A Glaze That Fits Its Tile

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

A ceramics exhibit models a thin glassy glaze bonded to a tile. When cooled through the same temperature range, a free sample of each material contracts by the amount in the table. On a coated tile the glaze and tile stay attached, so they cannot both contract freely by different amounts.

Material	**Contraction of a free sample (mm per m)**
Tile	3.0
Glaze J	3.2
Glaze K	5.0
Glaze L	2.8

1 Which glaze has the largest difference from the tile’s free contraction?

(1) J

(2) K

(3) L

(4) All have the same difference.

2 Explain why glaze K on the tile can be stretched during cooling, even though a free piece of K would shrink. [1]

Answer and work

In the exhibit model, glaze J and glaze L both pass an initial cooling test. The class now wants to know which stays intact after repeated warming and cooling.

3 Describe a comparison that could distinguish their performance after repeated use. State what to keep the same and what to measure. [1]

Answer and work

4 A student says J and L will necessarily behave the same because their contraction differences have equal magnitude. Explain one relevant difference in their measured values. [1]

Answer and work