Ceramics Polymers Composites

KS3 Chemistry · Follows the national curriculum

Name _____ Class _____ Date _____

1. Worked example

Why are mugs made of ceramic rather than polymer?

Step 1 · Job

Hold very hot drinks safely; be washed many times.

Step 2 · Ceramic properties

Hard, heat-resistant, do not melt or soften at 100 °C, easy to clean.

Step 3 · Polymer problem

Many polymers soften with heat.

Answer: Ceramics resist heat and are hard

Check: Disadvantage: ceramics are brittle — they smash if dropped.

2. Now try one with the steps

What is a polymer?

Step 1 · Structure

Step 2 · Examples

Answer:

3. Practice

Show your working. The marks tell you how much is expected.

1. Give ONE example of a ceramic. [1]

2. Give ONE example of a polymer. [1]

3. What is a composite material? [1]

4. Give TWO properties of ceramics. [2]

5. Give TWO properties of most polymers. [2]

6. What does 'brittle' mean? [1]

7. Name the two materials in reinforced concrete. [1]

8. Why are electrical plugs made of polymer? [2]

9. Why are spark plugs in car engines insulated with ceramic, not polymer? [2]

10. What are the small molecules that join to make a polymer called? [1]

11. Name a natural polymer. [1]

12. Carbon-fibre composite is used for tennis rackets. Suggest TWO properties that make it suitable. [2]

13. Why are composites hard to recycle? [1]

14. A student tests the strength of three plastic strips by hanging masses until they break: 400 g, 650 g, 420 g. Which strip is strongest, and what must be kept the same for a fair test? [2]

4. Before you hand it in

"Glass isn't a ceramic."
Glass is usually grouped with ceramics.

"A composite is a compound."
In a composite, each material is still there; they are combined physically.

"All plastics are the same."
Compare: polystyrene foam (light insulator), nylon (strong fibre), PVC (rigid pipes).

"Ceramics are weak."
Say 'hard but brittle'.