Excretion in plants and animals

Student activity • observation and reasoning

YEAR 10 / LESSON 67 / BIOLOGY + SCIENCE (DOUBLE AWARD)

The question

Which substances are removed as metabolic waste, and where do they originate?

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: Shared Biology / Double Award: 2.70–2.71. Metabolic wastes and excretory organs.

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. Define excretion and distinguish it from egestion using carbon dioxide, urea and undigested food.

2. Link respiratory carbon dioxide to its removal through lungs in humans.

3. Identify kidneys as removing urea with water and ions in urine, and skin as losing water, salts and small amounts of urea in sweat.

4. Explain that photosynthesis produces oxygen and respiration produces carbon dioxide in plants.

5. Show gases diffusing through stomata according to gradients; a gas can be used by another process rather than all of it leaving.

6. Explain why sweating's main role in temperature control does not prevent it also removing some substances.

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

Excretion removes metabolic waste and substances in excess. Plant oxygen production comes from photosynthesis; plant carbon dioxide production comes from respiration. Net exchange depends on production, use and gradients. Faecal removal is egestion, not the removal of products of cellular metabolism.

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. Which process produces respiratory CO_2?

2. Which human organ removes much CO_2?

3. Which organ removes urea in urine?

4. Name two sweat components.

5. Which plant process produces oxygen?

6. Is all produced oxygen necessarily lost?