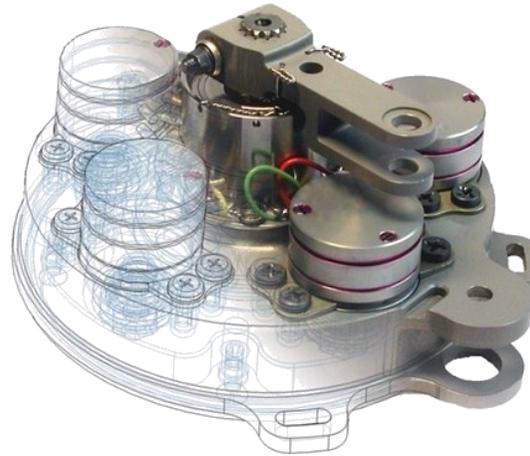


# Design and Manufacture



**Level 4**  
**S3**

**Theory homework**



# Wood questions



### Homework 1

1. Briefly explain the term 'grain' when referring to timber. (2)
2. Woods are usually classified into 2 groups, what are they. (2)
3. Name 3 types of hardwood. (3)
4. Name 3 types of softwood. (3)
5. Sketch and name 3 different forms in which wood can be supplied to the workshop. (3)

### Homework 2

1. What 2 factors determine what type of joint should be used when joining pieces of timber? (2)
2. Why are very wide boards in softwood and hardwood very rare? (2)
3. How has the problem of wide boards been overcome? (3)
4. Briefly explain how the man-made ( manufactured) board plywood is constructed (3)
5. Sketch a butt joint and state a problem associated with it. (3)
6. Sketch a dowel joint. (2)

### Homework 3

1. Briefly explain how the man-made manufactured/board blockboard is constructed (3)
2. Briefly explain how the man-made manufactured/board chipboard is constructed (3)
3. Sketch a through housing joint. (2)
4. Sketch a stopped housing joint. (2)
5. State 3 advantages of working with MDF. (3)
6. Briefly explain the term 'finishing' when referring to timber, and name 2 finishes. (2)
7. Name two stages in preparing wood before applying a finish. (2)

### Homework 4

1. What is the most commonly used glue in the workshop and how should excess glue be removed? (2)
2. Saw teeth are usually SET, what is meant by this term and why is it done? (3)
3. What is the purpose of a hole saw? (2)
4. Name 4 types of man-made/manufactured boards. (2)
5. Name a saw used for sawing awkward cuts in wood, what is unique about this type of saw? (2)
6. Name two types of chisel used in the school workshop. (2)

## Homework 5

1. State the name of the plane used to flatten the bottom of housing joints, what is its other name? (3)
2. What is the purpose of a rebate plane? (3)
3. What is a plough plane used for and in what direction must it be used? (2)
4. What is the purpose of a “G” cramp? (2)
5. State the purpose of a sash cramp. (3)
6. What is the purpose of countersinking wood? (2)

## Homework 6

1. Describe the 4 stages in preparing a piece of wood for turning. (3)
2. Explain what a wood turning lathe is used for. (2)
3. Name 3 parts of a wood turning lathe. (3)
4. Briefly explain the purpose of a revolving centre. (2)
5. Briefly explain the purpose of a fork centre. (2)
6. Name 4 wood turning chisels (4)

# metal questions



Homework 7

1. Sketch and name 5 different forms in which metal can be supplied to the workshop. (5)
2. Metals are usually classified as Ferrous and Non-Ferrous. Explain what is meant by each of these terms. (4)
3. What is the purpose of using a countersink bit? (2)
4. What is the purpose of a centre punch? (2)
5. What tool is used to check metal for squareness? (1)
6. What is the tool used to mark metal? (1)
7. What are odd leg callipers used for? (1)

Homework 8

1. Copy the table into your jotter and fill in the blank spaces. (15)
2. Explain what an alloy is. (2)
3. What is the purpose of a spring divider? (1)
4. What are inside and outside callipers used for? (2)

Material	Ferrous	Non-Ferrous	Alloy or Pure metal
High Carbon Steel			
Brass			
Copper			
Duralumin			
Bronze			
Mild steel			

### Homework 9 (Heat treatment)

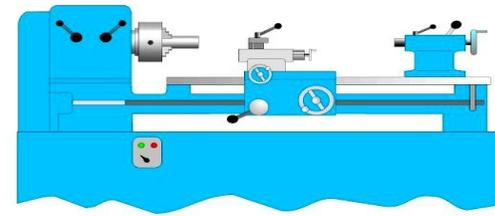
1. Briefly explain what is meant by the term “tempering”. (2)
2. Briefly explain what is meant by the term “annealing”. (2)
3. Briefly explain what is meant by the term “heat treatment”. (2)
4. Briefly explain what is meant by the term “case hardening” (2)
5. Which tool is used to hold hot metal whilst shaping is being carried out? (1)

### Homework 10 (Threading)

1. What is the name of the tool used to cut an external thread on metal rod? (1)
2. How is the end of the rod prepared to make it easier to start the thread? (1)
3. What is the centre screw used for on the tool? (2)
4. Which 3 tapping tools are used to make an internal screw thread and in what order are they used? (4)
5. What is the name of the tool used to hold a tap? (1)

Homework 11 (Lathework)

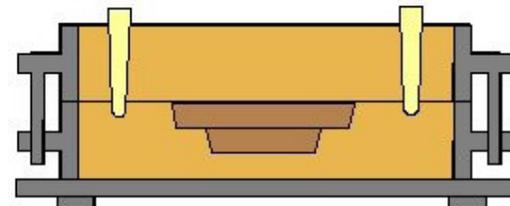
1. Name any 3 parts of a centre lathe.
2. Briefly explain the process of parting off, use a sketch if required.
3. Briefly explain the process of Facing off, use a sketch if required.
4. Briefly explain the process of Parallel turning, use a sketch if required.
5. Briefly explain the process of Taper turning, use a sketch if required.
6. Briefly explain the process of Knurling.
7. Name two lathe cutting tools used on the centre lathe



- (3)
- (2)
- (2)
- (2)
- (2)
- (2)
- (2)

Homework 12 (Casting)

1. What are the name of the two parts that hold the sand for casting?
2. What are sprue pins used for when casting?
3. Briefly explain why the runner and riser are made when sandcasting
4. What is the name of the piece of equipment that makes the shape in sand?
5. Why are aluminium or casting alloy suitable metals for casting in schools?
6. Why are air holes pushed into the sand before casting?
7. What happens to the runner and riser after casting?



- (2)
- (2)
- (2)
- (1)
- (1)
- (1)
- (2)

### Homework 13 (Joining metals)

1. Briefly explain the process of Resistance spot welding. (2)
2. Briefly explain the process of Electric welding. (2)
3. Briefly explain the process of Brazing (2)
4. Briefly explain the process of Knurling. (2)
5. Name and sketch 3 types of rivet. (3)
6. What type of hammer is used when riveting? (1)
7. What is the difference between a permanent and non-permanent joint? (2)

### Homework 14

1. A plastic coat on metal will prevent it from rusting, Explain the four stages of applying the plastic coat . (4)
2. Name another 3 ways of applying a finish to metals. (3)

# Plastic questions



Homework 15

1. Sketch and name 5 different forms in which plastic can be supplied to the workshop. (5)
2. Plastics are usually classified as thermoplastics or thermosetting plastics.  
 Explain what is meant by each of these terms. (4)
3. What substances are used as the source of man made plastics? (3)
4. What is meant by the term plastic memory? (2)
5. Briefly explain the process of vacuum forming, use a sketch if required. (4)

Homework 16

1. Copy the table into your jotter and fill in the blank spaces. (15)
2. State a suitable polish for acrylic (2)
3. Name 3 tools used to cut acrylic. (3)

Material	Thermo	Thermo -setting	Possible uses in every day products
Acrylic			
Epoxy Resin			
Polystyrene			
PVC			
Polyester Resin			

### Homework 17 (Industrial processes)

1. Briefly explain the process of rotational moulding, use a sketch if required. (4)
2. Briefly explain the process of injection moulding, use a sketch if required. (4)
3. State two everyday objects which could have been rotational moulded. (2)
4. State two everyday objects which could have been vacuum formed. (2)
5. State two everyday objects which could have been injection moulded. (2)

### Homework 18 (Finishes)

1. The 5 stages used to finish the edge of a piece of acrylic are listed in the wrong order, in your jotter write them in the correct order. (5)
  - Use acrylic polish
  - Cross file
  - Buff with a clean cloth
  - Use wet and dry paper
  - Draw file
2. Write a brief description of acrylic. (2)

# Factors that influence design

## Homework 19 (Design process)

1. List the 8 stages of the Design Process (8)
2. What Design Factors should be considered when researching a new product? (7)
3. What is a Product/Design specification? (3)

## Homework 20 (Design process)

1. At the Idea Generation stage of the design process, what are ANNOTATIONS? (2)
2. What should be considered when developing some of the initial ideas further? (3)
3. What four pieces of information should be included when Planning for Manufacture? (4)
4. What should be considered when writing an evaluation? (2)

### Homework 21 (Ergonomics)

1. What is meant by the term “Ergonomics”? (2)
2. What is an Ergonome ? (2)
3. What size of person are most things designed for and why are they designed for them? (3)
4. Why is a doorway or access hatch not designed for this size of person? (2)
5. Why are supermarket shelves designed for the smaller sized people? (3)

### Homework 22 (Aesthetics)

1. What is Aesthetics and why is it an important thing to think about when designing a new product? (3)
2. What colours do you think would be best for a child's toy and why? (4)
3. How can a designer achieve contrast within a design? (3)
4. What types of shapes would be classed as “geometric”? (2)
5. What types of shapes would be classed as “organic”? (2)