Fingerprints

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Overview

This article explains how police find and take fingerprints from a crime scene and use them to help solve the crime. The article gives an insight into the work of a fingerprint expert. It includes instructions about how students can take their own fingerprints.

The text requires students to "confidently use a range of processing and comprehension strategies to make meaning from and think critically about" text (from *The Literacy Learning Progressions*, page 14).

There is a PDF of the text and an audio version as an MP3 file at www.juniorjournal.tki.org.nz

Related texts

Texts that describe a process: "Build Your Own Double Waka" (*JJ 33*); "Make a Mini Worm Farm" and "Wrist Wrappers" (*JJ 39*); "Making Paper" (*JJ 44*); "Making a Road" (*JJ 50*); "Pop! Froth! Fizz!" (*How Do You Know?* Connected L2 2014)

Texts about jobs that people do: *Isobel's Garden* (this features the work of the Student Volunteer Army, Ready to Read, Turquoise); *Duckling Palace* (Ready to Read, Purple); *Red Rattlers* (Ready to Read, Gold); "Fronting the Show", "Wild Orphans" (*JJ 41*); "The Port" (*JJ 47*); "Always Great, Never Late", "Breakdown" (*JJ 48*); "Making a Road" (*JJ 50*); "Llamas" (*JJ 51*); "Winning the Bledisloe Cup" (*How Do You Know?* Connected L2 2014); "Learning from the Tangata Whenua" (*Have You Checked?* Connected L2 2016)

Texts with a focus on using evidence: *How Do You Know?* (Connected L2 2014); *I Spy …* (Connected L2 2013); *Show and Tell* (Connected L2 2016)
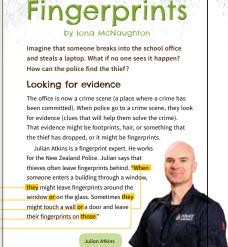
Text characteristics

Key text characteristics relating to the reading standard for after three years at school, as they relate to this text, are shown in the boxes with the solid outlines. Other boxes indicate additional characteristics.

A mix of explicit and implicit content within text and visual language features that requires students to make connections between ideas in the text and their prior knowledge to ask questions, track information, and make inferences (for example, why experts have to be careful when they examine fingerprints for evidence at a crime scene)

Some unfamiliar words and phrases, including commonly used words with more than one meaning and subject-specific vocabulary, the meaning of which is supported by the context, the sentence structure, the visual language features, and/or definitions or explanations

Ideas and information organised in paragraphs

A range of punctuation, including bullet points, speech marks for reported speech, and parentheses to indicate definitions

The structure of pages 18–22 as an explanation with an introduction, a series of main points grouped under subheadings, and a conclusion, and of pages 23–25 as a procedural text

A variety of sentence structures including complex sentences so that students are required to notice words and phrases (for example, "When", "That", "or", "Sometimes", "those", "These", "Whenever", "Even though", "Whether", "Then") that link ideas and information

Visual language features such as subheadings, photographs, diagrams, and labels that are clearly explained and linked to the body text

The Literacy Learning Progressions

Reading standard: after three years at school

Curriculum contexts	Reading purposes and learning goals

Curriculum contexts

English (Reading)
Level 2 – Ideas: Show some understanding of ideas within, across, and beyond texts.

Structure: Show some understanding of text structures.

Science: Nature of science
Level 2 – Participating and contributing: Explore and act on issues and questions that link their science learning to their daily living.

Technology
Level 2 – Characteristics of technological outcomes: Understand that technological outcomes are developed through technological practice and have related physical and functional natures.

Social Sciences
Level 2 – Understand how people make significant contributions to New Zealand's society.

Reading purposes and learning goals

Select from and adapt the suggestions below according to your students' strengths, needs, and experiences – their culture, language, and identity (*Reading and Writing Standards for Years 1–8*, Knowledge of the Learner, page 6).

Possible reading purpose
(What can the students expect to find out or think about as a result of reading this text?)

- To find out how police discover and use fingerprints
- To learn about the job of police fingerprint experts

Possible learning goals
(What opportunities does this text provide for students to learn more about how to "read, respond to, and think critically" about texts?)

- The students **make connections** between the text and the visual language features in order to clarify and track information.
- They **ask questions** and look for answers about aspects they are unsure of.
- They **make connections** between explicit and implicit information in the article to **make inferences** about why Julian's job is important.
- They **evaluate** the effectiveness of the article
- They **monitor** their reading, and when something is unclear, they take action to solve the problem, for example, by rereading a sentence or looking for clues close by.

The New Zealand Curriculum

The Literacy Learning Progressions

Text and language features	Possible supporting strategies

Text and language features

Vocabulary

- Possibly unfamiliar words and phrases, including subject-specific language: "thief", "crime scene", "committed", "evidence", "palms of your hands", "tips of your fingers", "ridges", "sweat", "natural oil", "impressions", "ridges", "billion", "surfaces", "transparent", "computer database", "loops, whorls, and arches", "similar", "identical", "magnifies", "talcum powder", "scalp"
- Commonly used words with more than one meaning: "palms", "impressions", "fine", "lift", "match"

Possible supporting strategies
(These suggestions may be used before, during, or after reading in response to students' needs.)

Prompt the students to remember the strategies they can use, often in combination, for example:

- when **decoding**:
  - recognising word chunks or syllables within a word ("com-mit-ted", "ev-i-dence", "trans-parent", "i-den-ti-cal", "mag-ni-fies")
  - noticing similarities to known words ("ridges" – "bridges"; "billion" – "million"; "surfaces" – "fur")
  - drawing on their awareness that letter combinations can have more than one sound ("th**ie**f", "p**a**lms", "surf**a**ces", "sw**ea**t", "wh**o**rls")
- when **working out word meanings**:
  - using the context of the sentence and the paragraph
  - looking for definitions or explanations within parentheses
  - reading on to look for further information including definitions and/or explanations.

Have a dictionary available for students to confirm or clarify word meanings, but remind them that they can make a best attempt at a word and come back to it later.

> Readers are able to use strategies for working out unfamiliar words only when they know most of the vocabulary in the text. For English language learners who need support with vocabulary, introduce and practise selected items before reading. See ESOL Online: Vocabulary for suggestions.

Text features

- Words and phrases that connect ideas within and across sentences
- The use of speech marks to indicate comments from the fingerprint expert

Select a short section of text and explore how ideas are connected. For example, "The police take a photograph of the fingerprint <u>from</u> the crime scene. <u>Then</u> they scan the photograph and put it into a computer database. <u>This</u> database is a huge collection of fingerprints taken from people <u>who</u> have committed crimes". This will be particularly supportive for English language learners.

See "Introducing the text".

Sounds and Words

Metacognition

HOW YOU CAN SUPPORT YOUR STUDENTS TO BE METACOGNITIVE
Here are some ways you can build students' awareness of the processes and strategies they are using as they make meaning and think critically.

- *What helped you to work out the meaning of "impressions"?*
- *How did the photographs help you understand what you were reading?*

Introducing the text

- Use your knowledge of your students to ensure that your introduction to the text is effective in activating their prior knowledge and providing appropriate support for a successful first reading. Several alternative suggestions are listed here for you to choose from or adapt.
- Have the students look at the opening spread (pages 18–19) and ask them to share their ideas about what they are likely to find out in the article. You could have them read the first three sentences and briefly discuss their answers to the questions. To provide more support, you could have the students read all of page 18. Explore the key ideas such as crime scenes, committing a crime, and collecting evidence. Draw attention to the use of parentheses to explain word meanings. Use the first sentence of the second paragraph to clarify that Julian Atkins is the person in the photograph (and not the writer of the article). Discuss the use of speech marks. *Who is talking here?*
- Write the words "fingerprints" and "crime" and ask the students to predict some other words they might expect to find in the article. They could preview the article to stimulate their thinking. Have a short discussion to clarify word meanings and remind the students to be on the alert for further information (and more subject-specific words) while reading the article.

- Briefly review the structure of an explanation (for example, an introduction that says what the topic is and why it's important, a series of sections that explain what and why or how, and a conclusion that reminds the reader of why the topic is important). Together, preview the article, and the accompanying set of instructions on pages 23–25, to make predictions about the content or to share any questions. English-language learners might benefit from a more explicit summary of the text. You could explain that the text explores what fingerprints are and how police use them and that it includes comments from a police fingerprint expert.
- You could record the students' ideas and questions from their preview of the article on a KWL chart for them to come back to after the reading. If the students have read page 18, their questions could be focused on Julian Atkins. *If you could talk to him about what he does, what questions would you ask?*
- Together, decide on the reading purpose and share the learning goals.
- You could provide students with sticky notes to mark information that relates to the KWL chart (if you are using one) or to mark any new questions as they read.

Reading and discussing the text

Suggestions for ways that you can support the students to achieve the learning goals are in the right-hand column of the table below. **Select from and adapt** the suggestions according to your students' needs. These suggestions may apply to the first or a subsequent reading of the text. The first reading of this text is likely to stimulate discussion as the students discover new ideas (and examine their own fingers).

Student behaviours	Deliberate acts of teaching
Examples of what to look for and support as the students work towards achieving their learning goal(s). Note that much of the processing that students do at this level is "inside their heads" and may not be obvious until after they have read the text and you are discussing it as a group.	*Examples of how you can support students as they work towards achieving their learning goal(s). Often this will involve individual students rather than the whole group.*

The first reading

- The students visualise the crime scenario as they read the first paragraph (in bold print). They make links between the subheading, "Looking for evidence", and the following sentence to clarify that the office is now a "crime scene".	- Remind the students of the purpose of the introduction (the first two paragraphs on page 18) in clarifying the topic and saying why it's important.
- They use the definition within the parentheses to help clarify the meaning of "evidence" and why the police look for fingerprints. - They write notes or mark sections that have answers to their questions or things they might want to find out more about.	- If necessary, prompt the students to notice the definition in parentheses and remind them to be alert for further information about the meanings of unfamiliar words.
- On page 19, the students infer that the answer to the question in the subheading will be in the following paragraph. They make connections to their own experience by looking at their hands to help visualise the description of fingerprints.	- Enjoy the students' discovery and exploration of these new ideas.
- They demonstrate self-monitoring, for example, they reread the previous sentence or read on to clarify the meanings of words such as "sweat", "natural oil", "impressions".	- Remind them to think about the strategies they can use when meaning is unclear.
- On pages 20 and 21, the students draw on the subheadings and visual language features (the series of photographs that show the procedure of taking fingerprints and the illustration of the fingerprint patterns) to support their understanding. They attempt to identify their own fingerprint patterns.	- Prompt the students to use the visual language features as well as the text to clarify their thinking.
- As the students read page 22, they notice the emphasis on accuracy ("long, careful job", "double-checked", "certain there are no mistakes") and infer why the police have to be so careful. They confirm their inferences as they read about using the match found between the crime scene prints and the database.	- Prompt the students to make connections between key words across sentences to track ideas and make inferences. *I wonder how Julian makes sure a fingerprint from the database is exactly the same as the one at the crime scene.*

- The students infer from the heading and the layout on page 23 that the next section of the text contains instructions.
- On page 24, they use the bullet points and photographs to identify the materials required and then follow the sequence to track each step of the process.
- At the end of page 25, they respond to the question by attempting to confirm their fingerprint pattern and the fingerprint pattern in the photograph.
- When they have finished reading, they reflect on what they have found out and what questions they still have, referring back to sections they have marked in the text.

- You can choose to have the students read the instructions as part of the lesson or have them read and carry out the procedure independently.

- As they finish reading, remind them of their questions and what they have found out so far.

Discussing the text after the first or subsequent readings

- The students share what they have found out, referring to any notes they have made or sections they have marked and discuss any further questions they have.
- The students identify information that adds to their understanding of words on the chart and identify other subject-specific words or phrases they have discovered during the reading.
- The students make connections between the article and their prior knowledge to infer how police might use other kinds of evidence or what could go wrong if they made a mistake.
- The students share their opinions of (evaluate) how well they understood the article and what helped them to understand it (for example, the text structure, the visual language features, the definitions in parentheses, and links to what they already knew).

- Encourage the students to share their responses to the article. Remind them of their reading purpose. Add relevant information (and any further questions) to the KWL chart if you have used one.
- Refer to the vocabulary chart created before reading and review what the students have learned about the word meanings. Add new words and phrases they have discovered.
- Prompt the students to think critically. *How might "footprints", "hair", or "something the thief dropped" help the police solve a crime? What could happen if the police didn't get an identical match?*
- Ask the students to evaluate the article. *Did the author make a good job of explaining fingerprints? What helped you?*

Supporting metacognition

With support, the students reflect on their learning.

- The students identify some subject-specific words or phrases they have discovered and explain how they worked out their meanings.

- They describe the connections they made between key words and phrases to infer why getting the match right is so important.

Remind the students of the reading purpose and learning goal(s).

- Ask the students to identify a challenge they had when reading and how they solved or attempted to solve it. Note anything you might want to follow up on.

- *What helped you decide that getting an identical match is an important idea in this article?*

After reading: Practice and reinforcement

- The students can build their comprehension and fluency by rereading the article as they listen to the audio version. Audio versions also provide English language learners with good models of pronunciation, intonation, and expression.
- Provide opportunities for students to reread this text and other texts about fingerprints or related topics, including online texts and those in the school library (and see "Related texts").
- Support summarising by having students locate and organise information in the text. For example, you could have them identify three facts about fingerprints, add labels to a printout of page 20 for the equipment Julian is using, or list three or four steps that Julian takes to match a fingerprint (pages 21–22). The students could do this individually or in pairs and then compare their findings with those of others in the group.
- Have the students reread the article to find information that will help them write a description of the skills needed for Julian's job. Alternatively they could choose another aspect of the article to investigate further, for example, how another item at a crime scene could be used as evidence.
- Provide an opportunity for the students to take and investigate their own fingerprints as described on pages 23–25. They could:
  – create a database of the fingerprints of everyone in the class and sort it into loops, whorls, and arches (They could link this to statistics.)
  – create a mock crime scene with a few fingerprints from willing volunteers and see if the students can make a match using the class database
  – write an account of what it was like to take their own fingerprints, including how they felt, any difficulties they had doing it, and any ideas for making the process more effective.
- Investigate other uses for fingerprints, for example, as the logo for Te Papa or to unlock phones, and explain why they are used in this way.
- Make an enlarged copy of each student's fingerprint, and ask them to write words on the ridges to describe themselves.
- To build vocabulary, the students could choose new words from the article and write their own definitions, based on information in the text.
- The New Zealand Police Museum at Porirua runs an educational programme for schools. Details are available at New Zealand Police Museum Learning: http://www.police.govt.nz/about-us/history-museum/museum/learning-events/learning
- You could check for relevant resources within your local community. For example, Hutt City Council's Hutt Science offers a school resource on forensics entitled "Whodunnit". For more information, go to: http://huttscience.co.nz/resource-kits/whodunnit/

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