



Caldergleng High School

Technology Department

Design & Manufacture

S3/S4

Homework & Exam Revision Booklet

HOMWORK INSTRUCTIONS

Name:-

Class:-

Teacher:-

Academic Year:-

- Homework will be issued every two weeks or by teacher discretion.
- It is always due in a week after issuing, but may be handed in earlier if you wish.
- Homework is to be completed in this booklet or in your class jotter (teachers discretion).
- All homework relates to what you have learnt in class.
- Help is available at lunchtime and after school.
- If homework is not handed in on time a letter WILL automatically be sent home, NO EXCUSES!!



Caldergleng High School

Technology Department

Design & Manufacture:- Pupil Record

This Pupil Record sheet is for YOU to keep track of completed and uncompleted work and to identify the units you need more revision on. It should be completed every time you receive marked work back from your teacher.

KEY: -	H/W	=	Homework
	T/R	=	Test Revision
	P/R	=	Prelim Revision

WORKSHEET TITLE	COMPLETED (X) ALLOCATED TO GRADE				DATE COMPLETED	WORKSHEET TITLE	COMPLETED (X) ALLOCATED TO GRADE				DATE COMPLETED	WORKSHEET TITLE	COMPLETED (X) ALLOCATED TO GRADE				DATE COMPLETED
	A	B	C	F			A	B	C	F			A	B	C	F	
PLASTIC UNIT					PRODUCT EVALUATION UNIT					PRELIM REVISION							
H/W 01						H/W 13						P/R 01 - Sect 1					
H/W 02						H/W 14						P/R 02 - Sect 1					
H/W 03												P/R 03 - Sect 1					
H/W 04						METAL UNIT					P/R 04 - Sect 2						
H/W 05						H/W 15						P/R 05 - Sect 2					
H/W 07						H/W 16						P/R 06 - Sect 2					
T/R 01 - Plastic						H/W 17											
T/R 02 - Design						H/W 18						EXTRA HOMEWORK					
						H/W 19						H/W 22					
WOOD UNIT						H/W 20						H/W 23					
H/W 09						H/W 21						H/W 24					
H/W 10						T/R 07 - Metal						H/W 25					
H/W 11						T/R 08 - Metal						H/W 26					
H/W 12						T/R 09 - Design						H/W 27					
T/R 03 - Design						T/R 10 - Design						H/W 28					
T/R 04 - Wood																	
T/R 05 - Wood																	
T/R 06 - Wood																	



SECTION 1 = 24 MARKS

Based on the manufacturing of different parts of a single project.

SECTION 2 = 36 MARKS

Questions on design and manufacturing in industry.

How To Answer Design Questions Correctly

READ THIS BEFORE STARTING THE BOOKET AND BEFORE YOU DO TESTS, PRELIMS AND THE EXAM

- 1) **DESIGN FACTORS = FEEDSCAMP** (**F**unction, **E**rgonomics, **E**nvironmental concerns, **D**urability, **S**afety, **C**ost (economics), **A**esthetics, **M**aterials and **P**roduction). Easy way to remember it, write it down before you start the exam.
- 2) Give more description in answers relating to a given product, for example **“The kettle should be safe and durable”** is not enough. To gain full marks, you should make clear reference to the product, for example: -

“It needs to be safe because the body of the kettle could get very hot with the boiling water and you could burn yourself. It needs to be durable because during the lifespan of a kettle it may get banged in the kitchen sink when being filed and it should withstand these collisions”
- 3) Another example is when answering product evaluation questions, for example when being asked about evaluating the ease of use and value for money of a vacuum cleaner a poor response would be **“They should do a user trial”** and **“They should do a comparison with other products”**. You need to explain the activity in detail, for example: -

“They should carry out a user trial, where a range of users vacuum an area of carpet and then describe how easy or difficult they found the vacuum cleaner to manoeuvre around small items of furniture. They should look at a range of existing vacuum cleaners that perform similar functions and see what their selling price is. They could then compare the selling price to theirs and this will show if their vacuum cleaner is good value for money”
- 4) Be careful when answering questions about the properties of materials that make them suitable for a particular product. Do not just simply repeat all of the material properties even if they don't relate to your product. First try to list the properties the product needs to have, to be successful at its function. For example a milk carton is made from HDPE and we need the properties of **Recyclable, Range of Colours and Non-Toxic**. So refer to **“What the product needs to do”** rather than **“listing material properties”**
- 5) An ergonomics question will always be asked in an exam, so remember the three aspects of ergonomics **“Anthropometrics”**, **“Physiology”** and **“Psychology”**. Then try to write two answers for each area relating to the product in the question, give examples from the product itself. For example for a kettle: -

“Anthropometrics deals with human sizes and the handle of the kettle should fit the adult palm width. The switches should suit the human finger size. Physiology deals with physical capabilities and when filling the kettle it should be easy to open the lid. It should also not be too heavy to lift when full of water. Psychology deals with feelings and emotions, so the switch on the kettle should make a clicking sound to let you know that its on. Its colour choice of silver and black shows strength and durability”



Calderglen High School

Technology Department

Design & Manufacture:- H/W 01

- Problem Identification
- The Design Team
- The Design Process



Name:-		
Date:-		
GRADE	MARK	✓
A	16 - 18	
B	12 - 15	
C	8 - 11	
F	0 - 7	
Total	___ / 18	

Q1. (a) Explain the design term "Problem Identification" _____

(b) Identify the design problem with the picture above. _____

(c) Name two methods of problem identification.

(i) _____

(ii) _____

Q2. Name and describe four members of the design team.

(i) _____

(ii) _____

(iii) _____

(iv) _____

Q3. Complete the missing stages of the design process below.

STAGE 1 = _____

STAGE 2 = Research & Summarising Design Factors

STAGE 3 = _____

STAGE 4 = _____

STAGE 5 = Develop Ideas

STAGE 6 = _____

STAGE 7 = _____

STAGE 8 = _____

MARKS

1

1

2

2

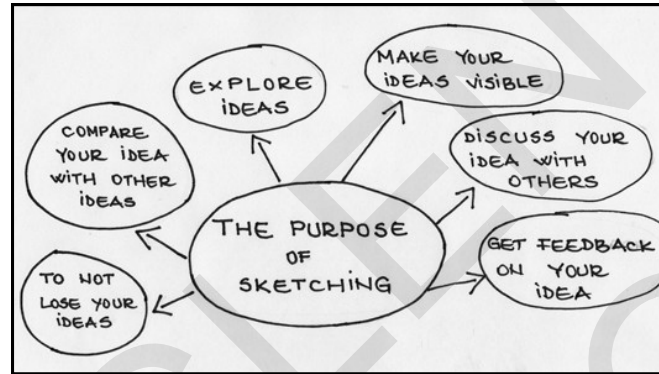
2

2

2

Design & Manufacture:- H/W 02

- Annotating Ides
- Types Of Drawings
- Modelling Techniques



Name:-		
Date:-		
GRADE	MARK	✓
A	11 - 12	
B	8 - 10	
C	5 - 7	
F	0 - 4	
Total	___ / 12	

Q1. Explain five different pieces of information you could discuss about your sketched ideas.

- (i) _____
- (ii) _____
- (iii) _____
- (iv) _____
- (v) _____

MARKS

- 1
- 1
- 1
- 1
- 1

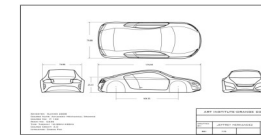
Q2. Name the following types of drawings.



(i) _____



(ii) _____



(iii) _____

3

Q3. (a) Name three types of modelling materials. (i) _____ (ii) _____ (iii) _____

3

(b) What is the advantage of making a 3D model of your idea?

1



Name:-		
Date:-		
GRADE	MARK	✓
A	16 - 18	
B	11 - 15	
C	7 - 10	
F	0 - 6	
Total	___ / 18	

Design & Manufacture:- H/W 03

- Plastic Categories, Types & Forms
- Plastic Tools, Processes & Adhesives

Q1. (a) What are the three basic raw materials used in the manufacture of plastics?

(i) _____ (ii) _____ (iii) _____

(b) Name the two main groups of plastic and give one example of each.

(i) _____ + Example = _____

(ii) _____ + Example = _____

(c) Give three general properties often associated with plastic.

(i) _____ (ii) _____ (iii) _____

(d) Plastic can be bought in various forms and shapes, name three types.

(i) _____ (ii) _____ (iii) _____

Q2. (a) Name the following tools and machines used when working with plastic.



(i) _____ (ii) _____ (iii) _____

(b) Explain the plastic process "Vacuum Forming".

MARKS

3

2

2

3

3

3

2



Calderglen High School

Technology Department



Design & Manufacture:- H/W 04

- Injection Moulding
- Rotational Moulding
- Blow Moulding

Name:-		
Date:-		
GRADE	MARK	✓
A	8 - 9	
B	6 - 7	
C	4 - 5	
F	0 - 3	
Total	___ / 9	

Q1. (a) Explain the process of "Injection Moulding". _____

(b) Give an example of a product which has been injection moulded. _____

Q2. (a) Explain the process of "Rotational Moulding". _____

(b) Give an example of a product which has been rotational moulded. _____

Q3. (a) Explain the process of "Blow Moulding". _____

(b) Give an example of a product which has been blow moulded. _____

MARKS

2

1

2

1

2

1



Calderglen High School

Technology Department



Name:-		
Date:-		
GRADE	MARK	✓
A	7 - 8	
B	5 - 6	
C	3 - 4	
F	0 - 2	
Total	___ / 8	

Design & Manufacture:- H/W 05

- Design Factors:- Function, Environment, Economics, Durability, Market Niche & Planned Obsolescence

Q1. Explain the primary and secondary function of the teachers desk shown above.

Primary Function = _____ Secondary Function _____

Q2. Explain what the term "Carbon Footprint" means. _____

Q3. (a) Explain what the term "Economics" means. _____

(b) If a process can produce more of something quicker, what does this do to its cost? _____

Q4. Durability is the life expectancy of a product, what product factor can affect this? _____

Q5. Explain the term "Market Niche". _____

Q6. Explain the term "Planned Obsolescence". _____

MARKS
2

1

1

1

1

1

1



Calderglen High School

Technology Department



Name:-		
Date:-		
GRADE	MARK	✓
A	9 - 10	
B	7 - 8	
C	4 - 6	
F	0 - 3	
Total	___ / 10	

Design & Manufacture:- H/W 06

- Design Factors:- Ease Of Maintenance, Materials, Aesthetics & Safety

Q1. (a) Explain what "Ease Of Maintenance" means. _____

(b) What two factors will effect the amount of maintenance a product requires?

(i) _____ (ii) _____

Q2. The choice of materials used in a product will have a direct effect on various aspects of the design, explain two of them.


(i) _____


(ii) _____

Q3. Explain how Aesthetics have been used in the Alessi Kettle, shown above (by Michael Graves 1985) to help its function as a Kettle. Hint:- Think of colour, form and a kettles function.

Q4. (a) Why is safety important in a products design? _____

(b) Name and explain the following two symbols.

 (i) _____

 (ii) _____

MARKS
1
2
1
1
2
1
1
1



Calderglen High School

Technology Department



Name:-		
Date:-		
GRADE	MARK	✓
A	8 - 9	
B	6 - 7	
C	4 - 5	
F	0 - 3	
Total	___ / 9	

Design & Manufacture:- H/W 07

- Design Factors:- Ergonomics
- Environmental Considerations, Circular Economy & Cradle to Cradle

Q1. (a) Explain what “Ergonomics” means. _____

(b) Explain how a car seat has been ergonomically designed. _____

(c) What are “Ergonomics”? _____

(d) The study of human sizes is known as :- _____

(e) Explain who are within the following percentiles.

(i) 0 - 5th Percentile = _____ (ii) 95 - 100th Percentile = _____

Q2. Explain two environmental issues you must think about when designing a product.

(i) _____

(ii) _____

Q3. Explain what the “Circular Economy” is. _____

MARKS

1

1

1

1

2

1

1

1



Name:-		
Date:-		
GRADE	MARK	✓
A	14 - 16	
B	10 - 13	
C	7 - 9	
F	0 - 6	
Total	___ / 16	

Design & Manufacture:- Test Revision 01

• **Plastic Processes**

Q1. The photograph above shows plastic iPhone holders, designed by a pupil.

(a) Give an example and explain the difference between Thermoset Plastics and Thermoplastics.

(i) - Thermoset Plastics:- _____

(ii) - Thermoplastics :- _____

(b) Give two advantages of choosing plastic as the material for the iPhone holder.

(i) _____

(ii) _____

(c) Give two disadvantages of choosing plastic as the material for the iPhone holder.

(i) _____

(ii) _____

(d) Name four different forms in which plastic can be purchased.

(i) _____ (ii) _____ (iii) _____ (iv) _____

(e) Describe the four stages of finishing the edges of the plastic iPhone holder.

(i) _____ (ii) _____

(iii) _____ (iv) _____

MARKS

2

2

1

1

1

1

4

4



Calderglen High School

Technology Department



Name:-		
Date:-		
GRADE	MARK	✓
A	8 - 9	
B	6 - 7	
C	4 - 5	
F	0 - 3	
Total	___ / 9	

Design & Manufacture:- Test Revision 02

- Ergonomics
- Design Factors

Q1. The market for hairdryers has increased over recent years and designers have to consider various factors in their designs.

(a) Describe how the following ergonomic factors have affected the design of hairdryers with relation to the human body.

(i) Anthropometrics:-

(ii) Physiology:-

(iii) Psychology:-

(b) Before producing a design specification for a hairdryer, the designer would have researched various design factors. Explain why the following design factors are important for designing hairdryers.

(i) Aesthetics:-

(ii) Performance:-

(iii) Materials:-

MARKS

2

2

2

1

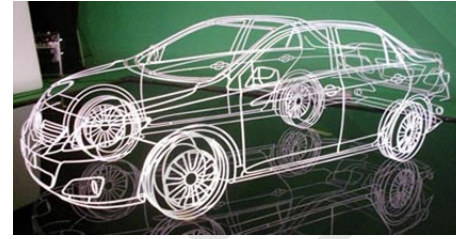
1

1



Caldergleng High School

Technology Department



Name:-		
Date:-		
GRADE	MARK	✓
A	14 - 16	
B	11 - 13	
C	7 - 10	
F	0 - 7	
Total	___ / 16	

Design & Manufacture:- H/W 08

- CAD:- Advantages, Inventor Modelling, Animation, Simulation and Industry CAM

Q1. (a) What does CAD stand for? C _____ A _____ D _____

(b) Explain what CAD is. _____

(c) Give three examples of industries which use CAD. (i) _____ (ii) _____ (iii) _____

(d) Describe three advantages of using CAD compared to manual drawing board methods.

(i) _____

(ii) _____

(iii) _____

(e) State the name of the type of CAD model shown in the picture at the top of this page. _____

Q2. (a) Give an example and describe what Animation is. Example:- _____

Description:- _____

(b) Give an example and describe what Simulation is. Example:- _____

Q3. (a) What does CAM stand for? C _____ A _____ M _____

(b) Give one advantage and one disadvantage of CAM.

(i) Advantage = _____

(ii) Disadvantage = _____

MARKS

1

1

3

1

1

1

1

1

1

1

1

1

1

1

Design & Manufacture:- H/W 09

- Research Techniques
- Wood Categories & Types
- Wood Tools and Processes



Name:-		
Date:-		
GRADE	MARK	✓
A	17 - 19	
B	13 - 16	
C	9 - 12	
F	0 - 8	
Total	___ / 19	

Q1. What research methods could you use for the following design factors:-

(i) Anthropometrics = _____

(ii) Aesthetics = _____

(iii) Economics (Value for Money) = _____

Q2. State the three categories of wood and give two examples for each.

(i) Category _____ Examples:- _____ & _____

(ii) Category _____ Examples:- _____ & _____

(iii) Category _____ Examples:- _____ & _____

Q3. (a) Name the following tools:-



(i) _____



(ii) _____



(iii) _____



(iv) _____

(b) Name the woodwork process shown at the top of the page and give two advantages of this process.

(i) Name:- _____

(ii) Advantage 1:- _____

(iii) Advantage 2:- _____

MARKS

1

1

1

3

3

3

1

1

1

1

1

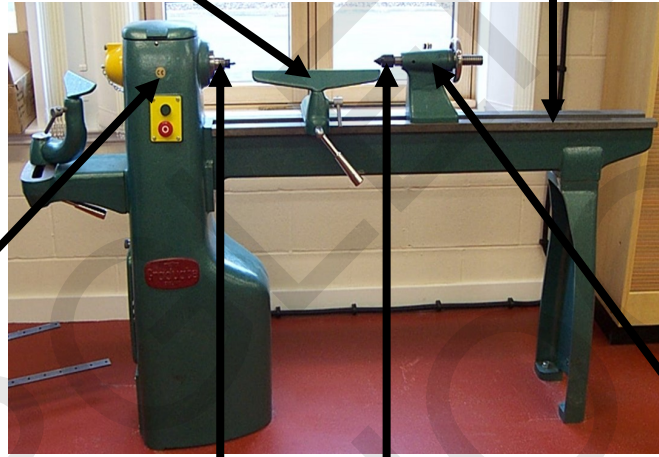
1

1

Design & Manufacture:- H/W 10

- Wood Lathe Turning
- Woodwork Machines
- Wood Finishes

Q1. (a) Name the labelled parts of the Wood Lathe



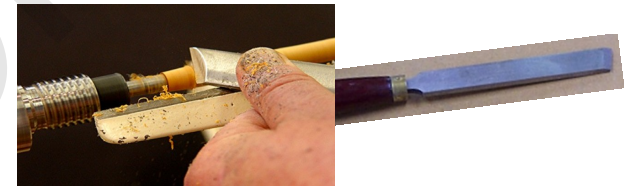
(b) Name the following Wood Lath tools:-



(i) _____



(ii) _____



(iii) _____

Q2. Name and describe the following wood work machines:-

(i) Name:- _____

Description:-



(ii) Name:- _____

Description:-



(iii) Name:- _____

Description:-



Q3. Name three different finishes that can be applied on to wood:- (i) _____ (ii) _____ (iii) _____

Name:-		
Date:-		
GRADE	MARK	✓
A	16 - 18	
B	12 - 15	
C	9 - 11	
F	0 - 7	
Total	___ / 18	

MARKS

6

1
1
1

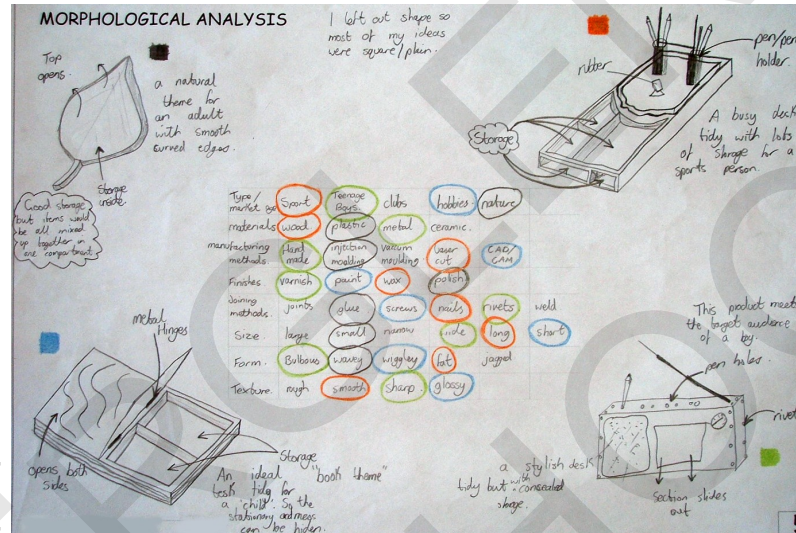
2
2
2

1
1
1

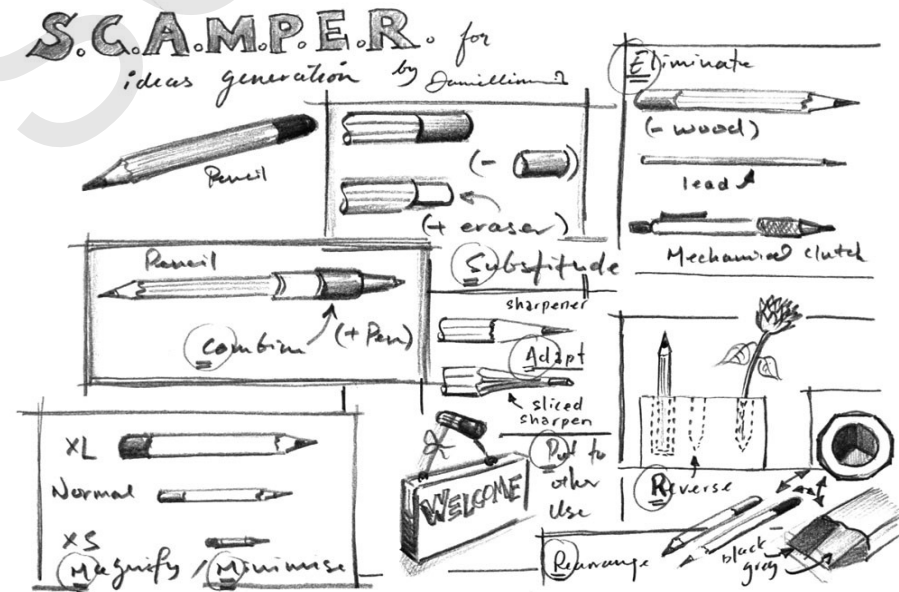
Design & Manufacture:- H/W 11

Idea Generation Methods

Q1. (a) Using the folio example, explain how a Morphological Analyse works:-



(b) Using the folio example, explain how S.C.A.M.P.E.R. Works:-



(c) Name another method of Idea Generation you have learned:-

Name:-		
Date:-		
GRADE	MARK	✓
A	5	
B	4	
C	2 - 3	
F	0 - 1	
Total	___ / 5	

MARKS

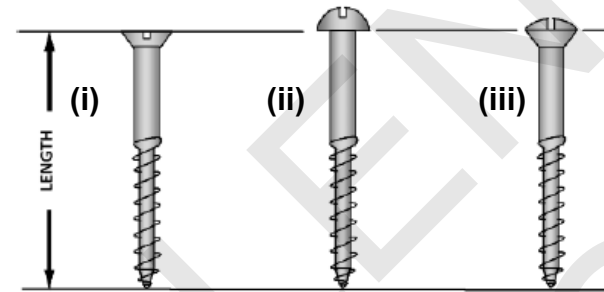
2

2

1

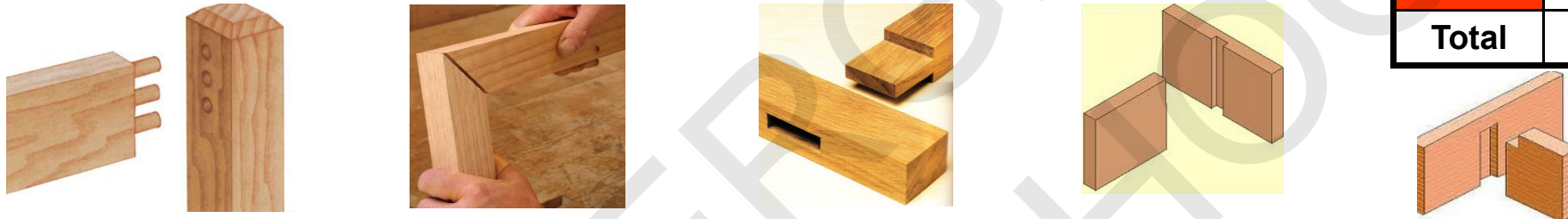
Design & Manufacture:- H/W 12

- *Joining wood*
- *Knockdown fittings & Flat-Pack Furniture*



Name:-		
Date:-		
GRADE	MARK	✓
A	17 - 19	
B	13 - 16	
C	9 - 12	
F	0 - 8	
Total	___ / 19	

Q1. (a) Name the following woodwork joints:-



(i) _____ (ii) _____ (iii) _____ (iv) _____ (v) _____

Q2. (a) Name the following types of screws shown above :- (i) _____ (ii) _____ (iii) _____

(b) State an advantage of using screw (i) compared to the other two:- _____

Q3. (a) Name two different types of Cramps used in the workshop:- (i) _____ (ii) _____

(b) Explain the term "Dry-Clamping":- _____

(c) What does PVA stand for? P _____ V _____ A _____

Q4. (a) Explain the term "Knock-Down Fittings":- _____

(b) Name three types of Knock Down Fittings:- (i) _____ (ii) _____ (iii) _____

(c) State two advantages of Flat-Pack Furniture to the buyer:-
(i) _____ (ii) _____

MARKS

5

3

1

2

1

1

1

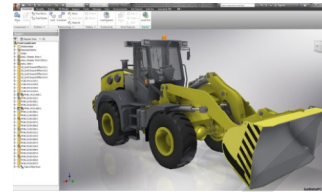
3

2



Calderglen High School

Technology Department



Name:-		
Date:-		
GRADE	MARK	✓
A	11 - 12	
B	8 - 10	
C	6 - 7	
F	0 - 5	
Total	___ / 12	

Design & Manufacture:- Test Revision 03

• CAD/CAM Advantages & Disadvantages

Q1. (a) What does CAD stand for? C _____ A _____ D _____

(b) Explain what CAD is. _____

(d) Describe two advantages of using CAD.

(i) _____

(ii) _____

(e) Describe two disadvantages of using CAD.

(i) _____

(ii) _____

Q2. (a) What does CAM stand for? C _____ A _____ M _____

(b) Explain what CAM is. _____

(d) Describe two advantages of using CAM.

(i) _____

(ii) _____

(e) Describe two disadvantages of using CAM.

(i) _____

(ii) _____

MARKS

1

1

1

1

1

1

1

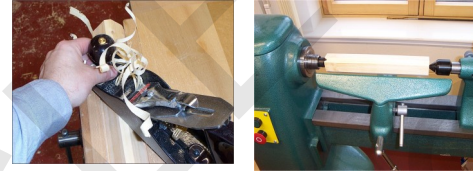
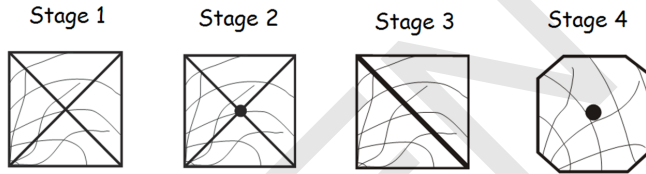
1

1

1

1

1



Design & Manufacture:- Test Revision 04

- Wood Lath Turning
- Wood Finishes
- Flat-Pack Furniture

Name:-		
Date:-		
GRADE	MARK	✓
A	8 - 9	
B	6 - 7	
C	4 - 5	
F	0 - 3	
Total	___ / 9	

Q1. (a) Describe the four stages in preparing a piece of wood for turning , use the sketches above to help.

(i) Stage 1:- _____

(ii) Stage 2:- _____

(iii) Stage 3:- _____

Q2. (a) Explain the advantage of using clear varnish on a good piece of hardwood instead of paint.

(b) When sanding wood with Glass Paper, why do you apply a fine sprinkle of water over the wood between sanding?

(c) What direction should you sand wood? _____

Q3. (a) Explain what Flat-Pack Furniture is:- _____

(b) State two advantages of Flat-Pack Furniture for the seller (i.e. IKEA):-

(i) _____ (ii) _____

MARKS

1

1

1

1

1

1

1

1

1



Calderglen High School

Technology Department

Design & Manufacture:- Test Revision 05

- *Softwood*
- *Manufactured Boards*



Name:-		
Date:-		
GRADE	MARK	✓
A	8 - 9	
B	6 - 7	
C	4 - 5	
F	0 - 3	
Total	___ / 9	

Q1. A pupil's project for a DVD storage box is shown in the photo above.

- (a) State the name of the manufactured board used in the box. _____
- (b) Describe three benefits of using a manufactured board for this project.
- (i) _____
- (ii) _____
- (iii) _____
- (c) State the name of the softwood used for the sides of the box. _____
- (d) Describe two sustainability issues that may have made softwood the preferred material for the sides of the box.
- (i) _____
- (ii) _____
- (e) Describe two design issues that may have affected the overall sizes of the DVD box.
- (i) _____
- (ii) _____

MARKS

1
1
1
1
1
1
1
1

Design & Manufacture:- Test Revision 06

- Woodwork Joints
- Woodwork Finishes

Q1. Photograph 1 above shows a woodwork joint used to hold a shelf in place.

(a) State the name of this woodwork joint and why it is suitable for a shelf.

(b) Describe the three stages required to manufacture this type of woodwork joint and include the names of the tools used.

(i) _____

(ii) _____

(iii) _____

(c) State the name of the woodwork joint show in photograph 2 and why this is aesthetically a better choice.

(d) Describe two benefits of using paint as a surface finish for the shelf.

(i) _____

(ii) _____

(e) State an alternative to paint as a finish for the shelf. _____



Name:-		
Date:-		
GRADE	MARK	✓
A	9 - 10	
B	7 - 8	
C	5 - 6	
F	0 - 4	
Total	___ / 10	

MARKS

2

1

1

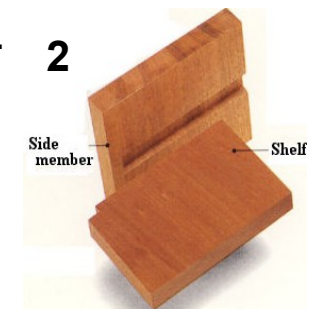
1

2

1

1

1





Calderglen High School

Technology Department

Design & Manufacture:- H/W 13

• *Product Evaluation*

Q1. Choose 5 design factors which have affected the design of this Flymo Electric Lawn Mower and then describe where they are used.



Name:-		
Date:-		
GRADE	MARK	✓
A	9 - 10	
B	7 - 8	
C	5 - 6	
F	0 - 4	
Total	___ / 10	

(i) Design Factor:- _____ & Description:- _____

MARKS

2

(ii) Design Factor:- _____ & Description:- _____

2

(iii) Design Factor:- _____ & Description:- _____

2

(iv) Design Factor:- _____ & Description:- _____

2

(v) Design Factor:- _____ & Description:- _____

2



Calderglen High School

Technology Department

Design & Manufacture:- H/W 14

• *Product Evaluation*

Q1. Describe where THREE aspects of aesthetics have influenced the design of the Sky+ remote control.



Name:-		
Date:-		
GRADE	MARK	✓
A	8	
B	6 - 7	
C	4 - 5	
F	0 - 3	
Total	___ / 10	

(i) _____

(ii) _____

(iii) _____

Q2. Describe the ergonomic issues that are relevant for the Makita cordless drill.



MARKS

2

2

2

2



Caldergleng High School

Technology Department



Design & Manufacture:- H/W 15

- Target Market & Marketing Mix (4 Ps)
- Technology Push, Market Pull & Technological Opportunity

Name:-		
Date:-		
GRADE	MARK	✓
A	17 - 20	
B	13 - 16	
C	8 - 12	
F	0 - 7	
Total	___ / 20	

Q1. (a) A TARGET MARKET is a "Set of P_____ L / B ___ E ___ / of / a / P ___ D ___ / or / S ___ I ___"

(b) State three factors which effect the number of buyers of a particular market.

(i) _____ (ii) _____ (iii) _____

(c) Define the following terms:-

(i) Consumer Demands = _____

(ii) Niche Marketing = _____

(iii) Market Segments = _____

Q2. (a) When identifying the Target Market it is important to understand the Marketing Mix and the 4 P's, state the 4 P's.

(i) _____ (ii) _____ (iii) _____ (iv) _____

Q3. (a) (i) Technology Push = N ___ / T _____ G ___ (ii) A product example could be = _____

(b) (ii) Market Pull = _ E E ___ / OF / S _____ Y (ii) A product example could be = _____

Q4. Technological Opportunity occurs by A ___ AN ___ M ___ TS in science, engineering and design (Technology Push).

An example is the development of the Mobile Phone which have advanced through M ___ O - ___ E ___ O _____

MARKS

4

3

1

1

1

4

2

2

2



Calderglen High School

Technology Department



Name:-		
Date:-		
GRADE	MARK	✓
A	11 - 12	
B	8 - 10	
C	5 - 7	
F	0 - 4	
Total	___ / 12	

Design & Manufacture:- H/W 17

- Metal Categories, Types, Forms, Properties and Uses

Q1. (a) Explain the difference between PURE METALS and ALLOYS.

(b) Metals can be categorised as either FERROUS or NON-FERROUS, explain each one and give an example of each.

(i) FERROUS METALS = _____
 & Example = _____

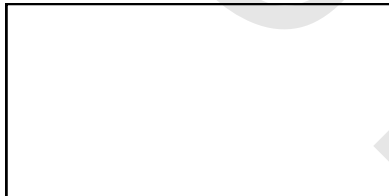
(ii) NON-FERROUS METALS = _____
 & Example = _____

(c) (i) List the properties of COPPER = _____

(ii) Give an example of where COPPER can be used = _____

Q2. Name and draw FOUR different forms/shapes in which metal can be bought.

(i) _____ (ii) _____ (iii) _____ (iv) _____



MARKS

2

1

1

1

1

1

1

1

1

1

1

Design & Manufacture:- H/W 18

• *Metalwork Tools*

Q1. (a) Name the following tools and explain their purpose:-

(ii) Name:- _____



Purpose:-

(iii) Name:- _____



Purpose:-

(iv) Name:- _____



Purpose:-

(v) Name:- _____



Purpose:-

(vi) Name:- _____



Purpose:-

(vii) Name:- _____



Purpose:-

(viii) Name:- _____



Purpose:-

(ix) Name:- _____



Purpose:-

(i) Name:- _____



Purpose:-

Name:-		
Date:-		
GRADE	MARK	✓
A	17 - 18	
B	13 - 16	
C	10 - 12	
F	0 - 9	
Total	___ / 18	

MARKS

2

2

2

2

2

2

2

2

2

Design & Manufacture:- H/W 19

- Metal Processes - Screw Threads & Heat Treatment
- Joining Metal



Name:-		
Date:-		
GRADE	MARK	✓
A	14 - 15	
B	11 - 13	
C	7 - 10	
F	0 - 6	
Total	___ / 15	

- Q1. (a) Name the tool shown above, which is used to achieve an internal screw thread. _____
- (b) This tool is available in sets of three, name the three types. _____



- (i) _____ (ii) _____ (iii) _____

- (c) Name the tool shown on the right, which is used for External Screw Cutting:- _____

- Q2. (a) Explain the term "HEAT TREATMENT" _____

- (b) Give TWO examples of Heat Treatment:- (i) _____ (ii) _____

- (c) Explain the following terms:-

(i) Malleability = _____

(ii) Ductility = _____

- Q3. Name FIVE different methods of joining metal together.

- (i) _____ (ii) _____ (iii) _____ (iv) _____ (v) _____

MARKS

1

3

1

1

2

1

1

5

Design & Manufacture:- H/W 20

• *Metal Processes - Metal Turning*

Q1. Photograph "A" shows a machine used for working with metal.

(a) State the name of this machine.

(b) Name parts 1, 2, 3 and explain their purpose.

(1) _____

(2) _____

(3) _____

Q2. The torch shown to the right was knurled using a knurling tool on the machine shown above.

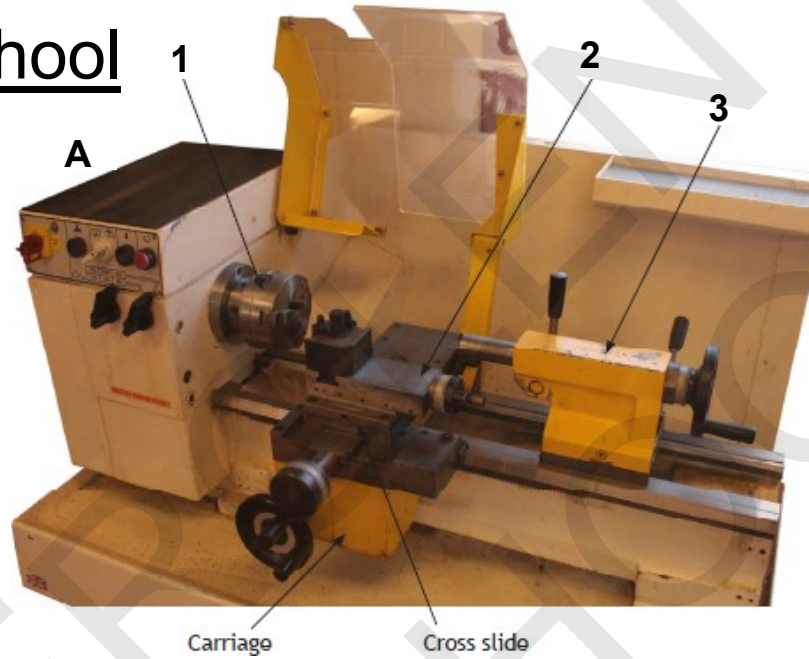
(a) Describe the process of knurling on the machine shown above (discuss speed and location of part 3)

(b) State the functional reason for knurling the torch.

(c) Part A was created from a piece of aluminium bar. State two process used on the machine above to manufacture the overall form of Part A from the original blank.

(i) _____

(ii) _____



Name:-		
Date:-		
GRADE	MARK	✓
A	11 - 12	
B	8 - 10	
C	5 - 7	
F	0 - 4	
Total	___ / 12	

MARKS

1

2

2

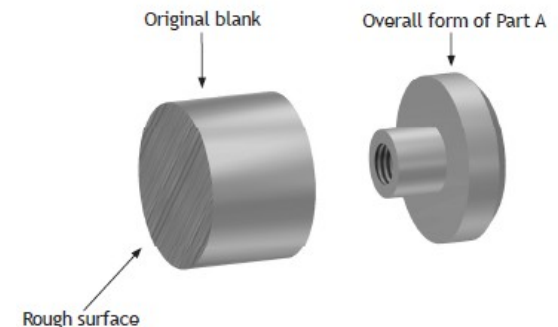
2

2

1

1

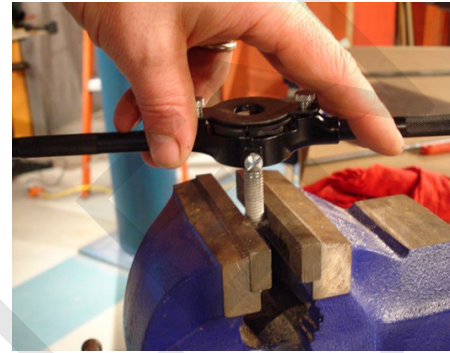
1





Calderglen High School

Technology Department



Design & Manufacture:- H/W 21

- Intellectual Property
- Metal Finishes

Name:-		
Date:-		
GRADE	MARK	✓
A	14 - 15	
B	11 - 13	
C	7 - 10	
F	0 - 6	
Total	___ / 15	

Q1. (a) Explain what the term “INTELLECTUAL PROPERTY” means.

(b) Give an example of where each of the following types of Intellectual Property protection are used.

- (i) Copyright:- _____
- (ii) Trademark:- _____
- (iii) Design Right:- _____
- (iv) Registered Design:- _____
- (v) Patent:- _____

Q2. (a) Explain the purpose of applying a finish to a piece of metal.

(b) State THREE different types of finishes which could be used to protect metal.

- (i) _____ (ii) _____ (iii) _____

Q3. Describe the method of turning the circular split die in the die stock (shown above) so as to achieve a good cut thread.

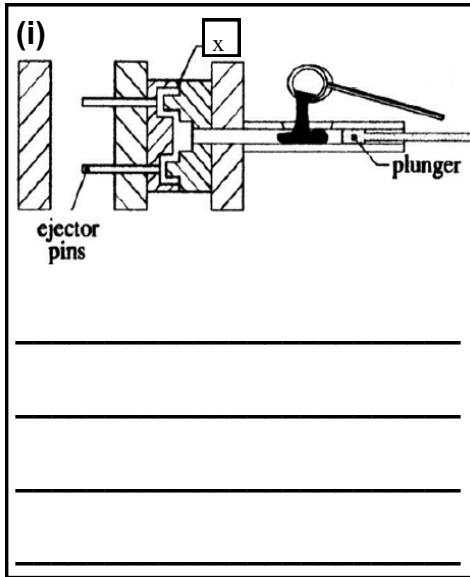
MARKS



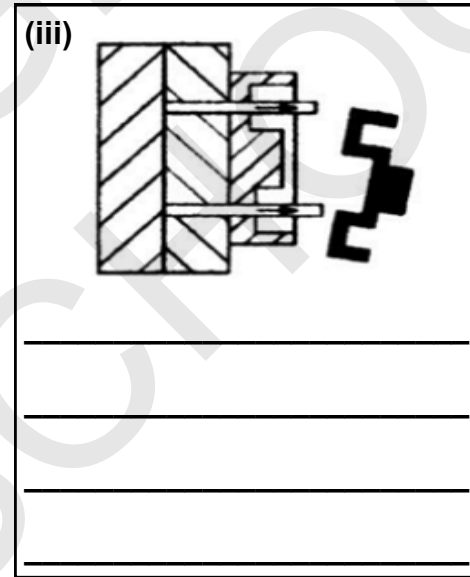
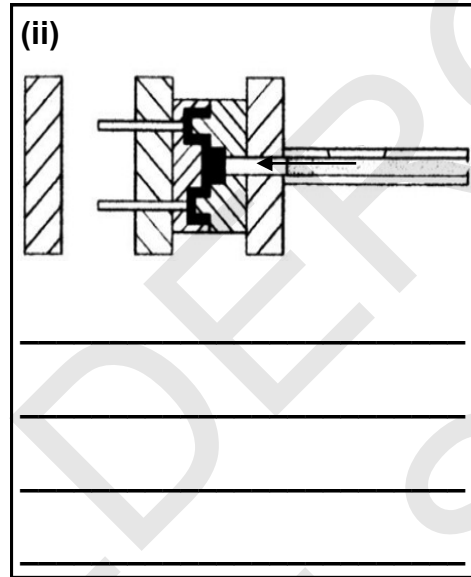
Design & Manufacture:- Test Revision 08

• Die Casting (Metal)

Q1. (a) The process of Die Casting is shown in the pictures below, explain what is happening in each picture.



START



FINISH

Name:-		
Date:-		
GRADE	MARK	✓
A	7	
B	5 - 6	
C	3 - 4	
F	0 - 2	
Total	___ / 7	

MARKS

(b) When would Die Casting be a better choice than Sand Casting? _____

(c) What is the name of the permanent mould labelled above as "X" _____

(d) How can you identify that the pencil sharpener shown above has been Die Casted. _____

(e) State an advantage of using Die Casting _____

1
1
1
1


Design & Manufacture:- Test Revision 09

• *Types Of Production Methods*

Q1. (a) Name and describe the type of production shown in each of the following photos.
(Hint: they are shown in order of production size from largest to smallest)


(i) Type of production = _____

Description = _____




(ii) Type of production = _____

Description = _____




(iii) Type of production = _____

Description = _____



(iv) Type of production = _____

Description = _____



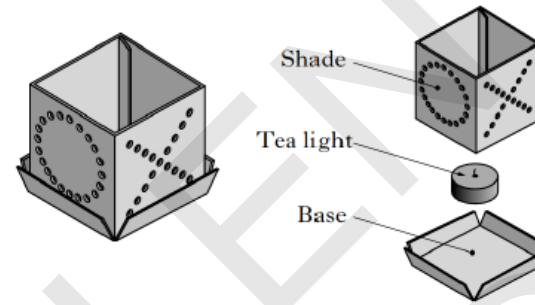
Name:-		
Date:-		
GRADE	MARK	✓
A	7 - 8	
B	5 - 6	
C	3 - 4	
F	0 - 2	
Total	___ / 8	

MARKS

1
1
1
1

1
1
1
1

Design & Manufacture:- Test Revision 10



Name:-		
Date:-		
GRADE	MARK	✓
A	5	
B	4	
C	2 - 3	
F	0 - 1	
Total	___ / 8	

• **Material choice**

Q1. (a) A tea light holder is shown above, state a manufacturing reason for using aluminium compared to steel.

(b) State an aesthetic reason for using aluminium.

Q2. (a) A folding kitchen stool is shown.

(i) State a reason why tubular metal is a suitable material for the frame of the stool.

(ii) Describe how the design of the stool has been influenced by ergonomics.

(iii) State why safety is important in the design of the stool.



Stool in open position



Stool in folded position

MARKS

1
1

1

1

1



Name:-		
Date:-		
GRADE	MARK	✓
A	21 - 23	
B	17 - 20	
C	11 - 16	
F	0 - 10	
Total	___ / 23	

Design & Manufacture:- Prelim Revision 01

• Section 1 - Materials and Manufacture

Q1. (a) Name the two categories of metal and give an example for each:-

i) _____ & Example = _____ ii) _____ & Example = _____

(b) Name the two categories of plastic and give an example for each:-

i) _____ & Example = _____ ii) _____ & Example = _____

(c) Name the three categories of wood and give an example for each:-

i) _____ & Example = _____ ii) _____ & Example = _____ iii) _____ & Example = _____

Q2. (a) Describe three benefits of using manufactured boards for the construction of modern flat pack furniture.

(i) _____

(ii) _____

(iii) _____

(b) Explain why softwood is a more sustainable choice over hardwood. _____

(c) Name the following wood work joints:-

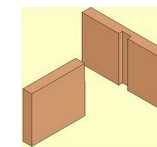
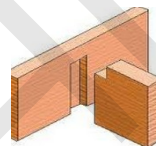
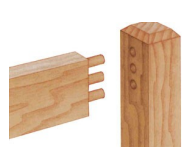
(i) _____

(ii) _____

(iii) _____

(iv) _____

(v) _____



MARKS

4

4

6

1

1

1

1

5

Wooden Toy

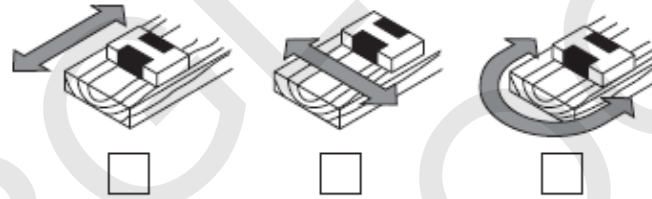


Name:-		
Date:-		
GRADE	MARK	✓
A	10 - 11	
B	8 - 9	
C	6 - 7	
F	0 - 5	
Total	___ / 11	

Design & Manufacture:- Prelim Revision 02

• Section 1 - Materials and Manufacture

Q1. (a) Glass paper was used to remove pencil marks before applying a finish to a wooden toy. Tick the box under the sketch which shows the correct direction for sanding the wood.



(b) The grain was raised before the finish was applied. State how to raise the grain of the wood.

(c) Clear varnish was used as a finish. Describe two benefits of using clear varnish as a surface finish for the wood.

i) _____

ii) _____

(d) Name three alternative finishes which could have been used for the toy.

(i) _____ (ii) _____ (iii) _____

(e) Name the machine that would have been used to make the wheels of the toy:- _____

(b) Describe the three stages required to manufacture this type of woodwork joint and include the names of the tools used.

(i) _____

(ii) _____

(iii) _____



MARKS

1

1

1

1

3

1

1

1

1

Design & Manufacture:- Prelim Revision 03

Section 1 - Materials and Manufacture

Q1. (a) A Key holder is shown above, of which the pegs where manufactured on a metal lathe. Name the three missing labels A, B and C.

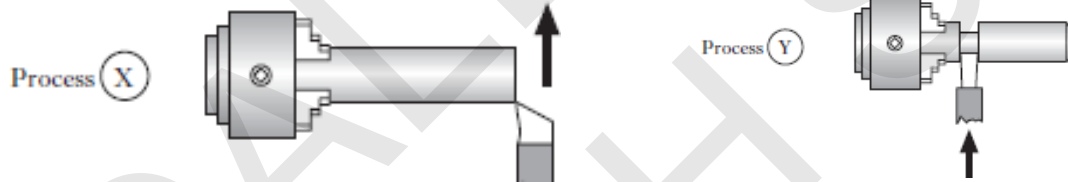
(b) State a reason for the chamfer on the peg.

(c) State the function of the rubber collar.

(d) The following processes were used in the manufacture of the metal peg.

(i) State the name of Process X, shown below.

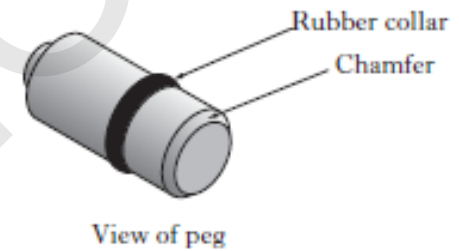
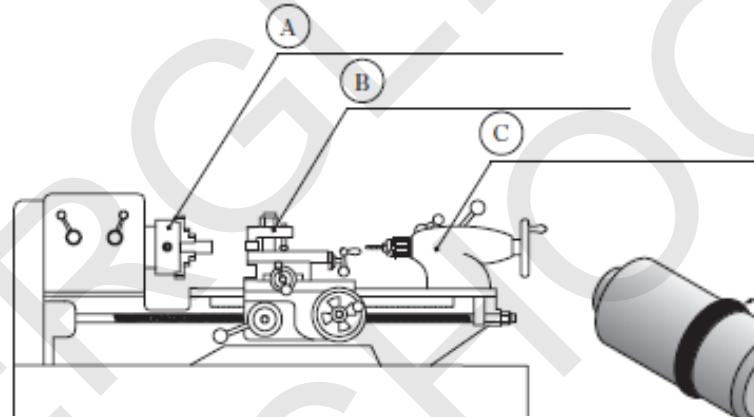
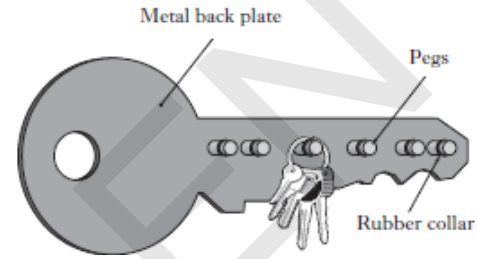
(ii) State the name of Process Y, shown below.



(e) Explain the following two other processes which can be done on the metal lathe.

(i) Parallel Turning: -

(ii) Knurling: -



Name:-		
Date:-		
GRADE	MARK	✓
A	9	
B	7 - 8	
C	5 - 6	
F	4	
Total	___ / 9	

MARKS

1

1

1

1

1

1

1

1

1



Calderglen High School

Technology Department

Design & Manufacture:- Prelim Revision 04

Name:-		
Date:-		
GRADE	MARK	✓
A	6	
B	5	
C	4	
F	0 - 3	
Total	___ / 6	

• Section 2 - Design Theory

Q1. (a) An electric toaster is shown below. Describe one way in which the design of the toaster has been influenced by each of the following ergonomic aspects, link your answer to the toaster parts.

(i) Anthropometrics: - _____

(ii) Physiology: - _____

(iii) Psychology: - _____

(b) The environment is an important aspect in the design of kitchen products. Explain three ways in which the designer could reduce the environmental impact of this toaster.

(i) _____

(ii) _____

(iii) _____



MARKS

1

1

1

1

1

1



Calderglen High School

Technology Department



Name:-		
Date:-		
GRADE	MARK	✓
A	8	
B	6 - 7	
C	4 - 5	
F	0 - 3	
Total	___ / 8	

Design & Manufacture:- Prelim Revision 06

• Section 2 - Design Theory

Q1. (a) Two CAD models of a new proposed kettle design are shown above. The manufacture and designer wishes to carry market research for the new design. Why would they want to do this?

(b) Describe a market research technique that could be carried out for each of the following aspects and explain what they would need to do: -

(i) Easy of Maintenance: - _____

(ii) Value for money: - _____

(iii) Aesthetics: - _____

(c) CAD modelling was used in the design of the kettle. Describe two advantages of CAD modelling: -

(i) _____

(ii) _____

(d) State two other methods of communicating ideas to the design team: - (i) _____ (ii) _____

MARKS

1

1

1

1

1

1

2



Calderglen High School

Technology Department



Design & Manufacture:- H/W 22

• *Ergonomics & Modelling*

Q1. (a) A children's slide is shown above. Describe one way in which the design of the slide has been influenced by each of the following ergonomic aspects, link your answer to the slide parts.

(i) Anthropometrics: - _____

(ii) Physiology: - _____

(iii) Psychology: - _____

Q2. (a) During the design process, a designer will use various materials to build models. State two reasons why the designer would build models.

(i) _____

(ii) _____

(b) State the name of two materials that could be used to produce models and explain why each material is suitable.

(i) Material: - _____ & Why: - _____

(ii) Material: - _____ & Why: - _____

(c) What does the following letters stand for: - C _____ A _____ D & C _____ A _____ M _____

Name:-		
Date:-		
GRADE	MARK	✓
A	10 - 11	
B	8 - 9	
C	5 - 7	
F	0 - 6	
Total	___ / 11	

MARKS

1

1

1

1

1

1

1

1

1

2



Calderglen High School

Technology Department

Design & Manufacture:- H/W 23



Name:-		
Date:-		
GRADE	MARK	✓
A	9 - 10	
B	7 - 8	
C	5 - 6	
F	0 - 4	
Total	___ / 10	

• *Graphic Techniques & Marketing*

Q1. (a) Designers use a variety of different graphic techniques in order to communicate. State two graphic techniques, which the designer could use to effectively communicate with: -

(i) The client: - _____ & _____

(ii) The manufacturer: - _____ & _____

(iii) Other designers: - _____ & _____

Q2. (a) Nike unveiled the new Magista Boot Volt in 2014 as shown above. Describe how consumer demand influences the design of football boots, with regards to the sport. _____

(b) Advertising is one technique used by Nike to increase sales of the Magista Boot Volt. Describe two other techniques which could also be used to increase sales.

(i) _____

(ii) _____

Q3. The Magista Boot Volt was launched under the Nike brand name, describe a benefit to the designer of launching a product under a successful brand name like Nike. _____

MARKS

2
2
2

1

1

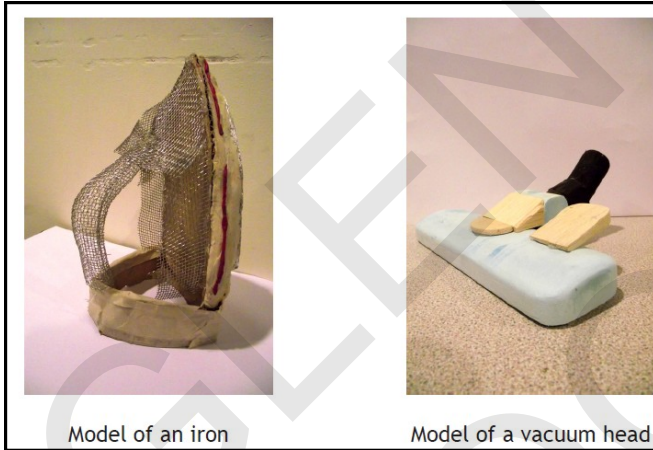
1

1

Design & Manufacture:- H/W 24

• **Modelling & Manufacturing Processes**

Q1. (a) Designers often make models of their designs as they work through the design process as shown in the photos above. Describe two benefits a designer could gain from modelling.



Name:-		
Date:-		
GRADE	MARK	✓
A	8	
B	6 - 7	
C	4 - 5	
F	0 - 3	
Total	___ /	

(i) _____

(ii) _____

(b) Explain what “Rapid Prototyping” it and describe one benefit that it offers the designer.

Explanation: - _____

Benefit: - _____

Q2. Name the manufacturing process used to make these products: -

(i) Process = _____



(ii) Process = _____



(iii) Process = _____



(iv) Process = _____



MARKS

1

1

1

1

1

1

1

1



Calderglen High School

Technology Department

Design & Manufacture:- H/W 25



Name:-		
Date:-		
GRADE	MARK	✓
A	10	
B	8 - 9	
C	6 - 7	
F	0 - 5	
Total	___ / 10	

- Design Team & CNC, CAD, CAM

Q1. (a) Over recent years there has been a steady increase in the number of electronic products available to consumers in the marketplace. Explain the term “Technology Push” with reference to electronic products which you are familiar with.

TECHNOLOGY PUSH: - _____

(b) Name and describe the roles of two design team members who would have been involved in the evaluation of the electrical products shown above.

(i) Design team member: - _____ & Description of role: - _____

(ii) Design team member: - _____ & Description of role: - _____

Q2. (a) Manufacturers are increasingly using CNC and CAD CAM technologies to make their products. Describe three ways that these technologies have effected the manufacturing of products: -

(i) _____
 (ii) _____
 (iii) _____

(b) Explain what 3D Printing is: - _____

MARKS

2

2

2

1

1

1

1

Design & Manufacture:- H/W 26

• Wood & Vacuum Forming

Q1. (a) A chess box is shown above. Hardwood was used for some of the squares of the chess board. State the name of a hardwood that could have been used for the squares. _____

(b) Describe two benefits of using hardwoods for the manufacture of this product: -

(i) _____

(ii) _____

(c) A comb joint has been used for the corner. State the name of two alternative joints that could have been used at each corner: - (i) _____ & (ii) _____

(d) Clear varnish was used as a surface finish for the chess box. Describe two benefits of using clear varnish as a surface finish for the chess box: - (i) _____

(ii) _____

(e) The plastic tray shown below was vacuum formed and is used to hold the chess pieces. The wooden pattern used in the process is also shown. Explain the reasons for the following features in the wooden pattern: -

(i) Rounded corners _____

(ii) Sloping sides _____

(d) State a benefit of using a thermoplastic material for the tray.



Name:-		
Date:-		
GRADE	MARK	✓
A	9 - 10	
B	7 - 8	
C	5 - 6	
F	0 - 4	
Total	___ / 10	

MARKS

1

1

1

2

1

1

1

1

1



Plastic tray



Wooden Pattern

Sloping side

Rounded corner



Caldergleng High School

Technology Department



Name:-		
Date:-		
GRADE	MARK	✓
A	9	
B	7 - 8	
C	5 - 6	
F	0 - 4	
Total	___ / 9	

Design & Manufacture:- H/W 27

• Die Casting & Mass Production

Q1. (a) Aluminium chess pieces shown below were commercially produced by the process of die casting.

State two reasons for using aluminium for the chess pieces: -

- (i) _____
- (ii) _____

(b) State three benefits of using die casting to manufacture the chess pieces: -

- (i) _____
- (ii) _____
- (iii) _____

Q2. (a) A stainless steel colander is shown below. Give two reasons why stainless steel would be suitable for the colander: -

- (i) _____
- (ii) _____

(b) The colander was mass produced. Describe two benefits to the manufacturer in using mass production techniques: -

- (i) _____
- _____
- (ii) _____
- _____



MARKS

1
1

1
1
1

1
1

1
1



Calderglen High School

Technology Department

Design & Manufacture:- H/W 28

- *User Trials, Marketing & Idea Generation Techniques*

Q1. (a) An electric razor is shown on the right, as well as other types of razors. The manufacturer wishes to carry out an evaluation of the razor. Describe a suitable user trial to evaluate the ergonomics of the razor.



Name:-		
Date:-		
GRADE	MARK	✓
A	7	
B	5 - 6	
C	4	
F	0 - 3	
Total	___ / 7	

(b) State two key questions that would be included in a survey to evaluate the aesthetics of the electric razor.

(i) Q1 = _____

(ii) Q2 = _____

(c) There are a wide variety of razors available on the market today, as shown above. With such a large selection, designers need to find ways of marketing their product. Describe two marketing techniques that a design team may use to promote their product: -

(i) _____

(ii) _____

(d) Designers often have to generate new ideas to stay ahead of their competitors. Describe two idea generation techniques that they could use: -

(i) _____

(ii) _____

MARKS

1

1

1

1

1

1

1