DESIGN AND TECHNOLOGY
REVISION BOOKLET 4

COMPOSITE MATERIALS - FIRST BOOKLET

NATURAL WOOD
CONCRETE
STEEL REINFORCED CONCRETE
FIBREGLASS / GLASS REINFORCE PLASTIC (GRP)
CARBON FIBRE REINFORCED POLYMER (CFRP)

SUITABLE REVISION MATERIAL FOR:

PRODUCT DESIGN
RESISTANT MATERIALS
GRAPHIC PRODUCTS
DESIGN AND TECHNOLOGY

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1a. What is a composite material?  

1b. Why can a natural wood be considered a composite material?  

1c. Label the drawing of a cross-section of a tree trunk, naming all the parts, as indicated by the arrows.
1d. Write a description of each of the parts of a tree trunk, listed below.  5 marks

PITH: ____________________________________________________________
_______________________________________________________________
_______________________________________________________________

ANNUAL RINGS: _________________________________________________
_______________________________________________________________
_______________________________________________________________

HEART WOOD: _________________________________________________
_______________________________________________________________
_______________________________________________________________

SAPWOOD: _____________________________________________________
_______________________________________________________________
_______________________________________________________________

RAYS: _________________________________________________________
_______________________________________________________________
_______________________________________________________________
2a. Describe typical practical applications of concrete, around the home and in industry.  

3 marks

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2b. List the individual materials that are mixed to form concrete.  

4 marks

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2c. Name a precast concrete product. This could be a product bought at a typical DIY store.  

1 mark

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2d. In the space below, draw a diagram that clearly shows the structure of concrete. Label the component materials that form this composite material.  

4 marks
2e. Using the internet or other research resources, collect images of practical applications of concrete. Glue samples in the space below. Label each image.  

4 marks

LINK TO HELP AND INFORMATION  
http://www.technologystudent.com/joints/concret1.html

COMPOSITE MATERIALS - CONCRETE

2f. Describe how the component materials that form reinforced concrete are put together. Use a diagram(s) including labels and notes. Add colour and shade to the diagram(s).  

5 marks

LINK TO HELP AND INFORMATION  
http://www.technologystudent.com/joints/reinforc1.html

COMPOSITE MATERIALS - STEEL REINFORCED CONCRETE

NOTES:

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2g. The incomplete diagram opposite, shows a cavity brick wall, supported by concrete foundations.

Complete the diagram by adding:

A. Arrows that indicate the direction of forces applied to the foundations.  
   **2 marks**
B. Additional labels.  
   **2 marks**
C. Notes the explain the forces applied to the cavity wall and foundations.  
   **3 marks**

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2h. Draw a diagram that demonstrates the weakness of concrete, when under a tensile force. Add explanatory notes.
3a. When was Glass Reinforced Fibre invented and by whom?  

DATE:______________________________

NAME:______________________________

3b. Describe the structure of a typical piece Glass Reinforced Fibre. Include a sketch of a 'weave' of Glass Fibre textile.  

(Description - 2 marks  
Sketch - 2 marks)

DESCRIPTION:________________________________________________________________________

____________________________________________________________________________________

____________________________________________________________________________________

SKETCH OF WEAVE
3c. Describe some of the **properties** and **practical applications** of GRP. Use the internet as a research tool to help you answer this question, attaching a selection of images of practical uses to this page.

**PROPERTIES:** 3 marks

________________________________________________________________________________________

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**PRACTICAL APPLICATIONS:** 5 marks

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4a. What is Carbon Fibre Reinforced Polymer? 3 marks

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_________________________________________________________________________

4b. Describe two advantages Carbon Fibre Reinforced Polymer has over materials such as GRP and Titanium? 2 marks

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_________________________________________________________________________

4c. Describe a disadvantage of CFRP compared to GRP. 2 marks

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4d. Describe a practical application of CFRP in the aerospace industry. Include an explanation of why CFRP has been used.

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