

# True Forensic Crime Stories

## Introduction

Gripping true-crime stories are a perfect way to investigate how the tools and techniques of forensic science help detectives solve crimes. The engaging text and photos in the *True Forensic Crime Stories* series grab readers' attention and keep them involved. Each book contains details about real crimes and the science behind the forensics that cracked the case. As students read, they use critical-thinking skills, such as comparing and contrasting, identifying sequence, determining cause-and-effect relationships, and making inferences.

## National Standards

This series supports Science, Social Studies, and Language Arts. Go to [www.enslowclassroom.com](http://www.enslowclassroom.com) and/or [www.enslow.com](http://www.enslow.com) and click on the "View State Correlations" tab. Click on your state, grade level, and curriculum standard to display how any book in this series backs up your state's specific curriculum standard.

## Classroom Activities

Included in this teacher's guide are activities linking to Reading/Language Arts, Math, Science, and Social Studies. The activities, and a reproducible handout, require readers to use comprehension and vocabulary skills relating to the book's subject. Some activities can be reworked to use with any book in the series. The last page of this guide offers a reproducible assessment tool covering comprehension, vocabulary, and inference.

## Guided Reading Level: W

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## Where to Find More Information about Titles in this Series:

Visit [www.enslowclassroom.com](http://www.enslowclassroom.com) and/or [www.enslow.com](http://www.enslow.com) to search for other titles and series, as well as download the teacher's guides for other titles in this series:

<u>Titles in this series</u>	<u>Library Edition ISBN</u>	<u>Paperback Edition ISBN</u>
<b>Bones</b> <i>Dead People DO Tell Tales</i>	978-0-7660-3669-7	978-1-59845-363-8
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## Titles in this series can be purchased through all major vendors or directly from:

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## Teacher's Guide for *DNA and Blood: Dead People DO Tell Tales*

When a trained forensic scientist looks at the blood spattered about at a crime scene, he or she finds a clear story of what has happened. The DNA in the blood helps to narrow down a list of suspects—clearing the innocent or sending the guilty to prison. In this book, readers discover how blood-spatter analysis and DNA fingerprinting began, how they are used today, and how they solved decades-old mysteries.

### Before Reading

Remind students that good readers preview a book to find out what they might learn and what they already know about the subject. Allow time for read to the title, study the cover photo, and browse pages to note the chapter headings, photographs and other illustrations, diagram, captions, sidebars, Chapter Notes, Glossary, and Index. Ask volunteers to predict what they will learn from the book, then have students make Anticipation Guides, using the questions below or ones students suggest. Explain that after reading, students will return to see if they still agree or disagree.

Anticipation Guide Statements	Agree	Disagree
No two people have exactly the same DNA.		
Bloodstains at a murder can reveal if the killer was left- or right-handed.		
The blood of humans is different from the blood of other animals.		

### During Reading

Review with students that visualizing is the process of creating pictures in your mind as you read. You look for words that describe people, places, and events and try to picture what's going on in your head. Forming mental images helps you better understand and remember what you read. Add that each picture stirs an emotional response, or feeling. Have students use stickies as they read to note words and/or phrases that help them visualize, and to write or sketch their emotional response to each image.

### After Reading

Have students revisit their Anticipation Guides. Ask: *Did you change your opinion about any statement? If so, what changed your mind?* Encourage students to cite information in the text that convinced them to change their minds. To elicit personal responses to the book, encourage students to share their sticky notes/sketches. Did everyone visualize the same things? Discuss how making mental images helps when reading. Then prompt discussion with questions, such as: *What was the most interesting fact you learned from this book? Did the information in the book inspire you to choose a career in DNA and blood forensics? Why or why not?*

Review the Glossary terms, then ask students to write a short review of the book, complete with an illustration, using at least five vocabulary terms. Let students share and compare their reviews.

Use the Reading/Language Arts, Math, Science, and Social Studies activities on the next page. Make copies of the Handout and Assessment pages that follow for students to do in class or as homework. **Answers: Handout**—1. chromosomes/e, 2. adenine/g, 3. nucleus/i, 4. genome/a, 5. secretor/b, 6. spatter/h, 7. antigen/f, 8. hemoglobin/d, 9. mitochondria/c. **Assessment**—1. D, 2. B, 3. C, 4. D, 5. B, 6. A, 7. C, 8. D, 9. C, 10. B.

## Curriculum Links

### SAFETY WARNING:

Before doing any activity, make sure students do not have allergies to any materials. Supervise activities requiring the use of sharp or hot/cold objects. Always review directions and safety rules with students before they begin any project.

### Reading/Language Arts Activity:

Revisit page 19 and review that **fact boxes** highlight interesting information related to, but set apart from, the main text. They help readers make connections and enhance understanding with examples or details. Ask: *What is this fact box about? How does it clarify the main text?* Have students create a fact box to elaborate on some aspect of DNA and blood in forensic crime, using information from the book or researched online. Let students share their fact boxes.

### Math Activity:

Remind students that the chances of two unrelated people having the exact same DNA is about 1 in 1.7 million billion. Review that “the chances of” denotes probability, then invite students to perform a coin probability test. Have them make two-column charts labeled *Heads* and *Tails* to track results. As you distribute coins, point out that with every toss, there’s an equal (50%) chance that a coin will land heads or tails. Let students toss their coins 10 times and record the results. Then ask them to toss 30 times more and record those results. Did the odds, or probability, change? What do they predict will happen with 50 tosses? Try it!

### Science Activities:

1. Have students make fake blood and analyze spatter patterns. For the “blood,” have students mix 2 Tbsp. corn syrup, 4 tsp. water, and red food coloring. Ask them to predict if blood dropped from different heights will leave a similar pattern. Next, let them fill an eyedropper with the fake blood, hold it 1 foot above a sheet of paper, and release one drop. Repeat from 3 feet and 5 feet above papers. Have students record and discuss their observations. Challenge students to drop the blood from varying distances onto wood, cardboard, plastic, and cement. Ask: *Does the type of surface make a difference in patterns made by blood spatter?*
2. Perform an experiment that models separating DNA into a visual representation of its components. Explain that in **chromatography**, color separates into its individual pigments. Use a variety of washable markers. Have students draw a thick line horizontally across a strip of paper towel, pour several inches of water into a glass, then put the bottom of the paper in the water while keeping the marker line above the water. Discuss students’ observations: the paper absorbs water up and over the marker line, leaving behind shades of blue and red if a marker is purple, etc. Ask students who used the same color marker to compare results. Ask: *If you found another sample like yours, could you tell which color marker made it? How is this like matching DNA?*

### Social Studies Activity:

Ask: *Should you have the right to refuse to give a DNA sample, or should the government have the right to take it without permission? Should we map the DNA of the entire human population?* Have pairs of students choose a question to debate. Remind them that they personally don’t have to agree/disagree, but when role-playing someone who does, they should fight for that person’s ideas. Let partners prepare and present their mock debates. Have classmates decide which side had the more compelling argument.

## Handout

### Crack the Code

Use the Code key below to decipher each word. Then draw a line to match it with its description.

A	B	C	D	E	G	H	I	L	M	N	O	P	R	S	T	U
8	17	11	14	7	13	9	4	10	12	2	1	15	3	6	5	16

1. 11 9 3 1 12 1 6 1 12 7 6

\_\_\_\_\_

2. 8 14 7 2 4 2 7

\_\_\_\_\_

3. 2 16 11 10 7 16 6

\_\_\_\_\_

4. 13 7 2 1 12 7

\_\_\_\_\_

5. 6 7 11 3 7 5 1 3

\_\_\_\_\_

6. 6 15 8 5 5 7 3

\_\_\_\_\_

7. 8 2 5 4 13 7 2

\_\_\_\_\_

8. 9 7 12 1 13 10 1 17 4 2

\_\_\_\_\_

9. 12 4 5 1 11 9 1 2 14 3 4 8

\_\_\_\_\_

a. an organism's total genetic makeup

b. person who carries blood group antigens in body fluids

c. responsible for producing energy

d. transports oxygen in blood

e. carry genes transmitted from generation to generation

f. molecule that induces an immune response

g. DNA molecule base the always pairs with thymine

h. pattern made by blood drops

i. structure containing DNA in most cells

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## Assessment

Circle the letter that best completes the statement or answers the question.

- The shapes of bloodstain alone can reveal \_\_\_\_\_.
  - how old the victim was
  - what the attacker had to eat
  - if the victim lived nearby
  - if an attacker was left- or right-handed
- Nearly 99% of the stretches of DNA called genes are identical for all humans.
  - True
  - False
- Which is **NOT** one of the four bases in a DNA molecule?
  - adenine
  - thymine
  - nucleotide
  - guanine
- Which is an organization that uses DNA to prove the innocence of wrongfully convicted people?
  - The Freeman's Bureau
  - The Victim's United
  - The Virtue Organization
  - The Innocence Project
- Which is the study of blood and other bodily fluids?
  - arteriology
  - serology
  - plasmography
  - hermology
- An *antibody* is a protein that neutralizes a specific antigen.
  - True
  - False
- A legal inquiry to determine facts relating to a death is \_\_\_\_\_.
  - a locus
  - an assault
  - an inquest
  - a felony
- The author infers that \_\_\_\_\_.
  - elephants are found all over the world
  - people are not doing enough to protect African elephants
  - poachers are careful hunters
  - elephant tusks have no value
- Which does **NOT** describe someone who works with DNA and blood forensics?
  - detail-oriented
  - good at solving puzzles
  - persistent
  - squeamish
- You can always trust the testimony of an eyewitness.
  - True
  - False

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