# Who Has It Now?

## Topic

Chain of custody

## Introduction

When the investigation of a criminal case has been completed and the case brought to court, evidence collected during the investigation will be used in the trial. The court must be able to trust the evidence, i.e., to know that it hasn't been tampered with since its collection at the crime scene. A document that accompanies each piece of evidence (securely packaged to prevent contamination) through all the tests made by various forensic specialists gives this assurance. The document states the date and time of any transfer between people, the name of the person handling it, the process undergone, and the conditions in which it is stored. This document details what is called the chain of custody. The chain of custody document must be an unbroken record, beginning with the discovery of the evidence at a crime scene and ending with its appearance in court. If evidence is not accompanied by a chain of custody document or if the document shows breaks in the chain, lawyers could argue that the evidence has been tampered with, and that the evidence is invalid and inadmissible in court. In this experiment, you will collect and secure evidence at a "pretend" crime scene. Over the course of a few days, you will make tests on the evidence and pass it on to your fellow students, keeping track of all processes in a chain of custody document.

## Time required

Week one: 30 minutes
Week two: 5 minutes

## Materials

*For Part A:*
a small container of baking powder with detachable plastic lid
2 pieces of plain white paper ($8\frac{1}{2} \times 11$ inches)
4 zippered plastic bags: one large enough for the container of baking powder, one for the lid, and two for samples of the baking powder (extra bags should be supplied to allow for the bags being tampered with)
stapler
pen
3 clean scoops or spatulas
clean forceps
translucent tape

*For Part B*
The items of evidence and chain of custody documents from Week one

## Safety note

**Please read the general safety precautions.**

## Procedure

Students need to be in groups of four for this experiment.

*To create the crime scene:*

1. Place the container on one of the pieces of paper on a table.
2. Remove the lid and place it on the floor beside the table.
3. Using the spatula, spoon about two tablespoons of baking powder from the container into a heap on the other piece of paper on the table.

*Part A: Collecting evidence at the scene of crime*

1. Using a clean scoop, one student puts some of the powder from the pile on the table into a clean zippered plastic bag.
2. Seal the bag, tape over the top of the bag, and initial the tape.
3. Complete the chain of custody form (data table A below) and staple the form to the bag.

**DATA TABLE A**

| | | | | | | |
|---|---|---|---|---|---|---|
| Date of collection: | | | | | | |
| Name of person taking the sample: | | | | | | |
| Description of evidence: *White powder* | | | | | | |
| Description of place from which evidence taken: *Pile on table* | | | | | | |
| **Date of transfer** | **Name of custodian** | **Signature** | **Name of new custodian** | **Signature** | **Description of contents and condition of seal** | **Description of storage conditions** |
| | | | | | | |
| | | | | | | |
| | | | | | | |

4. Invite a second student to use a clean scoop to place some of the powder from the container in a clean zippered plastic bag.
5. Seal the bag, tape over the top of the bag, and initial the tape.
6. Complete the chain of custody form (data table B below) and staple the form to the bag.

**DATA TABLE B**

| | | | | | | |
|---|---|---|---|---|---|---|
| Date of collection: | | | | | | |
| Name of person taking the sample: | | | | | | |
| Description of evidence: *White powder* | | | | | | |
| Description of place from which evidence taken: *Open container* | | | | | | |
| **Date of transfer** | **Name of custodian** | **Signature** | **Name of new custodian** | **Signature** | **Description of contents and condition of seal** | **Description of storage conditions** |
| | | | | | | |
| | | | | | | |
| | | | | | | |

7. Ask a third student to use the forceps to place the container of powder upright in a large clean zippered plastic bag.
8. Seal the bag, tape over the top of the bag, and initial the tape.
9. Complete the chain of custody form (data table C on the next page) and staple the form to the bag.
10. Ask the fourth student to use the forceps to place the lid in a clean zippered plastic bag.
11. Seal the bag, tape over the top of the bag, and initial the tape.
12. Complete the chain of custody form (data table D on the next page) and staple the form to the bag.

## Data table C

Date of collection:

Name of person taking the sample:

Description of evidence: *Container of white powder*

Description of place from which evidence taken: *Table*

| Date of transfer | Name of custodian | Signature | Name of new custodian | Signature | Description of contents and condition of seal | Description of storage conditions |
|---|---|---|---|---|---|---|
| | | | | | | |
| | | | | | | |
| | | | | | | |

## Data table D

Date of collection:

Name of person taking the sample:

Description of evidence: *Circular piece of plastic, probably a lid from a container*

Description of place from which evidence taken: *Floor*

| Date of transfer | Name of custodian | Signature | Name of new custodian | Signature | Description of contents and condition of seal | Description of storage conditions |
|---|---|---|---|---|---|---|
| | | | | | | |
| | | | | | | |
| | | | | | | |

**INSTRUCTIONS TO STUDENTS**

If you are not carrying the bag containing the "clue" on your person, keep it safely in a lockable cabinet. If it is left with someone else, make an entry in the form identifying the transfer of custody.

If you have signed for the "clue," you are responsible for its security.

If the seal is broken, the person responsible should place the "clue" in its original bag in a spare bag (spare bags are provided) confirming this on the form.

During the week, you can perform some simple tests on your "clue" such as testing the container and lid for fingerprints (see Experiment 3.02: No Two The Same) or testing the white powder (see Experiment 4.03: Which Is Which 1? and Experiment 4.04: Which Is Which 2?) If you do this, fill in a report (data table E) detailing your test and its results, and attach the form to the evidence bag (resealed in a new bag).

**DATA TABLE E**

| Description of evidence (from chain of custody document) | Date | Name of person performing test | Description of test | Result of test |
|---|---|---|---|---|
| | | | | |

*Part B: Examining the evidence*

The students should return to the class with the "clues" one week later.

1. Inspect the chain of custody document.
2. Inspect the "clues" and check to see if the seals on the bags are broken.
3. If the seal is broken, check the chain of custody document to see who is responsible and identify the cause (e.g., a test may have been performed).

## Analysis

1. Does the document show a complete chain of custody?
2. Were the seals on the bag intact and, if not, was the bag resealed with an explanation within another bag?
3. Would you trust this evidence?

## Want to know more?

1. An unbroken chain of custody should be shown on the document with the evidence kept safely in a locked cabinet if not physically in the possession of the person named as responsible for it.
2. If the seal is intact, it shows that the evidence is in the same condition as when it was collected at the "scene of crime." If the bag has been resealed in another bag, the reasons for this should be stated on the document.
3. If the seal is intact and the chain of custody is unbroken, the evidence can be trusted. If the seal on the evidence is broken, but the reason is given on the document (the evidence was being tested) and the chain of custody is unbroken, then the evidence can be trusted.

# Special Safety Note To Experimenters

Each experiment includes any special safety precautions that are relevant to that particular project. These do not include all of the basic safety precautions that are necessary whenever you are working on a scientific experiment. For this reason, it is absolutely essential that you read, copy, and remain mindful of the General Safety Precautions that follow this note. Experimental science can be dangerous, and good laboratory procedure always includes carefully following basic safety rules. Things can happen very quickly while you are performing an experiment. Things can spill, break, even catch fire. There will be no time after the fact to protect yourself. Be prepared for unexpected dangers by following basic safety guidelines the entire time you are performing the experiment, whether or not something seems dangerous to you at a given moment.

We have been quite sparing in prescribing safety precautions for the individual experiments. We made this choice for one reason: We want you to take very seriously every safety precaution that is printed in this book. If you see it written here, you can be sure that it is here because it is absolutely critical to your safety.

One further note: The book assumes that you will read the safety precautions that follow, as well as those in the box within each experiment you are preparing to perform, and that you will remember them. Except in rare instances, the general precautions listed below will not be repeated in the procedure itself. It is up to you to use your good judgment and pay attention when performing potentially dangerous parts of the procedure. Just because the book does not say **BE CAREFUL WITH HOT LIQUIDS or DON'T CUT YOURSELF WITH THE KNIFE** does not mean that you should be careless when boiling water or cutting a section of a stem for microscope work. It does mean that when you see a special note to be careful, it is extremely important that you pay attention to it. If you ever have a question about whether a procedure or material is dangerous, wait to perform it until you find out from a qualified adult that it is safe.

**GENERAL SAFETY PRECAUTIONS**

Accidents caused by carelessness, haste, insufficient knowledge, or taking unnecessary risks can be avoided by practicing safety procedures and being alert while conducting experiments. Be sure to check the individual experiments in this book for additional safety regulations and adult supervision requirements. If you will be working in a lab, do not work alone.

**PREPARING:**

—Clear all surfaces before beginning experiments
—Read the instructions before you start
—Know the hazards of the experiments and anticipate dangers

**PROTECTING YOURSELF:**

—Follow the directions step-by-step; only do one experiment at a time
—Locate exits, fire blanket and extinguisher, gas and electricity shut-offs, eyewash, and first-aid kit
—Make sure there is adequate ventilation
—Act sensibly at all times
—Wear an apron and safety glasses
—Do not wear open shoes, loose clothing, or loose hair
—Keep floor and workspace neat, clean, and dry
—Clean up spills immediately, being careful to follow the recommended procedure for dealing with the spilt substance
—Never eat, drink, or smoke in the laboratory or workspace
—Do not eat or drink any substances tested unless expressly permitted to do so by a knowledgeable adult

**USING EQUIPMENT WITH CARE:**

—Set up apparatus far from the edge of the desk
—Use knives and other sharp or pointed instruments with caution
—Pull plugs, not cords, when removing electrical plugs

—Don't use your mouth to pipette liquids; use a suction bulb
—Check glassware is clean and dry before use
—Check glassware for scratches, cracks, and sharp edges
—Report broken glassware immediately so that it can be cleaned up by a responsible person
—Do not use reflected sunlight to illuminate your microscope
—Use only low voltage and current materials such as lantern batteries
—Be careful when using stepstools, chairs, and ladders

**USING CHEMICALS AND BIOLOGICAL MATERIALS:**
—Never taste or inhale chemicals
—Label all bottles and apparatus containing chemicals
—Read labels carefully
—Avoid chemical contact with skin and eyes (wear safety glasses, lab apron, and gloves)
—Do not touch chemical solutions
—Wash hands before and after using solutions
—Wipe up spills thoroughly
—Use sterile procedures when handling even common and harmless microorganisms
—Avoid contact with human blood
—Treat all living organisms with appropriate respect

**HEATING SUBSTANCES:**
—Wear safety glasses, apron, and gloves when boiling water
—Keep your face away from test tubes and beakers
—Use test tubes, beakers, and other glassware made of Pyrex™ or borosilicate glass
—Use alcohol-filled thermometers (do not used mercury-filled thermometers)
—Never leave apparatus unattended
—Use safety tongs and heat-resistant mittens
—If your laboratory does not have heat-proof workbenches, put your Bunsen burner on a heat-proof mat before lighting it
—Take care when lighting your Bunsen burner; use a Bunsen burner lighter in preference to wooden matches
—Turn off hot plates, Bunsen burners, and gas when you are done
—Keep flammable substances away from heat
—Keep sheets of paper and other flammable objects away from your Bunsen burner
—Have a fire extinguisher on hand

**FIELDWORK:**
—Be aware of environmental dangers (e.g., do not carry out fieldwork near dangerous roads, cliffs, or water)
—Remember that strong sunlight can be dangerous – pack sunscreen and a good supply of drinking water if you will be outside all day
—Never carry out fieldwork in areas where you cannot find your way to safety easily and quickly and never wander off on your own in search of new areas to study

**FINISHING UP:**
—Clean your work area and glassware (follow any instructions given by a supervising adult)
—Be careful not to return chemicals or contaminated reagents to the wrong containers
—Don't dispose of materials in the sink unless instructed to do so
—Wash your hands
—Clean up all residues and put in proper containers for disposal
—Dispose of all chemicals according to all local, state, and federal laws
—Dispose of all microbiological cultures by treatment with an appropriate disinfectant

**BE SAFETY CONSCIOUS AT ALL TIMES**

# Settings And Warning Signs

Settings and hazard warning signs are used throughout the experiments to indicate where they should take place and where particular care should be taken with the materials involved.

SCHOOL LAB

HOME

TOXIC

SPLASH

WARNING

IRRITANT

NAKED FLAMES

HOT LIQUIDS

CORROSIVE

CUT / STAB HAZARD