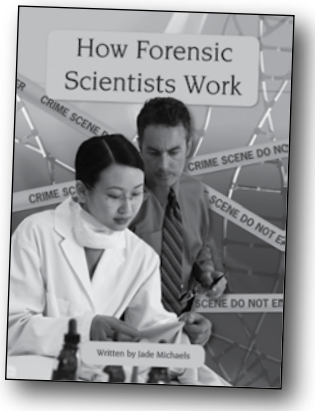
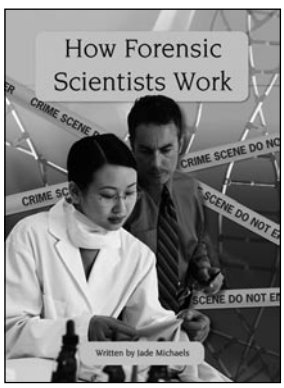


How Forensic Scientists Work

	Text Type	Lower 1500–1800 words RA 8.8–9.2	Middle 1900–2400 words RA 9.3–9.7	Upper 2500–3000 words RA 9.8–10.2
Fact	**Procedure**	Build Your Own Easel	Making a Cheesecake	So You Want to Be a Cartoonist?
	Recount (Explanation)	Ten Milestones in Space	Rail Accidents	Three Terrible Hurricanes
	Information Report (Description)	Mythical Creatures	The World of Caves	Top Towers
	Information Report (Explanation)	A Weather Counting Book	Two Polar Regions	Seven Ancient Wonders
	Interview	Food Science FAQs	Hobbies	Fireflies and Glow-worms
	Biography	Ned Kelly	Mother Teresa: Saint of the Gutters	Edmund Hillary
	Explanation	How Forensic Scientists Work	How Musical Instruments Work	How Solar Energy Works
	Procedural Recount	How I Learned to Be a Nipper	How I Trained for the Junior Triathlon	How I Learned to Snowboard
Fiction	**Realistic Fiction** (Out of School)	Junkyard Treasure	Outback Betty's	Harry's Dream
	Realistic Fiction (In School)	On the Case	The Real-Life School Project	Ms McMahon
	Historical Fiction	The Wooden Horse Trick	Cheung Saves the Day	The Slave
	Fantasy	The Cloud Washerwoman	Sammy Stevens Sings	Finbar and the Long Trek
	Science Fiction	A New Source of Power	The Intergalactic Race	Eighth Moon
	Humour	The Upstairs Dragon	My Rhyming Grandpa	Catty Bimbar and the New-Age Pirates
	Mystery	Mystery Under the Big Top	The Mystery of Autoplane 500	The Mystery of the Missing Food
	Folktales	The Wicked Witch of the Singing Sands	Gulnara	Momotaro, Little Peachling

MACMILLAN

We have designed these lesson plans so that you can have the plan in front of you as you teach, along with a copy of the book. Suggestions for teaching have been divided into questions and discussion that you may have with students before, during, and after they read. You may prefer to explore the meaning and the language in more detail before students read. Your decisions will depend on the gap between students' current knowledge and the content, vocabulary, and language of the book they are about to read. The more information students have up front, the easier it will be for them to read the text.



HOW FORENSIC SCIENTISTS WORK

Lower level fact
Text type: Explanation
Reading age 9.2
Word count 1,678

Before Reading

Activate prior knowledge by asking students whether they have heard of the term *forensic science*. *What have you seen or heard about this topic?* Discuss students' responses. Guide students to understand that forensic science involves the collection and study (analysis) of evidence from crime scenes.

Who do you think does this job? Guide students to the term *forensic scientists. Do you think forensic scientists are police?* Support students to understand that forensic scientists work with police and sometimes need to give evidence in court to support police investigations. The evidence given by the forensic scientist often strengthens the case against the accused person or persons.

COVER

Before Reading

Read the title and examine the cover photograph. Discuss what the book may be about. *What does this image tell you about forensic scientists? What is the relevance of the tape in the background? What is the tape used for?*

Read the blurb. What additional information does this give you? What do you expect to find inside this book? Guide the discussion to build understandings that this book will provide information about the job of forensic scientists.

What do you think is involved in collecting evidence from crime scenes?

What would be unusual about this type of job? Discuss. Lead students to understand that forensic scientists may work unusual hours, as crimes are committed at all times of the day and night.

How do you think forensic scientists might analyze the evidence?

CONTENTS PAGE

Open the book. Tell me what you know about this page. Discuss features of the contents page. *Where would I go to learn about*

how forensic scientists collect evidence? Students should quickly respond with the page number. Repeat for other pages. Encourage quick responses. *What do you know about information books?* Students should indicate that the reader can choose where they'd like to start.

Students should also mention the terms *glossary* and *index*. Ask students to explain what each term means. Visit each of these pages to clarify that the glossary provides meanings for new or tricky words about the topic, and the index provides the page numbers to help the reader locate particular things in the book.

Revisit the contents page. Discuss the term *introduction. What does this mean?* Lead students to acknowledge that an introduction will provide background information about the topic which will help us to read the book.

INTRODUCTION

During Reading

What do you notice first about this page? Guide students to discuss the information contained in the visual imagery. Read the caption for each photograph. Guide the discussion so that students understand that machines can help obtain information found in the evidence. Discuss the term *DNA* and explain that this is a sample of a person's genetic makeup that is unique to that person.

What do you notice when you look at the text? Students should identify the bold text. *What does this tell us?* Students identify that these words are explained in the glossary. Instruct students to navigate quickly to the glossary to view these terms.

As you read the introduction, take note of how forensic scientists help investigate crimes.

After Reading

What does the term evidence *mean?*

What types of work do forensic scientists do?

Do all forensic scientists do the same jobs? Guide the discussion to build understandings that some forensic scientists are involved in field work, which means they go out to the crime scene to search for evidence and try to piece together what happened. Other forensic scientists work in laboratories and analyze the evidence brought in from crime scenes.

What is the name given to the small parts of things that are sent to the lab?

What sorts of tools do lab scientists use to study, test, or analyze the samples? Direct students to the illustrations to search for information. Encourage inferences.

HOW FORENSIC SCIENTISTS WORK A CRIME SCENE

During Reading

Tell me what you see on this page. Discuss the photographs and read the captions. *What can you infer from these photos? What might occur to make a car accident a crime scene? Why might investigators wear special clothing as they search for clues?*

As you read, take note of some examples of evidence that may be left at a crime scene. Think about why the evidence collected at crime scenes is very important.

Be ready to talk about what it means to contaminate a crime scene and how this may occur. Consider how contaminating a crime scene can be damaging to an investigation. Gather your thoughts on this and be ready to share your ideas after reading.

After Reading

What are some examples of evidence that may be left at a crime scene? Invite students' responses. *How might this evidence be important to police investigations?* Guide the conversation so that students understand that sometimes the forensic evidence may provide a strong link between a criminal and a crime. Discuss the ways that a shoeprint, a speck of blood, a thread of fabric, or a single hair can provide strong evidence in an investigation.

What does it mean to contaminate the scene? How can this occur? Who may be responsible for contaminating a crime scene? Is it done on purpose? What measures do the police take to try to prevent this from occurring?

What is a paramedic? How do you think you'd feel if you were the first to arrive at the scene of a bad car accident? Why? How do you think paramedics might feel?

HOW FORENSIC SCIENTISTS RECORD A CRIME SCENE

During Reading

Read the title. What do you expect to learn about on these pages? Invite prediction.

Draw students' attention to page 9. *Look carefully at page 9. What does the information from this image tell you?* Discuss a forensic scientist's equipment and how this equipment may be used.

Read page 8 and be ready to talk about how detailed the investigation needs to be at a crime scene. Jot down a list of things that occur after an accident or crime which help investigators piece together what occurred. Be prepared to discuss why this level of detail is important.

After Reading

Discuss how a scene is examined following a crime. Invite students to share the notes they recorded during reading. As students share information, probe for detail found in the text. Direct students to find parts of the text that support their understandings.

Why do you think it is important for investigators to photograph the scene before it has been tidied up? Why is the scene:

- *photographed from many different angles?*
- *photographed close up?*
- *measured carefully?*
- *drawn by an artist?*

What do you think can be learned from looking at skid marks?

Guide the discussion so that students understand that the more information is gathered at the scene, the more likely scientists will be able to piece together what happened.

HOW FORENSIC SCIENTISTS COLLECT EVIDENCE

During Reading

Read the title. What could this chapter be about?

Direct students to read the caption and look at the photograph. *What might this scientist be doing? What may she find out about the hammer?*

Read the first paragraph together. *What kind of evidence may need to be collected with care?* Invite discussion.

Read pages 10 to 13. As you read, make a list of the evidence that is easy to collect. Be ready to discuss how this evidence is collected for examination. Make another list of evidence that needs to be collected with care. Be ready

to talk about how this evidence is collected. Think about why this evidence needs to be carefully collected, and what could happen if scientists did not exercise care with this evidence. Check the glossary to clarify tricky words.

After Reading

Discuss the evidence that is easily collected. *How do scientists collect this evidence and how is it stored?* Revisit page 10 to clarify if needed. *Why do you think forensic scientists wear gloves and pick the evidence up with tweezers? Why is each piece of evidence placed in a separate bag?* Guide the discussion so that students understand that not all things at a scene may be linked to the crime.

What kinds of evidence are collected with care? Why is this evidence more delicate? How is this evidence collected? Revisit page 11 and 12 to check if needed.

How can forensic scientists find evidence that cannot be seen by the naked eye? Revisit the last paragraph to reread if needed. *Why do you think some evidence cannot be seen?* Invite prediction.

HOW FORENSIC SCIENTISTS ANALYZE EVIDENCE

During Reading

What does the photograph and caption tell you? What can saliva tell a forensic scientist?

Read the first paragraph. This chapter is about matching DNA and fingerprints, and how microscopes are used to assist forensic scientists to analyze evidence. Activate prior knowledge to support students during reading.

As you read, jot down how DNA, fingerprinting, and using microscopes can help investigators. Jot down something interesting that you know about each of these that you didn't know before you began reading.

If students have limited prior knowledge of these topics, you may wish to have students read each section separately, and clarify understandings as you go, before reading the next section.

After Reading

What is DNA? What is special about DNA? How can DNA be used to solve crimes? How often would you need to give a sample of DNA? Build understandings that once DNA is taken, the information can be stored on a computer indefinitely. *Do you think everyone should give a sample of DNA to be kept on file?* Tell students that this has been hotly debated in the past. *Why may some groups disagree with a national DNA register? Explain.*

What do you know about fingerprints? Encourage discussion of fingerprint types. *How are fingerprints and DNA similar? Do you think fingerprint evidence would be as strong as DNA evidence?* Invite inferences.

How do microscopes help scientists to analyze the evidence? What types of evidence can be analyzed under a microscope?

HOW FORENSIC SCIENTISTS USE COMPUTERS

During Reading

Direct students to look at the photographs and read the captions. *What else do you think computers could be used for in forensic science?* Invite inferences.

As you read pages 20 and 21, note the ways computers are used to assist forensic scientists to analyze evidence. Jot down some ideas to share with the group.

After Reading

What is a database? Invite responses. Explain that a database is a way of sorting, organizing, and storing information on a computer.

How can a database assist a forensic scientist?

CODE BREAKER

Forensic scientists use lots of words that we don't use in our daily conversations. Many specialty fields have a collection of words that are used regularly. For people who don't work in these fields, understanding these words can be difficult. To make this book easier for us to understand, some forensic science words are explained in the glossary.

Go through the book with a partner and find other words that could have been included in the glossary. Record these words, write what you think they mean, and then check their dictionary meanings and write these down.

Compare your list with that of a friend to see how many words you have in common.

MEANING MAKER

A forensic scientist has lots of equipment. Turn to page 9. Work with a partner. Write a list of all the items labelled. Beside each item, write:

- *how the item helps the forensic scientist to do their job, or*
- *why you think the item is necessary for the forensic scientist to use or wear.*

Think of occasions that a forensic scientist might need to wear:

1. *a disposable dust mask*
2. *protective clothing with fume hood and dust mask*
3. *booties*

Which of the items do you think a forensic scientist would need to use when collecting cigarette butts at the scene of a crime?

TEXT USER

Direct students to look at the front cover. *What were your first impressions of what this book would be about? Did the title and cover image give you an idea of what to expect? Was there anything you expected to read about that was not in the book?* Explain*. Does the blurb accurately represent this book?* Discuss.

When you look at the photo on the title page, you can tell immediately that the book is about gathering evidence. What tells you this? Prompt students to identify the fingerprint on the magnifying glass. *Do you think this was done to make this clear to us, or was it an accident?*

Help students to generalize that when the words and images support readers' expectations, it makes the book easier to read.

TEXT CRITIC

When we read a book, it is important to ask ourselves whether the information we are reading is accurate. If we don't ask this question, we may believe everything we read without question. Sometimes it is clear that the information is somebody's opinion, but not always.

Do you think by the way this book is written that the information is true and accurate? Do you think the author, Jade Michaels, is a forensic scientist? If she is, would you believe that the information is correct? Discuss*. What if Jade Michaels is not a forensic scientist? Would you*

be as likely to believe that the information is accurate? Guide the discussion to build understandings that authors may research the topics they write about, and this can enable them to present true and accurate information on a range of topics.

How could you check that the information is correct? Discuss.

USING MULTIPLE INTELLIGENCES

The Case of the Missing Pen

Ask a colleague to provide these items:

- a hair
- a pen lid with an inked fingerprint on it
- a scented tissue

Read the following *Who did it?* to the class. As you read, motion towards the scene of the crime and the places that the pen lid, tissue, and hair were later located.

After marking papers, I locked the door and went to check the notices. When I returned, the door was unlocked and my pen was missing. The only clues left at the scene of the crime are this hair, this fingerprint on the pen lid, and a scented tissue.

Divide students into groups and provide each group with the three clues and a copy of the statement above. The students must attempt to solve the crime.

Examine the crime scene (P, V, L)

Sketch the crime scene (S)

Collect fingerprints from suspects (P, V, B)

Analyze the evidence (P, V)

Solve this crime (P, V, L)

MULTIPLE INTELLIGENCES

The theory of multiple intelligences was developed by Howard Gardner, a professor of education at Harvard University. Howard Gardner's theory suggests that the current view of intelligence, as measured by IQ tests, is far too limited and discriminates against students who think in different ways. He proposes taking a broader perspective and has identified eight different intelligences. These are:

- verbal-linguistic intelligence – word smart
- logical-mathematical intelligence – number/reasoning smart
- visual-spatial intelligence – picture smart
- bodily-kinaesthetic intelligence – body smart
- musical-rhythmic intelligence – music smart
- interpersonal intelligence – people smart
- intrapersonal intelligence – self smart
- naturalist intelligence – nature smart

Multiple intelligences have enormous potential as a tool in furthering reading and language development. Traditionally, the teaching of language and reading has focused mainly on two intelligences: logical-mathematical and verbal-linguistic. This means that many students who possess different intelligences do not receive the necessary opportunities, encouragement, instruction, or reinforcement to succeed with reading as well as they might.

How Forensic Scientists Work

Name _____

Before you read each chapter, jot down what you already know and what you are interested in knowing about each topic. After you read each chapter, record the new things you have learned.

I already know . . .	I am interested to know . . .

I have learned . . .

How Forensic Scientists Work

Name _____

Multiple Intelligences (intrapersonal, visual-spatial, verbal-linguistic)

Invent a piece of technology that will help forensic scientists with their duties, either at the scene or back at the lab. Sketch your design below. Write the name of your invention at the top of your sketch. Add labels to help others to understand how your invention works. Complete the details below.

What my invention is used for:

_____

_____

_____

How my invention works:

_____

_____

_____

How my invention will help forensic scientists to solve crimes:

_____

_____

_____

How Forensic Scientists Work

Name _____

Use the ink pad to record your fingerprints below. You will need to roll each finger from one side to the other in the ink to get a full sample. Analyse each fingerprint and record whether it is an arch, loop, whorl, or composite fingerprint. How many of each do you have?

Your Fingerprint	Type of Fingerprint	Your Fingerprint	Type of Fingerprint

_____ Arch fingerprints _____ Loop fingerprints

_____ Whorl fingerprints _____ Composite fingerprints

Does anyone in your class have the same or similar combination of fingerprints as you do? Write their name/s. _____

_____

_____

_____

How Forensic Scientists Work

Name _____

Think of two other words that belong to the same word families as these words from the book. Try to think of interesting words. If you need help, use your dictionary and don't forget that you can use -s, -ed, and -ing endings if you are stuck.

science	scientist	scientific
crime		
collect		
analyze		
contaminate		
photo		
measure		
examine		
solve		
suspect		
naturally		
chemical		

If micro means small, and a scope is something to look through, what do you think the word microscope means?

_____

_____

If *lum* means light, what do you think the chemical luminal (page 11) does, when it is sprayed onto a surface containing traces of blood?

_____

_____

How Forensic Scientists Work

Name _____

Page 22 of the book outlines the steps in a forensic investigation. Write about why each of these things occur. Use the book to research the answers.

1. Police rope off the crime scene.

2. Forensic scientists put on protective clothing.

3. Forensic scientists photograph the scene.

4. Forensic scientists collect evidence.

5. Forensic scientists analyze evidence in the lab.

6. Evidence and crime details are stored in a computer database.

7. Forensic scientists may speak in court to support the police case against the person accused of the crime.

How Forensic Scientists Work

Name _____

Some books and magazines contain information that is factual. Others present information as if it is true, but it may be a blend of truth or what someone believes is true, and opinion.

Use an assortment of books, magazines, advertising material, brochures, etc, and write the titles or articles under the appropriate heading.

Factual (entirely true information)	Opinion (may be based on both truth and opinion)

How Forensic Scientists Work

Name _____

You have learned a lot about forensic scientists from this book, and there is still more to learn. Revisit each section of the text below. Think of something else you would like to know about each of these things.

How Forensic Scientists Work a Crime Scene

_____

_____

How Forensic Scientists Record a Crime Scene

_____

_____

How Forensic Scientists Collect Evidence

_____

_____

How Forensic Scientists Analyze Evidence

_____

_____

How Forensic Scientists Use Computers

_____

_____

From what you have learned, write one thing that would be interesting about being a forensic scientist.

_____

_____

Write one thing that you don't think you would like about being a forensic scientist.

_____

_____

If you met a forensic scientist, what would you ask them?

_____

_____

Notes

Notes