

Scientists across the curriculum

Research has shown that, while learning science can be interesting and enjoyable, many children find that what they learn at school is abstract and they cannot see how it relates to their own lives. Consequently, they see science as something that is not for them. Studies have shown that these perceptions can start early in a child's primary school career. Children who think or feel this way have low science capital.

One way of increasing children's science capital is for them to learn about scientists that they can identify with. This document is intended to help schools and teachers include scientists in the curriculum who:

- are relevant to the topics
- illustrate how scientific knowledge has developed over time
- children can identify with and whose work they can relate to.

The document is organised by year-group. For each topic in each year-group, scientists are listed with a short description of their work to make the link with the topic. For each topic, where possible, we have attempted to identify scientists that meet three different criteria:

- historical figures who illustrate the development of scientific knowledge over time
- scientists from under-represented groups
- modern scientists whose work is relevant to children and who reflect their world and backgrounds.

To help identify which criteria each scientist was included for, they have been colour-coded, as shown below.

Type	Colour code
Historical figures	Blue
Under-represented groups	Green
Modern scientists	Red

The name of each scientist is also a link to further information about them and their work, or resources that can be used with children for this purpose.

Plants	Animals, including humans	Everyday materials	Seasonal change
	<p><u>Leonardo Da Vinci</u> (Anatomical drawing, 'Vitruvian Man')</p> <p><u>Miller Hutchinson</u> - search document for information (Engineer who invented the first electric hearing aid)</p>	<p><u>Chester Greenwood</u> (Inventor of earmuffs)</p>	
<p><u>Maria Sibylla Merian</u> (German artist, scientific illustrator, and naturalist)</p>	<p><u>Joan Beauchamp Procter</u> - search document for information (Herpetologist and Curator of Reptiles, London Zoo)</p>		
	<p><u>Patricia Bath</u> - links to free resources requiring a login (Ophthalmologist and inventor of using lasers in cataract operations)</p> <p><u>Tanesha Allen</u> (Zoologist who studies badgers)</p>	<p><u>Becky Schroeder</u> - links to free resources requiring a login (Inventor of Glo-sheets which she patented as a 12-year-old)</p>	<p><u>Jim Cantore</u> (Meteorologist and storm tracker)</p>

Living things and their habitats	Plants	Animals, including humans	Uses of everyday materials
<p><u>William Kirby</u> (Father of modern entomology, the study of insects)</p>	<p><u>Daniel Solander</u> (Botanist who worked with Joseph Banks on Captain Cook's voyage around the World)</p> <p><u>Joseph Banks</u> (Naturalist on Captain Cook's voyage around the World)</p>	<p><u>Florence Nightingale</u> (Nurse and founder of modern nursing)</p>	<p><u>Charles Macintosh</u> - links to free resources requiring a login (Chemist and inventor of waterproof clothing)</p> <p><u>John McAdam</u> (Inventor of the modern road surface)</p>
	<p><u>Thomas Wyatt Turner</u> - search document for information (Botanist who studied plant disease)</p>	<p><u>Elizabeth Garrett Anderson</u> (First English woman to qualify as a doctor)</p>	
<p><u>Prem Singh Gill</u> (Polar Scientist who studies where Antarctic seals live, breed and feed, so we can know more about where they prefer to live)</p> <p><u>Dawood Qureshi</u> (Marine Biologist who studies wildlife in the ocean)</p>	<p><u>Poppy Okotcha</u> (Horticulturalist interested in the connection between healthy environments, healthy food, and healthier people)</p> <p><u>Dr Ben Woodcock</u> (Ecological Entomologist who helps farmers grow food, so it is safe for insects and other wildlife)</p> <p><u>Angie Burnett</u> (Plant Biologist who grows plants and sees how they react to different conditions that make it more difficult for them to grow)</p>	<p><u>Dr Kelly Blacklock</u> (Veterinary Surgeon)</p> <p><u>Daniella Dos Santos</u> (Veterinary Surgeon)</p>	<p><u>Victoria Callaghan</u> (Develops sustainable packaging for BASF plc)</p> <p><u>Dr Pearl Agyakwa</u> (Materials scientist who studies why some materials wear out and other don't)</p>

Plants	Animals, including humans	Rocks	Light	Forces and magnets
<p><u>Jan Ingenhousz</u> (Doctor & Scientist who discovered the process of photosynthesis)</p> <p><u>Carl Linnaeus</u> (Botanist who studied the conditions for successfully growing bananas and developed a method to reproduce them in Europe)</p>	<p><u>Wilhelm Roentgen</u> (Physicist who discovered x-rays)</p> <p><u>Marie Curie</u> (Physicist who invented the first mobile x-ray machine to treat soldiers wounded on the battlefield in WWI)</p>	<p><u>William Smith</u> (Engineer & Geologist who developed the science of rock strata)</p> <p><u>James Hutton</u> (Scientist who studied rocks and the effects of natural processes on them, such as rain, running water, tides, and volcanoes, on the development of the Earth)</p>	<p><u>Percy Shaw</u> (Inventor of the cat's eye)</p>	<p><u>William Gilbert</u> (Doctor who developed the theory of magnetism)</p> <p><u>Leonardo Da Vinci</u> - search document for information (First person to plan and carry out tests on friction)</p> <p><u>Eric Laithwaite</u> (Electrical Engineer who developed the technology behind the Maglev train)</p>
<p><u>Charles Henry Turner</u> - search document for information (Zoologist who made ground-breaking discoveries about insect behaviour)</p> <p><u>Jagadish Chandra Bose</u> - search document for information (Biophysicist who measured plant response to different stimuli)</p> <p><u>George Washington Carver</u> (Agricultural Scientist who encouraged the planting of different crops to prevent soil degradation)</p>	<p><u>Adelle Davis</u> (Biochemist & Nutritionist who linked health and diet)</p>	<p><u>Florence Bascom</u> (Geologist who studied the origin and formation of mountains)</p>		

Dr Kelsey Byers
(Biologist who studies
flower smells and how they
attract insects)

Michelle Williams
(Radiologist)

Anjana Khatwa
(Geologist who collects
rocks and fossils from the
beach and studies them to
learn about the creatures
that lived in the sea and on
Earth over 150 million years
ago)

Brianna Green
(Biogeochemist who
collects soil to see what
kind of living things are in it
to study the effects of
climate change)

Living things and their habitats	Animals, including humans	States of matter	Sound	Electricity
<p><u>Jacques Cousteau</u> (Oceanographer and co-inventor of the aqualung)</p>	<p><u>William Beaumont</u> (Surgeon who first observed and studied human digestion as it occurs in the stomach)</p> <p><u>Washington & Lucius Sheffield</u> (Dentists who invented toothpaste in a tube)</p>	<p><u>Joseph Priestley</u> (Clergyman who discovered oxygen at about the same time as Carl Wilhelm Scheele)</p> <p><u>Carl Wilhelm Scheele</u> (Chemist who discovered oxygen at about the same time as Joseph Priestley)</p> <p><u>Daniel Fahrenheit</u> (Physicist who invented the Fahrenheit temperature scale and the thermometer)</p> <p><u>Anders Celsius</u> (Astronomer who invented the degrees Celsius temperature scale)</p> <p><u>John Boyd Dunlop</u> (Inventor of the pneumatic tyre)</p>	<p><u>Aristotle</u> (Philosopher who developed the concept that sound travels through air due to the movement of air particles)</p> <p><u>Isaac Newton</u> - search document for information (Mathematician & Physicist who measured the speed of sound)</p>	<p><u>Thomas Edison</u> (Inventor of the lightbulb and power grid)</p> <p><u>Joseph Swan</u> (Physicist & Chemist who developed a primitive electric light 20 years before Thomas Edison)</p>
<p><u>Rachel Carson</u> (Aquatic Biologist who wrote about environmental pollution)</p>				<p><u>Lewis Howard Latimer</u> (Electronic Engineer who improved the design of Edison's light bulb and brought street lighting to the world)</p>

<p><u>Wangari Maathai</u> - search document for information (Biologist & Environmental Activist awarded the 2004 Nobel Peace Prize for her contribution to sustainable development)</p>				
<p><u>Kelsey Archer Barnhill</u> (Deep Sea Ecologist who sends robots to the seafloor to collect samples of different animals to study)</p> <p><u>Liz Bonnin</u> (TV Presenter & Wildlife Conservationist)</p>	<p><u>Paul Sharpe</u> (Bioengineer who studies how to regrow teeth if they become damaged)</p>			<p><u>Ronit Kanwar</u> - links to free resources requiring a login (Businessman who set up company to provide affordable, sustainable solar-powered lights for poor in rural India)</p> <p><u>William Kamkwamba</u> - search document for information (Inventor who used wind turbines to bring electricity to his village in Malawi)</p> <p><u>Zubera Iqbal</u> (Chemist who explores sustainable ways to recycle electric vehicle batteries)</p>

Living things and their habitats	Animals, including humans	Properties and changes of materials	Earth and space	Forces
<p><u>David Attenborough</u> - links to free resources requiring a login (Naturalist & TV Presenter)</p> <p><u>Jane Goodall</u> (Wildlife Researcher & Conservationist who studied chimpanzees)</p>		<p><u>Spencer Silver & Arthur Fry</u> (Chemical Engineer & Chemist respectively who invented the post-it note)</p> <p><u>Ruth Benerito</u> (Chemist who developed wrinkle-free cotton fabric)</p>	<p><u>Claudius Ptolemaeus (Ptolemy)</u> (Astronomer who developed the theory that the Earth was at the centre of the Solar System around which the Sun and other planets orbited)</p> <p><u>Nicolaus Copernicus</u> (Astronomer who developed the theory that the Sun was at the centre of the Solar System around which the planets orbited)</p> <p><u>Galileo Galilei</u> - search document for information (Astronomer, Mathematician & Physicist who made the first telescope and discovered Neptune and the rings of Saturn)</p> <p><u>Johannes Kepler</u> - search document for information (Mathematician, Astronomer and Astrologer who developed the theory that the planets moved on oval paths around the Sun)</p>	<p><u>Archimedes</u> (Mathematician who developed theories about how levers and pulleys can lift and move heavy objects)</p> <p><u>Galileo Galilei</u> - links to free resources requiring a login (Astronomer, Mathematician & Physicist who was the first person to use the scientific method to test theories about gravity and the Solar System)</p> <p><u>Isaac Newton</u> - links to free resources requiring a login (Mathematician & Physicist who developed theories about gravity)</p> <p><u>George Cayley</u> (Aeronautical Engineer who designed the first successful glider to carry a human being)</p>

			<p><u>Stephen Hawking</u> - links to free resources requiring a login (Physicist & Cosmologist who developed the theory that the Big Bang may have been caused by a black hole in reverse)</p> <p><u>Neil Armstrong</u> (Astronaut who was the first human to walk on the Moon)</p>	
<p><u>Roger Arliner Young</u> - search document for information (Zoologist who studied reproduction in marine organisms)</p> <p><u>Ernest Everett Just</u> - search document for information (Zoologist who studied the early development of marine invertebrates)</p>	<p><u>Virginia Apgar</u> (Doctor & Medical Researcher who developed a method of evaluating the well-being of new-born babies)</p>		<p><u>Margaret Hamilton</u> (Computer Scientist who was responsible for the software that allowed astronauts Neil Armstrong and Buzz Aldrin to land on the Moon)</p> <p><u>Caroline Herschel</u> (Astronomer who was the first woman to discover a comet)</p> <p><u>Valentina Tereshkova</u> (Astronaut and first woman in space)</p> <p><u>Mae Jemison</u> (Astronaut and first Black woman in space)</p> <p><u>Dr Claudia Alexander</u> (Physicist who was the Project Manager on NASA's Galileo mission to Jupiter)</p>	<p><u>Brahmagupta</u> - search document for information (Mathematician & Astronomer who was the first scientist to talk about gravity)</p>

	<p><u>Robert Winston</u> (Professor of Science and Society, Emeritus Professor of Fertility Studies & TV presenter)</p>	<p><u>Andre Geim & Konstantin Novoselov</u> (Physicists who discovered graphene)</p> <p><u>Jamie Garcia</u> - links to free resources requiring a login (Chemist who discovered a fully recyclable plastic)</p> <p><u>Raquel Prado</u> (Chemist who develops a sustainable fabric that looks like leather but comes from pineapple leaves that would otherwise be burnt)</p>	<p><u>Maggie Aderin-Pocock</u> - links to free resources requiring a login (Space Scientist & TV Presenter)</p> <p><u>Helen Sharman</u> (Astronaut who was the first British citizen to go into space)</p> <p><u>Tim Peake</u> (Astronaut who was the first British person to walk in space)</p>	
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Living things and their habitats	Animals, including humans	Evolution and inheritance	Light	Electricity
<p><u>Carl Linnaeus</u> (Botanist & Zoologist who developed a taxonomy for classifying organisms)</p>	<p><u>William Harvey</u> (Doctor who discovered the nature of blood circulation and the function of the heart as a pump)</p> <p><u>Santorio Santorio</u> (Doctor who invented an instrument to measure pulse accurately using a pendulum and did the first scientific study of the metabolism)</p> <p><u>Richard Doll</u> (Doctor who proved the link between lung cancer and smoking)</p>	<p><u>Mary Anning</u> - links to free resources requiring a login (Fossil hunter who developed the theory that dinosaurs had become extinct a long time ago)</p> <p><u>Charles Darwin</u> - links to free resources requiring a login (Natural Historian who developed the theory of evolution by natural selection)</p> <p><u>Alfred Wallace</u> (Natural Historian who developed the theory of evolution by natural selection)</p>	<p><u>Euclid</u> - search document for information (Mathematician who predicted that light travels in straight lines and we only see things that light falls on)</p>	<p><u>Nikola Tesla</u> - links to free resources requiring a login (Electrical & Mechanical Engineer who developed the AC electrical system and made important advances in technologies such as x-rays, neon lights and robotics)</p> <p><u>Alessandro Volta</u> (Physicist who developed the electric battery)</p>
<p><u>Agnes Arber</u> (Botanist and first woman to become a fellow of the Royal Society who studied aquatic flowering plants and monocots, a group of flowering plants)</p>	<p><u>Ruth Ella Moore</u> - search document for information (Bacteriologist who researched immunology, blood groups and tuberculosis)</p>	<p><u>Nettie Stevens</u> - search document for information (Geneticist who concluded that sex is inherited as a chromosomal factor and that males determine the gender of offspring)</p>	<p><u>Ibn al-Haytham (Alhazen)</u> (Physicist & Mathematician who developed a theory that light travels in a straight line, and proved it by carrying out the first scientific experiment)</p>	<p><u>Mildred S Dresselhaus</u> (Materials Scientist whose research led to the development of the rechargeable batteries in all modern electronic equipment)</p>

<p><u>Hu Xiansu</u> - search document for information (Botanist and founder of plant taxonomy in China)</p> <p><u>Beatrix Potter</u> (Mycologist, study of fungi, and Scientific Illustrator)</p>	<p><u>James Miranda Steuart Barry</u> - search document for information (Doctor - born Margaret Bulkley, who went to medical school by presenting as male and lived the rest of his life as a man – who became Inspector General of military hospitals and improved conditions for wounded soldiers, native inhabitants, and performed the first caesarean section in Africa)</p>		<p><u>Ibn Sahl</u> - search document for information (Mathematician who observed the paths of rays of light as they reflected off different mirrors)</p>	
		<p><u>Emma Dunne</u> (Palaeobiologist who investigates how ancient climate change affected the evolution of different species)</p> <p><u>Telma Laurentino</u> (Evolutionary Biologist who measures differences in the colour of lizards that live in white desert sands to find differences in their genes which might have allowed them to survive in such an extreme environment)</p>	<p><u>Colin Webb</u> (Professor of Laser Physics)</p>	

Useful resources

- [A Scientist Just Like Me](#), Primary Science Teaching Trust
- [1001 inventions](#) gives information about discoveries from Muslim Civilisation
- [Unsung Scientists](#), Linnean Learning
- [A Future in Chemistry](#), Royal Society of Chemistry
- [Research Cards](#), Ogden Trust
- [Standing on the Shoulders of Giants](#), Primary Science Teaching Trust
- [Superhero Scientists](#), Millgate House Education