Urinary system and kidney roles

Student activity • observation and reasoning

YEAR 11 / LESSON 68 / BIOLOGY ONLY

The question

How do the urinary organs remove waste while regulating water balance?

Use the supplied examples, record your reasoning and correct it using evidence.

Equipment

- Student booklet, paper models, pencil and ruler

Paper, modelling and written reasoning only. No chemicals or biological samples are handled.

Course coverage: Biology only: 2.72B–2.73B. Excretion and osmoregulation.

Plan, model or apparatus sketch

Draw and label the apparatus or biological model; identify one limitation.

Method and reasoning

Read the whole sequence before starting

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1. Label kidneys, ureters, bladder and urethra on a body diagram.

2. Trace blood through renal artery and vein separately from the urine route.

3. Explain kidney excretion of urea and regulation of water and ion balance.

4. Distinguish a ureter carrying urine from a renal vein carrying blood.

5. Explain the bladder's storage role and why it is not the organ that filters blood.

6. Use a two-colour diagram to keep urine and blood pathways distinct, then identify a limitation of the simplified diagram.

Cleanup

- Return models and keep the corrected work.

Record your evidence

Blank spaces are for your own work

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Reference and task data

Kidneys form urine while regulating internal conditions. Ureters carry urine to the bladder; the urethra carries it out. Renal blood vessels are separate from these urinary passages. This is a diagram activity with no urine collection or health testing.

Example / trial	Observation / evidence	Explanation / limit
Evidence / comparison		
Explanation		
Limit / correction		

Show your calculations, labelled model or correction here.

Explain and evaluate

Use evidence and show calculation steps where relevant

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1. Where is urine formed?

2. What do ureters carry?

3. What is the bladder’s role?

4. How does urine leave the bladder?

5. What is osmoregulation?

6. Does the renal vein contain urine?