Water teacher pack

Follow drinking water and wastewater while separating treatment, pressure and flow.

For learners around age 14 and curious adults. Three 40-minute sessions. Use with the current AHA Water manuscript. References use chapter titles so they work in both print and ebook.

Learning goals

Follow drinking water and wastewater while separating treatment, pressure and flow.

Use the terms source; filtration; disinfection; pressure; flow; wastewater. Show the reasoning behind an answer and identify where the example stops applying.

Reading route

1. What a filter can and cannot do

2. Disinfection is a different job

3. Flow: how much passes in a time

Teaching plan

Session 1: Ask the opening question before reading (5 minutes). Read the first selected chapter together (15). Draw the mechanism or compare two possible explanations (15). End with a one-sentence explanation (5).

Session 2: Read the remaining selected material (10 minutes). Complete the worksheet individually, then compare reasoning in pairs (20). Discuss the common wrong turn (10).

Session 3: Revisit one uncertain answer (10 minutes). Try the extension (15). Give a two-minute explanation without the book (10). Use the exit question (5).

Materials and access

Paper, pencil, the book and an optional calculator. Read diagrams aloud, allow spoken or drawn responses, and give extra time for vocabulary. No real accounts or specialist equipment are needed.

Water learner worksheet

Opening question

If water looks clear after filtering, is it necessarily safe to drink?

Investigation

Draw a fictional path from source to treatment, storage, faucet, drain and wastewater treatment. A faucet runs at 6 liters per minute for 5 minutes. In a separate network example, 1,000 liters enter and 850 liters are recorded as delivered, with no change in storage.

1. How much water leaves the faucet?

Show your reasoning, label units or evidence, and state any assumptions.

2. What is the network's unexplained balance?

Show your reasoning, label units or evidence, and state any assumptions.

3. Why does clear appearance not establish safety?

Show your reasoning, label units or evidence, and state any assumptions.

Transfer question

A 10-liter-per-minute faucet running for 3 minutes also uses 30 liters. Explain how the rate and duration can change while the amount stays the same.

Exit question

What would you now check before accepting a claim about this topic? Name one specific check and explain why.

Water answers and teaching notes

Answer 1

6 × 5 = 30 liters.

Answer 2

1,000 - 850 = 150 liters. Investigate leakage, unmetered uses and measurement error rather than assuming one cause.

Answer 3

Hazards may be invisible. A filter's capability depends on its design; disinfection and chemical treatment perform different jobs.

Common wrong turn

Pressure and flow are related but not interchangeable. This activity does not establish that any real water is safe.

Extension discussion

A 10-liter-per-minute faucet running for 3 minutes also uses 30 liters. Explain how the rate and duration can change while the amount stays the same.

Assess the explanation

Give one point each for a correct conclusion, visible reasoning, correct units or evidence, and a relevant limitation. A correct number with no explanation is not a complete answer. Accept equivalent wording and well-supported alternative interpretations where the question allows them.

If the learner gets stuck

Return to the diagram or the smallest example. Ask what is being counted, compared or transferred. Let the learner revise the answer after explaining the mistake; do not reward speed over understanding.

Family connection

Draw the route to and from a faucet. Do not taste experimental filtered water or open plumbing, treatment chemicals or sewer access.