

Name **one** suitable, *specific* material which has been used to make each product.

Give **one** reason for **each** choice.

Give the original source of the material.

Kitchen stool



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Material
(2 marks)

Reason
.....
.....
(1 mark)

Original source of the material
.....
(1 mark)

Toy digger



© Thinkstock

Material
(2 marks)

Reason
.....
.....
(1 mark)

Original source of the material
.....
(1 mark)

Name **one** suitable, *specific* material which has been used to make each product.

Give **one** reason for **each** choice.

7 (a) (i)

Nest of tables



Material
(2 marks)

Reason
.....
.....
(1 mark)

7 (a) (ii)

Ring



Material
(2 marks)

Reason
.....
.....
(1 mark)

7 (a) (iii)

Food storage boxes



Material
(2 marks)

Reason
.....
.....
(1 mark)

7 (a) Study the products shown below.

Name **one** suitable, **specific** material which has been used to make each outdoor chair.

Give **one** reason for **each** choice.

Give the original source of the material.

Wooden chair



Material (1 mark)

Reason

.....

..... (1 mark)

Original source of the material

..... (1 mark)

Metal chair



Material (1 mark)

Reason

.....

..... (1 mark)

Original source of the material

..... (1 mark)

Name **one** suitable, specific material which has been used to make each product.

Give **one** reason for **each** choice.

Give the original source of the material.

Metal table



Material [1 mark]

Reason

.....

..... [1 mark]

Original source of the material

..... [1 mark]

Wooden table



Material [1 mark]

Reason

.....

..... [1 mark]

Original source of the material

..... [1 mark]

You are advised to spend about 15 minutes on this question. [Full screen](#)

5 Study the three kitchen utensils shown below.



Beech spoon

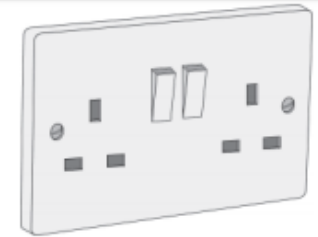
Melamine spoon

Stainless steel ladle

5 (a) (i) Explain why beech has been used to make the wooden spoon. [2 marks]

5 (a) (ii) Explain why melamine has been used to make the plastic spoon. [2 marks]

5 (a) (iii) Explain why stainless steel has been used to make the metal ladle. [2 marks]



5 (b) (i) Name the **category** of plastic that has been used to manufacture the margarine tub. (1 mark)

5 (b) (ii) Explain why this **category** of plastic has been chosen. (2 marks)

5 (c) (i) Name the **category** of plastic that has been used to manufacture the electrical socket. (1 mark)

5 (c) (ii) Explain why this **category** of plastic has been chosen. (2 marks)

5 (a) Complete the following table by matching each plastic (polymer) with its correct category.

The first one has been done for you.

Plastic (polymer)	Category	
	Thermoplastic	Thermosetting plastic
Acrylic (PMMA)	✓	
Urea formaldehyde (UF)		
Polyvinyl chloride (PVC)		
Polypropylene (PP)		
Polyethylene terephthalate (PET)		
Melamine formaldehyde (MF)		

(5 marks)

5 (a) Complete the table by placing a tick in the correct box to show whether the material is a thermoplastic or a thermosetting plastic.

For each material you should only tick **one** box.

[5 marks]

Material	Use	Thermoplastic	Thermosetting plastic
Acrylic (PMMA)	Car indicator lens		
Polyethylene terephthalate (PET)	Fizzy drink bottle		
Melamine formaldehyde (MF)	Kitchen worktop		
Low-density polyethylene (LDPE)	Plastic carrier bag		
Urea formaldehyde (UF)	Electric socket		

7 (a) (i) Explain what is meant by the term 'smart material'.

[2 marks]

.....

.....

.....

7 (a) (ii) Complete the table.

Product	Material
[1 mark]	Shape memory alloys (SMA) 'Nitinol'
A baby's feeding spoon that changes colour if the food is too hot	[1 mark]
[1 mark]	Motion control gel 'Smart grease'

7 (b) (i) Explain what is meant by the term 'nanomaterial'.

[2 marks]

.....

.....

7 (b) (ii) Give an example of the use of a 'nanomaterial' and explain its advantages.

[3 marks]

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7 (c) Name a composite material used for the body of a Formula 1 racing car.

Explain why this material has been used.

[2 marks]

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Material	Property	Use
Shape memory alloys (SMA) 'Nitinol'	This metal will return to its original shape when heat is applied to it.	Spectacle frames
Thermochromatic plastic (2 marks) (1 mark)
Carbon fibre (2 marks) (1 mark)
'Polymorph' (2 marks) (1 mark)
Motion control gel 'Smart grease'

7 (b)

The car shown below has bodywork made from Glass Reinforced Plastic (GRP).



GRP is an example of a composite material

Explain the advantages of using composite materials.

[4 marks]
