

Year 8

DESIGN AND TECHNOLOGY

TERM 2 LST / HOMEWORK

LST: Your teacher will tell you how many LST questions you will need to revise. You will be tested at the beginning of every lesson.

DUE DATES:

Task 1 _____

Task 2 _____

Task 3 _____

Task 4 _____

Task 5 _____

Task 6 _____

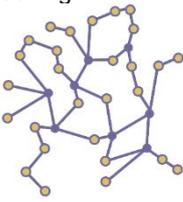
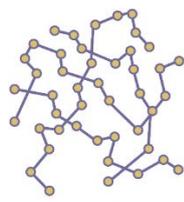
NAME:

GROUP:

TEACHER:

DESIGN AND TECHNOLOGY – LST MATERIALS – Unit 3

	Question	Answer																								
1	Which of the following is a unit of board measurement? Kilogram, Grams per square metre, Micron, Micrometre	Micron																								
2	What type of plastic is most suitable for drainpipes, guttering and roofing sheets? Polyester resin, Nylon, PVC, Acrylic	PVC																								
3	State one property of inkjet paper that makes it suitable for printing photo-quality images.	Special coating; ink sits on surface; glossy.																								
4	Softwood trees grow faster than hardwood trees. Explain how a faster-growing tree is advantageous to the timber industry.	Timber can be produced more quickly; (commonly) making it cheaper; a more dependable supply is available.																								
5	Name two methods to protect metal to prevent or slow down the process of rusting?	Paint; coating in zinc or galvanising; coating of oil, black japanning, plastic dip coating and black oxide.																								
6	Describe the difference between brittle and tough metal.	Tough – can absorb more energy before breaking. Brittle – likely to crack or shatter on impact or force.																								
7	<p>Thick acrylic of 4mm – 8mm thickness is commonly used as a material to make bath tubs.</p>  <p>Explain two reasons as to why this is an appropriate material.</p>	<ul style="list-style-type: none"> • Good impact strength / impact resistance in thick stock forms • Available in many colours • Hard and stiff • Lighter weight than cast iron or enamelled steel alternatives - so easy to carry and fit into position in a bathroom • Durable so will last a long time before needing replacing • Finishes well - can be easily polished to keep it looking good for many years • It is resistant to chemicals that might be used when cleaning 																								
8	<p>Fabrics can be classified into one of six different categories: natural, synthetic, blended, woven, non-woven and knitted textiles.</p> <p>Complete the missing words from the sentence below:</p> <p>Silk, wool and cotton are all classified as..... fabrics which means their raw materials come from and</p>	Silk, wool and cotton are all classified as natural fabrics which means their raw materials come from plants and animals .																								
9	<p>State how the following set of textiles are classified and give their raw material.</p> <table border="1" data-bbox="156 1384 705 1619"> <thead> <tr> <th>Textile</th> <th>Classification</th> <th>Raw material</th> </tr> </thead> <tbody> <tr> <td>Polyamide (Nylon)</td> <td></td> <td></td> </tr> <tr> <td>Elastane (Lycra)</td> <td></td> <td></td> </tr> <tr> <td>Polyester</td> <td></td> <td></td> </tr> <tr> <td>Acrylic</td> <td></td> <td></td> </tr> </tbody> </table>	Textile	Classification	Raw material	Polyamide (Nylon)			Elastane (Lycra)			Polyester			Acrylic			<table border="1" data-bbox="837 1328 1465 1630"> <thead> <tr> <th>Textile</th> <th>Classification</th> <th>Raw material</th> </tr> </thead> <tbody> <tr> <td>Polyamide (Nylon)</td> <td rowspan="4">Synthetic fabrics</td> <td rowspan="4">Petrochemical sources / Oil</td> </tr> <tr> <td>Elastane (Lycra)</td> </tr> <tr> <td>Polyester</td> </tr> <tr> <td>Acrylic</td> </tr> </tbody> </table>	Textile	Classification	Raw material	Polyamide (Nylon)	Synthetic fabrics	Petrochemical sources / Oil	Elastane (Lycra)	Polyester	Acrylic
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10	<p>Some products combine materials from different material areas.</p> <p>Below is an image of hammer with two component parts.</p>  <p>Suggest a suitable material for each component and justify your reason.</p> <table border="1" data-bbox="146 1910 774 2110"> <thead> <tr> <th>Component</th> <th>Material</th> <th>Justification</th> </tr> </thead> <tbody> <tr> <td>Handle</td> <td></td> <td></td> </tr> <tr> <td>Head</td> <td></td> <td></td> </tr> </tbody> </table>	Component	Material	Justification	Handle			Head			<table border="1" data-bbox="837 1630 1465 1859"> <thead> <tr> <th>Component</th> <th>Material</th> <th>Justification</th> </tr> </thead> <tbody> <tr> <td>Handle</td> <td>Ash (or hickory)</td> <td>Tough; shock resistant; flexible</td> </tr> <tr> <td>Head</td> <td>High-carbon steel; tool steel;</td> <td>Hard; semi-resistant to rust</td> </tr> </tbody> </table>	Component	Material	Justification	Handle	Ash (or hickory)	Tough; shock resistant; flexible	Head	High-carbon steel; tool steel;	Hard; semi-resistant to rust						
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11	Some hammers have a composite handle made from	Resistant to rot; light weight; durable.																								

	fibreglass resin. State one disadvantage and one advantage of using fibreglass resin for a handle over a traditional timber handle.	Less effective than ash at dissipating shock away from the user's hand; less easily replaced if broken; more expensive to purchase / produce.																														
12	Polymers can be classified as being either thermoforming or thermosetting.  <i>Figure 1</i>  <i>Figure 2</i> (a) Identify which category of polymer is represented by Figure 1 and Figure 2.	Figure 1: Thermosetting polymer Figure 2: Thermoforming polymer																														
13	Explain, with reference to <i>Figure 1</i> and <i>Figure 2</i> , the difference in properties of each category	Thermosetting polymers: cannot be reformed when reheated; tend to burn before they melt; cross links between molecules; which make the materials more rigid; harder; more brittle; good resistance to heat and chemicals. Thermoforming plastics: Polymer chains are loosely entangled; with very few cross links; making them more flexible. Can be reheated and reformed without damage to their structure.																														
14	State one specific material that exhibits high absorbency.	Answers may include: Cartridge paper; MDF, Cotton, wool, silk, felt, some bonded fabrics used for cleaning cloths for example.																														
15	State one specific material that is highly ductile.	Low carbon steel; aluminium; copper; tin; zinc; platinum; plastics.																														
16	Match the following images of natural timbers to their correct identities and suggest one appropriate application for each. <table border="1" data-bbox="127 1153 774 1523"> <thead> <tr> <th>Image</th> <th>Timber</th> <th>Application</th> </tr> </thead> <tbody> <tr> <td></td> <td>Chipboard</td> <td></td> </tr> <tr> <td></td> <td>Oak</td> <td></td> </tr> <tr> <td></td> <td>Pine</td> <td></td> </tr> <tr> <td></td> <td>Mahogany</td> <td></td> </tr> </tbody> </table>	Image	Timber	Application		Chipboard			Oak			Pine			Mahogany		<table border="1" data-bbox="821 1075 1468 1444"> <thead> <tr> <th>Image</th> <th>Timber</th> <th>Application</th> </tr> </thead> <tbody> <tr> <td></td> <td>Chipboard</td> <td>Flooring; low-end furniture; kitchen worktops / unit carcasses</td> </tr> <tr> <td></td> <td>Oak</td> <td>Railway sleepers, furniture, quality floor boards</td> </tr> <tr> <td></td> <td>Pine</td> <td>Interior constructions; lower cost furniture; decking (if treated)</td> </tr> <tr> <td></td> <td>Mahogany</td> <td>High end furniture; veneers</td> </tr> </tbody> </table>	Image	Timber	Application		Chipboard	Flooring; low-end furniture; kitchen worktops / unit carcasses		Oak	Railway sleepers, furniture, quality floor boards		Pine	Interior constructions; lower cost furniture; decking (if treated)		Mahogany	High end furniture; veneers
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17	11. Plain weave is a common weave pattern used with a variety of textiles. (a) State one property of plain weave.	Weft goes alternately over and under the warp threads; identical on both sides; tight weave.																														
18	(b) Give one example of a fabric commonly woven using a plain weave.	Poplin; calico; muslin.																														
19	12. Brass is an alloy of copper and zinc. (a) State what is meant by an <i>alloy</i> .	A mixture of at least one pure metal and one other element. (Carbon, a non-metal element, is alloyed to make steel.)																														
20	(b) Give one reason why copper and zinc are alloyed to make brass rather than using them as raw metals.	Enhance the properties of both element metals / combine the advantages of both elements in one alloy.																														



Homework 1: Papers and boards

1. Which of the following is a unit of paper measurement? [1]

- ◇ Milligram
- ◇ Grams per square metre
- ◇ Micron
- ◇ Nanometre

2. Wood fibre is used to make paper pulp.

(a) Name **two** alternative fibres that can be used? [2]

(b) Give **two** reasons why wood fibres are most commonly used. [2]

3. Name **one** common paper with high absorbency. [1]

4. Describe the properties of **one** board that make it suitable for displaying artwork. [2]



5. Study the packaging below. Considering the physical and working properties of the materials used, explain **one** reason why each type of paper and board has been utilised.

[6]

150gsm paper bag with handle
This material is used because...

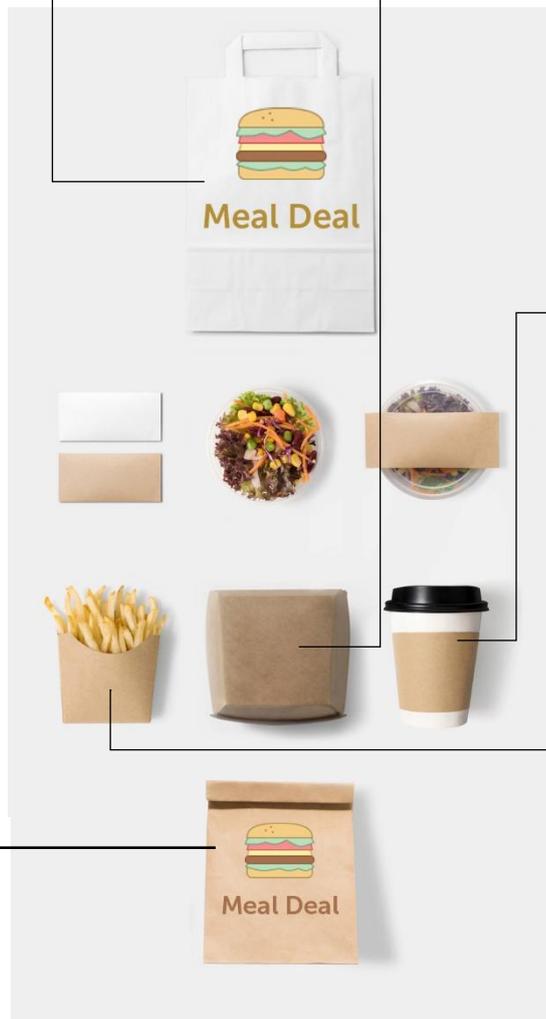
Carton board container
This material is used because...

2-ply serviette
This material is used because...

Corrugated card cup sleeve
This material is used because...

100gsm brown paper bag
This material is used because...

Duplex board container
This material is used because...



Total 14 marks



Homework 2: Natural and manufactured timbers

1. Which **one** of the following is a type of wood from a coniferous tree? [1]

- ◇ Beech
- ◇ Ash
- ◇ Oak
- ◇ Larch

2. Give **one** common characteristic of hardwood trees. [1]

3. Give **one** advantage of using ash to make a set of cricket stumps. [1]

4. (a) Suggest an appropriate type of wood for making a model aircraft. [1]

(b) Give **two** reasons for your choice. [2]

5. An architect has designed a house that is entirely clad in larch.

State and justify **one** physical or working property of larch that make it suitable for exterior cladding. [2]



6. A kitchen worktop has been made from melamine laminate covered chipboard.
Evaluate the use of chipboard for a kitchen worktop.

[4]

Total 12 marks

Homework 3: Metals and alloys

1. Which **one** of the following metals is the most effective conductor of electricity? [1]
 - ◇ Tin
 - ◇ Iron
 - ◇ Copper
 - ◇ Steel

2. From the list of common items:
 - (a) Name the metal and state if they are ferrous or non-ferrous metals [5]
 - (b) Match the characteristics to the item [5]

Metal	Name	Characteristics
		Hard and hard wearing, less ductile
		Soft, malleable, good conductor
		Easily machined, formed or brazed. Ductile and tough.
		Lightweight Ductile Good strength to weight ratio
		Hard, brittle

3. Metal naturally occurs in the crust of earth. In its natural state, what is the mixture of metal and rock known as? [1]

4. Name **one** method of extracting metal from the earth. [1]



5. Name **one** element that is combined with iron to produce steel. [1]

6. Name **one** key difference between ferrous and non-ferrous metals. [1]

7. Explain how the addition of carbon affects the properties of steel. [1]

8. Explain what is meant by:

(a) ductility [1]

(b) malleability [1]

Total 18 Marks



Homework 4: Polymers

1. State the **two** categories of polymer? [2]

2. What type of plastic is most commonly used for disposable cups, food containers, cheap toys, and school based vacuum forming? [1]

- ◇ Expanded polystyrene
- ◇ High Density Polyethylene
- ◇ HIPS (High Impact Polystyrene)
- ◇ Acrylic

3. Complete the following table by matching each plastic (polymer) with its correct category. The first two have been completed for you. [6]

Category Plastic (polymer)	Thermoplastic	Thermosetting plastic
Epoxy resin		X
Acrylic (PMMA)	X	
Polyvinyl chloride (PVC)		
Polyester resin		
Polyethylene terephthalate (PET)		
Low density polyethylene (LDPE)		
Urea formaldehyde (UF)		
Polystyrene (PS)		

4. Urea formaldehyde is commonly used in the manufacture of electrical plugs and fittings. Give **two** properties of urea formaldehyde that make it suitable for these applications. [2]





5. Bleach bottles are commonly manufactured from HDPE.



Give **two** properties of HDPE that make it suitable for this use. [1]

6. Give **two** reasons as to why PVC is the most widely used polymer in medical applications such as blood bags, tubes, surgical and examination gloves? [2]

Total 14 marks



Homework 5: Textile based materials

- 1. Which of the following is an example of a textile from an animal-based source? [1]
 - ◇ Lycra
 - ◇ Cotton
 - ◇ Polyester
 - ◇ Silk

- 2. What would be a suitable fabric construction for a pair of tights?
Explain how the fabric construction can improve the performance of a product. [4]

- 3. Blended or mixed fabrics are used to combine the most desirable properties of two or more fibres.
Polycotton, made from cotton and polyester, is used by many mass-market clothing manufacturers.
What are the advantages and disadvantages of using polycotton in mass-produced apparel? [6]



4. Match the key terms to the definitions.

[4]

Key term	Definition
Woven	Non-woven fabric made from brushed and compressed fibres.
Knitted	Fabrics made by interlocking yarns that run from top to bottom (the warp) and right to left (the weft). The fabric is made on a loom.
Felted	One or more non-woven fabric that has been bonded, fused or stitched to another fabric.
Bonded	Fabric made from a single interlocking yarn. Construction allows fabric to stretch.

Total 15 marks