



Properties of Ceramics

Complete the table with the following information.

Raw material – the starting substance(s) obtained from the Earth needed to make the ceramic, e.g. wood, sand, oil, clay, ore.

How is it made – what happens to the raw materials to convert them into the ceramic.

Properties - these are observable or can be measured. Examples are:

- Colour
- Hard / Soft
- Strong / Weak
- Heat resistant
- Electrical conductors / insulators
- Heat conductors / insulators
- Low density / High density
- Flexible / Stiff
- Malleable (can be made into different shapes)
- Brittle (shatter when struck)
- Porous / non-porous (a substance is porous if water/liquid can soak into it)
- Chemical resistant (inert) does not react with other chemicals

Unique properties for its use – which of the properties you have looked at means that the ceramic has a particular use?





Mission Assignment: Describe the properties of ceramics



KS3-17-03

Properties of ceramics

Examine samples of different ceramics and complete the table below with your research and observations. Include a description about what makes each ceramic unique.

Unique properties for its use					
Properties					
How is it made					
Raw material					
Ceramic	Concrete	Earthenware	Brick	Glass	Porcelain



Mission Assignment: Describe the properties of ceramics



1. What is meant by the term 'ceramic'?

2. List three properties all ceramics have in common.

3. Describe how ceramics are processed to transform them from their raw materials into their final product.

4. Bricks are a ceramic made by baking moulded clay. Suggest two advantages and two disadvantages of using bricks as a building material

advantages _____

disadvantages _____

5. Challenge: Suggest why ceramics are commonly found in kitchens and bathrooms.





Mission Assignment: Describe the properties of ceramics ANSWERS



KS3-17-03

Properties of ceramics

Examine samples of different ceramics and complete the table below with your research and observations. Include a description about what makes each ceramic unique.

Ceramic	Raw material	How is it made	Properties	Unique properties for its use
Concrete	Cement, sand and stones	Brittle, grey, strong,	Combining crushed rock and sand with water and cement	Very strong and durable (long lasting) used in bridges, houses
Earthenware	Clay	Brittle, heat resistant, porous if unglazed	Clay is mixed with water shaped and then fired at around 1000 °C.	Porous if unglazed used in plant pots
Brick	Clay	Brittle, heat resistant, porous	Clay mixed with water, shaped and fired in a kiln.	Fixed regular shape which allows to be fitted together to build walls
Glass	Soda-lime - sand, sodium carbonate and limestone. Borosilicate – sand and boron trioxide	Brittle, translucent, non-porous, heat resistant	Heating raw materials until melts and then allowing molten liquid to cool.	Borosilicate glass has higher melting point than soda-lime glass
Porcelain	China clay (kaolin)	Brittle, hard, heat resistant white,	Shaping the kaolin and then firing between 1,200-1,400 °C.	Stronger and white in colour, high resistance to chemicals



Mission Assignment: Describe the properties of ceramics ANSWERS



KS3-17-03

1. What is meant by the term 'ceramic'?

Substance made from non-metallic inorganic material

2. List three properties all ceramics have in common.

Brittle, inert, strong under compression

3. Describe how ceramics are processed to transform them from their raw materials into their final product.

The clay is shaped and then baked in a kiln

4. Bricks are a ceramic made by baking moulded clay. Suggest two advantages and two disadvantages of using bricks as a building material

advantages **Hard so not easily damaged**
Strong under compression

disadvantages **Brittle so can break easily**
Can crack with extreme changes in temperature

5. Challenge: Suggest why ceramics are commonly found in kitchens and bathrooms.

Liquids cannot soak into the ceramic, if glazed, as non-porous.

The clay is malleable so can be made into different shapes.

Ceramics are heat resistant so can be put in the oven and will not break.

