Finding a Dye Path Through a Test Pouch

Base your answers on the information provided and your knowledge of chemistry. Use the 2025 Chemistry Reference Tables as needed.

A class builds clear film pouches to hold a model dye solution. Dye outside a pouch could have moved through the flat film or through a seam. The class makes three otherwise identical pouches with the same dye solution. Its model coating blocks dye where the coating is applied. All pouches sit in equal volumes of clear water for the same time.

Pouch	**Where blocking coating was applied**	**Dye measured in surrounding water (mg/L)**
A	Nowhere	4.0
B	Seams only	0.2
C	Flat film only	3.8

1 Which pair directly tests what happens when the seams alone are blocked?

(1) A and B

(2) A and C

(3) B and C

(4) All three are needed for that comparison.

2 Which route appears to account for most of the dye movement in the uncoated pouch? Use both coating tests to justify your answer. [1]

Answer and work

A new student plans to reuse the surrounding water from a pouch test. The class wants to compare small changes in dye concentration during the new trial.

3 Explain how reusing the water could mislead the class and propose a measurement that would address that problem. [1]

Answer and work

4 In a follow-up the film faces are blocked so dye can leave only through seams. Propose a test of whether total seam length affects dye release. State what to change, what to measure, and one condition to hold constant. [1]

Answer and work