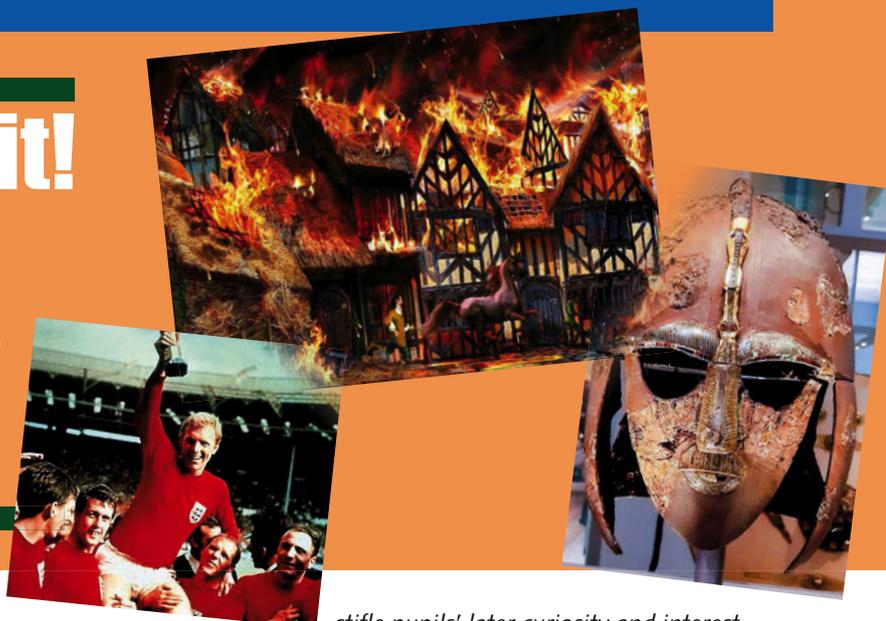


Read all about it!

Science and history: the perfect combination for creative science



Michele Grimshaw and Kathy Schofield from PSTT outline how history and science can be linked to develop even better teaching

Man lands on Moon; England's World Cup victory; Pudding Lane blaze rips through London; Sutton Hoo treasure discovered

All these newsworthy events have brought with them scientific developments that have furthered our knowledge and understanding of the world and impacted on our life today. Events such as these can provide the perfect way to link history with science and provide children with the opportunity to make the connection between science and everyday life. We are also giving them the chance to see the process of working scientifically, whereby a problem needs a solution and, by a process of investigation, testing and failure, a solution can be achieved. The National Curriculum in England science programmes of study state: *The social and economic implications of science are important but, generally, they are taught most appropriately within the wider school curriculum: teachers will wish to use different contexts to maximise their*

pupils' engagement with and motivation to study science (DfE, 2013a)

The world beyond the classroom is cross-curricular and never has this been more relevant. The headline '*Virus panic hits schools*' has impacted on the mode of education that children all through the UK have experienced from March 2020. The focus on the COVID-19 pandemic in the media has provided opportunity for discussion around the science involved. The situation has required a different approach to education and many of the resources available online are of a cross-curricular nature.

Many cross-curricular planning tools are available to teachers, either through paid schemes or freely on the internet. The English curriculum is often the starting point for planning for a cross-curricular topic, with the other subjects 'slotted in'. Although science is still a core subject, it is often classified alongside the foundation subjects and not given the status and time required to fully cover all the necessary content. This can result in a haphazard approach whereby science knowledge and skills are not developed in a logical way, being guided by the genre of English writing tasks pertinent to a particular year group. A recent Ofsted research paper states:

Inspectors found that science and most of the foundation subjects often had weaknesses in the curriculum design that were not present in English and mathematics. ...

Science has clearly been downgraded in some primary schools since the scrapping of the key stage 2 test. This is likely to have a serious impact on the depth and breadth of science understanding and knowledge that pupils take with them into secondary school, which may in turn

stifle pupils' later curiosity and interest in the sciences. (Ofsted, 2019: 2, 5)

As Primary Science Teaching Trust (PSTT; pstt.org.uk) mentors for the North West Area of England (Michele) and North Wales Region (Kathy), along with teacher Naomi Shallcross we have developed a set of resources based on key historical eras: 1066, 1666 and 1966. Science lies at the heart of these resources and the structure encourages progression in understanding, highlights the 'working scientifically' elements and links directly to the National Curriculum in England programmes of study for science and history (DfE, 2013a,b). The resources also link to the Scottish, Northern Irish and Welsh curriculum requirements. Additionally, they provide opportunities for writing activities appropriate to the targeted key stages and links to other curriculum areas.

From the 7th century onwards, men and women of different faiths and cultures built on knowledge from ancient civilisations, making breakthroughs that have left their mark on our world. The resources reference some of these figures who were making incredible discoveries during the Anglo-Saxon period and also scientists from the 1960s who have not been given full recognition for their work.

The resources

1066 – lower key stage 2 (ages 7–9)

We all know that the Battle of Hasting took place in 1066 but how much do we know about the everyday lives of the Anglo-Saxons? This resource brings to life the influences of the Anglo-Saxons still relevant to our lives today, namely their house building, farming, knowledge of medicine and creativity. It encourages children to construct Anglo-Saxon houses and to investigate the importance of

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location with reference to light and the necessity of a water source.

Children explore the digestive system practically, learning how the body functions and what happens to the food they consume. Finding out what the Anglo-Saxons ate involves children becoming archaeologists, as deconstructing (model) poo gives them practical experience of uncovering what the Anglo-Saxons ate on a day-to-day basis. From that knowledge, they can go on to grow the foods eaten by the Anglo-Saxons and secure their understanding of parts of a plant and the requirements for successful growth. Knowledge of plants is developed further through the production of ink, modelling Anglo-Saxon techniques.

Having experienced the daily life, the children go on to replicate Anglo-Saxon leisure pursuits, including music and drama, bringing science into play with the story of Beowulf, an epic poem purported to have been written during the Anglo-Saxon period.

All these investigations tie in closely with the history of the Anglo-Saxons, culminating in working out how, in 1939, archaeologists recovered the huge ship at Sutton Hoo using physics skills.

1666 – key stage 1 (ages 5–7)

This was a significant period in history with many scientific discoveries by leading scientists of the day, including Sir Isaac Newton and Robert Hooke. However, for people living in London at this time, life was hazardous, with the Great Plague being followed later that year by the Great Fire of London. People also had to survive the vagaries of the weather that year – a summer drought with changing winds preceded by a cold winter.

Setting the scene for the Great Fire of London the resource begins with the creation of a weather station, which will provide valuable data for the children to compare with the data from 1666, cleverly incorporating maths and science with a history focus. The story unfolds with the exploration of materials used in 1666 and an investigation of combustion, to create a vivid picture for the children as to how and why the fire started and spread so rapidly.

Every aspect of health and safety has been considered within the resource to support teacher confidence to provide first-hand experiences for the children. Doing and seeing means believing, allowing the children, for a brief time, to live the past. Drawing on first-hand accounts of the time about how people

attempted to put out the fire with buckets of water from the River Thames, the children are encouraged to repair a damaged bucket with the appropriate materials and test their problem-solving skills.

Children cannot relive the story of the Great Fire without preparing bread as the baker in Pudding Lane, where the fire started, would have done on that fateful night. They use maths skills for measuring and weighing, while beginning to understand how yeast works as a living organism.

Staying with the topic of food, children are introduced to life after the fire and the development of an apothecary garden, the importance of herbs and how the Stuarts catered for their ailments. This section ends with a problem-solving task for the children: can they create a boat that will carry Samuel Pepys's prized Parmesan cheese across the River Thames to be buried for safekeeping, a science enquiry set in a real-time context.

This resource culminates with a further look at materials, as the children look back to 1666 and compare this period with materials in their own lives. Which objects are important to them? What would they save if a fire took place in their home?

1966 – upper key stage 2 (ages 9–11)

Although not a widely taught era, the 1960s was a time of enormous change throughout the world; it provides a perfect context for giving children an insight into how our world has been transformed and benefited from developments in science. It also provides children with the opportunity to discuss ethical issues, such as 'Should we use animal organs for transplants?' and 'Was it ethical to spend so much money on sending men to the Moon when there is so much poverty in the world?'

Using the areas of sport, health and space, the resource fits in with the non-statutory history suggestions and the science programmes of study for key stage 2. As we are talking about just 60+ years ago, it also allows for interviews to be conducted with older family members and for their accounts of life in the era to be compared. Most of the children who trialled this resource were from a Pakistani heritage background; the 1960s was a significant period in their family history when many of their relatives moved to this country.

Using the topics of sport, health and space to link with the requirements of the key stage 2 science curriculum, provided the chance to look more deeply into the

ethics surrounding funding for some scientific projects. Focusing on the history of space exploration provided a different angle as we studied the Cold War and the start of the Space Race between the USA and Russia. The children were fascinated to discover how many 'firsts' Russia had achieved in this field. We listened to President Kennedy's speech about sending a man to the Moon and analysed his motives for this. During this part of the topic, the children produced some wonderful discursive writing alongside developing their debating skills.

Watching the 1966 World Cup Final was the hook to introduce this part of the unit. We compared the material used in football shirts then and now, discussing cotton versus synthetic materials from a biodegradable aspect as well as performance. Other areas looked at were the development of football boot designs and the change in the type of grass used for football pitches.

Conclusion

Throughout each of the resources, careful consideration has been given to developing science enquiry skills, all linked to the history context. It is our belief that using science as a vehicle for teaching history brings positives and allows relevance and continuity for both subjects.

Crucial to science education is hands-on involvement: showing not just telling; real experiences and field trips and not just 'virtual reality'. (Martin Rees, 60th President of the Royal Society)

References

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It is planned to publish these resources under the general title *Science in the 60s*. More information will be available in due course on the PSTT website: <https://pstt.org.uk>

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