

2027-05-13 · 80 minutes

Renal and digestive records: compare without overclaiming

Your goal: Supplied-record paper preparation only. Do not collect samples, handle reagents, run enzyme tests or operate gel equipment. Actual lab work requires the teacher's approved protocol, materials and supervision. Today's objective: Run urinalysis and enzyme-digestion labs to connect filtration and digestion to health.

One product: Combined data table recording urinalysis dipstick results, enzyme-digestion rate observations, and gel-electrophoresis band interpretation for PKD markers.

Question: What does each record support when its key, units and missing evidence stay visible?

Start the work

Label the path and direction before naming the process; a diagram or isolated test result does not establish a diagnosis.

1. Supplied-record paper preparation only. Do not collect samples, handle reagents, run enzyme tests or operate gel equipment. Actual lab work requires the teacher's approved protocol, materials and supervision. Actual route: genuine teacher-assigned records, interpretation key and rubric replace original records and row counts. Complete one combined table only. Ask the teacher for the assigned materials and directions. Do laboratory work only with the required authorization and supervision. Step: Review safe handling of simulated urine and enzymes.
2. Supplied-record paper preparation only. Do not collect samples, handle reagents, run enzyme tests or operate gel equipment. Actual lab work requires the teacher's approved protocol, materials and supervision. Actual route: genuine teacher-assigned records, interpretation key and rubric replace original records and row counts. Complete one combined table only. Ask the teacher for the assigned materials and directions. Do laboratory work only with the required authorization and supervision. Step: Perform urinalysis and record indicator results.
3. Supplied-record paper preparation only. Do not collect samples, handle reagents, run enzyme tests or operate gel equipment. Actual lab work requires the teacher's approved protocol, materials and supervision. Actual route: genuine teacher-assigned records, interpretation key and rubric replace original records and row counts. Complete one combined table only. Ask the teacher for the assigned materials and directions. Do laboratory work only with the required authorization and supervision. Step: Run an enzyme-digestion test and observe substrate breakdown.

4. Supplied-record paper preparation only. Do not collect samples, handle reagents, run enzyme tests or operate gel equipment. Actual lab work requires the teacher's approved protocol, materials and supervision. Actual route: genuine teacher-assigned records, interpretation key and rubric replace original records and row counts. Complete one combined table only. Ask the teacher for the assigned materials and directions. Do laboratory work only with the required authorization and supervision. Step: Run gel electrophoresis to interpret PKD genetic markers.
5. Supplied-record paper preparation only. Do not collect samples, handle reagents, run enzyme tests or operate gel equipment. Actual lab work requires the teacher's approved protocol, materials and supervision. Actual route: genuine teacher-assigned records, interpretation key and rubric replace original records and row counts. Complete one combined table only. Ask the teacher for the assigned materials and directions. Do laboratory work only with the required authorization and supervision. Step: Tabulate results across the renal and digestive tests.

Supplied-record paper preparation only. Do not collect samples, handle reagents, run enzyme tests or operate gel equipment. Actual lab work requires the teacher's approved protocol, materials and supervision. If access is blocked, save the table and tell the teacher what you need. After uploading, check that Schoology shows Submitted.

Words you will use

urinalysis

Examination of urine properties and components.

dipstick indicator

A kit-specific readout for a tested property or substance.

analyte

Substance a test is intended to detect or measure.

protein

Molecule made from amino-acid chains; the fictional U channel concerns protein.

categorical

Expressed as a class rather than a measured amount.

concentration

Amount of a substance per stated volume.

reference category

A class used for comparison under a stated key, not automatically a health range.

negative reference

A comparison record expected to show the lower or absent-target readout under its key.

positive reference

A comparison record expected to show a specified target-associated readout under its key.

control

Comparison used to check a specified part of an interpretation; not proof of every aspect of quality.

internal consistency

Agreement among the supplied rules and records within this exercise.

catalyst

Substance that speeds a reaction without being consumed as a reactant.

reactant

Starting substance changed during a chemical reaction.

enzyme

Biological catalyst that speeds a reaction without being consumed as a reactant.

substrate

Substance acted on in the enzyme reaction.

product

Substance formed by a reaction.

reaction

Change that converts substances into products.

AU

Arbitrary signal units, without a supplied conversion to mass or concentration.

signal

Recorded readout associated with a system; its biological meaning needs validation.

endpoint

Supplied beginning or ending observation for an interval.

elapsed time

Difference between ending and starting time.

min

Minute, a unit of time.

average rate

Change divided by the elapsed time across the specified interval.

numerator

Top part of a fraction, here the signal loss.

denominator

Bottom part of a fraction, here elapsed minutes.

initial rate

Rate near a reaction's beginning; two endpoints alone do not establish it.

calibration

Evidence relating a readout to a known reference or quantity.

blank correction

Adjustment using a designated background reference under an authorized rule.

causation

Claim that one factor produced a change.

gel electrophoresis

Molecular separation through a matrix using an electric field.

matrix

Material through which molecules move during separation.

electric field

Electrical influence exerting force on charged particles.

DNA

Molecule whose sequence carries genetic information.

linear fragment

A piece of DNA represented as an unclosed chain in this size model.

bp

Base pairs, a unit for the length of double-stranded DNA.

band

Detected group of molecules at a position in a separation.

lane

One labeled record column in the gel schematic.

origin

Starting location at the top of this conceptual gel map.

nominal size

Assigned reference label, not a new measured estimate.

sequence

Order of DNA building blocks.

assay

A defined test with a specified target and interpretation method.

validated key

Interpretation rule checked for its intended use; exercise consistency is not clinical validation.

PKD

Polycystic kidney disease, a group of disorders involving kidney cysts.

cyst

Fluid-filled sac.

genotype

Genetic constitution at specified locations, not established by this generic pattern.

diagnosis

Identification of a condition from appropriate evidence and clinical interpretation.

provenance

Where a record came from and what was actually done.

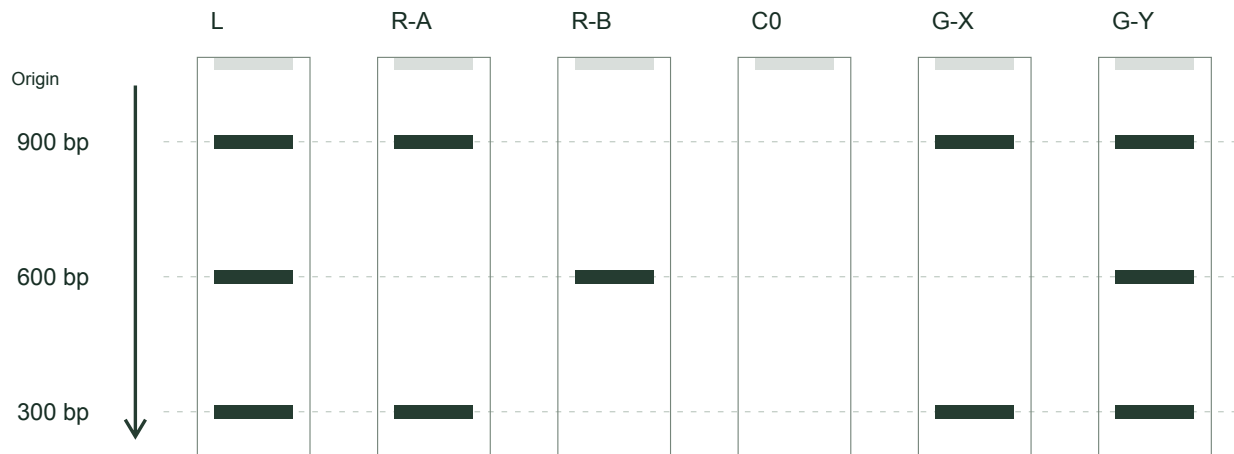
Submission check

After uploading, check that Schoology shows Submitted; ask for help if it does not.

Fictional complete-pattern reference

G-MAP: fictional complete-pattern reference

No actual gel, patient, PKD marker or operating instructions.



Away from top origin: smaller linear DNA fragments generally travel farther in this size model.

Nominal labels only; spacing is not a distance-to-size calibration. C0 has no recorded bands.

G-KEY: A = exactly {900,300}; B = exactly {600}; all other sets = neither.

Expected references: R-A=A, R-B=B, C0=no bands. Internal teaching-key check only.

Original route: interpret G-X/G-Y in the SAME table. Full band lists are in G1.

Actual assigned data/key replace this schematic; actual PKD-marker interpretation stays pending.

Original idealized teaching schematic, not patient genetics or a validated PKD assay. Actual assigned records/key replace it; no extra gel-copy task.

Text description: Left to right L=900/600/300bp, R-A=900/300, R-B=600, C0=no bands, G-X=900/300, G-Y=900/600/300.

Origin at top; downward is farther. Complete text and exact key in G1.

H1: A record is not a completed experiment

Supplied-record paper preparation only. Do not collect samples, handle reagents, run enzyme tests or operate gel equipment. Actual lab work requires the teacher's approved protocol, materials and supervision.

All U, E and G records are invented teaching inputs, not actual measurements or linked patient records. A chart match, signal rate or fictional band pattern does not diagnose PKD or another condition.

Opening input: a card reports an invented color code K1 but supplies no matching chart. Can K1 be converted into a concentration? No conversion is supplied. Original route: write the missing input and one claim that must wait. Actual route: identify the genuine key needed for the assigned record, or mark it missing. Use H1 only.

Use one combined table with five columns: record/source ID; recorded observation; key or calculation; limited interpretation; missing evidence or next action. Add rows in each interval rather than recopy them at the end. The original route needs seven rows: U-N, U-P, U-X, E0, E1, G-X and G-Y. Short phrases suffice.

Today is Thursday May 13. The May 11 source is preparation only; its completion is not assumed. Start S1's brief checks and next actions now. Friday May 14 is the next scheduled exhibit lesson; carry the table with its invented or genuine source clearly identified.

U1: Complete fictional indicator chart and records

Urinalysis examines urine properties and components. A dipstick indicator is a test-specific readout. A categorical result is a class, not a concentration. Protein results require context and may have several explanations (URINE). No clinical reference range, amount or diagnosis is assigned here.

Original teaching chart U-KEY concerns a fictional protein-indicator channel only. K0 = pale yellow = category P0, lower reference category. K1 = light green = category P1, middle reference category. K2 = dark green = category P2, upper reference category. All categories have no numerical concentration unit. These invented colors/codes are not a real kit chart, a normal range, or instructions to read any strip.

Already-recorded cards, not materials to handle: U-N | negative-reference card | expected K0 | observed K0, pale yellow. U-P | positive-reference card | expected K2 | observed K2, dark green. U-X | fictional unknown card | expected category unspecified | observed K1, light green. The words/codes are complete color alternatives.

Teaching comparison rule: first compare the two reference cards with their expected codes and record whether each matches. Then map U-X through U-KEY and report its category. The control matches show internal consistency of this invented exercise only. They do not verify an actual device, reagent, reading time, sample identity or measurement quality.

Original route: at 10–28 enter U-N, U-P and U-X in the same table. Record code/color, expected-versus-observed reference match or U-X category, and one shared limit: real kit context and diagnosis unavailable. Do not convert P1 to a mass/concentration or call it abnormal. Actual route: genuine teacher-assigned records, interpretation key and rubric replace original records and row counts. Complete one combined table only. Ask the teacher for the assigned materials and directions. Do laboratory work only with the required authorization and supervision.

E1: Recorded change and elapsed time

An enzyme speeds a chemical reaction without being consumed as a reactant (ENZYME). Reaction rate describes change over elapsed time (RATE). This paper record uses an arbitrary substrate-associated signal, not a measured mass or concentration. AU means arbitrary signal units. No

conversion from AU to substrate amount is provided.

Fictional recorded columns: record | label | starting signal at elapsed 0 min | ending signal at elapsed 5 min. E0 | no-enzyme comparison label | 100 AU | 90 AU. E1 | enzyme-present label | 100 AU | 70 AU. The endpoints and times are supplied observations to interpret, not instructions to prepare, time or run anything. No intermediate readings, repetitions or actual conditions are supplied.

Original calculation rule: positive signal-loss rate = (starting AU minus ending AU) / (ending time minus starting time). Keep the numerator positive for a decline. Report the change, elapsed time and average rate in AU/min. If elapsed time is zero or unavailable, the rate is unavailable, not zero. No rounding is needed for these values.

E0 has a signal decline despite its no-enzyme label. The two labels alone do not prove enzyme causation or validate a chemical measure. Report each raw signal-loss rate without subtracting E0 as a blank correction. No such correction or calibration is authorized by this teaching rule.

A single interval gives an average signal change per minute, not an initial rate, direct substrate disappearance, product appearance, optimal condition or digestive-health finding. The substrate-associated label does not supply a validated signal-to-amount relationship.

Original route: at 28–45 add E0 and E1 to the same table. Preserve both endpoints/times, show each numerator/denominator and unit, and state the signal-versus-amount limit. Actual route: genuine teacher-assigned records, interpretation key and rubric replace original records and row counts. Complete one combined table only. Ask the teacher for the assigned materials and directions. Do laboratory work only with the required authorization and supervision.

G1: Fictional band pattern and complete key

Gel electrophoresis separates molecules using an electric field and matrix; size and charge affect movement (GEL). Under comparable conditions, smaller linear DNA fragments generally move farther. A size-reference lane supports approximate size comparisons. This schematic supplies nominal sizes directly; it is not an actual gel or measured image.

Original teaching figure G-MAP has lanes left to right L, R-A, R-B, C0, G-X, G-Y. Top marks the origin/wells; the arrow points downward, away from origin. For this idealized linear-DNA size model, the higher level is 900 bp, middle 600 bp and lower 300 bp. bp means base pairs, a DNA length unit. These levels are not a linear distance-to-size calibration or operating instructions.

Complete text equivalent: L contains bands at 900, 600 and 300 bp. R-A contains 900 and 300 bp. R-B contains 600 bp. C0, the blank reference, has no recorded bands. G-X contains 900 and 300 bp. G-Y contains 900, 600 and 300 bp. No band intensities or additional bands are supplied. The lane codes are fictional records, not people or real genotypes.

Teaching key G-KEY: pattern A is exactly {900,300}; pattern B is exactly {600}; otherwise report neither. Match all listed bands, not just one shared band. Expected reference patterns are R-A=A, R-B=B and C0=no bands. Their supplied records satisfy those expectations. This validates the exercise's internal

key consistency only, not a biological assay or PKD marker.

Original route: at 45–60 add G-X and G-Y to the same table. Preserve each complete band set, apply G-KEY and state match A, match B or neither. Reference lanes remain supplied inputs; they do not require a second copied gel or three extra table rows. Use G-MAP or its complete text equivalent.

PKD is polycystic kidney disease, involving kidney cysts. A cyst is a fluid-filled sac. Actual PKD-marker interpretation needs a validated assay-specific key and appropriate context (PKD); this teaching key cannot supply them. No real gene or disease variant is assigned to A or B. Equal apparent length does not prove equal sequence, disease-causing effect or clinical outcome. Actual route: genuine teacher-assigned records, interpretation key and rubric replace original records and row counts. Complete one combined table only. Ask the teacher for the assigned materials and directions. Do laboratory work only with the required authorization and supervision.

Q1: Finish the same seven-row table

At 60–72 finish the existing table. Original route: check all three U rows against U-KEY, both E calculations against their endpoints, and both complete G band sets against G-KEY. Use one shared note when the same evidence limit or next action applies. Do not copy a second final table.

Label a genuine partner check as peer review only if it happened. Otherwise perform the same source check yourself and label self review. Correct a real mismatch or record one verified match. Do not invent a peer comment, experimental observation or discrepancy.

Recovery: identify the source ID first. A category comes from U-KEY; a rate needs both change and elapsed time from E1; a pattern needs the entire band set from G1. If a required input is absent in the actual route, leave the affected cell blank and name the precise input you need. Actual route: genuine teacher-assigned records, interpretation key and rubric replace original records and row counts. Complete one combined table only. Ask the teacher for the assigned materials and directions. Do laboratory work only with the required authorization and supervision.

S1: Save the table; keep execution separate

Use twelve short checks. 1: ask what preparation to submit. 2: obtain the genuine dataset and its source. 3: obtain the actual kit/assay key and reference context. 4: obtain the approved safety protocol. 5: obtain materials, equipment, supervision and participation authorization. 6: use evidence only from laboratory work actually performed. 7: follow the assigned official task's scope.

Also check 8: the actual rubric, accommodations and grading policy. 9: how to take part with peers if required. 10: your section and deadline. 11: the saved table. 12: that Schoology shows Submitted after uploading. Note evidence from a check you performed or the missing input and a specific next action. Update changed marks, not twelve narratives.

The course plan names 4.1.4 Diagnose with DNA, 4.1.5 Urine Trouble and 4.2.4 Break It Down. Ask the teacher which of them are assigned and where to stop.

Assignment: Wk17 Data table: Renal and digestive labs. Section 1292:

<https://clevelandmetro.schoology.com/assignment/8544602456> . Section 6792:

<https://clevelandmetro.schoology.com/assignment/8544602476> . Confirm section, deadline and accepted preparation. Open your section's assignment and, after uploading, check that Schoology shows Submitted.

At 72–80 check/save the same table or submit through the confirmed section if authorized. If access is blocked, keep the file and tell the teacher what you need. Check Schoology after uploading. This paper route has no specimen or equipment cleanup. Actual cleanup requires the teacher's real protocol. Supplied-record paper preparation only. Do not collect samples, handle reagents, run enzyme tests or operate gel equipment. Actual lab work requires the teacher's approved protocol, materials and supervision. Actual route: genuine teacher-assigned records, interpretation key and rubric replace original records and row counts. Complete one combined table only. Ask the teacher for the assigned materials and directions. Do laboratory work only with the required authorization and supervision.

M1: Distinct invented sorting-log example

Optional nonclinical model: an imaginary warehouse supplies two records. Model K: tag code T2; key T0=unreviewed and T2=reviewed. Model Q: queue count drops from 20 cards to 8 cards over 4 min. No warehouse actually ran; these inputs are authored examples.

Completed model table in words: K | recorded T2 | key T2=reviewed | matches the reviewed category | no proof a real inspector acted. Q | 20 to 8 cards in 4 min | $(20-8)/4=3$ cards/min | average queue decrease | reason for change and real operation unknown.

Worked self-check: I retained both queue endpoints and the four-minute denominator. The computed decrease is 12 cards and rate is 3 cards/min. The tag and queue records are separate, so I do not claim the review caused the decrease.

Transfer only the method: keep source, observation, key/calculation, bounded interpretation and missing evidence visible. A warehouse log does not model kidney physiology, enzyme chemistry or genetic diagnosis. No extra model table is assigned. Actual route: genuine teacher-assigned records, interpretation key and rubric replace original records and row counts. Complete one combined table only. Ask the teacher for the assigned materials and directions. Do laboratory work only with the required authorization and supervision.

Try the decision

Original route: practice lane Z, not one of your records, lists 600 and 300 bp. It shares the 600 bp band with B and the 300 bp band with A. Apply the supplied complete-pattern rule. Actual route: use the genuine validated key and its scope.

- Compare Z's complete band set with each G-KEY pattern before reporting a category.
- Call pattern B because the 600 bp band matches, ignoring the additional 300 bp band.
- Diagnose PKD from the extra 300 bp band in the teaching pattern.

Explain your choice using the reading. Discuss it or say it to yourself. This practice does not add another submission.

Your 80-minute flow

0–10 minutes	Read H1 and identify missing input/held claim; start S1 short marks. Actual route: genuine teacher-assigned records, interpretation key and rubric replace original records and row counts. Complete one combined table only. Ask the teacher for the assigned materials and directions. Do laboratory work only with the required authorization and supervision.
10–28 minutes	Add U-N/U-P/U-X from U1 to the combined table. Actual route: genuine teacher-assigned records, interpretation key and rubric replace original records and row counts. Complete one combined table only. Ask the teacher for the assigned materials and directions. Do laboratory work only with the required authorization and supervision.
28–45 minutes	Add E0/E1 calculations from E1 to the same table. Actual route: genuine teacher-assigned records, interpretation key and rubric replace original records and row counts. Complete one combined table only. Ask the teacher for the assigned materials and directions. Do laboratory work only with the required authorization and supervision.
45–60 minutes	Add G-X/G-Y interpretations from G1 to the same table. Actual route: genuine teacher-assigned records, interpretation key and rubric replace original records and row counts. Complete one combined table only. Ask the teacher for the assigned materials and directions. Do laboratory work only with the required authorization and supervision.
60–72 minutes	Finish/check those same rows with Q1 and a clear note of whether you checked alone or with a peer. Actual route: genuine teacher-assigned records, interpretation key and rubric replace original records and row counts. Complete one combined table only. Ask the teacher for the assigned materials and directions. Do laboratory work only with the required authorization and supervision.
72–80 minutes	Check/save the one table and update S1 checks and next actions; paper work has no specimen cleanup. Actual route: genuine teacher-assigned records, interpretation key and rubric replace original records and row counts. Complete one combined table only. Ask the teacher for the assigned materials and directions. Do laboratory work only with the required authorization and supervision.

Your response record

Use these labels on paper or in your document. The space below also works when this page is printed.

Name the missing interpretation input

Original route: answer H1 with one missing input and one claim that must wait. Actual route: use the genuine assigned record or mark missing.

Actual route: genuine teacher-assigned records, interpretation key and rubric replace original records and row counts. Complete one combined table only. Ask the teacher for the assigned materials and directions. Do laboratory work only with the required authorization and supervision.

Use this space or the same labeled section in your existing document. Add paper when your table, graph or drawing needs more room.

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Three indicator rows on one table

Original route: use U1 for U-N, U-P and U-X; preserve all codes/colors, check reference matches, and report U-X's category with its limit.

Actual route: genuine teacher-assigned records, interpretation key and rubric replace original records and row counts. Complete one combined table only. Ask the teacher for the assigned materials and directions. Do laboratory work only with the required authorization and supervision.

Use this space or the same labeled section in your existing document. Add paper when your table, graph or drawing needs more room.

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Two signal-rate rows on the same table

Original route: use E1 for E0/E1 endpoints/times, both change/time calculations and AU/min units. Keep signal-rate limits visible.

Actual route: genuine teacher-assigned records, interpretation key and rubric replace original records and row counts. Complete one combined table only. Ask the teacher for the assigned materials and directions. Do laboratory work only with the required authorization and supervision.

Use this space or the same labeled section in your existing document. Add paper when your table, graph or drawing needs more room.

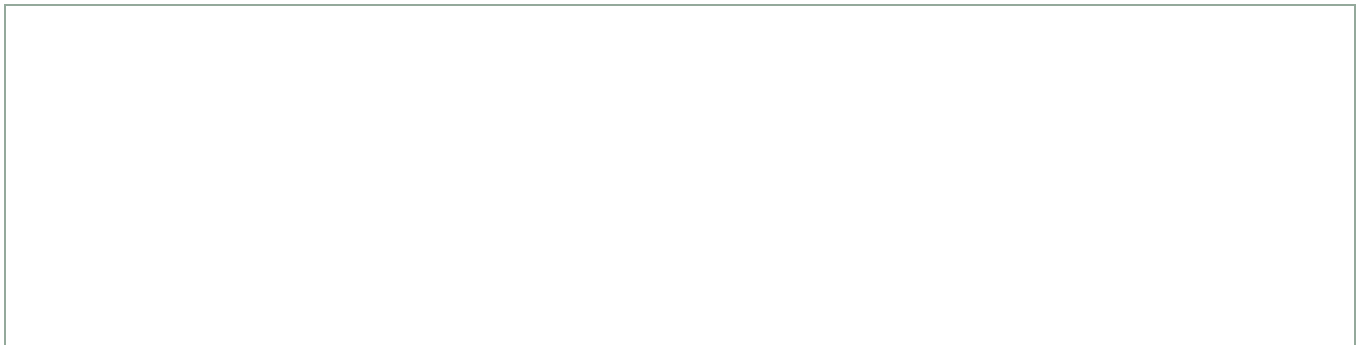


Two complete-pattern rows on the same table

Original route: use G1/G-MAP for G-X/G-Y complete band sets and G-KEY matches. Explain why actual PKD-marker interpretation needs a validated assay-specific key and appropriate context.

Actual route: genuine teacher-assigned records, interpretation key and rubric replace original records and row counts. Complete one combined table only. Ask the teacher for the assigned materials and directions. Do laboratory work only with the required authorization and supervision.

Use this space or the same labeled section in your existing document. Add paper when your table, graph or drawing needs more room.

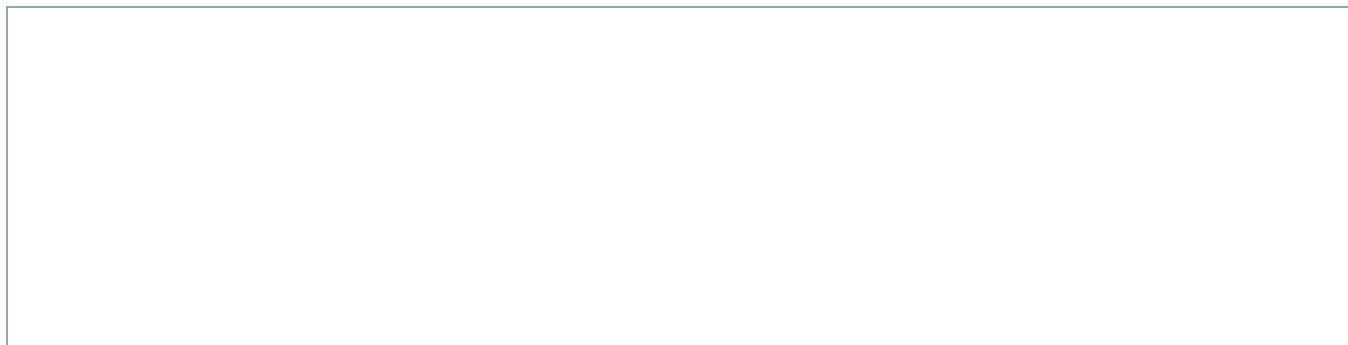


Finish and check the same combined table

Original route: use Q1 to check the seven existing rows. Correct an error or retain a checked match; identify whether you checked alone or with a peer.

Actual route: genuine teacher-assigned records, interpretation key and rubric replace original records and row counts. Complete one combined table only. Ask the teacher for the assigned materials and directions. Do laboratory work only with the required authorization and supervision.

Use this space or the same labeled section in your existing document. Add paper when your table, graph or drawing needs more room.

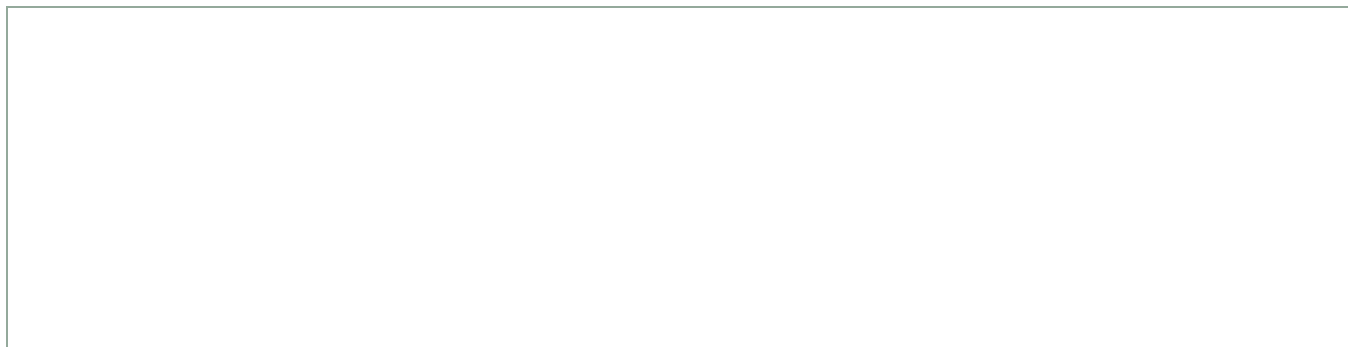


Save and check your next actions

Both routes: use S1's twelve checks and save the table or submit to your section. Keep actual laboratory and official-task evidence separate, and check Schoology after uploading.

Actual route: genuine teacher-assigned records, interpretation key and rubric replace original records and row counts. Complete one combined table only. Ask the teacher for the assigned materials and directions. Do laboratory work only with the required authorization and supervision.

Use this space or the same labeled section in your existing document. Add paper when your table, graph or drawing needs more room.



Check your product

- Original route: one combined table preserves three U records and the exact U-KEY category/control comparisons, without an invented concentration or diagnosis.
- Original route: both E rows show original endpoints/times, positive signal loss, elapsed time and AU/min average rate; no blank correction or biological rate claim.
- Original route: preserve every band in both G rows and use the exact teaching key. Explain why actual PKD-marker interpretation needs its own validated assay-specific key and context.
- Original route: one genuine self/peer check finishes the same seven rows; the optional model adds no assignment.
- Actual route: actual records/key/rubric replace original records and counts; no duplicate table.
- Both routes: obtain required authorization before actual experiments, follow official-task directions, save the table and check Schoology after uploading.

Keep the limit: All U, E and G records are invented teaching inputs, not actual measurements or linked patient records. A chart match, signal rate or fictional band pattern cannot diagnose PKD or another condition.

Turn in your work

Assignment: Wk17 Data table: Renal and digestive labs. Section 1292:

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[Section 1292: Wk17 Data table: Renal and digestive labs](#)

[Section 6792: Wk17 Data table: Renal and digestive labs](#)

Carry forward

Preserve the observation, name the comparison rule and stop the claim where the evidence stops.

Friday May 14 is the next scheduled patient-exhibit lesson. Carry this table only as labeled invented preparation or genuine teacher-verified work. Which exhibit claim can your labeled record support, and which remains unknown?

Sources and resources

[Open today's page](#)

URINE · Protein in Urine

MedlinePlus

<https://medlineplus.gov/lab-tests/protein-in-urine/>

RATE · Chemical Reaction Rates

OpenStax Chemistry 2e

<https://openstax.org/books/chemistry-2e/pages/12-1-chemical-reaction-rates>

GEL · Electrophoresis

NHGRI

<https://www.genome.gov/genetics-glossary/Electrophoresis>

ENZYME · Enzyme

NHGRI

<https://www.genome.gov/genetics-glossary/Enzyme>

PKD · Autosomal Dominant Polycystic Kidney Disease

NIDDK

<https://www.niddk.nih.gov/health-information/kidney-disease/polycystic-kidney-disease/autosomal-dominant-pkd>