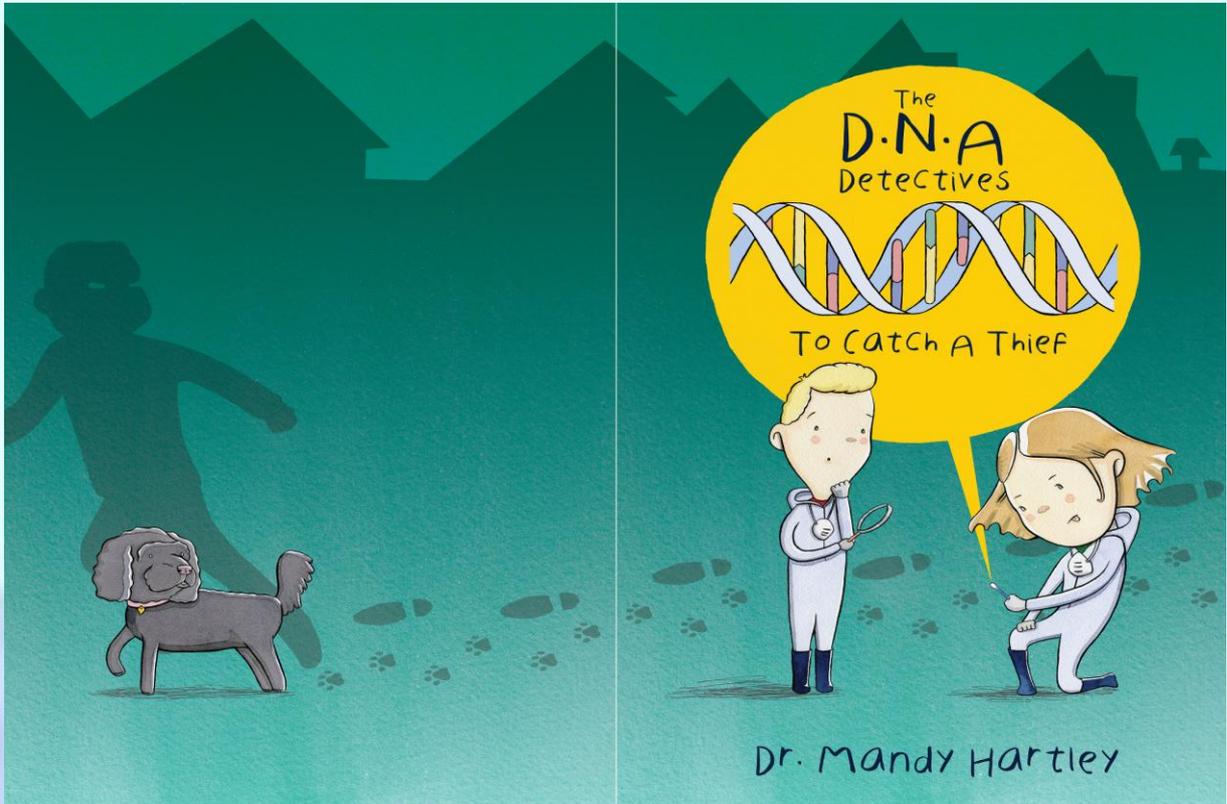
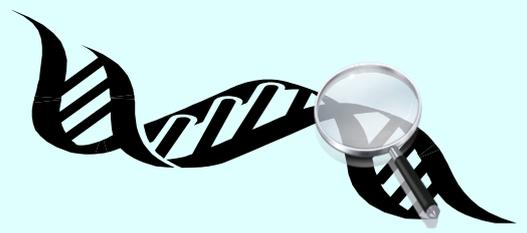


'DNA Detectives – To Catch a Thief'



Weblinks



Web links for “The DNA Detectives – To Catch a Thief”

Chapter 1: A laboratory in the garden

Would you like to find out What DNA is?

In Chapter 1 Annabelle introduces us to DNA. You can find out more about DNA and try these fun activities by clicking on the web links for this chapter.

1. Watch this video clip to find out what DNA is:
<http://learn.genetics.utah.edu/content/basics/dna>
2. This fact page from yourgenome gives a great introduction to what DNA is.
3. What is DNA fact page – <https://www.yourgenome.org/facts/what-is-dna>
4. Do you know what a genome is? Find out with this fact page from yourgenome.

What is a genome fact page - <https://www.yourgenome.org/facts/what-is-a-genome>

5. Why not make a DNA sequence bracelet. Find out more about DNA and its chemical letters A, T, G and C with this bracelet making activity from yourgenome.

<https://www.yourgenome.org/activities/sequence-bracelets>

6. Find out how to make a DNA Helix out of sweets:

<https://www.youtube.com/watch?v=iNztJjHKw98>

7. Make an origami DNA helix:

<http://www.yourgenome.org/activities/origami-dna>

8. Have a look at this great song all about DNA!

<https://www.youtube.com/watch?v=T5gEIViVAPw>



Chapter 3: The Investigation begins

Would you like to find out how forensic scientists compare hairs under the microscope? Can you catch a thief using hairs?

In Chapter 3 Annabelle and Harry collect hairs from people who they suspect could have stolen Milly. They compare hairs from the suspects with hairs in the hat they found at the crime scene in the garden. They have worked out if the hairs from the hat match one of the suspects they could identify the pet thief! You can find out how forensic scientists use hairs to solve crimes and try these fun activities by clicking on the web links for this chapter.

1. Click on the video links on my website to watch these clips and find out more about how real forensics scientists compare hairs and fibres found at crime scenes:

Comparing hairs and fibres – Forensics Part 1 (movie clip)

Comparing hairs and fibres – Forensics Part 2 (movie clip)

2. Why not try being a real forensic scientist? Click on the web link below to play an interactive game to collect hairs from suspects and compare them under the microscope and by chemical analysis to see who is guilty of the crime.

<http://www.nhm.ac.uk/resources/kids-only/fun-games/hair-detective/hair-detective.swf>

Chapter 5: How to catch a thief

Would you like to find out what our DNA does and how our DNA make us unique?

In Chapter 5 Annabelle and Harry are discussing what DNA is. Annabelle explains to Harry that all living things have DNA. She explains that everyone and everything's DNA is different. Find out more about DNA "the instruction manual for life", what makes us unique and try these fun activities by clicking on the web links for this chapter.

1. This video clip by Dr. Aoife McLysaght from the Royal Institution lectures explains about DNA, genes and chromosomes. There are some great illustrations of these different topics which make them easy to understand

<http://ed.ted.com/on/86fguRtb>



2. Find out about the DNA code from yourgenome. What does DNA do?
<https://www.yourgenome.org/facts/what-does-dna-do>

3. Why do some people have different eye colour or dogs have different fur colour? It's all in the DNA code find out more from yourgenome

What is genetic variation: <https://www.yourgenome.org/facts/what-is-genetic-variation>

4. Why not have a go at this interactive game to learn about variation in our DNA that makes us unique.

<http://www.insidedna.org.uk/hmlm>

5. Have a go at this interactive program to find out what happens when you zoom into our bodies and have a look at the cells, nucleus and our DNA in more detail.

<http://www.rigb.org/education/games/human-body/dna-focus>

6. Watch the video clip first to see how DNA affects the colour of our eyes then try the interactive game to see if you can use what you have learnt to change the colour of the baby's eyes to blue and then brown!

<http://www.richannel.org/collections/2013/chromosome#/chromosome-15>

<https://www.abpishools.org.uk/full-screen-animation/232/229>

7. This video clip gives a beautiful animated explanation about DNA 'The instruction manual for life'. It explains about what makes us unique.

<http://www.popsci.com/science/article/2013-03/watch-absolutely-beautiful-animated-explainer-dna>

8. Find out about other organisms which have DNA, how much DNA they share in common with humans and what makes you – you! There are some amazing facts in this video!

<http://www.richannel.org/18-things-you-should-know-about-genetics>



Find out about the outfit worn by Crime Scene Investigators (CSI) and how real forensic scientists investigate a crime scene

When Annabelle and Harry go to collect evidence from the different crime scenes they wear overalls, gloves and a facemask just like real "Crime Scene Investigators (CSI)".

1. Watch the video clip below to find out why real Crime Scene Investigators (CSI) wear outfits like this when they collect evidence from a crime scene.

<https://www.youtube.com/watch?v=JgzdhUAJrBA>

Every contact leaves a trace

When Annabelle and Harry go to collect evidence from the crime scene Annabelle reminds Harry about what they learnt in their Mum's Forensic Workshop "Every Contact leaves a trace". This means everything you touch can leave a trace of DNA. Forensic scientists can use the DNA to identify who has been at the crime scene. You can find out how forensic scientists collect evidence and try these fun activities by clicking on the web links below.

1. Watch this video clip to see how forensic scientists use DNA evidence found at a crime scene to catch a criminal.

<https://www.youtube.com/watch?v=AkBUriMK9u8>

2. Find out about the different roles of the police, Crime Scene Investigators (CSI), crime scene photographers and forensic scientists, how they work together to solve a crime and what qualifications you need to do these jobs by watching this presentation made by Birmingham Metropolitan College.

<https://www.youtube.com/watch?v=QP9IE0XWqw0>

3. Have a look at this series of videos made by a Primary school who carried out their own criminal investigation. Find out what evidence was left at the crime scene and how the children tested the evidence to find the culprit. They even did their own DNA analysis from a sample found at the crime scene just like Annabelle and Harry in the story.

<http://archive.teachfind.com/ttv/www.teachers.tv/videos/part-2-collecting-the-evidence.html>

<http://archive.teachfind.com/ttv/www.teachers.tv/videos/part-3-dna-fingerprinting.html>

<http://archive.teachfind.com/ttv/www.teachers.tv/videos/part-4-the-verdict.html>

Find out "What is a DNA profile?"



In Chapter 5 Annabelle and Harry talk about their Mum's Forensic workshop where they used DNA to find out who had stolen the sweets. It's your turn now! Have a look at the DNA from the suspects and the sweets to work out who was the thief!

1. Click on the Power point presentation on my website "Who stole the sweets". Follow the instructions to find out what a DNA profile is and find out the identity of the thief! Is it Harry or Peter?

Chapter 6: The DNA Detectives investigate the scene of the crime

Find out how Crime Scene Investigators collect evidence from a crime scene

In this Chapter Annabelle and Harry collect evidence from the crime scene in the garden. This is the location where they think Milly was taken. There is a lot of evidence to collect! You can find out how forensic scientists collect evidence and try these fun activities by clicking on the web links below.

1. Watch the video clip below to find out what it is like to work as a real Crime Scene Investigator (CSI) and collect evidence from a crime scene.

http://news.met.police.uk/blog_posts/realcsi-crime-scene-examiners-47236

2. Help Detective Bones solve a crime that has occurred in the Science Centre. You will need to collect the evidence and then send it to the laboratory to be analysed. Can you solve the case?

<http://www.glasgowsciencecentre.org/play-games-online/gsi-glasgow-science-investigation.html>

3. Another case for you to solve against the clock! Gather the clues and see if you can work out who did it!

https://web.archive.org/web/20131226063804/http://www.trutv.com/shows/forensic_files/games/burgledbonuses/index.html

Find out how to make your own plaster cast of a foot print

In chapter 6 Annabelle and Harry make a plaster cast of the foot print they found in the garden. They want to compare it with the boots from their suspect to see if they match. Then they can prove that person was at the crime scene.

1. Click on the web link below to find out how real Crime Scene Investigators and Forensic Scientists collect and analyse footprints from Crime Scenes.

<https://www.youtube.com/watch?v=7-esqwmLmCs>



2. Click on the web link below to find out how you can make your own plaster cast animal or human footprints and then paint them.

<http://www.pennilessparenting.com/2014/11/making-plaster-cast-footprints-fun-and.html>

Or watch this YouTube clip for an alternative method.

<https://www.youtube.com/watch?v=ZHpo-ImFkgQ>

3. Why not try this interactive game where you have to examine shoe prints and tyre tracks to solve the mystery. Good luck!

https://web.archive.org/web/20131226070448/http://www.trutv.com/shows/forensic_files/games/hiddenmine/index.html

Chapter 9: In the laboratory

Find out how to identify your own fingerprints at home

In this Chapter Annabelle and Harry dust for fingerprints so they know which buttons their Mum has pressed on the keypad to get access to the laboratory. You can find out more about fingerprints and try these fun activities by clicking on the web links below.

1. Click on the link below to find out more about how Crime Scene Investigators and forensic Scientists collect and analyse fingerprints to catch criminals.

<https://www.youtube.com/watch?v=q1MzUIs-hr4>

2. Click on the link below to find out how to take fingerprints from your own hand. There is even a fingerprint record card to print out just like the police use!

<http://buggyandbuddy.com/exploring-fingerprints-science-for-kids/>

3. Click on the link below which has instructions to put your fingerprint on a balloon so it is easier to see and shows you how to collect fingerprints from different objects.

http://www.kidsciencechallenge.com/pdfs/2009activities/KSC_Fingerprint_2009.pdf



If you don't want to use an ink pad to collect your prints you can make your own fingerprinting kit with a pencil! Click on the link below to find out how.

<http://www.kiwicrate.com/projects/Fingerprint-Kit/2041>

4. Try this interactive game to see how good you are at identifying a criminal from their fingerprints.

https://web.archive.org/web/20131226061738/http://www.trutv.com/shows/forensic_files/games/fingerprint/index.html

5. Have a look at Mr. Dapple's 'Did you know clip' to find out more about fingerprints. Some very interesting facts!

http://www.skwirk.com/includes/mediawindow.asp?media_id=2966

Why not have a look round a real forensic laboratory

In Chapter 9 Annabelle and Harry describe their Mum's laboratory to us where they go to extract DNA from the samples they have collected from the crime scene. Why not look around a real lab or extract some DNA by clicking on the web links below.

1. Why not click on the link below to have a look around a real forensic laboratory.

<http://kidsahead.com/external/activity/6>

2. This is a great activity to try. Click on the link to go to a virtual laboratory where you can extract DNA just like Annabelle and Harry using pipettes, centrifuges and water baths!

<http://learn.genetics.utah.edu/content/labs/extraction/>

What is a cell?

In this chapter to help Harry understand what is happening when they are extracting DNA from their samples Annabelle explains what cells are and where the DNA is found in the cell. Find out more about cells by clicking on the links below.

1. Why not watch the video clips below to help your understanding of what cells are?

<https://www.youtube.com/watch?v=8qFACgy7Ufw>

<http://ed.ted.com/on/lm7NqUdx>



2. Find out what a cell is with this great fact page

<https://www.yourgenome.org/facts/what-is-a-cell>

3. Ever wondered what the inside of the cell looks like? Click on this link to zoom into the cell, the nucleus and the chromosomes!

<https://www.abpischools.org.uk/full-screen-animation/231/228>

4. Find out what a chromosome is?

<https://www.yourgenome.org/facts/what-is-a-chromosome>

5. Watch this video clip to find out more about the structure and function of different cells.

<https://www.youtube.com/watch?v=hywRdDVR76A>

6. Got a good memory? Can you match all the things found inside a cell with this game?

<https://www.yourgenome.org/interactives/cell-snap>

7. See where your DNA is found by zooming into the body with this 3D animation.

Zoom into your genome: <https://www.yourgenome.org/video/zoom-in-on-your-genome>

8. Try these interactive games to find out just how big a cell in your body is!

http://www.cellsalive.com/howbig_js.htm

<http://learn.genetics.utah.edu/content/cells/scale/>

9. Why not make your own cell out of a cookie. Click on the link below to find out how.

<https://www.childrensmuseum.org/blog/saturday-science-homemade-animal-cell-cookie>



Why not try extracting some DNA from fruit at home

In chapter 9 Annabelle and Harry break into their mother's laboratory and extract DNA from their samples. Find out how you can extract some DNA from fruit by clicking on the link below.

1. Why don't you try extracting some DNA at home? Watch the video clip below to find out how.

https://www.youtube.com/watch?v=Fga_IUQdVh4

What does extracted DNA look like?

When Annabelle and Harry extract human DNA from their samples they describe it as looking like white cotton. Have a look at what human DNA looks like by clicking on the web links below.

1. Have you ever seen human DNA? Why not watch the video clip below to see Professor Brian Cox extract some human DNA.

<http://www.bbc.co.uk/news/science-environment-21184523>

2. Click on the link below to see an image of what human DNA looks like. Do you think it looks like white cotton?

<https://explainers.wordpress.com/2007/10/18/the-bubbles-in-your-test-tube/>

Chapter 10: The results are in

DNA Snap – Can you match the DNA from the stolen dogs?

In this Chapter Annabelle and Harry match up the DNA from the fur they found in the shed with samples from Milly, Scally and Poppy. Will they get a match?

1. This is your chance to be DNA Detectives. Print out the DNA profiles from five stolen dogs and the fur found in the shed (you can find these on my website). See if you can correctly identify which dogs were being kept in the shed. Check the results to see if you identified which dogs were in the shed correctly.

PDF: 'Can you match the DNA to the dog?'

PDF: 'Can you match the DNA to the dog?' Results



How can you tell if DNA is from a girl or a boy?

In Chapter 10 Annabelle and Harry are looking at the DNA profiles from the evidence they found in the garden. By looking at the information in the DNA profile they were able to identify whether the DNA they were looking at were from a male or a female. Can you remember how they do it?

1. Have a look at the Powerpoint presentation "How can you tell if DNA is from a boy or a girl?" on my website. Use the presentation to find out how to tell the difference between a male and female from looking at the DNA profiles. See if you can correctly identify which of Annabelle and Harry's friends are male and which are females.
2. Click on this interactive animation which explains how Nettie Stevens and Dr Edmond Wilson discovered the chromosomes responsible for making you male or female.

<http://www.dnaftb.org/9/animation.html>

3. Click on the movie clip on my website "Explanation of X and Y chromosome" to find out more and how we can identify males and females.

How to use DNA to see if someone is related

Read Chapter 10 before you look at the web links below. In Chapter 10 Annabelle and Harry make an important discovery about who stole Milly.

1. Click on the video link to find out how DNA is passed down from generation to generation.

<http://learn.genetics.utah.edu/content/basics/inheritance/>

2. You are now DNA Detectives! Print out the PDF's for "Relationship testing" from my website. Compare the DNA profiles for these individuals and identify whether they are related. Click on the PDF 'Results Relationship Testing' for the results and see if you were right.

PDF "Relationship Testing"

PDF "Results Relationship Testing"

Looking at the DNA evidence – Criminal Snap!



Read Chapter 10 before you look at the web links below. In Chapter 10 Annabelle and Harry match up the DNA evidence with the suspects. You can do the same by trying out the activity below.

1. Why don't you become DNA Detectives? Print out the PDF's "Criminal Snap Part 1" from my website. Look at the evidence and play your own game of Criminal Snap. Look at the results (PDF Criminal Snap Part 1 – Answer) to see if you got it right!

PDF: Criminal Snap Part 1

PDF: Criminal Snap Part 1 Answer

2. Print out the PDF's "Criminal Snap Part 2" from my website. See if you can identify whose DNA is on this evidence? Look at the results (PDF Criminal Snap Part 2 – Answer) to see if you got it right!

PDF: Criminal Snap Part 2

PDF: Criminal Snap Part 2 Answer

3. Find out about "DNA fingerprinting" and how it is used to solve a crime (this is for older children).

<https://www.yourgenome.org/facts/what-is-a-dna-fingerprint>

Chapter 11: Collecting the final piece of the DNA Jigsaw

How good are you at matching footprints?

In Chapter 11 Annabelle and Harry compare the footprint they found in the garden with the suspect. Try the fun activities below to learn more about using footprints as evidence.

1. Click on the link below and print out the footprints. Can you find the pair of shoes from the eight footprints? Good luck!

https://www.activityvillage.co.uk/sites/default/files/downloads/shoe_print_detective_2.pdf

2. See if you can solve this case by printing out the case book and evidence for this exciting footprint comparison activity!

<https://www.scienceworld.ca/resources/activities/shoeprint-identification-crime-fighters-station-5>

Chapter 15: Trapped



Can you make an electromagnet?

In this Chapter Annabelle and Harry make an electromagnet to help them to escape. Why not have a go at making your own electromagnet?

1. Find out how to make an electromagnet by clicking on the link below (you will need an adult to help you):

https://www.youtube.com/watch?v=wX9QBwJBI_Y

2. Read more about electromagnets and why they work by clicking on the link below:

<http://www.bbc.co.uk/education/guides/z3g8d2p/revision/4>

Chapter 16: DNA Detectives catch pet thief!

Make your own headlines

In the final Chapter the story of the "DNA Detectives" makes it into the newspaper.

1. Click on the link below to make your own news story!

<http://newspaper.jaguarpaw.co.uk/>