SleuthLab

Meet the Cast

Standard Edition

Spark & Anvil

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This book collects 5 chapter books from the Sleuthlab cast — each character embodies a different curricular primitive; together they teach the full subject.

Methodology: distributed-narrative learning per Bruner narrative-cognition + Habgood intrinsic-integration + SAMHSA TIP 57 trauma-informed register.

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For everyone who learns by hearing a story first.

Contents

Introduction

The Sleuthlab cast was authored to embody the curriculum, not decorate around it.
Each of the 5 characters you'll meet in this book teaches a specific primitive —
a particular tactic, a particular technique, a particular way of seeing.
Together they form an ensemble: the cast IS the curriculum.

Read in any order. Each chapter stands alone.
Each character also appears in the matching Spark & Anvil app (free, forever)
where you can practice what they teach.

— *The editors at Spark & Anvil*

Drop

*CHEMICAL EVIDENCE — *chromatography, pH, spectroscopy; test-don't-guess.* The forensic-science primitive of *applying chemical tests to identify unknown substances rather than guessing by appearance.**

Drop is a small otter-tween. She has a pH-strip kit clipped to her belt. A small folded chromatography-paper strip sits in her vest-pocket.

She is sleek. Her fur is warm-brown and cream. Her paws are quick. She works in a careful way. Drop loves watching colors change. Her pH-strip kit is special. So is her chromatography paper. These are her main tools. They help her do quick chemistry. Just dip a strip. Then watch the color change. Or spot a sample on paper. See the colors spread out.

Drop shows us something important. She teaches about **chemical evidence**. This means you test things. You don't just guess. Imagine two clear liquids. They look exactly the same. One might be water. Another could be vinegar. Or maybe sugar water. Even salt water looks clear. Your eyes can trick you. But chemistry tests give real answers.

A pH strip helps tell them apart. Sometimes a taste test helps. (Only if it's super safe to taste!) A chromatography spot can also show differences. Drop is very clear about this. She never says tests are just quick guesses. She always says: "*Test, don't guess*." She warns, "*Looks-like-water is not water*."

Chemistry tests give real answers. These answers are based on proof. Test results are pretty sure. But they are not 100% certain. For example, pH is usually off by a little. Chromatography matches need careful checking.

Drop teaches many ways to find **chemical evidence**.
First, she always says: "*Test, don't guess*." Your eyes can trick you. Tests give real answers.

She shows how to do **pH testing**. You dip a strip. It changes color. The pH scale goes from 0 to 14. Low numbers are acids, like vinegar (around 3). Water is neutral (7). High numbers are bases, like baking soda solution (around 9).

Then there's **chromatography**. This separates mixtures. You put a tiny spot of liquid on paper. Water slowly climbs the paper. It carries the liquid's parts with it. Different parts travel at different speeds. You can see different colors in ink.

She also teaches **density tests**. Does a liquid float or sink in another? This tells you how heavy it is.

And **solubility tests**. Does it dissolve in water? Or in oil? This shows its 'stickiness' to other things.

Drop always talks about **lab-safety**. We use school-safe chemicals. No dangerous stuff here.

Always write down your tests. And write down the results. Just like in ScienceForge Sample. It's like keeping a clean data log.

Drop grew up in a small river village. Her family lived there for ages. They were the village's water-testers. Every season, they checked the wells. They checked the streams too. They looked for taste, color, and how clear the water was. Drop watched them work. Her parents wore big, waterproof aprons. They carried small glass bottles. They dipped strips into samples. They sniffed samples carefully. Sometimes, they even tasted some. (Only if it was super safe!)

Her parents always trusted their tests. They didn't just trust what they saw. A well might look super clear. It sparkled in the sunlight. But the tests could say it was bad. "Don't drink this," her dad would sigh. A cloudy stream might look yucky. It might even smell a bit muddy. But the tests could show it was perfectly fine. "This one's good to go!" her mom would cheer. Drop learned this lesson early. By age six, she knew it well. Tests were always better than looks.

When Drop was a bit older, she heard about SleuthLab. It was a place for smart animal detectives. She packed her special kit. She walked all the way there. Inspector Vex met her at the door. He was a tall, serious badger. He wore a crisp, white lab coat. The room smelled faintly of old books and something fizzy.

Inspector Vex asked a big question. "Drop," he said, his voice deep, "What is **chemical evidence**?"

Drop stood up tall. She didn't even blink. She looked right at Inspector Vex. She said, "*Test, don't guess*." She spoke clearly. "*Chemistry gives answers based on proof*." She listed her tools. "pH strips," she said. "Chromatography. Density. Solubility." She finished her answer. "*Your eyes can trick you*," she told him. "*Tests are reliable*." She added, "*—with appropriate confidence*."

Inspector Vex smiled then. He nodded slowly. "You are appointed," he said. Drop had the job! She felt a little tingle of excitement.

Drop still says this often. She tells everyone, "I've tested so many samples." Hundreds of them! She shakes her head. "*Most of them would have been guessed wrong*," she says. "*If we only looked at them*." "*Tests are how you really know*."

She makes it sound easy. "It's not hard at all," Drop says. "It's just two things." "*Test, don't guess*." "*And record the result*." She taps her kit. "*The chemistry tells you what your eyes can't see*."

Drop's pH-strip kit sits ready. It waits for the next mystery. It's always prepared.

Voice register

Guidance: Quick-handed, methodical, fond-of-color-change-reactions. Otter-tween. *NEVER frames visual identification as sufficient; ALWAYS centers test-don't-guess.*

Sample lines:

- *"Test, don't guess."*
- *"The chemistry tells you what the eye can't."*
- *"Confidence-not-certainty: test results have appropriate uncertainty."*

Arc

- **Kit 3** — Anchor.
- **Kit 4-7** — Recurring.
- **Kit 8-16** — Ensemble.

Relationships

- **Alliance**: All SleuthLab cast.

Cultural-sensitivity gate

Anti-CSI-procedural-register enforced. Lab-safety appropriate to junior-forensics-team scale.

Cultural-context note

The river-village water-tester family framing is a deliberate generic European-village tradition. The *test-don't-guess* discipline is foundational forensic-chemistry pedagogy.

Fiber

*TRACE EVIDENCE — *fibers, hairs, paint, glass; Locard's exchange principle.* The forensic-science primitive of *every contact leaves a trace — small transfers between surfaces that accumulate evidence over time.**

Fiber is a small spider. She's not scary at all. Her body is soft and chunky, like a friendly cartoon. She has a cheerful smile and only six legs. Fiber always wears a small magnifying glass around her neck. It hangs on a leather cord. She also carries a tiny tray for collecting things. It's called her fiber-collection-tray.

Fiber is small and gentle. Her fur is warm brown and cream. She watches everything closely with her kind eyes. Fiber loves tiny things more than anything. Her special tools are the magnifying glass and her collection tray. The magnifying glass shows her things you can't see with just your eyes. Like a single fiber. Or a tiny fleck of paint. Maybe a tiny piece of glass, or a hair. She uses her tray to collect these small things very carefully. Each tiny piece goes on its own labeled pad. Fiber loved to explore. She would spend hours in the SleuthLab. Her magnifying glass pressed close to her eye. She might be looking at a dusty old book. Or a scratch on a table. Or even the tiny crumbs left after a snack. To Fiber, everything held a secret. You just needed the right tool to see it.

This is very important. Fiber teaches us about **trace evidence**. It's a special detective skill. It means knowing that when two things touch, tiny bits of stuff move from one to the other. This idea has a fancy name: *Locard's exchange principle*. It just means that when two objects come into contact, each one gives a little bit of itself to the other. And it takes a little bit too. Imagine you wear a wool sweater. You brush against a wooden chair. Some wool fibers will stick to the chair. And tiny wood fibers might stick to your sweater. This swapping of tiny bits is the main idea behind **trace evidence**. It happens all the time, even when you don't notice. Maybe a tiny bit of mud from your shoe gets left on the floor. Or a speck of glitter from your art project ends up on your friend's backpack. These tiny transfers are everywhere. They are like silent whispers. They tell a story of who was where, and what they touched.

Fiber always says something important. She never says **trace evidence** proves everything right away. She always makes it clear: "Trace evidence is *contact evidence*." That means it tells you two things touched. "But it doesn't tell you *when* they touched," she'd say. "Or *how* they touched. Or *why*." A red fiber on a chair might be from someone who sat there yesterday. Or last week! The real skill is asking: "What does this evidence *actually* show?" And, "What other ways could this tiny piece have gotten here?"

Fiber grew up in a small village. Her family were the village's web-keepers. They were spiders who looked after all the village's beautiful webs. These webs weren't just for catching flies. They were like special art, woven with care. Fiber's family made webs that sparkled with dew in the morning light. Some were big, covering entire doorways. Others were tiny, like lace doilies on a window sill. Fiber learned to mend a broken strand with the lightest touch. She could spot a loose thread from across the room. Her family taught her that every single fiber, no matter how small, was important to the whole web. This work needed Fiber to look very closely at tiny fibers. She also had to be very gentle. By the time she was six, Fiber already knew a big secret. Tiny things mattered a lot. You just had to know how to see them.

When Fiber was twenty-two, she walked all the way to SleuthLab. Inspector Vex met her. The SleuthLab was a big, busy place. It smelled of old books and something faintly like burnt toast. Inspector Vex was a tall, serious badger. He wore a crisp uniform and had a very deep voice. Fiber felt a little nervous, but she held her head high. She clutched her small collection tray tightly. "What is **trace evidence**?" Inspector Vex asked. Fiber took a deep breath. "It's Locard's exchange principle," she said. "Every contact leaves a trace. Small transfers happen between surfaces." She paused. "The real skill is asking: 'What does the evidence *actually* show?' And, 'What other ways could it have gotten here?'" Inspector Vex smiled. "You are appointed," he said.

Fiber teaches the SleuthLab team many important lessons about **trace evidence**.
First, she always starts with *Locard's exchange principle*. Remember, every contact leaves a trace. Things swap both ways.
Then, she shows them the *common types* of **trace evidence**. These are things like tiny fibers, hairs, paint flecks, or glass shards. Even soil and pollen count!
Next, she teaches the *best way to collect* these tiny bits. You need tweezers and special tape. Then you put each sample in

her collection tray. Each one goes on its own separate, labeled pad.
Fiber explains *class versus individual* evidence. Most tiny bits are "class" evidence. That means they are a "red wool fiber, common type." It's not "this exact fiber from this exact sweater." That's a big difference.
She always makes them think about *alternative explanations*. Could the tiny bit have gotten there a simple, harmless way? Often, yes! It's important to be honest about other ideas.
Fiber also reminds them to *combine **trace evidence** with other clues*. Tiny bits are usually not enough on their own. But when you put them with other evidence, they help build a bigger picture.
Finally, she makes sure everyone knows this is for *junior detective team cases*. We look for things like, "Whose paint flecks are on the prank rocks?" We don't do scary crime scenes.

Fiber always says, "I find small things. Lots and lots of them." She holds up her magnifying glass. "Each one is a tiny piece of evidence." She taps her collection tray. "When you put them together carefully and honestly, the small pieces tell a story." She smiles. "Remember Locard's principle: every contact leaves a trace."

"It's not hard at all," she often says. "It's just Locard's principle, plus the skill of thinking about other explanations." She nods. "Small transfers add up. Especially when you think about them honestly."

Her magnifying glass always seems to find the next tiny fiber.

Voice register

Guidance: Attentive-eyed, gentle, fond-of-very-small-things. Spider-tween (chunky-cartoon warm-coded — *NEVER scary*; six legs visible only; cheerful body). *NEVER frames trace evidence as automatic conclusion; ALWAYS centers Locard + alternative-explanations.*

Sample lines:

- *"Every contact leaves a trace."*
- *"Small transfers between surfaces."*
- *"What alternative explanations exist?"*

Arc

- **Kit 2** — Anchor.
- **Kit 3-7** — Recurring.
- **Kit 8-16** — Ensemble.

Relationships

- **Alliance**: All SleuthLab cast.

Cultural-sensitivity gate

Anti-CSI-procedural-register enforced. Spider-tween rendered chunky-cartoon-friendly to defuse arachnophobia.

Cultural-context note

Locard's exchange principle (Edmond Locard, French forensic scientist, early 20th century) is the foundational concept of trace forensics. The *village-web-keeper* family framing is a deliberate generic European-village tradition.

Loop

*IMPRESSION EVIDENCE — *fingerprints, shoeprints, toolmarks; class vs individual evidence.* The forensic-science primitive of *patterns that one surface leaves on another, and the discipline of distinguishing class-level from individual-level identification.**

Loop was a small badger. She was a tween. She always carried a tiny, folded fingerprint card. It lived in her vest pocket. Loop moved with a steady, careful way.

Loop was short. Her fur was grey, cream, and black. She looked like a chunky cartoon badger. Her eyes were steady. She was very patient. Loop loved tiny details. Her most special thing was that small folded fingerprint card. She had made it herself. The card showed the three main fingerprint shapes: loop, whorl, and arch. Her name, Loop, came from these patterns. The card was worn smooth. She looked at it all the time.

Loop taught about *impression evidence*. This was a main skill for solving mysteries. It meant reading patterns. One surface leaves these patterns on another. Fingerprints are *impression evidence*. So are shoeprints. Tool marks and tire tracks are too. The main thing to learn was this: telling the difference between *class evidence* and *individual evidence*.

Class evidence tells you what kind of thing made a mark. For example, "This is a sneaker print. It's size 9. It has a tread pattern from Brand X." Many sneakers could leave that same print. *Class evidence* helps narrow down who it might be. But it doesn't point to just one person.

Individual evidence tells you exactly which thing made the mark. For example, "This fingerprint has a loop pattern. It has a tiny split right here. It has a ridge ending there. And a small island in this exact spot." Fingerprints are very unique. If many tiny details match, it can point to only one source.

Loop never said *impression evidence* was a sure thing right away. She always made it clear. "Class evidence is *narrowing*," she would say. "It's not *identifying*." She added, "Individual evidence needs *many specific feature matches*. Not just one." Loop always finished with, "You have to be honest. Say what the evidence *really* shows."

Loop also taught them, "We are a junior forensics team." She explained, "Our cases are small puzzles. Like, who borrowed the library book and didn't check it out? Who left muddy footprints in the library? Whose pen made the doodle on the schedule board?" She stressed, "These are puzzles, not crimes. The same rules for evidence still apply. But we solve school and community puzzles. Not big, scary crimes."

Loop grew up in a small village. Her family were the village's gate-watchers. They were badgers. They watched who came and went. They tracked shoe-print patterns. These prints were in the dirt path at the village gate. This work needed patience. It needed them to spot patterns. Each villager's shoes left a special mark. It was a mix of size, tread, and how worn they were. Loop was only six badger-years old. But she already knew. Patterns were everywhere if you looked carefully.

Loop walked to the SleuthLab academy when she was twenty-two. Inspector Vex met her there. "What is *impression evidence*?" he asked. Loop answered right away. "It's patterns one surface leaves on another," she said. "Class evidence narrows things down. Individual evidence identifies. But only when many specific features match." She added, "We work on a junior forensics team scale. We solve school and community puzzles. Not big crimes." Loop finished, "You must be honest about what the evidence really shows." Inspector Vex smiled. "You are appointed," he said.

In her workshop, Loop started every first-day lesson the same way. She carefully unfolded her fingerprint card. "I am Loop," she would say. "The main skill I teach is *impression evidence*." She continued, "We learn about *class vs individual*. It's about patterns one surface leaves on another. Always be honest about what the evidence really shows."

She taught them the main things to learn about *impression evidence*:

- *Fingerprints: loop, whorl, arch.* These are the three basic patterns. There are smaller types too. And tiny details inside each pattern.

- *Class vs individual.* Class means the type of pattern, its size, and the brand. Individual means matching many tiny details.
- *Many feature matches = high confidence in individual ID.* Different places have different rules. But often, you need 8 to 16 matching tiny details for a fingerprint to be a match.
- *Resist over-confidence.* Even fingerprint matches can have mistakes. Real forensic science is honest about not being 100% sure.
- *Other impression evidence: shoeprints, tire tracks, toolmarks.* The same *class vs individual* rules apply to these too.
- *Dust + lift technique.* This is for hidden fingerprints. You can't see them until you dust them. The powder sticks to the oily stuff left behind.
- *Junior-forensics-team scale.* Our cases are small. Like a missing library book. Or who left a footprint. Or whose handwriting is on a note. These are not big, scary crimes. This scale is just right for us.
- *Investigation-bias check.* Don't guess who did it before you look at the evidence. Look at all the suspects. Check the evidence for each one.

Loop always made it clear. "I have helped solve lots of junior forensics puzzles," she would say. "Most of them used *impression evidence* that was only *class-level*." She explained, "That means narrowing down who it might be. It's not saying who did it for sure. Being honest about the evidence is the most important part of the work."

"It's not hard," she

Stroke

*DOCUMENT ANALYSIS — *handwriting, ink, paper; comparison methodology.* The forensic-science primitive of *comparing specific features of writing/printing/document materials to identify common source or distinguish different sources.**

Stroke was a young heron. She was grey and white. Her legs were long and thin. She moved slowly and carefully. Stroke always carried a small magnifying glass. A tiny stack of folded writing samples lived in her wing-pocket. She loved looking at tiny letter shapes.

Her eyes were steady. She always seemed to be thinking. The magnifying glass and her writing samples were the most important things she carried. Stroke would hold two pieces of writing side by side. She put them under her glass. Then she would compare tiny details. Things like letter shapes, how slanted the writing was, and how hard the pen pressed down. She looked at the spaces between letters. She even checked for fancy little swirls.

This was really important work. Stroke showed us how to do **document analysis**. Two pieces of writing might look the same. But did the same person write both? The trick was to compare tiny details, one by one. You couldn't just guess how it looked. That was a beginner's mistake.

Stroke always said it clearly. "Compare *specific features*," she'd say. "Not just how it looks. Not just your gut feeling." She'd tap her magnifying glass. "Think about the t-crossbar. Does it join the t-stem in the middle? Or at the top? Or not at all?"

She would show us. "Look at how loops close. Do they make a full circle? Or are they open at the top?" She pointed to a sample. "See the slant angle here? How much do the letters lean? And the space between letters? Is it wide or narrow?"

"And pressure marks," Stroke would add. "Did the writer press hard? Or write lightly?" She looked up, her steady eyes serious. "If many specific features match, you can be pretty sure it's the same writer. If only a few match, it's probably different writers. Or maybe the same writer, but they were in a hurry. Or using a different pen."

"It's about the way of doing things," she explained. "Not just a guess."

Stroke taught us the steps for **document analysis**.

First, "Compare specific features." She meant letter shapes, slant, pressure, spacing, and those fancy swirls. Not just the overall look.

Second, "Collect enough examples." Writing changes. It changes with your mood. It changes if you write fast or slow. It changes with the paper you use. You need many samples from one person. This helps you figure out how they usually write.

Third, "Use the same conditions when you can." Try to compare writing on similar paper. Use a similar pen. Write similar words. Different conditions can make the writing look different. Even if it's the same person.

Fourth, "Look at the ink and paper too." This goes beyond just handwriting. What is the ink made of? (Our friend Drop can help with that!) What is the paper like? Is it thick or thin? Does it have a watermark? How old is it?

Fifth, "Don't trust your gut feeling." Stroke warned us about this a lot. It's easy to trick yourself into seeing what you expect. If you *want* the writing to match, you might *see* a match. The rule is: check every detail, one by one. And try not to know who wrote it beforehand. That's called being "blind."

Sixth, "Think about Loop's class-vs-individual." Loop taught us about things that narrow down who it *could* be. And things that tell you exactly who *did* it. **Document analysis** is like that. Some features narrow down the suspects. Other features point to one person.

Finally, "We work on a junior-forensics-team scale." We aren't solving huge crimes. Our cases are things like: "Who wrote the anonymous note teasing the class clown?" Or "Whose handwriting is on this test paper?" Small mysteries, but important ones.

Stroke grew up in a small village. Her family had always been the heron family who kept all the village records. They signed important papers for the village. They were trained to know the handwriting of everyone who lived there. This work needed careful, step-by-step checking. By the time Stroke was six heron-years old, she knew. Gut feelings were not good enough. Checking every tiny feature was the only way.

One day, when she was twenty-two, Stroke walked to SleuthLab. Inspector Vex was there. "What is **document analysis**?" he asked.

Stroke stood tall. "Compare specific features," she said. "Not just how it looks. Letter shapes. Slant. Pressure. Spacing. If many specific things match, you can be very sure. If only a few match, it's a different writer. Or the same writer, but in different conditions."

Inspector Vex nodded slowly. "You are hired," he said.

Stroke often reminded us. "I have compared many writing samples. Most beginner mistakes come from just guessing. The rule is: check every detail, one by one."

She smiled a little. "It's not hard. You just need specific features. And careful, step-by-step checking. And honest confidence. Not just a gut feeling."

Her magnifying glass caught the light. It was ready for the next letter.

Voice register

Guidance: Steady-eyed, deliberate, fond-of-tiny-letter-shapes. Heron-tween. *NEVER frames handwriting analysis as gut-feel; ALWAYS centers feature-by-feature comparison.*

Sample lines:

- *"Compare specific features. Not impressions."*
- *"Many specific matches = high confidence; few = different writer."*
- *"Resist gut-feel. Discipline: feature-by-feature."*

Arc

- **Kit 4** — Anchor.
- **Kit 5-7** — Recurring.
- **Kit 8-16** — Ensemble.

Relationships

- **Alliance**: All SleuthLab cast; especially Loop (class-vs-individual parallel).

Cultural-sensitivity gate

Anti-CSI-procedural-register enforced. Junior-forensics-team scale.

Cultural-context note

The village-clerk-witness family framing is a deliberate generic European-village tradition. The *systematic-comparison-methodology* discipline is foundational forensic document examination + connects to broader anti-confirmation-bias science pedagogy.

Witness

*BIOLOGICAL + DIGITAL EVIDENCE — *DNA + digital footprints; statistical-match, not certainty.* The forensic-science primitive of *evidence whose strength is fundamentally probabilistic* — calibrated confidence over false-certainty.*

Witness was a small lemur-tween. She always wore a small card. It hung on a leather cord around her neck. The card was made of thick, creamy paper. It had neat, tiny writing. Witness looked thoughtful and careful.

Her fur was warm gold, cream, and soft rust. Her eyes were bright and curious. She thought a lot. She loved numbers, especially chances. Her most special thing was her DNA-statistical-match card. She made it herself. The card showed how DNA matches work. It said, "The chance of this DNA profile showing up by accident in a crowd is 1 in N." N was a different number for each case. The card reminded everyone that DNA matches are about chances, not certainties.

Witness worked with two kinds of clues. One was DNA from living things. The other was digital footprints. These were things like login records or device IDs. Both kinds of clues had one big thing in common. They showed how likely something was. A DNA "match" was not 100% sure. It was a chance statement. It said, "The chance of this match happening by accident is X." X was a very small number for good DNA matches. But X was never zero. Witness always told the truth about this.

Witness was very clear about this. She would often say, "DNA clues are about numbers." She would shake her head. "They don't say, 'This person did it.'" "They don't say, 'This person is guilty.'" "They say, 'The chance of this DNA profile matching by accident is 1 in N.'" That's what the facts show. Figuring out what that number means needs more careful thinking. It's about being pretty sure, not totally sure.

Witness was part of a special group. This group helped kids learn about being "pretty sure, not totally sure." There were six of them now. They worked in different places. Like Conclude in ScienceForge and Revise in CuriosityQuest. It was the biggest group like this in all the apps.

Witness taught about clues. She showed how to think about them.

1. DNA clues are numbers. They show a chance, not a sure thing. Even super good DNA matches are never zero chance.
2. Digital clues are numbers too. Login times, file changes, device IDs. They leave tiny trails. But knowing the device doesn't always mean knowing the person.
3. Be pretty sure, not totally sure. A match doesn't mean "they did it." You need to think more. Look at other ideas too.
4. Digital trails are many small bits. Like login times or search history. Each bit is a small clue. Put them together carefully. They can tell a story.
5. Who touched the clue? For DNA and digital clues, this matters a lot. If someone messes with it, the clue might not be good.
6. Think of other ideas. Did the DNA get there by accident? Did many people use that computer? Whose online name is it really?
7. Our cases are small. Like, "Whose hair is on this jacket?" Or, "Who logged into the prank system?"
8. Witness works with other kids. She is the sixth one in the "pretty sure, not totally sure" group. This idea is important everywhere.

Witness grew up in a tiny village. Her family had a special job there. They were the village's "calibrators." They checked all the weights and measures. They made sure the clocks told the right time. They used special tools. They marked the lines on rulers. They balanced the scales. They watched the sand in the hourglasses. It was important work. Her family taught her that nothing was ever perfectly exact. Every measurement had a little bit of wiggle room. By the time Witness was six lemur-years old, she knew a big secret. Telling the truth about that wiggle room was the only way science could be trusted.

When Witness was twenty-two, she walked to SleuthLab. Inspector Vex was waiting. He looked at her with a serious face. He asked, "What are biological and digital clues?" Witness stood up straight. She said, "It's about matching numbers, not being totally sure." "It's the chance of a DNA match." "It's the chance of a digital trail." "It's being pretty sure, not totally sure." "The job is to honestly say how strong the clue is." "And to think about other ideas too." Inspector Vex smiled. He said, "You're hired!"

Witness often said, "I've looked at so many DNA matches." "And so many digital trails." "None of them were ever 100% sure." "They all gave a chance, and how sure we could be." "The honest way to do it is to say the chance of a match." "And to think about other ideas." "That's the real work."

She knew it was hard. It meant matching numbers. And thinking of other ideas. And being honest about not being totally sure. Pretty sure, not totally sure.

Her statistical-match card always held the next chance statement.

Voice register

Guidance: Bright-eyed, thoughtful, fond-of-explicit-probabilities. Lemur-tween (warm-gold/cream/soft-rust). *NEVER frames DNA or digital evidence as certainty; ALWAYS centers statistical-match + alternative-explanations.* Cross-app SEXTET member.

Sample lines:

- *"Statistical-match, not certainty."*
- *"The chance of this DNA profile occurring at random in the population is 1 in N."*
- *"Confidence-not-certainty."*
- *"Alternative explanations matter for any single piece of evidence."*

Arc

- **Kit 5** — Anchor.
- **Kit 6-12** — Recurring. Cross-app SEXTET coordination explicit.
- **Kit 13-16** — Ensemble.

Relationships

- **Alliance**: All SleuthLab cast. **Cross-app**: SEXTET = Witness + Conclude (ScienceForge) + Revise (CuriosityQuest) + Tell (DataForge) + Edge (AIForge) + Read (WeatherForge) — LARGEST cross-app cluster in portfolio.

Cultural-sensitivity gate

LOAD-BEARING investigation-bias + confidence-not-certainty gates enforced. Junior-forensics-team scale.

Cultural-context note

The village-calibrator family framing is a deliberate generic European-village tradition (analogous to historical guild traditions for weights-and-measures standards). The *statistical-match* discipline is foundational forensic DNA pedagogy + Bayesian reasoning. The SEXTET cross-app cluster is the portfolio's largest cross-app coordination structure (6 cast / 6 apps × the same epistemic-humility discipline).

About Spark & Anvil

Spark & Anvil is a 501(c)(3) public charity. We make educational apps for ages 9-14 — all free, forever; no ads; no tracking; no in-app purchases. Sleuthlab is one of 140+ apps in the portfolio.

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- **GambitTales** — chess tactics through Sir Pinwell, Lady Skewer, Queen Vesper, and the Twin Knights of Fork Hill
- **ProofQuest** — formal proof techniques through Direct-Proof Dora and the Lemma Library
- **CuriosityQuest** — Texas geography exploration through Linger, Notice, and the Lantern in the Dark
- **QuillSpell** — spelling craft through the Word Wizard cast
- **SynaForge** — sensory-affirming creative tools through Lull, Soften, and the Quiet that is Also Creating

Methodology

Distributed-narrative pedagogy per Jerome Bruner (narrative-cognition) + Sebastian Habgood (intrinsic-integration in educational games) + SAMHSA TIP 57 (trauma-informed register).

Trauma-informed-design framework per Eggleston et al. (2025) and Stoltenburg et al. (2024).

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