

# How We Know What Happened: The Evidence Record

*Check the Source. Follow the Evidence.*

# Learning Targets



Sort evidence into three kinds: things, records, and words.



Explain why a second source makes a claim stronger.



Describe how a lab test checks an event no one can repeat.



Put events in order using time stamps on photos.



Explain why a good report says what it left out.

# A Day That Cannot Be Rerun

## A Scientist

- Can rerun a test to check a result.
- Repeats a trial until a pattern holds.
- Controls conditions to isolate one cause.

## An Investigator

- September 11, 2001 happened once, and only once.
- That day brought enormous loss.
- An investigator cannot rerun a day that has already happened.

**Key Concept:** When an event happens once, evidence has to be gathered, tested, and questioned after the fact.

# Gathering What Survives

1

## Materials

Things recovered and preserved for direct examination.

2

## Paperwork

Made at the time, before anyone knew what would matter later.

3

## Accounts

What people say, collected afterward through questions.

4

## A timeline

When each piece happened, fixed against a reliable clock.

Note: An investigation is built from many small, checkable pieces, not one big story.

# How Investigators Sort What Survives

- The first two strands: something you can touch, something written down.
- Physical evidence is an object you can hold, weigh, or test in a lab.
- A documentary record is a log, tape, memo, or file made when an event happened.
- Example: a recovered steel sample is one kind; a security recording is another.
- Neither kind proves a claim alone - investigators build a case from many pieces.

Tip: An investigator tests each piece differently, checking what it can and cannot prove.

# What People Can Tell Investigators

- Testimony is what a witness says happened, given in answer to questions.
- A primary source is a document someone made with direct knowledge of the event.
- Strength: a person may notice something no paper record captured.
- Limit: a person's memory is one moment, recalled later, and it can drift.
- Investigators weigh both strengths and limits before trusting an account.

Note: A person's memory and a written record rarely match perfectly - checking both is the point.

# What 236 Pieces of Steel Could Show

| Steel Record           | Figure           | What It Establishes                          |
|------------------------|------------------|----------------------------------------------|
| Pieces analyzed        | 236 pieces       | Confirms which recovered material was tested |
| Share of tower steel   | 0.25% to 0.5%    | Why NIST could not claim a complete survey   |
| Total tower steel      | 200,000 tons     | The scale investigators worked against       |
| How a piece was placed | Stamped markings | Method for tracing a piece's likely location |

Remember: A small, honestly labeled sample beats a claim of finding everything.

# Knowing Where a Thing Came From

- Investigators cannot use an object until they know where it came from.
- Provenance is the traceable origin of an object, showing where it came from.
- Chain of custody is the written trail of who held an item and when they held it.
- A piece with no traceable origin cannot support a conclusion about where it sat.
- Both records travel with the object, from recovery to the final report.

Warning: An untraceable object is not proof of nothing - it is simply unusable as proof of anything.

# An Archive Built From the Public

1

**6,977 video segments**

Collected from many sources into one searchable archive.

2

**6,899 photographs**

Contributed by at least 200 photographers, not one office.

3

**Many contributors**

Media outlets, public agencies, and individual photographers all took part.

4

**Publicly supplied**

Much of the material came from the public, not federal files alone.

**Did You Know:** Investigators did not already have this archive - they built it, submission by submission.

# How Investigators Fixed the Time



## **Anchor one moment**

Fixed 9:02:59 a.m. using satellite- and atomic-clock-verified time stamps.



## **Extend outward**

Matched smoke plumes, shadows, and falling objects across many recordings.



## **Cross-check the archive**

Applied the same method across thousands of items, not just one recording.



## **Report the accuracy**

3,032 photographs and 2,673 clips reached 3 seconds of accuracy or better.

**Key Concept:** One well-timed clip anchors the whole timeline; everything else is measured against it.

# Why a Second Source Matters

- One source can be honestly wrong; a second source is how investigators check it.
- Corroboration is a check that finds the same fact in a second, separate source.
- Independence is the whole point - a copy of the first source proves nothing new.
- Two accounts that were compared beforehand are not two independent sources.
- A claim that survives an independent check is stronger than one that has not.

Tip: Ask where the second source came from before counting it as a second source at all.

# A Second Investigation, A Different Question

## NIST

- Asked how the buildings behaved.
- A technical, engineering investigation.
- Reported its findings in 2005.

## The 9/11 Commission

- Asked what the government knew and did.
- Created by Public Law 107-306, Nov. 27, 2002.
- Ten members, five from each party; reported without dissent in 2004.

Note: Two investigations, two different questions - neither one answers the other's question.

# The Commission Working Method

## Documents Reviewed

- More than 2.5 million pages examined.
- Pulled from many agencies and sources.
- A written trail others can re-check.

## People Interviewed

- More than 1,200 individuals interviewed.
- Interviews reached across ten countries.
- Included officials and private citizens.

## Public Hearings

- 19 days of hearings held in public.
- 160 witnesses gave public testimony.
- Anyone could check what was actually said.

Remember: Public hearings are a method too - testimony given where anyone can check it.

# Testing What You Cannot Repeat

- NIST could not rerun the event, so it could not observe the real fires directly.
- Reconstruction - a rebuilt copy of conditions, used to test what could happen.
- NIST rebuilt office conditions at full scale and burned them under instruments.
- Measured results replace guesswork about how the real fires behaved.
- NIST reported openly that the usual physical traces were scarce.

**Key Concept:** When you cannot rerun the real event, you rebuild its conditions and measure them instead.

# Reconstruction in the Laboratory



*NIST rebuilt WTC office conditions at full scale and burned them, 2005.*

# From Test to Model

## The Physical Test

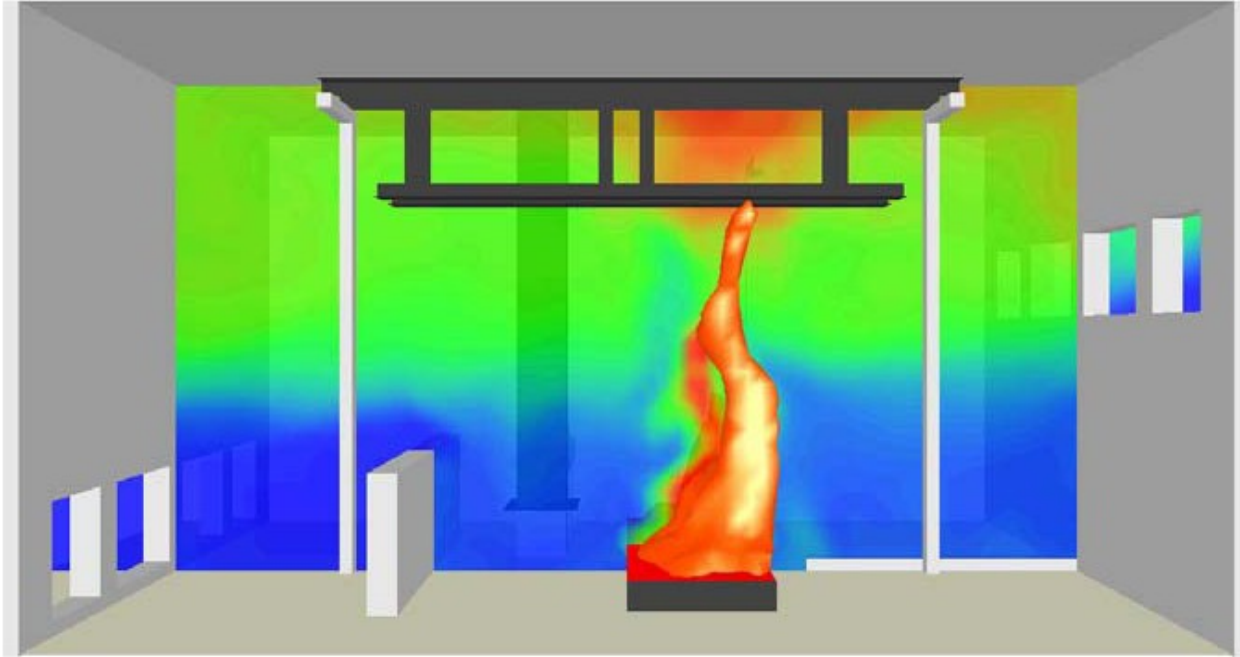
- Real conditions, burned under instruments.
- Produces hard, measured data.

## The Computer Model

- Must reproduce what the test measured.
- Then explores conditions the test could not reach.

Did You Know: A model earns trust only after it matches a real, instrumented test - never before.

# A Model Checked Against a Test



*NIST modeled fire reaching a steel truss; blue is cool, red is hot.*

# Claims You Can Actually Check

- Some claims about an event are so vague that nothing could prove them wrong.
- Falsifiable: stated exactly enough that a finding could prove it wrong.
- Vague: 'It explains everything.' Precise: 'Accurate to three seconds.'
- A precise claim names the exact test or finding that would settle it.
- If nothing could ever count against a claim, it is not a claim you can check.

**Warning:** A claim that cannot be tested cannot be checked - and a claim that cannot be checked proves nothing.

# What the Investigators Said They Did Not Do

*We have not interviewed every knowledgeable person or found every relevant piece of paper. New information inevitably will come to light.*

— 9/11 Commission Report, Preface, p. xvii

A stated limitation is a report's own note about what it did not examine.

Key Concept: Naming your own limits is not weakness - it is what makes a finding trustworthy.

# A Checklist You Can Use



**What kind is it?**

Something physical, something recorded, or someone's account?



**Where did it come from?**

Can its origin and its handling be traced and checked?



**Who confirms it?**

Does a separate, independent source find the same thing?



**What would prove it wrong?**

Name the exact finding that would show the claim false.

Note: You watched NIST and the 9/11 Commission apply each of these four questions in this lesson.

# Key Takeaways

- ★ Evidence sorts into three kinds: things, records, and words.
- ★ A second, truly independent source is what makes corroboration meaningful.
- ★ A small, traceable sample beats a claim of finding everything.
- ★ Investigators fixed a timeline by anchoring one moment, then extending outward.
- ★ A report that states its own limits is more trustworthy, not less.