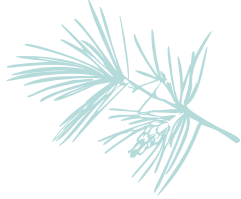
- Textbooks
- Story books
- Famous scientists
- Resources
- Visitors

'Ensuring learning is specifically tailored to the children' (Button *et al.*, 2021, p.35)

- Developing interest in the world around them
- Children's own interests
- Practical based
- Mixed-age groupings
- Mixed gender groupings
- Discussion based with opportunities to talk



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