🧪 CSI Investigator Training Manual: Wildlife Crime Lab Prep

Prepare. Protect. Prove It.
Grades 4–7 | Pre-Lab Curriculum Guide for "The Rhino Horn Experiment"

👮 Mission Briefing: Welcome to the Wildlife Crime Lab

You've been recruited by the Wildlife Crime Forensics Unit.
Your first case? A wildlife trafficking ring is suspected of smuggling powdered rhino horn across borders in East Africa. Three white powders have been seized. One could be **crushed rhino horn** — illegal and endangering a critically threatened species.

Your team must analyze these mystery powders using chemical testing. But beware: smugglers often disguise illegal substances. One of the bags may contain a banned **narcotic**, and one may be a **legal but suspicious powder** used to confuse investigators.

🧪 Science Warm-Up: "What's in the Bag?"

Before testing, discuss these questions:

- What does "wildlife trafficking" mean?
- Why might people want to buy rhino horn?
- Why do scientists use **experiments** to test materials?
- What are some examples of powders that look alike?
- What might happen if you **guessed** instead of tested?

💬 *In science, your job isn't to be right—it's to be honest and observant. Evidence tells the story.*

🧰 Lab Equipment Visual Guide

Equipment	Use
🧪 Test Tubes or Plastic Cups	Mix solutions safely
🫓 Petri Dish or Plate	Observe chemical changes
📏 Graduated Cylinder	Measure precise amounts
🥄 Plastic Spoon or Stir Stick	Stir safely
🧤 Gloves	Protect hands
🥽 Safety Goggles	Protect eyes
🔬 Notebook or Worksheet	Record data

💡 *CSI Scientists handle all tools with care and responsibility. Tools are never toys.*

🧠 Science Vocabulary Words

1. Precipitate – A solid that forms when chemicals react in liquid
2. Reaction – A change when substances mix
3. Acid – A substance that can cause reactions
4. Solution – A mixture where substances dissolve
5. Observation – Careful notes of what you see
6. Hypothesis – A science "guess" based on what you know
7. Variable – The thing that changes in an experiment
8. Control – The thing that stays the same
9. Substance – A material made of only one kind of matter
10. Evidence – Proof that supports a claim

🧪 Safety Checklist

Before you begin:

✅ Wear gloves and goggles at all times

✅ Tie back long hair

✅ Do not eat, drink, or touch your face

✅ Keep your area clean and organized

✅ Ask the teacher if you're unsure

✅ Wipe up any spills right away

✅ Only mix the items listed in your directions

✅ Wash hands after lab

SCIENCE LAB SAFETY RULES

✔ Always wear goggles and gloves

✔ Listen to your teacher's instructions

✔ Never taste or smell chemicals

✔ Keep your workspace clean

✔ Handle glassware carefully

✔ Wash your hands after the lab

No running or horseplay

👥 Team Roles: Who Does What?

Role	Responsibility	
Lead Investigator	Reads the steps aloud and leads timing	
Chemical Technician	Measures and mixes the powders and liquids	
Data Recorder	Writes observations on worksheets	
Safety Monitor	Watches for rule violations and checks goggles/gloves	

📣 *Each role is important. Scientists work together to protect each other and solve real problems.*

⚖️ CSI Code of Conduct

As Wildlife Forensic Scientists, we agree to:

- Respect each other's ideas and space
- Speak calmly and clearly in our group
- Handle materials responsibly
- Use kind and encouraging words
- Report spills or accidents right away
- Stay focused on the mission
- Ask thoughtful questions
- Take pride in our work
- Protect the planet and living things with our choices
- Seek truth, not shortcuts

Signature: _____
CSI Wildlife Science Cadet

🧪 Mystery Powder Background

Your teacher has labeled three bags of powder:

Bag	Possible Identity	
A	Rhino Horn (contains **calcium**)	
B	Narcotic Substance (simulated)	
C	Over-the-counter (OTC) powder used in medicine or baking	

Your job: Use chemical testing to identify which bag contains **crushed rhino horn**, based on whether it forms a **precipitate** (solid) when mixed with phosphoric acid.

💡 Teacher Note: About the composition of other white powder:

You can simulate it in class using **Baking soda** or **vitamin C tablets** — both appear white and powdery and do not react in the same way as calcium-based substances.

✅ 1. Pre-Lab Behavior & Safety Check Quiz

Directions for Students:
Before entering the CSI Lab, you must demonstrate your readiness by scoring **70% or higher** on this quiz. Choose the best answer for each question.

🔒 Behavior & Safety Quiz (10 Questions, Multiple Choice)

1. **Why should you wear goggles during a lab experiment?**
   A) To look cool
   B) To protect your eyes from chemicals

C) Because the teacher said so
D) So you don’t get sleepy

2. **If something spills in the lab, you should:**
   A) Ignore it
   B) Tell your lab partner
   C) Tell the teacher immediately
   D) Wipe it with your sleeve
3. **Which of the following is NOT allowed in the lab?**
   A) Wearing gloves
   B) Chewing gum
   C) Taking notes
   D) Following directions
4. **If you break something in the lab:**
   A) Throw it away quietly
   B) Hide it from your group
   C) Tell the teacher right away
   D) Use it anyway
5. **Why do we use plastic tools instead of glass in this experiment?**
   A) They look better
   B) They're harder to break
   C) They’re cheaper
   D) The experiment won’t work otherwise
6. **Before touching any equipment, you must:**
   A) Run around the table
   B) Ask the teacher what to do
   C) Test it out first
   D) Take a photo
7. **What should you do if your partner isn't listening or following the rules?**
   A) Argue loudly
   B) Tell them they’re wrong
   C) Ask the teacher for help
   D) Do the lab by yourself
8. **What is the purpose of the lab rules?**
   A) To make the lab boring
   B) To protect students and make learning safe
   C) To punish people
   D) To waste time
9. **Why is it important to write down your observations?**
   A) So you look smart
   B) So your friends can copy

C) So you remember what happened
D) So you don't have to listen

10. **What is the correct way to clean up after a lab?**
A) Leave everything where it is
B) Put trash on the floor
C) Follow the teacher's clean-up instructions
D) Wait until tomorrow

✔ **Scoring:**
– 7 or more correct = ✅ Qualified
– 6 or fewer = 🔁 Review rules and retake with support

🧠 2. CSI Science Vocabulary Quiz

Directions: Choose the correct definition or best match for each science term.

📘 Science Vocabulary Quiz (10 Questions, Multiple Choice)

1. **What is a "precipitate"?**
A) A powder that dissolves
B) A gas that forms bubbles
C) A solid that forms in a liquid after a reaction
D) A type of acid
2. **What does "observe" mean in science?**
A) To guess
B) To copy answers
C) To use your senses to gather data
D) To fix something
3. **What is a "reaction"?**
A) A mistake
B) A change that happens when substances mix
C) A way to decorate slides
D) A question

4. **What does “acid” mean?**
   A) A base
   B) A substance that burns
   C) A chemical that can react strongly with others
   D) Water
5. **A “graduated cylinder” is used to:**
   A) Mix chemicals
   B) Heat substances
   C) Measure liquids accurately
   D) Break solids
6. **“Evidence” in science means:**
   A) Proof that supports your claim
   B) An opinion
   C) A funny story
   D) A lab partner’s guess
7. **What is a “hypothesis”?**
   A) A question
   B) A random guess
   C) An educated prediction
   D) A finished conclusion
8. **What are “chemical properties”?**
   A) What something looks like
   B) How it smells
   C) How a substance reacts with other substances
   D) Its cost
9. **“Calcium” is:**
   A) A gas
   B) A metal
   C) A mineral found in rhino horn
   D) A flavor
10. **“Collaboration” means:**
    A) Working alone
    B) Copying answers
    C) Working together respectfully
    D) Asking the teacher for answers

✔ **Scoring:**

– 7 or more correct = ✅ Ready to enter the lab

– 6 or fewer = 🔁 Review science vocabulary and retry

📘 Worksheet 1: Observation Log

CSI Rhino Case – Observation Worksheet

Name: _____
Date: _____
Lab Group Members: _____

Powder #	Description Before Mixing	Reaction After Water	Reaction After Acid	Precipitate Formed? (Y/N)	Notes/Sketches	
#1						
#2						
#3						

🔍 Instructions:

- Use **complete sentences** or labeled sketches.
- Record **smells, bubbles, color change, or texture**.
- Circle any mystery powder that created a solid (precipitate)!

🧠 Worksheet 2: CER Writing Frame

Claim – Evidence – Reasoning | Rhino Horn Mystery Lab

Name: _____

Powder I Identified as Rhino Horn: _____

Suspect Name (from Slide 27–28 of the Rhino Game): _____

🧪 Claim

What did you find?

I claim that Bag # _____ is crushed rhino horn because _____.

🧬 Evidence

What proof supports your claim?

When we mixed it with water and phosphoric acid, we observed:

🔬 Reasoning

Why does that evidence prove your claim?

This shows it's crushed rhino horn because _____

📝 Conclusion Sentence

The evidence points to [Suspect Name] because _____.

📊 Worksheet 3: Final Results Table

Use this to summarize your group results.

Powder #	**Type of Reaction** (bubble / none / solid)	**Substance Identity**	**Suspect Linked**	
#1				
#2				
#3				

✅ Final Prep Checklist

- Students understand lab roles
- Safety rules have been discussed
- All equipment is set up and labeled
- CSI Code of Conduct is signed
- Vocabulary and warm-up completed
- Hypotheses recorded
- Teacher confirms readiness to begin

🧪 Let the Investigation Begin...

Remember: this is **your** investigation.
Ask questions. Record carefully. Use logic. Be fair.
You are the future of science—and the rhinos are counting on you.