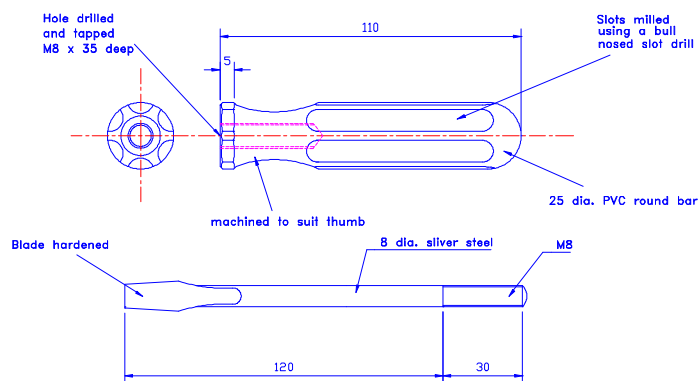


## BEAUDESERT STATE HIGH SCHOOL

### ENGINEERING WORK BOOK

#### SCREWDRIVER

Time allowed – 3 weeks



#### Procedure for making the Screwdriver

##### Handle

1. Cut a piece of 20 diameter grey PVC rod to 113 long.
2. Face off both ends and make 110 long – use a tool bit sharpened for plastics.
3. Hold it in the three jaw chuck on the centre lathe and use the specially ground concave tool to shape the end radius.
4. Reposition the piece and use the other specially sharpened(convex) turning tool to turn the thumb location shape.
5. Use a smooth file and wet and dry paper (wet) to polish the two machined faces.
6. Centre drill and then drill for an M8 x 1.0 thread x 35 deep.

- Use the T shaped tap holder to start the tread in the lathe, and if necessary finish off the thread hole depth in the vice.

### Blade

- Cut a piece of silver steel of 8 diameter to length using the hacksaw.
- Chamfer 1 end and use the centre lathe to start the M8 x 1.0 thread.
- Cut to 30mm long.
- Use the Oxy/Acetylene torch to heat the blade end to red hot, then hammer on an anvil to the shape required.
- Use the bench grinder to shape the flattened end to fit the screw size required.
- Reheat to cherry red all over and quench in an oil bath to harden the steel all over.
- Polish the steel with emery cloth /steel wool.
- Reheat the handle end to anneal it – get it to a straw colour almost up to the blade and re-quench in the oil bath.
- Test that the blade shaft is not hard and brittle, and that the blade is still quite hard. Do this with a file.
- Repolish and then fit into the handle – use a little two part epoxy to glue the two together.

### Competencies covered

#### **Unit 1.1F.1 Undertake interactive workplace communication.**

**Element – 1.1F.1 Communicate information about tasks, processes, events, or skills.**

Criteria		Met
1.1F 1.1	An appropriate choice of communication techniques are used.	
1.1F 1.2	Multiple operations involving several topics are communicated.	
1.1F 1.3	Listening is done without continuous interruptions of the speaker.	
1.1F 1.4	Questions are asked to gain extra information	
1.1F 1.5	Correct sources of information are identified	
1.1F 1.6	Information is selected and sequenced appropriately	
1.1F 1.7	Verbal reporting and written reporting done where required	
1.1F 1.8	Communication is demonstrated in unfamiliar situations	

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**Element - 1.1F.2 Take part in group discussion to achieve appropriate work outcomes.**

1.1F	2.1	Responses sought and provided from others in the group	
1.1F	2.2	Constructive contributions are made towards the production processes involved.	
1.1F	2.3	Goals and aims are communicated.	

**Element - 1.1F 3 Represent the views of the group to others.**

1.1F	3.1	Views and opinions of others are understood and reflected accurately.	
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**Unit 1.2F Apply principles of occupational health and safety (OH&S) in work.****Element – 1.2F.1 Follow safe work practices**

1.2F	1.1	Work is carried out safely to school standards and legislative requirements.	
1.2F	1.2	Housekeeping is undertaken to school standards.	
1.2F	1.3	Responsibilities and duties of students are understood and demonstrated.	
1.2F	1.4	Personal protective equipment is worn and stored to school standards.	
1.2F	1.5	All equipment and safety devices are used to legislative requirements and school standards.	
1.2F	1.6	Safety signs are identified and followed as per instruction.	
1.2F	1.7	All manual handling is carried out to legal requirements and school standards.	
1.2F	1.8	Emergency equipment identified and used as appropriate.	

**Element – 1.2F.2 Report workplace hazards**

1.2F	2.1	Workplace hazards identified and reported to teacher.	
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**Element – 1.2F.3 Follow emergency procedures**

1.2F	3.1	Identifies the means of contacting appropriate personnel in the event of an accident	
1.2F	3.2	Emergency and evacuation procedure understood and carried out.	
1.2F	3.3	School evacuation procedures followed	

## Unit 1.3F Apply quality procedures

### Element - 1.3F.1 Take responsibility for own quality

1.3F	1.1	Concept of supplying product or service to meet customer needs or requirements understood and applied.	
1.3F	1.2	Accepts the “right first time” concept as a personal responsibility	

### Element – 1.3F.2 Apply standard procedures of workplace quality to own job

1.3F	2.1	Quality system procedures followed.	
1.3F	2.2	Conformance to specifications ensured.	

## Unit 1.4F Plan to undertake a routine task

### Element – 1.4F.1 Identify task requirements

1.4F	1.1	Instructions for procedures are obtained, understood and if necessary, clarified.	
1.4F	1.2	Relevant specifications for task outcomes are obtained, understood, and if necessary, clarified.	
1.4F	1.3	Task outcomes are identified	
1.4F	1.4	Task requirements, such as completion time and quality measures are identified.	

### Element – 1.4F.2 Plan steps required to complete task

1.4F	2.1	Based on specifications and instructions provided, the individual steps or activities required to undertake the task are understood, and if necessary, clarified.	
1.4F	2.2	Sequence of activities required to be completed are identified in plan.	
1.4F	2.3	Planned steps and outcome are checked to ensure conformity with instructions and relevant specifications.	

### Element – 1.4F.3 Review plan

1.4F	3.1	Outcomes are identified and compared with (planned) objectives, task instructions, specifications, and task requirements.	
1.4F	3.2	If necessary, plan is revised, to better meet objectives and task requirements.	

## Unit 18.1A Use hand tools

### Element – 18.1A.1 Use hand tools

18.1A	1.1	Appropriate hand tools selected according the task requirements.	
18.1A	1.2	Hand tools are used to produce required outcomes to job specifications which may include finish, tension, size or shape.	
18.1A	1.3	All safety requirements are adhered to before during and after use.	
18.1A	1.4	Unsafe or faulty tools are identified and marked for repair, according to designated procedures, before, during, and after use.	
18.1A	1.5	Routine maintenance of tools, including hand sharpening undertaken according to standard operational procedures, principles, and techniques.	
18.1A	1.6	Hand tools are stored safely in an appropriate location, according to standard operational procedures, and manufacturers' recommendations.	

## Unit 2.5C11 Measure with graduated devices

### Element – 2.5C11.1 Use graduated devices to check dimensions or variables

2.5C11	1.1	Selects appropriate device or equipment to achieve required outcome.	
2.5C11	1.2	The correct and appropriate measurement technique used.	
2.5C11	1.3	Measures accurately to the finest graduation of the instrument.	

## Unit 7.32A Use workshop machines for basic operations

### Element – 7.32A.1 Determine job requirements

7.32A	1.1	Job requirements interpreted.	
7.32A	1.2	Appropriate machine selected to meet requirements.	

### Element – 7.32A.2 Set up machine

7.32A	2.1	Tools are selected where appropriate.	
7.32A	2.2	Cutting tools are sharpened as required.	
7.32A	2.3	Tools are correctly installed using standard operating procedures.	
7.32A	2.4	Appropriate guards are set and adjusted as required.	

### Element – 7.32A.3 Operate machine

7.32A	3.1	Material to be machined is positioned and secured.	
7.32A	3.2	Machine is operated appropriately to suit job and material requirements.	

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**Element – 7.32A.4 Check finished component**

7.32A	4.1	Machined component checked against requirements and predetermined finish.	
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**Machinery and equipment used**

300 mm rules, scribes, pedestal grinder, hacksaw, metal work vice, centre lathe, specially ground forming lathe tools, stock and die, T shaped tap holder, hand taps.

**Record keeping**

All criteria which have been successfully met by each student, must be recorded on the students **Engineering Competencies Student Booklet** as soon as possible, but no less often than at the end of each semester.