“The DNA Detectives – The Stone Age Mystery” – curriculum links

“The DNA Detectives – The Stone Age Mystery” is the third book in “The DNA Detectives” series. The other titles include “The DNA Detectives – To Catch a Thief” and “The DNA Detectives – The Smuggler’s Daughter”. These are the first fiction books written for 7 – 14-year olds where children use DNA to solve a crime. The idea is that as well as an exciting story children are learning about DNA, cells and forensic science.

The books were written so that they could be used as a cross curricular resource for science and literacy. The third book in the series “The DNA Detectives – The Stone Age Mystery” is about archaeology and the Stone age and can also be used to teach history. The books are accompanied by a series of weblinks which children can use to discover more about the topics in the book and to try out fun and exciting activities.

How do these books support the curriculum for English?

Reading the books in class fulfils many of the requirements of the National Programme of study for English in terms of vocabulary, reading and comprehension for both KS1 and KS2.

I have written these books so they are fast paced, easy to read, with an exciting plot and plenty of twists and turns along the way. I hope that it will inspire children with a love of reading, to show them that reading is fun and leave them wanting more!

Children can read the books independently or as a class. Through reading the books children can practice their phonic knowledge and skills to help them decode words they don’t recognise. The vocabulary in the books is aimed at children between 7 – 14 years who have a wide range of reading skills. The books can be read aloud to test children’s knowledge of blending and common words.

There are plenty of contractions within the text which have been included to make the speech within the story more realistic and fluid. These provide great examples to help children understand that the apostrophe in the text represents the missing text e.g. I’ll – I will, it’s – it is, should’ve – should have etc.

There are great opportunities for discussion and guided reading with these books. Children can be encouraged to take turns in asking relevant questions and listening to others asking questions. Reading the books can lead to a class discussion where children can express their views, discuss the chapters, recap on the evidence that has been found or the sequence of events – What does it mean? Who do they think has stolen the artefacts? How are the characters in the story different? What do they think will happen next? What was the order of evidence found? What was the sequence of events that led to the characters coming to their conclusion? This can be used to demonstrate that the children have listened or read the story accurately and have understood the meaning of the language and text used.

Children can also talk about their ideas for writing a chapter in the book and come up with ideas for stories of their own. In my experience children reading these books love making inferences as to who they think is the thief and why. They love trying to work this out by piecing together the information.

Through listening to the books being read and having discussions with their teacher or friends in class children can start to increase their vocabulary. They will also learn how language sounds, how sentences are structured and they can learn new words that they may not hear in everyday language. This book will help children build up a range of specialist vocabulary and technical terminology such as deoxyribonucleic acid (DNA), cell, cytoplasm, archaeologist, tartar, ochre, petrous bone and DNA profile.

Children can participate in role play, maybe excavating their own grave to find artefacts and act out the parts of the children in the story, the thief, archaeologist or police officers. This can help them to identify with and explore the different characters especially “Annabelle” and “Harry” who are very different. The children could decide which of these characters they are more like! These roles will require them to problem solve, listen and respond to what they are being asking to do. They will be encouraged to speak audibly and fluently for their part in the story. They will have opportunities to improvise and respond appropriately to others in the role. This will help them to understand what they have read and try out the language they have listened to. This could help to build confidence and competence for speaking language.

Children can also try some of the activities on the web links to help extend their understanding of what they have read e.g. When reading the chapter in this book where the children break into the lab and extract DNA from their samples children could go to the virtual laboratory online and have a go at extracting DNA or try extracting DNA from fruit in the classroom. They could also create some display posters for the new museum which is created in the story in Annabelle and Harry’s school to show off the discoveries that were made in the cave.

How do these books support the curriculum for Science?

This book has been designed been designed to fit with several aspects of the national programme of study for science for KS1 and KS2.

Children will learn that all living things have DNA which complements their work on living organisms. There is a great activity on the web links where children can make bracelets based on DNA sequences from species in each of the Kingdoms. A great activity to support learning about “Classification”.

Within the story the archaeologist shows the children the skeleton that has been found in the cave. They talk about the bones which make up the skeleton and whether all the bones are present, whether the skeleton is a girl or a boy and what the damage to the skeleton can tell us about that person. This information helps support learning about “Animals” and will help children make the link between the skeleton and different body parts e.g. How would damage to the skeleton have affected the persons movement?

Throughout the book children are learning about DNA which fits very well into the topic of "Evolution and inheritance". It is very hard to explain these topics to children without a basic understanding of DNA which the book and associated weblinks provide. The idea used in the book of how our DNA is like a Lego kit with instructions on how to build all the different parts of our body has been included to help with this.

The chapter in the book where the scientists explain how we can use DNA to find out what someone looks like is really useful for helping children to understand why we get variation. This is a hard concept for them to visualise and their understanding of this topic is fundamental to explaining evolution. The descriptions in the book including the evolution of skin and eye colour and the weblinks will really help children to grasp this complicated concept.

When comparing forensic data in the book the characters identify what materials scene of crime officers are looking for as sources of DNA. They then look at the DNA profiles from the crime scenes and the suspects for patterns and identify similarities and differences. Children can do this by printing out the DNA profiles used in the book from the web links on my web site.

This is encouraging the children to observe data and make inferences from the data. The children in the book identify the difference between a female and a male DNA profile. Also, when identifying which teacher is the thief using DNA from the mosquito, they look for similarities between the DNA profiles to solve the crime. In their haste the children in the story make a mistake. This teaches a valuable lesson when comparing scientific data, not to rush and make assumptions with the first piece of data you see. Look at everything and check your assumptions are correct!

Throughout the books children are encouraged to observe different aspects of DNA, to identify scientific evidence to support an argument and to ask questions about what they have found and to be curious. When the children in the book are extracting DNA in the laboratory, the reader can see how they are working scientifically i.e. labelling tubes, including controls etc. They can then apply this to their own work.

I hope that by finding out the answers to the different questions by reading the book i.e. what is DNA? Who is the thief? How old is the skeleton? Was the skeleton male or female? Children will be inspired to want to find out more, to read about it and find out the answers to their questions.

Once children have read the books if they want to find out more, they can access the web links on my web site. This will enable them to learn more about DNA, cells, archaeology, Stone Age and forensic science and try out some of the fun activities either at home or in the classroom such as - extracting DNA from fruit, making a plaster cast footprint, becoming forensic scientists and solving a crime online or going to a virtual online laboratory and extracting DNA just like the characters in the books!

How do these books support the curriculum for History?

In Key stage 2 children are encouraged to learn about changes which occurred in Britain in the Stone Age. In the story children find out how we can learn about this period of time through the artefacts which were left behind. They learn about what rots away and that our clues to the past come from skeletons and stone tools. Potentially, because the only artefacts that are left behind are stone tools this subject may be perceived by children as being “dull” or “boring”. This book aims to demonstrate this is very far from the case and that the Stone Age is probably one of the most exciting periods in time.

Discussion in the book around the story will include historical terms which relate to the Stone Age such as Paelolithic, Mesolithic and Neolithic. The inclusion of words for stone age tools and cave art like flint, knapping, hammer stone, axe, ochre, aurochs and arrow head. They will find out what was important to these people, what they needed to survive and what hardships they faced? They can see how scientists and archaeologists can make inferences about how people lived from different sources like excavating graves, looking at the artefacts, the soil and the skeleton. They can see how advances in DNA technology can tell us what these people looked like, what they ate and how healthy they were. Which raises questions like – Do they look that different from us? Are we related to Stone Age people? Were they clever?

Children will learn about different Stone Age tools, how important they were and how they were created. Also, how they changed over time. One of the most interesting aspects of the Stone Age is the discovery of cave paintings from this time period. Children will get to appreciate how amazing it is that these pictures have survived. They will learn what materials were used to create them, how children were involved and what they meant. They will learn how archaeologists think some paintings are the first ever examples of cartoons!

The weblinks will allow the children to find out more about the information in the book and enable them to read about and watch video clips about other Stone Age discoveries like “The Red Lady of Paviland” and “Cheddar Man” and how DNA is extracted from ancient bones and tartar on teeth. There are also articles about the actual discoveries made by scientists when examining soil and artefacts found in ancient caves and even ancient chewing gum!