Weighing a Coating One Tile at a Time

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

A tile workshop estimates the mass of a cured coating from the difference between the mass before coating and the mass afterward. Each balance reading can be up to 0.10 g above or below the true mass. For this task the two reading errors may act in opposite directions.

Objects on balance	**Before coating (g)**	**After coating (g)**
Tile 1 by itself	12.2	12.3
Ten tiles together, including tile 1	122.3	123.5

1 What is the greatest possible error in either reported mass difference under the stated limit?

(1) 0.00 g

(2) 0.10 g

(3) 0.20 g

(4) 1.00 g

2 Use the group readings and the error limit to calculate the lowest possible average coating mass per tile. [1]

Answer and work

The workshop requires at least 0.09 g of coating on every tile. Some tiles may receive thicker coatings than others.

3 Does the group measurement by itself establish that every tile meets the requirement? Explain using a possible distribution of the coating. [1]

Answer and work

4 Describe a way to check individual tiles, including what a better balance would need to improve. [1]

Answer and work