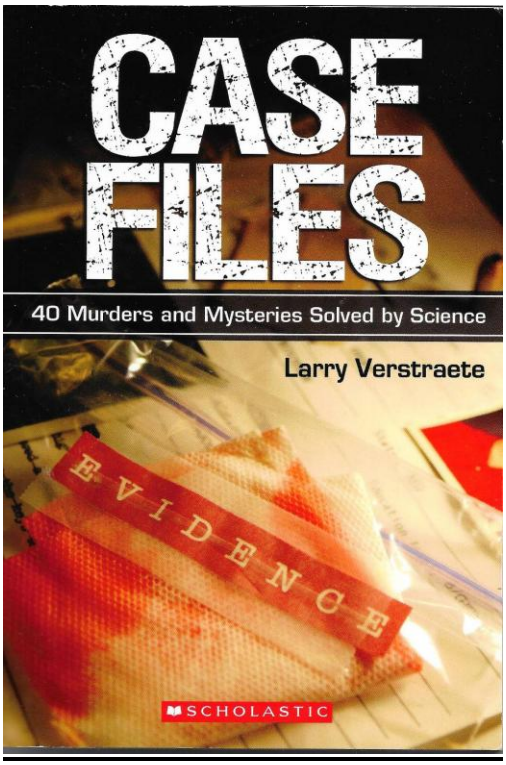
TEACHER'S GUIDE

CASE FILES: 40 MURDERS & MYSTERIES SOLVED BY SCIENCE

by Larry Verstraete
Scholastic Canada Ltd., 2012



In *Case Files: 40 Murders and Mysteries Solved by Science*, savvy investigative work and scientific knowledge combine to answer perplexing questions. The book is organized into 4 chapters that echo the primary purposes of science detection: Identify, Prove, Explain & Resolve. Through its intriguing mysteries, *Case Files* shows how scientists solve crimes, reveal identities, untangle evidence, and discover the truth.

The activities in this package are organized into two sections:

1) Teacher-Led Classroom Activities
2) Student Activities

TEACHER-LED CLASSROOM ACTIVITIES

Clue by Clue

Hide one or more objects in the classroom or on the playground then prepare a map, list of directions, or a series of clues that will lead students to the object. Discuss how clues (evidence) are fundamental to scientific investigations, in particular in situations where something that has been lost or missing is finally located. (Two examples: *The Case of Blackbeard's Missing Queen (p. 12); The Case of the Lost Romanovs (p. 34))*

Puzzle Pieces

Foster an appreciation for the task facing science detectives with this activity. Have students prepare a written or printed message on a full-sized piece of paper. Instruct them to tear up the message into a number of large irregularly-shaped pieces, and then have them randomly remove one of the pieces and set it aside. Put the remaining pieces in an envelope. Exchange envelopes with another student. Try to reassemble and interpret the message with one piece missing. How difficult is the task when one of the clues is missing? What strategies did they use? What do they think is on the missing piece?

Artifact Story

Objects and artifacts are often sources of clues and hidden stories. To hone their deductive skills, ask students to bring 5 -10 'artifacts' that belong to an undisclosed person in their household. Pair students, and allow time for them to examine the objects brought by their partner. From the objects, ask students to infer the age, gender, personality characteristics and habits of the owner. What can they tell about the person from the things he/she owns?

It's About Time

Letters, cancelled stamps, coins, milk cartons, newspapers, e-mails, prescription medicines and dozens of other objects either have dates stamped directly on them or are date-traceable in some way. Collect these items. Invite students to examine them, determine their dates and rank order them from oldest to most recent. As a variation, place the objects in a bag, have students draw them out one at a time, and place each newly drawn object on a number line relative to the ages of objects that were drawn prior to it.

Mystery Box –Teacher Style

Note*: This is a variation of the Mystery Box activity that follows in the student activity section. As a teacher-led activity, it allows for greater group discussion and class involvement.*

Prepare one or more 'mystery boxes' – shoeboxes that contain a series of objects which together tell a story. Invite students to examine the items, and try to deduce the story from the clues in the box. As a follow-up, read *The Case of Columbia's Final Flight (p. 46), The Case of the Missing Ships and Desperate Sailors (p.82), The Case of the Intertwined Bones (p.109),* or other cases from the book to show how the layout, age, size and other characteristics of found-objects can sometimes tell a story.

Is Science Ever Wrong?

After reading the book, lead the class in a discussion of the following:

*Is science ever wrong? Give one or more examples from the book to support your answ*er.

Note that with advances in technology, there are new and improved tools for scientists to use. When new evidence surfaces as a result, scientific conclusions are re-evaluated and sometimes changed. It's not that science is necessarily wrong. Conclusions are only as accurate as the current data allows.

One example is *The Case of Death's Forgotten Visitor* (the Stephen Truscott story) where blow-fly evidence collected at the time of the murder had no apparent relevance in 1959, but with advances in entomology became important in establishing a time-line in 2006.

The introduction of Chapter 4 provides more information on the evolving nature of scientific investigation and its impact on conclusions.

STUDENT ACTIVITIES

Mystery Box

Prepare a ‘mystery box’ – a box that contains a series of objects which together tell a story. Invite a classmate to examine the items and retell the story based on the clues in the box.

What Brand of Science?

Entomologists, archaeologists, geologists, microbiologists – these are just a few of the science detectives involved in *Case Files* Keep a chart of the scientists involved in various cases and the type of evidence each looks for.

Movie Ad

Imagine that one of the cases was being made into a movie. Create a movie poster to advertise the production.

Front Page News

Choose one of the cases from the book and write a newspaper article from the point of view of a reporter who might have been there at the time the crime or initial incident occurred. Another option: write a newspaper article from the point of view of one of the scientists or investigators who was instrumental in solving the case.

Four Box Story

Select a story from *Case Files: 40 Murders & Mysteries Solved by Science.*
Use the four boxes below to illustrate its story elements.

Box #1 – the crime, case, mystery or puzzle that needs to be solved
Box #2 – the people who help solve the case
Box #3 – the evidence or clues they uncover or follow
Box #4 – what they find, prove, explain or resolve at the end

#1	#2
#3	#4

As a twist on this activity, create your own detective story then illustrate the key components of the case using a 4 panel strip like the one above. Share it with classmates to see if they can retell the story.

Scrambled Evidence

Unscramble these letters to spell different kinds of evidence that scientists examined to solve cases in the book:

Example: ahri = hair

1) noebs _____
2) icson _____
3) vsaila _____
4) nipat _____
5) eteht _____
6) olbdo _____
7) camsoth toncestn _____
8) kusll grfanmste _____
9) nrgifenpsitr _____
10) dhnagwitrin _____

STUDENT ACTIVITY - *Case Files: 40 Murders & Mysteries Solved by Science*

Match the Science Detective

Match the science detective on the left with the case on the right that the science detective helped to solve:

Science Detective	*Case Solved*
A. maritime archeologist	1. The Case of Death's Forgotten Visitor
B. entomologist	2. The Case of the Killer Flu
C. forensic geologist	3. The Case of the Intertwined Bones
D. epidemiologist	4. The Lindbergh Kidnapping and Murder
E. handwriting analyst	5. The Case of Columbia's Final Flight
F. forensic artist	6. The Case of the Telltale Heart
G. xylotomist	7. The Case of the Oily Smear
H. geneticist	8. The Case of Blackbeard's Missing Queen
I. engineer	9. The Case of the Hitler Diaries

Scrambled Tools

Unscramble these letters to spell the names of different tools or equipment that scientists used to solve cases in the book:

Example: srxya = xrays

1) macear _____
2) TC nasc _____
3) occmiepros _____
4) leurr _____
5) ppertcssoeco _____
6) vsiee _____
7) pmcoutre _____
8) easlc _____
9) speralt oldme _____
10) D3 ggaimni _____

ANSWERS

Scrambled Evidence

1) bones
2) coins
3) saliva
4) paint
5) teeth
6) blood
7) stomach contents
8) skull fragments
9) fingerprints
10) handwriting

Match the Science Detective

A - 8; B – 1; C - 7; D – 2; E - 9; F-3; G - 4; H- 6; I - 5

Scrambled Tools

1) camera
2) CT scan
3) microscope
4) ruler
5) spectroscope
6) sieve
7) computer
8) scale
9) plaster model
10) 3D imaging