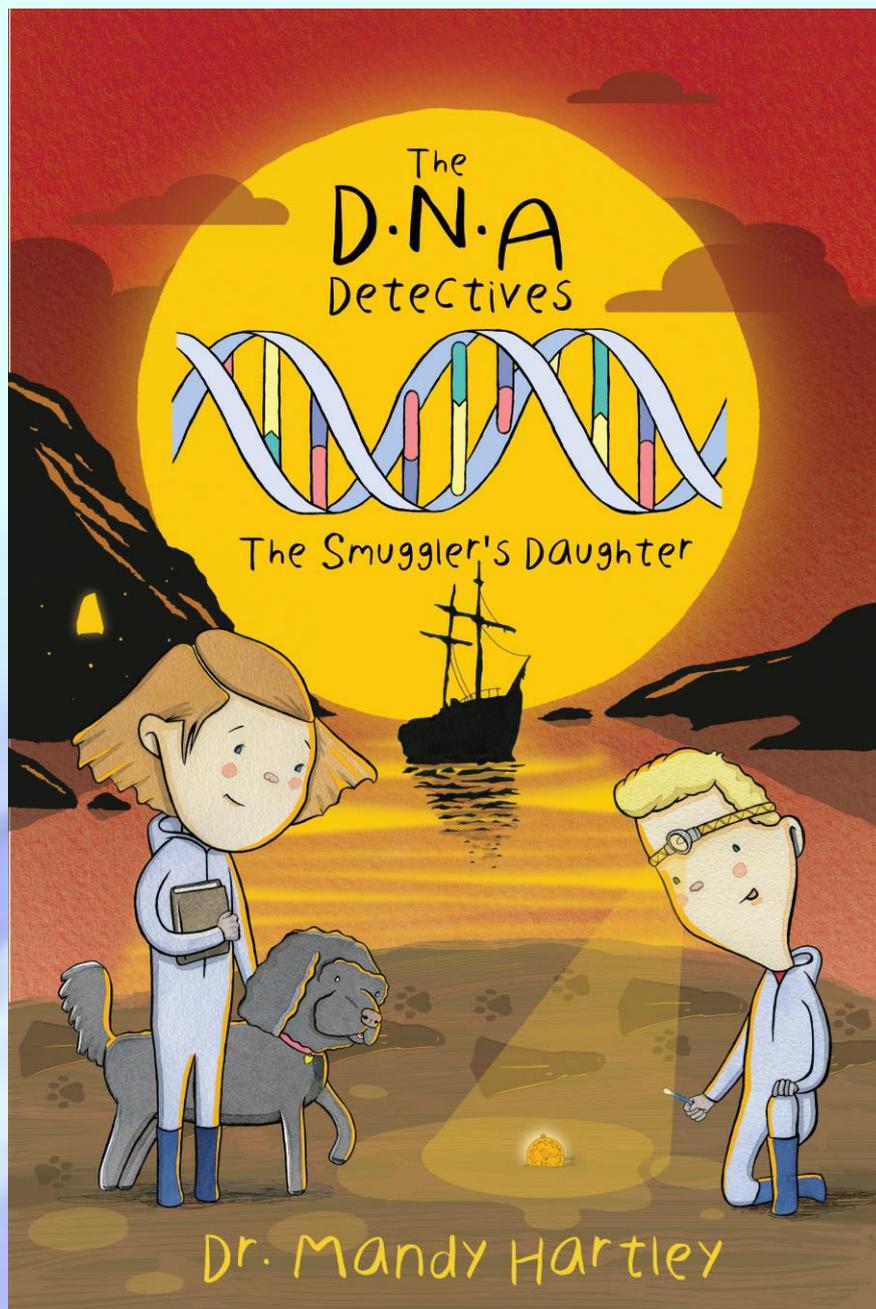
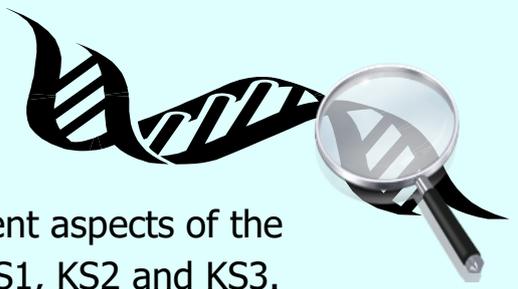


# 'DNA Detectives – The Smugglers Daughter'



## How does this workshop fit into the curriculum?



This workshop has been designed so that it fits with different aspects of the National Programme of study for English and science for KS1, KS2 and KS3.

### English

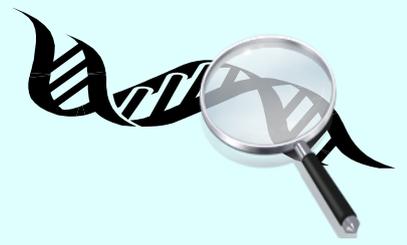
The idea is that the book "The DNA Detectives – The Smuggler's Daughter" and the workshop are combined together to act as a resource for English. Ideally the children should read the book together as a class prior to the workshop (it is possible to participate in the workshop without reading the book however). Reading the book in class fulfils many of the requirements of the National Programme of study for reading in terms of word reading and comprehension for both KS1, KS2 and KS3 (please see the curriculum links for the book for more details);

<http://www.thelittlestorytellingcompany.co.uk/the-smugglers-daughter>

Through listening to the workshop young children can start to learn how language sounds and older children can increase their vocabulary with words that they may not hear in everyday language. This work shop will help children build up a range of specialist vocabulary and technical terminology such as deoxyribonucleic acid (DNA), cell, cytoplasm, nucleus, mitochondria, DNA double helix, genetic code, mutation, inheritance, polydactyly, fingerprinting and DNA profile. There are sections of the workshop where we stop and review what we have learnt so the children get to explain and discuss with the others what their understanding of these terms is. These discussion sections will be used to ensure the children understand the terms and to probe and remedy any misconceptions.

There are great opportunities for discussion following this workshop. Children will be encouraged to take turns in asking relevant questions and listening to others asking questions at the end of workshop. Watching the workshop could then lead to class discussion where children can express their views, talk about their ideas for writing a chapter in my book, come up with ideas for stories of their own. This should really stimulate their imagination about what it would be like to be a character in the book and discover evidence to solve a crime or to trace family members using DNA to return long lost treasure!

During the workshop children are asked if they would like to participate in the roles of Henry Nance (the head of the smuggling gang), Elise (the smuggler's daughter), children on holiday, the King's men and scientists working on the case. These roles will require them to problem solve, listen and respond to what I am asking them to do. They will be encouraged to speak audibly and fluently for their part in the workshop. They will have opportunities to improvise and respond appropriately to others in the role. The children in the audience will also help me analyse the data to find out what Henry Nance would have looked like, to see if any of the audience have Norwegian or Cornish origins and could be related to either Henry Nance or Elise. We will find out who comes from a family of smugglers and who is the rightful owner of the treasure!



Volunteering to act out a role in the workshop in front of their class mates could be a new experience for many of the children. I hope this and answering questions as part of the workshop will build their confidence and competence for speaking language.

I think the children will be really proud of their achievements in helping me bring the roles in the workshop to life. I have found this is particularly the case with children who are quite nervous of joining in. For these children it is especially rewarding when they take part and are so proud of themselves for achieving their goal, something they may not have thought they could achieve.

## **Science**

This workshop has been designed to fit with several aspects of the national programme of study for science for KS1, KS2 and KS3, in particular the topics of evolution and inheritance.

In the first part of the workshop children are asked to think about what they can see, smell, hear, taste and touch in a particular location. We use this to recap what parts of the body are associated with the different senses.

In the workshop we will be analysing results from DNA extracted from a tooth belonging to Henry Nance and a lock of hair from Elise. We will use this process to learn about DNA (what DNA is, where we find it in the body and how big it is), cells and cell contents including the nucleus, cell membrane, cytoplasm and mitochondria.

We will be using DNA sequencing to look at inheritance in this case we will identify how a rare mutation in Elise's family has led to many generations inheriting polydactyly (the person will have an additional toe or finger). We will be comparing DNA sequences to identify what Henry Nance looked like i.e. his hair, eye and skin colour. In addition, we will look at how mitochondrial DNA can be used to identify where individuals come from geographically and how we can use this to identify relatives of Henry Nance and Elise.

Once children understand what DNA is, mutations and how DNA is inherited this enables them to understand the concept of evolution much more easily.

When the children are learning about DNA we use a game of operation to think about where the DNA and cells are in our bodies. The children in this section of the workshop have to demonstrate their knowledge of where the different organs in the body and to name them. This is great revision for the topic of "Animals and Humans".



Children will learn that all living things have DNA which complements their work on living organisms. Learning about DNA fits very well into the topic of evolution. As part of this work shop the children learn about the building blocks of DNA and how with different combinations of these four different blocks a human being is made. They will also learn at a simple level how different combinations can lead to different eye or hair colour and the ability to roll their tongues!

Throughout the workshop 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. We discuss our findings and the implications of these findings with the answers coming where possible from the children. I hope that by finding out the answers to the different questions in this workshop i.e. what is DNA? How are diseases inherited? How can we use DNA to find out what someone looks like? How can we use DNA to find out where someone comes from? Children will be inspired to want to find out more, to read about it and find out the answers to their questions. At the end of the workshop I will explain if the children want to find out more they can access the web links on my web site;

(<http://www.thelittlestorytellingcompany.co.uk/workshops>).

This will enable them to learn more about DNA, cells, inheritance, evolution and ship wreckers and try out some of the fun activities either at home or in the classroom such as - extracting DNA from fruit, trying some quizzes to identify where someone comes from and what they look like or going to a virtual online laboratory and extracting DNA just like real scientists!