DAILY INVESTIGATION PACKET

Sep 4 · Investigation Day 2 of 18

OFFICIAL

THE BRIEFING: WHAT YOU ARE DOING TODAY, AND HOW THE PROS DO IT — SEC 00

Picking up from yesterday: you learned that evidence earns conclusions. Nothing else does.

Real analysts never trust a single number on its own. They compare it to what is normal and they chart it to see whether it is climbing, falling, or holding steady. Today you tune up those same data tools, because in about two weeks a lab number is going to land on your desk and you will need to know whether it is boring or case-cracking.

OBJECTIVE

Today you will calibrate the data tools this case will lean on: mean, median, range, reference ranges, and choosing a graph that tells the truth.

Take-home (the ten-year idea): A number means nothing until it stands next to its reference range.

BACKGROUND AND BRIEFING (READ THIS FIRST) — SEC 02

In two weeks a lab panel will land on your desk with a number like 612 on it. Whether that number is boring or case-cracking depends on one question: what is normal? A reference range is the interval where healthy values usually land. Analogy: every road has its own speed limit; 55 is legal on the highway and reckless in a school zone. A lab value is only high or low relative to ITS range. LIMIT of the analogy: speed limits are laws with hard edges; biology is a distribution, and healthy people sometimes sit slightly outside the range. One out-of-range number is a flag, not a verdict.

Three summary numbers you will use constantly: MEAN (add and divide; fair when values cluster), MEDIAN (the middle value; fair when one outlier would drag the mean), RANGE (spread; tells you how much the data disagrees with itself).

Choosing the graph: BAR for comparing categories (blood types found at a scene), LINE for change over time (body temperature falling), SCATTER for testing whether two things move together (dose vs response). The wrong graph is not just ugly, it can lie: a bar chart whose axis starts at 90 instead of 0 makes a tiny difference look huge.

The skill today is skepticism with a pencil: before you accept any chart, check the axis start, the units, and whether the graph type fits the question.

NEW VOCABULARY (RECORD IN YOUR NOTEBOOK BANK) SEC 04

TERM	PLAIN-LANGUAGE DEFINITION	ANALOGY TO HOLD ONTO
reference range	the interval where healthy values usually land	the speed limit for a lab number

THE DECISION OF THE DAY SEC 03

YOUR ROLE

You are the team's data analyst.

THE SITUATION

Three practice datasets (category counts, a temperature series over hours, dose-response pairs) plus one deliberately misleading chart with a truncated axis.

THE RULE YOU APPLY

Match graph type to question type; report center with the statistic the data shape deserves; every axis starts where honesty starts.

WHAT YOU PRODUCE

One correct graph per dataset, plus a two-sentence callout of exactly how the misleading chart misleads.

Claim ceiling. You may describe what these practice data show. They are practice data; they prove nothing about our case yet.

WHAT THIS UNLOCKS

Next class you qualify for the scene: the safety practical and chain of custody.

PLTW ANCHOR AND INTERACTIVE LAYER REF

Activity 1.1.1 A Sketchy Scene (referenced by title only; all materials in this file are John Hay original work)

- Portal: day page and guided notes; the WebXam Baseline sheet (graph your start, predict your growth) carries today's data

myPLTW student access is down for technical reasons. When it is restored, this day's PLTW anchor is completed online; until then the portal simulation and these printed materials carry the day.

INVESTIGATION TEAM ASSIGNMENTS — SEC 05

A **Scene and Documentation**
Own the axis-honesty checklist; post it by the board.

B **Trace**
Build the bar graph station answer and brief it.

C **Serology and DNA**
Build the line graph station answer and brief it.

D **Toxicology and Chemistry**
Build the scatter station answer and brief it; this is your team's home turf.

E **Medical Examiner**
Compute the summary statistics table and brief the mean-vs-median call.

F **Records and Timeline**
Start the unit timeline: enter days 1 and 2 as its first two events, then log which graph goes with which future evidence type.

NOTEBOOK PAGES IN USE TODAY — SEC 06

- Day 2 Cornell page
- Vocabulary bank: reference range entry with your own analogy

DAILY SUBMISSION FORM: GRAPH EXIT SLIP

JH-26-0831-A / D2

- ☐ Three graphs, labeled axes and units
- ☐ Mean, median, range table
- ☐ Misleading-chart callout (two sentences)

INVESTIGATOR (PERIOD + CODE, NO NAMES)	TEAM	TIME SUBMITTED