Putting the Jigsaw Together

Practical strategies for assisting apprentices with numeracy issues

Quoting or Costing a Job
A trainer’s resource
Contents

Guide for trainers ......................................................................................................................... 1

*How to use this tool* .................................................................................................................... 1

*Functions are indicated by the following icons* ........................................................................... 4

Quoting or costing a job ............................................................................................................... 5

*Wordlist* ........................................................................................................................................ 5

Quoting or costing a job ............................................................................................................... 7

*Purpose of this tool* ..................................................................................................................... 7

*Industry specifics to highlight* .................................................................................................... 8

*Where quoting or costing of a job is required in industry* ......................................................... 8

Quoting on a job .............................................................................................................................. 9

*Job costing types* ....................................................................................................................... 9

Costing sheet .................................................................................................................................. 17

Quotation sheet .............................................................................................................................. 18

Answers to activities ...................................................................................................................... 31
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Guide for trainers

It is recommended that you read the Trainer’s Guide for a full understanding of how to use this tool.

How to use this tool

Each tool has been designed to support vocational trainers working with apprentices to develop their numeracy skills and focuses on a specific area of numeracy. Tools should be contextualised to match the workplace of the apprentice and the sample activities framed within a workplace context. The other tools in the tool kit support this tool in that they build on the underpinning numeracy skills required to be able to quote/cost a job. It is acknowledged that an apprentice may never need to quote or cost a job during their apprenticeships. However, this is a skill that the apprentice will need as a tradesperson.

This tool focuses on the numeracy skills required to quote on or cost a job of work in the Metals industry. The numeracy skills required to complete the activity in this tool are at Australian Core Skills Framework (ACSF) numeracy level 4. An apprentice undertaking this activity would work independently and initiate and use support from a range of established resources. They would be able to read complex numerical texts, identify embedded mathematical information using specialist vocabulary, and work with abstract concepts and a range of mathematical symbols. The apprentice would be able to undertake complex tasks which involve a number of steps and use processes, such as extracting (mathematical information), extrapolating, inferencing, reflecting and abstracting.

In the focus area of measurement and geometry, the apprentice would be able to use their knowledge about space and shape, including angle properties, symmetry and similarity to describe, draw or construct relevant 2-D and 3-D shapes, such as compound shapes. They would be able to estimate, accurately measure and calculate quantities, including areas and volumes, using relevant routine formulae, and convert within the metric system. The apprentice would also be able to use, calculate and interpret information based on maps and plans.

At this level the apprentice draws on prior mathematical knowledge and experience and uses diagrammatic, symbolic and other mathematical processes to select the appropriate strategies to solve the problem. They are able to use estimation and other assessment skills to check the accuracy of their solutions and will reflect on and evaluate these solutions in the context of their work environment.
This tool covers numerical operations, such as calculating labour, calculating Goods and Services Tax (GST), calculating the cost of materials, adjusting the quote to allow for company margins, and so on. The examples and activities within this tool can be easily contextualised to support apprentices with numeracy issues in other industries.

Topic content has been provided as background information for each numeracy task. This information can be worked through with the apprentice, or the trainer can go straight to the work examples and activities.

Apprentices may often question why they need to perform certain calculations manually rather than using a calculator. Some examples of times when it is useful to be able to perform manual calculations are:

- the battery in the calculator is flat
- the apprentice left the calculator at home
- the answer on the calculator looks 'wrong'
- the apprentice may have entered the incorrect details/numbers
- the apprentice may be using an incorrect application on the calculator.

As a trainer, you may be able to provide other examples relevant to the apprentice’s workplace.

The numeracy examples for each task have been designed in small incremental steps to assist the apprentice to build up to the final answer. It is intended that there is no assumed knowledge. The tool may, where appropriate, point to foundation numeracy topics which can be found on the MSA website. The tool may also support numeracy units from the Foundation Skills Training Package.

Sample activities are provided as practice for the numeracy task. These can be completed either with support from the trainer or alone by the apprentice. Worked answers are provided for each activity at the rear of the tool to assist the trainer to monitor the apprentice’s understanding and progress.

A wordlist has been provided to support the pre-teaching and/or review of specific numeracy terms. As the trainee, you may want to provide your own definition of these words and/or add other words as required. You may also use the word list to encourage the apprentice to develop their own definitions which will assist in demonstrating their understanding of the numerical concepts being developed.
You may use additional activities or replace the sample activities with activities relevant to the apprentice. In some instances, you may want to focus on a particular area in which the apprentice is experiencing difficulty.

For the more advanced apprentice, this tool could be provided as a self-paced learning resource.
Functions are indicated by the following icons

Information is provided that is relevant to the concepts, activities or workplace that the apprentice is engaged in.

‘Why we do this’ offers the apprentice an explanation regarding the relevance of the knowledge, skill or activity to the work they are engaged in.

A true statement.

An example of a function or calculation. Worked examples are given to assist the trainer to break down the steps involved in an activity.

A hint that can make things easier. Hints are an important part of the learning process for apprentices as they usually are based on the trainer’s own experiences.

A proposed theoretical activity for apprentices. This activity is designed to embed the underpinning mathematical concepts needed to complete a task.

Use a calculator.

Do not use a calculator.

Hands-on activity for apprentices. This activity is designed to engage the apprentice in a practical activity that consolidates conceptual learning.
Quoting or costing a job

The word list below is designed to introduce or review the words/terms commonly used when quoting or costing a job.

There may be other words/terms which the apprentice can add to this list.

**Word list**

<table>
<thead>
<tr>
<th>Word/term</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Decimal hour form</td>
<td></td>
</tr>
<tr>
<td>• Fixed cost</td>
<td></td>
</tr>
<tr>
<td>• GST</td>
<td></td>
</tr>
<tr>
<td>• Margin</td>
<td></td>
</tr>
<tr>
<td>• One-off job</td>
<td></td>
</tr>
<tr>
<td>• Routine job</td>
<td></td>
</tr>
<tr>
<td>• Butt weld</td>
<td></td>
</tr>
<tr>
<td>• Cutting cost</td>
<td></td>
</tr>
<tr>
<td>• Tax invoice</td>
<td></td>
</tr>
<tr>
<td>• Assembly/labour costs</td>
<td></td>
</tr>
<tr>
<td>• Variable costs</td>
<td></td>
</tr>
<tr>
<td>• Ø</td>
<td></td>
</tr>
<tr>
<td>• Subtotal cost</td>
<td></td>
</tr>
<tr>
<td>• Cutting cost</td>
<td></td>
</tr>
<tr>
<td>• Welding cost</td>
<td></td>
</tr>
<tr>
<td>• Assembly cost</td>
<td></td>
</tr>
<tr>
<td>• Line item costs</td>
<td></td>
</tr>
</tbody>
</table>
Quoting or costing a job

Purpose of this tool

In this tool, the underlying numeracy skills required by an apprentice to quote or cost a job have been identified. These include:

• perform cost calculations for labour in hourly and 6 minute intervals (0.1 of an hour) (Working with decimals)
• calculate the amount and cost of material for one or more jobs (Reading technical drawings and Working with decimals)
• calculate the extra cost allowed for materials when welding and oxy cutting (Working with shapes – Perimeter and Performing metric conversions)
• calculate and add a margin for company profit (Using percentages)
• provide information to assist in the preparation of a tax invoice (all)
• add GST to the cost of a job (Using percentages)
• prepare a tax invoice that covers all costs of the job (all).

As you can see, each tool in the tool kit develops the numeracy skills that are required to successfully quote or cost a job.
Industry specifics to highlight

Some tasks such as welding, oxy cutting, laying cable, etc. are charged for by the metre to cover material costs.

Time is always rounded up to the nearest 0.1 of an hour, where 0.1 hours equals 6 minutes.

Decimal hour form: Changing minutes to a form where they can be charged for in lots of 6 minutes

Fixed cost: Price that does not vary

GST: Goods and Services Tax that is currently set at 10%

Margin: An allowance to include profits and additional costs

Where quoting or costing of a job is required in industry

Quoting is used to allow the company to:

- find the cost of a one-off job
- bid for a job where a great number of the same item will be made
- determine how long it will take to complete a job
- calculate if more workers are required to finish a job by the required time
- calculate if a job is viable at the fixed cost offered by another company.
Quoting on a job

Job costing types

There are two types of jobs that need to be costed:

1) A one-off job where the time it will take is difficult to calculate because of its unusual nature. The cost therefore will be calculated after the job is complete, and will include materials and labour costs.

2) A routine job that has been done before or is straightforward so the time and cost of materials can readily be calculated from experience.

In either case, the cost for the work will be calculated in a similar manner as shown below.

**Cost A:** A fixed rate is a cost that does not change regardless of how much or little is produced. Two examples of fixed rates include a charge per:

- metre for oxy cutting or welding, including all consumables
- holes drilled.

**Cost B:** Assembly or labour costs are charged by the hour in 6 minute increments (0.1 of an hour) and is always rounded up to the nearest 6 minutes.

**Cost C:** Cost of materials used in the job (e.g. steel, bolts, and rust proofing paint)

**Cost D:** A 10% Goods and Services Tax (GST) is added to give the total cost.

All costs have a margin in them to cover for:

- company profit to buy new equipment and training
- fixed costs like building rents, costs for staff and rent of equipment
- variable costs of running the company. These are costs that increase with the amount of work you do, including electricity, materials and gas.

For the examples and activities in this tool it is necessary to cut all sides of all pieces and the costing structure below is to be used for all calculations unless specifically advised otherwise.
Costs:

<table>
<thead>
<tr>
<th>Item</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oxy acetylene cutting</td>
<td>$9.50 per metre</td>
</tr>
<tr>
<td>Welding</td>
<td>$12.50 per metre</td>
</tr>
<tr>
<td>Assembly</td>
<td>$48 per hour</td>
</tr>
<tr>
<td>Steel: 1200 x 900 x 5 mm thick sheet steel</td>
<td>$90 per sheet</td>
</tr>
</tbody>
</table>

Find the cost to cut and butt weld two sheets together on both sides given the following costs. Each joint length is 850 mm long.

850 mm

850 mm

Material thickness = 5 mm

Millimetres need to be converted to metres as costs are provided per metre.
Cost A: Fixed rates

a. Cutting cost

Step 1. Convert millimetres to metres.
1. Divide mm of each side by 100

\[
\text{850 mm ÷ 1000} = 0.85 \text{ m}
\]

\[
\text{200 mm ÷ 1000} = 0.20 \text{ m}
\]

Step 2. Calculate the total cutting length.
1. Formula for the total cutting length.

\[
\text{Total length} = \text{Perimeter} \times \text{Number of sheets}
\]

\[
= 2 \text{ sides} \times (0.85\text{m} + 0.2\text{m}) \times 2 \text{ sheets}
\]

\[
= 2 \times 1.05 \text{ m} \times 2
\]

\[
= 4.20 \text{ m}
\]

Step 3. Calculate the cutting costs.
1. Formula for cutting costs.

\[
\text{Cutting cost} = \text{Length} \times \text{Metre costs}
\]

\[
= 4.20 \text{ m} \times $9.50
\]

Total cost for cutting = $39.90
b. Welding cost

**Step 1.** Calculate the welding length.

1. Formula for the welding length.

   \[
   \text{Welding length} = \text{Length of sides to be welded} \times \text{Number of sides}
   \]

2. Insert the perimeter details into the formula and calculate the welding length.

   \[
   \text{Welding length} = 0.85 \text{ m} \times 2 = 1.70 \text{ m}
   \]

**Step 2.** Calculate the welding cost.

1. Formula for the welding cost.

   \[
   \text{Welding cost} = \text{Length} \times \text{Metre costs}
   \]

2. Insert the length and costs into the formula and then calculate the welding cost.

   \[
   \text{Total cost for welding} = 1.70 \text{ m} \times $12.50 = $21.25
   \]
Cost B: Assembly or labour costs

The time taken to get the steel, assemble it and move it to storage is 18 minutes at $48 per hour.

Step 1. Calculate the decimal hour form.

1. Insert the minutes identified and calculate the decimal form.

\[
\frac{18 \text{ minutes}}{60 \text{ minutes}} = 0.3 \text{ of an hour}
\]

Step 2. Calculate the assembly or labour cost.

1. Formula for the assembly or labour cost.

\[
\text{Assembly cost} = \text{Time required} \times \text{Hourly cost}
\]

2. Insert the time and hourly costs into the formula then calculate the cost for assembly or labour cost.

Total cost for assembly = 0.3 hour x $48

= $14.40
Cost C: Material costs

Sheet is charged for in a number of ways but the most common is to charge for 0.25, 0.5 or 0.75 of full sheet if the whole sheet is not being used. All remaining steel will be classed as scrap. This is unavoidable at times, but it is still charged to the customer.

Plate steel comes in various sizes. In this instance the plate being cut is 1200 mm x 900 mm x 5 mm thick.

Example

While the width of the two steel plate totals only 400 mm, it is better to allow an extra 20 mm width for oxy cutting.

Step 1. Calculate the proportion of the plate to be used.

1. Formula to calculate the plate width to be used.

   Material area used = Plate widths + Cutting width

   = 200 mm + 200 mm + 20 mm

   = 420 mm
Step 2. Round the plate width to the nearest quarter length of steel plate.

The 420 mm calculated above is rounded up to the nearest 0.25 of a sheet.

420 mm is larger than the 0.25 sheet (300 mm) and smaller than the 0.5 sheet (600 mm). This can be seen in the diagram opposite.

The customer would be charged for 0.5 a sheet.

Step 3. Calculate the material cost.

1. Formula to calculate the material cost.

\[
\text{Cost to customer} = \text{Proportion being used} \times \text{Material cost}
\]

2. Insert the area being used and the material cost to the formula then calculate the material cost to the customer.

\[
\text{Total material cost} = 0.5 \times $90 = $45
\]
Cost D: Good and Services Tax (GST)

GST is 10% of the sum of all the line item costs (subtotal cost). This can be done on a calculator using the % key or by multiplying by 0.1. Total cost is the sum of the line item costs and GST as calculated below.

<table>
<thead>
<tr>
<th>Items:</th>
<th>Costs $</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost A: Cutting</td>
<td>39.90</td>
</tr>
<tr>
<td>Welding</td>
<td>21.25</td>
</tr>
<tr>
<td>Cost B: Labour</td>
<td>14.40</td>
</tr>
<tr>
<td>Cost C: Materials</td>
<td>45.00</td>
</tr>
<tr>
<td><strong>Subtotal cost</strong></td>
<td><strong>$120.55</strong></td>
</tr>
<tr>
<td>Cost D: GST (10%)*</td>
<td>12.06</td>
</tr>
</tbody>
</table>

GST = $120.55 x 0.1

**Total cost (Subtotal cost + GST)** $132.61
Costing sheet

A costing sheet can be used internally by companies to cost jobs. These will vary in detail between companies. The following sheet is one example that shows the same information as that shown in Example 1.

Costing sheet

| Customer Name: | | | 
| Telephone: | | | 
| Date: | | | 

**Job Details:**

Cost for cutting the following steel sheets and welding them together on both sides along the 850 mm join.

**Material:** 850 mm x 200 mm x 5 mm Plate (x2)

Butt weld: Weld on front, turn steel over then weld on back because of 5 mm thickness. Both joint lengths are 850 mm long.

**Costing Details:**

<table>
<thead>
<tr>
<th>Item</th>
<th>Cost per item</th>
<th>Length/Time required/Number of items</th>
<th>Cost ($)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>COST A: Fixed rates</strong> – Cost = cost per item x total length</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Oxy acetylene cutting</td>
<td>$9.50/m</td>
<td>4.2 m</td>
<td>$39.90</td>
</tr>
<tr>
<td>Welding</td>
<td>$12.50/m</td>
<td>1.7 m</td>
<td>$21.25</td>
</tr>
<tr>
<td><strong>COST B: Assembly or labour costs</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Labour to assemble</td>
<td>$48 per hour</td>
<td>16 minutes or 0.3 hour</td>
<td>$14.40</td>
</tr>
<tr>
<td><strong>COST C: Cost of materials</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Steel</td>
<td>$90</td>
<td>50% of plate</td>
<td>$45.00</td>
</tr>
<tr>
<td><strong>Subtotal:</strong> Add Costs A, B and C together</td>
<td></td>
<td></td>
<td>$120.55</td>
</tr>
<tr>
<td><strong>COST D: Goods and Services Tax (GST)</strong> Subtotal cost x 10%</td>
<td></td>
<td></td>
<td>$12.06</td>
</tr>
</tbody>
</table>

**TOTAL COST TO CUSTOMER** – Add the subtotal and the GST $132.61
Quotation sheet

A quotation or quote sheet can also be used by companies. This is used to show customers how much the job will cost them. The following picture shows one example of a quotation sheet.

### Fabulous Fabrications
116 Industry Drive
Longreach
Queensland

#### Quotation

<table>
<thead>
<tr>
<th>Customer Name:</th>
<th>From:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Customer Address:</td>
<td>Telephone:</td>
</tr>
<tr>
<td></td>
<td>Fax:</td>
</tr>
<tr>
<td>Attention:</td>
<td>Pages:</td>
</tr>
<tr>
<td>Fax No:</td>
<td>Quote Ref:</td>
</tr>
<tr>
<td>E-mail:</td>
<td></td>
</tr>
<tr>
<td>Telephone:</td>
<td></td>
</tr>
<tr>
<td>Date:</td>
<td></td>
</tr>
<tr>
<td>Date Requested:</td>
<td></td>
</tr>
<tr>
<td>Date Customer Contacted:</td>
<td></td>
</tr>
<tr>
<td>Date Site Visit:</td>
<td></td>
</tr>
</tbody>
</table>

#### Scope of Works:

#### Costing:

<table>
<thead>
<tr>
<th>Item</th>
<th>Labour $</th>
<th>Material $</th>
<th>Total $</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

Subtotal excluding GST

GST

TOTAL including GST

#### Supplier Terms and Conditions:
This quote is valid for 14 days from date supplied.
Over the next few pages is a worked example showing how each of the costs are calculated. This example has a high level of difficulty. It requires the apprentice to identify the embedded numerical information in a large amount of text. It also requires the apprentice to decide what numerical information is relevant. The apprentice is also required to work with numerical information provided in two different formats – as text and in a table.

An order is placed for 30 steel cylinders 800 mm high x 180 mm diameter (⌀). Cutting size is 800 mm x 565 mm (\pi D) using 2 mm thick sheet steel. Each sheet is 1800 mm long x 900 mm wide. It is possible to cut 3 cylinders from one sheet. Using the costing schedule below, calculate the total cost of the job to the customer, including GST.

**Costs:**

<table>
<thead>
<tr>
<th>Item</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Welding</td>
<td>$8.90 per metre</td>
</tr>
<tr>
<td>Steel: 1800 x 900 sheet steel</td>
<td>$60 per sheet</td>
</tr>
<tr>
<td>Guillotine cutting and assembly: 1.5 hours per cylinder</td>
<td>$50 per hour</td>
</tr>
</tbody>
</table>

Millimetres need to be converted to metres as costs are provided per metre.
Cost A: Fixed rates – Welding cost

Step 1. Calculate the welding length.

1. Formula to calculate the welding length.

\[
\text{Welding length} = \text{Sides to be welded} \times \text{Number of cylinders}
\]

= 0.8 m x 30

= 24 m

2. Convert the length of the weld side into metres.

3. Insert the weld side length and number of cylinders into the formula then calculate the welding length. In this instance there is only one side per cylinder to be welded.

Step 2. Calculate the welding cost.

1. Formula to calculate the welding cost.

\[
\text{Welding cost} = \text{Welding length} \times \text{Metre costs}
\]

= 24m x $8.90

Total cost for welding = $213.60
Cost B: Assembly or labour costs

Step 1. Calculate the time taken to cut and assemble the 30 cylinders.

1. Formula to calculate the assembly time.

\[
\text{Assembly time} = \text{Time required} \times \text{Number of cylinders}
\]

2. Insert the time required and number of cylinders into the formula then calculate the time taken to cutting and assemble the 30 cylinders.

\[
= 1.5 \text{ hour} \times 30 \text{ cylinders} \\
= 45 \text{ hours}
\]

Step 2. Calculate the total assembly cost.

1. Formula to calculate the cost of assembly.

\[
\text{Assembly cost} = \text{Time required} \times \text{Hourly cost}
\]

2. Insert the required time required to cut and assemble the 30 cylinders and hourly cost into the formula then calculate the assembly cost.

\[
\text{Total cost for assembly} = 45 \text{ hours} \times 50
\]

\[
= 2250.00
\]
Cost C: Material costs

Step 1. Calculate the number of sheets required.

1. Formula to calculate the number of sheets required.

\[
\text{Number of Sheets} = \frac{\text{Number of cylinders required}}{\text{Number of cylinders per sheet}}
\]

2. Insert the number of cylinders required and number of cylinders per sheet into the formula then calculate the total number of sheets required (given that you get 3 cylinders out of each sheet).

\[
= \frac{30 \text{ cylinders}}{3 \text{ per sheet}} = 10 \text{ sheets}
\]

Step 2. Calculate the material cost.

1. Formula to calculate the cost to the customer.

\[
\text{Cost to customer} = \text{Number of sheets} \times \text{Material cost}
\]

2. Insert the number of sheets required and the material cost into the formula then calculate the material cost to the customer.

\[
= 10 \text{ sheets} \times 60 \text{ per sheet} = 600.00
\]

Total material cost = $600.00
Cost D: Goods and Services Tax (GST)

Calculate the GST by multiplying the subtotal cost by 0.1 or by 10%. The sum of costs A, B, C and D becomes the total cost to the client as outlined in the table below.

<table>
<thead>
<tr>
<th>Items</th>
<th>Costs $</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost A: Welding</td>
<td>213.60</td>
</tr>
<tr>
<td>Cost B: Labour assembly costs</td>
<td>2250.00</td>
</tr>
<tr>
<td>Cost C: Materials</td>
<td>600.00</td>
</tr>
<tr>
<td><strong>Subtotal cost</strong></td>
<td><strong>$3063.60</strong></td>
</tr>
<tr>
<td>Cost D: GST (10%)</td>
<td>306.36</td>
</tr>
</tbody>
</table>

GST = $3063.60 x 0.1

**Total cost (Subtotal cost + GST)** $3369.96
1. A job takes 36 minutes to complete at $46 per hour. Calculate the labour cost for this job.

2. Find the cost of cutting a disk with a Ø 450 mm from 5 mm plate. The cost of oxy acetylene cutting is $7.50 per metre.

- circumference = \( \pi \times \text{diameter} \)
- Ø = Diameter of the circle
- Remember to convert all measurements to metres.
Calculate the cost of welding 4 plates together as shown in the diagram below.
The cost of welding is $10.40 per metre.

[Diagram of 4 plates with dimensions]
Angle iron comes only in 5 m lengths and costs $22 per metre. A job requires 40 x 1.2 m lengths to be cut. Calculate the material cost of the angle iron.
Calculate the cost of assembling 25 pre-cut metal brackets. The job includes fitting bolt sets to the brackets then priming (painting) the completed brackets. Exclude GST from your calculation.

**Costs:**

<table>
<thead>
<tr>
<th>Item</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brackets</td>
<td>$45 each</td>
</tr>
<tr>
<td>Bolt sets (one set per bracket)</td>
<td>$3.20 each</td>
</tr>
<tr>
<td>Priming paint: 1 can per 5 brackets</td>
<td>$10 per can</td>
</tr>
<tr>
<td>Labour and assembly:</td>
<td>30 minutes per unit at $48 per hour</td>
</tr>
</tbody>
</table>
Calculate the cost to the customer, including GST, for the following job.

Job being quoted: Construction of a metal bench

![Diagram of a metal bench]

**Material list**

<table>
<thead>
<tr>
<th>Item</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 x 1200 x 50 angle iron (2 lengths, 1200 mm long, 50 mm by 50 mm angle iron)</td>
<td>$30 per metre</td>
</tr>
<tr>
<td>8 x 300 x 25 angle iron (8 lengths, 300 mm long, 25 mm by 25 mm angle iron)</td>
<td>$15 per metre</td>
</tr>
<tr>
<td>0.36 m x 5 mm plate for the seat</td>
<td>$50 per metre</td>
</tr>
<tr>
<td>3.2 m welding</td>
<td>$9.50 per metre</td>
</tr>
<tr>
<td>Cutting and assembly – 3.6 hours</td>
<td>$50 per hour</td>
</tr>
</tbody>
</table>
Check your answers to these activities in the last section
If possible, obtain from the apprentice’s employer, samples of completed job sheets and/or quotations. Use these samples to step the apprentice through the process used to complete the job sheet or quote.

Ask the apprentice for a blank copy of a job sheet or quote sheet from their workplace. Use this sheet to work through some activities that relate specifically to their workplace.
Answers to activities

1. Calculate the decimal hour form

\[
\frac{36 \text{ minutes}}{60 \text{ minutes}} = 0.6 \text{ of an hour}
\]

2. Calculate the cost of assembly or labour cost

\[
\text{Assembly cost} = \text{Time required} \times \text{Hourly cost} = 0.6 \text{ hour} \times 46 \$
\]

\[
\text{Total cost of assembly} = 27.60
\]
1. Calculate the number of pieces that can be cut from the 5 m length.

Number of pieces per length = Iron length ÷ Length of pieces required

\[ = \frac{5\text{ m}}{1.20 \text{ m}} = 4 \text{ pieces (the rest is waste)} \]

2. Calculate the number of 5 m lengths required to get 40 pieces.

Number of lengths required = Number of pieces required ÷ Pieces per length

\[ = \frac{40}{4} = 10 \text{ lengths} \]

3. Calculate the material cost to the customer.

Cost to customer = Number of lengths x Material cost

\[ = 10 \text{ sheets} \times \$22 \text{ per metre} = \$220.00 \]

**Total material cost**

\[ = \$220.00 \]

---

**Cost B – Assembly**

1. Calculate the decimal hour form for assembly

\[ \frac{30 \text{ minutes}}{60 \text{ minutes}} = 0.5 \text{ of an hour} \]

2. Calculate the total assembly time

Assembly time = Time required x Number of items

\[ = 0.5 \text{ hours} \times 25 \text{ brackets} = 12.5 \text{ hours} \]

3. Calculate the assembly cost

Assembly cost = Time required x Hourly cost

\[ = 12.5 \text{ hours} \times \$48 = \$600 \]
## Part C – Material costs

### Brackets

<table>
<thead>
<tr>
<th>Calculate the bracket cost for 25 brackets.</th>
<th>Bracket cost = Number of brackets x Individual bracket cost</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>= 25 x $45</td>
</tr>
<tr>
<td></td>
<td>= $1125</td>
</tr>
</tbody>
</table>

### Bolts

<table>
<thead>
<tr>
<th>Calculate the bolt set cost for 25 bolt set.</th>
<th>Bolt set cost = Number of bolt sets x Individual set cost</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>= 25 x $3.20</td>
</tr>
<tr>
<td></td>
<td>= $80</td>
</tr>
</tbody>
</table>

### Primer paint

1. Calculate the number of priming paint cans required.  
   Number of cans required = Number of brackets ÷ Number of brackets per tin  
   = 25 brackets ÷ 5 brackets per can  
   = 5 tins

2. Calculate the paint cost.  
   Paint cost = Number of tins x Material cost  
   = 5 tins x $10 per can  
   = $50

### Total costs:

<table>
<thead>
<tr>
<th>Add the costs</th>
<th>Total cost = Cost B + Cost C (Brackets + Bolts + Primer)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>= $600 + $1125 + $80 + $50</td>
</tr>
</tbody>
</table>

**Total cost**  
= $1855.00
Part A – Fixed rates

<table>
<thead>
<tr>
<th>Calculate the welding cost.</th>
<th>Welding cost = Length x Metre costs</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>= 3.20 m x $9.50</td>
</tr>
<tr>
<td></td>
<td>= $30.40</td>
</tr>
</tbody>
</table>

Part B – Assembly

<table>
<thead>
<tr>
<th>Calculate the assembly cost.</th>
<th>Assembly cost = Time required x Hourly cost</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>= 3.6 hours x $50</td>
</tr>
<tr>
<td></td>
<td>= $180</td>
</tr>
</tbody>
</table>

Part C – Material

50 mm x 50 mm

<table>
<thead>
<tr>
<th>1. Calculate the 50 mm x 50 mm material cost.</th>
<th>Angle length = Number of pieces x Individual angle length</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>= 2 x 1.20m</td>
</tr>
<tr>
<td></td>
<td>= 2.40 m</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>2. Calculate the 50 mm x 50 mm material cost.</th>
<th>Angle cost = Total length x metre cost</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>= 2.40 m x $30 per metre</td>
</tr>
<tr>
<td></td>
<td>= $72</td>
</tr>
</tbody>
</table>

25 mm x 25 mm

<table>
<thead>
<tr>
<th>1. Calculate the 25 mm x 25 mm material length.</th>
<th>Angle length = Number of pieces x Individual angle length</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>= 8 x 0.30 m</td>
</tr>
<tr>
<td></td>
<td>= 2.4 m</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>2. Calculate the 25 mm x 2 mm material cost.</th>
<th>Angle cost = Total length x metre cost</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>= 2.40 m x $15 per metre</td>
</tr>
<tr>
<td></td>
<td>= $36</td>
</tr>
</tbody>
</table>
### Plate for seat

**Calculate the seat material cost.**

**Plate cost = Area or material \( \times \) Cost per \( \text{m}^2 \)**

\[
\text{Plate cost} = 0.36 \text{ m}^2 \times 50 \text{ per m}^2 = 18
\]

### Part D – GST

<table>
<thead>
<tr>
<th>Items</th>
<th>Costs $</th>
</tr>
</thead>
<tbody>
<tr>
<td>Welding</td>
<td>30.40</td>
</tr>
<tr>
<td>Labour assembly costs</td>
<td>180.00</td>
</tr>
<tr>
<td>Materials</td>
<td></td>
</tr>
<tr>
<td>- 50 mm x 50 mm</td>
<td>72.00</td>
</tr>
<tr>
<td>- 25 mm x 25 mm</td>
<td>36.00</td>
</tr>
<tr>
<td>- Plate for seat</td>
<td>18.00</td>
</tr>
<tr>
<td>**Subtotal cost</td>
<td>$336.40</td>
</tr>
<tr>
<td>**GST (10%)</td>
<td>33.64</td>
</tr>
<tr>
<td>**Total cost (Subtotal cost + GST)</td>
<td>$370.04</td>
</tr>
</tbody>
</table>