Reading Writing
Learning Digital Literacy
Oral Communication
Numeracy Employability
Foundation Skills

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Manufacturing Skills Australia

Putting the Jigsaw Together

Practical strategies for assisting apprentices with numeracy issues

Numeracy Indicator Tool for the Certificate III in Engineering - Fabrication Trade

ISC INDUSTRY SKILLS COUNCILS
Creating Australia's Future

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A resource for vocational trainers

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Contents

Purpose of Indicator Tools

The purpose of the Indicator Tool is to assist you to identify the apprentice's strengths and gaps so that you can plan and deliver training and assessment that explicitly addresses the literacy and numeracy skills gaps as part of the achievement of vocational competency.
If individual apprentices have significant gaps, you may need to provide additional support for them to develop the foundation skills required or involve a Language, Literacy, Numeracy (LLN) specialist.
If a large number of the apprentice group have significant gaps, you may like to consider sourcing additional support for the group from a LLN specialist or other relevant specialist trainer.

What is a Literacy and Numeracy (L&N) indicator tool?

Literacy and numeracy (L&N) indicator tools can be used to identify whether apprentices have the essential reading, writing and numeracy skills at course entry to manage the demands of their training program.
To achieve this purpose, indicator tools need contextualisation to the particular industry sector area such as carpentry, electro technology, business administration, etc.
Indicator tools can also be used by the vocational trainer with individual apprentices at any time if the apprentice is struggling with a numeracy or literacy task. The tool can in this instance assist the vocational trainer to identify the numeracy or literacy concept within the task the apprentice is struggling with. This enables the trainer to provide specific targeted support for that apprentice.

Indicator tool, skills check or screening?

The terms indicator tool and skills check support the idea that the process provides an overall check of the L&N required for a qualification rather than a detailed pre-assessment.
It can also be called a screening tool, but the term screening can have negative connotations, suggesting apprentices who perform poorly on the screen will be excluded from the training.

Purpose of an L&N indicator tool

An L&N indicator tool can serve a number of purposes:

- identify apprentices' existing L&N skills including their confidence in using those skills
- identify apprentices at risk - do their identified L&N skills match the underpinning skills needed to undertake the qualification?
- establish apprentices' particular core needs -e.g. numeracy, reading and/or writing and the level of support required
- assist trainers to identify which apprentices will most likely need assistance during the training, thereby improving retention rates by providing a means for early targeting of apprentices who are at risk of withdrawing or failing
- give apprentices an opportunity to request assistance

Why use an L&N indicator tool?

Many apprentices are reluctant to disclose their language, literacy and numeracy problems to trainers or management. Many will not seek assistance and may have developed masking strategies to hide their lack of skills. This can be for various reasons including personal embarrassment of disclosure or fear of losing their job. This is particularly the case for apprentices at lower AQF qualification levels.

L&N indicator tools can be used by trainers to identify apprentices who may potentially benefit from assistance with the L&N demands of the qualification. Then targeted assistance can be planned by the trainer and the LLN specialist as needed.

Limitations

Indicator tools cannot predict apprentices' success. They cannot measure critical factors such as motivation. Therefore they should not be used as a tool to determine a apprentice's place in a specific training program.

L&N indicator tools should only be used to assess L&N skills appropriate to the level of the unit of competency or qualification the apprentice is undertaking.

Features of a L&N indicator tool

Trainers need to identify the underpinning L&N in the units of competency when developing a L&N indicator tool.

L&N indicator tools need to:

- be developed in consultation with vocational trainers
- be contextualised to the industry for authenticity, including text types and graphics or visual clues (graphs, charts, photos) relevant to the industry
- reflect the specific type of L&N required for the qualification – reading, writing and/or numeracy skills
- be mapped to the Australian Core Skills Framework (ACSF)

What about self-assessment indicator tools?

While self-assessment indicator tools are relatively easy to administer and mark, their main disadvantage is the potential for measurement error. Research shows apprentices tend to either overrate or understate their skills when completing self-assessments in order to appear 'normal'.

Other sources of error occur because there is no objective scale for people to rate themselves against. Rating your literacy as poor, average or high could be based on people's backgrounds, experiences or literacy requirements. *(Source: Links between Literacy and Numeracy Skills and Labour Market Outcomes, Shomos. 2010)*

As well, apprentices are less likely to admit to core skill deficits and are more likely to provide responses they think will please a trainer or an employer.

Numeracy Indicator Tool for the Certificate III in Engineering - Fabrication Trade

There are two sections in the Indicator Tool:

- Section A: For the trainer
- Section B: For the apprentice

Section A: For the trainer

Numeracy Indicator Tool Feedback Sheet

This section includes a *Numeracy Indicator Tool Feedback* sheet showing answers to numeracy questions provided in the apprentice section of the document.

Section B: For the apprentice

For the apprentice

The apprentice section is the numeracy indicator tool that apprentices will complete. It comprises calculations (Part A) and multiple choice questions (Part B). It should take approximately 20 minutes for the apprentice to complete. However the time limit is a guide only. Apprentices who take significantly longer than the recommended time are more likely to have numeracy issues.

Calculators can be used as this is what would be expected in a real life work situation.

Note: Many of the items in this Tool check Mathematics knowledge rather than numeracy skills. Many people have difficulty applying Mathematics knowledge to real-life situations and tasks, so be aware that training will always require development of the application of the Mathematics relevant to the task.

Section A: For the Trainer

Numeracy Indicator Tool Feedback Sheet

Name: .....
Date: .....
Group: .....

Question	ACSF Level	Skill	Answer	✓ or ✗
1	2	Decimal addition	18.2	
2	2	Whole number multiplication	11 502	
3	3	Whole number division	120	
4	3	Decimal square root	2.4	
5	3	Order of operations. Addition and multiplication of decimals	49.5	
6	3	Simple percentage of a whole amount	86.7	
7	3	Percentage of money.	$2.01	
8	3	Convert a fraction to a decimal	0.375	
9	4	Transposition of a formula to solve an equation	0.45	
10	4	Calculation using a squared number. Order of operations	14.96	
11	3	Convert millimetres to metres.	d	
12	4	Two-step fraction, addition and division	c	
13	4	Square root of squared numbers	b	
14	4	Estimation rounding to nearest 10 multiply & divide	a	
15	4	Apply formula	a	
16	4	Pythagoras' theorem	c	
17	4	Pythagoras' theorem	d	
18	3	Pay rates with fractions	c	

Question	ACSF Level	Skill	Answer	✓ or ✗
19	3	Apply rate of pay to calculate hours	b	
20	3	Addition of time amounts	a	
21	3	Calculate discount -%	c	
22	4	Calculate perimeter with missing measurements	d	
23	4	Calculate area of compound rectangle. Convert mm to m	a	
24	4	Calculate volume of a prism. Convert mm to m	c	
25	4	Calculate circumference. Formula given. π is given as approximately 3.14	a	

Comments:

Section B: For the Apprentice

Name: .....
Date: .....
Group: .....

Numeracy Indicator Tool

Instructions

- You may use a calculator (scientific calculator recommended)
- Show any working out in the spaces provided
- This tool should take approximately 20 minutes to complete
- Don't worry if you can't complete all the questions
- Do as much as you can

Note: This is not an assessment or test. It is a skills check to indicate your numeracy skills in relation to this qualification. It will help to identify strengths and skills gaps you may have. It is only an indicator tool.

Part A - Calculations

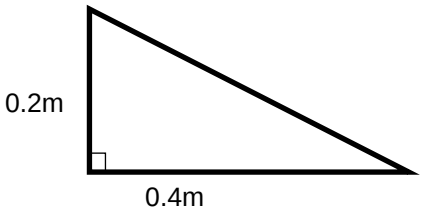
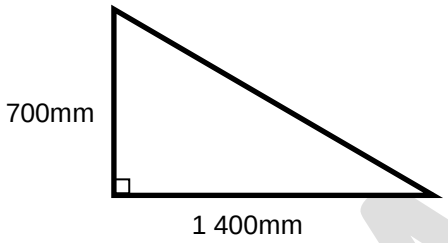
Instruction: Write your answer (and working out) in the space provided

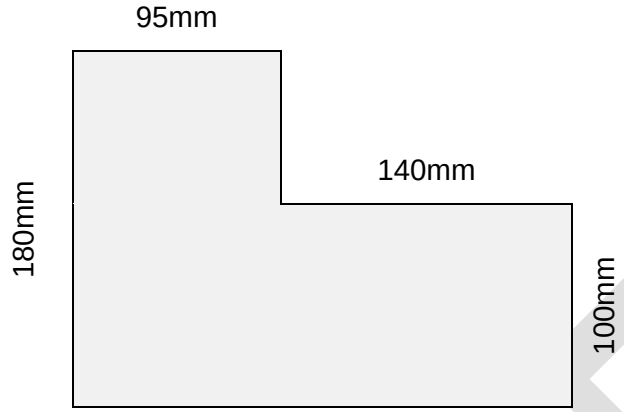
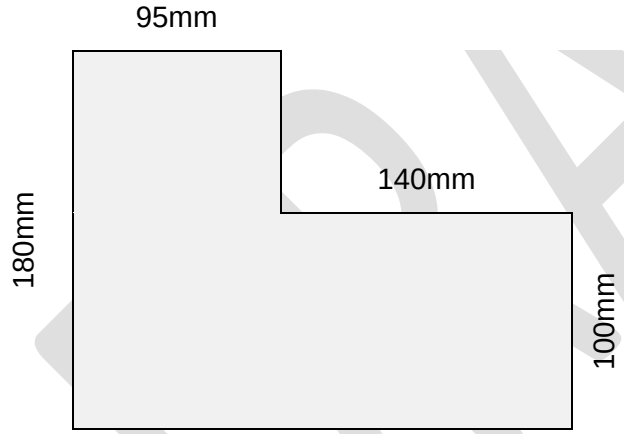
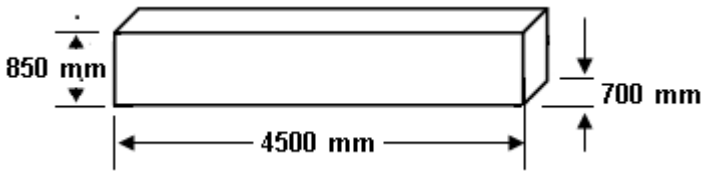
1. 5.4 + 12.8	
2. 54 x 213	
3. 2760 ÷ 23	
4. $\sqrt{5.76}$	
5. 5 (7.1 + 2.8) =	
6. 10% of 867	
7. 17.5% of $11.50	
8. Change $\frac{3}{8}$ to a decimal	
9. Find *x* when 3.6 ÷ *x* = 8	
10. $2 + 3.6^2$	

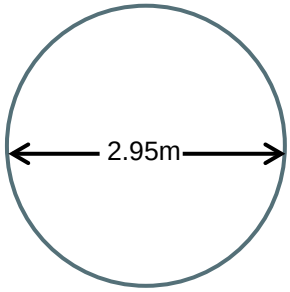
Part B – Multiple Choice

Instructions: Circle the correct answer

11. Change 45 millimetres to metres	a) 450m b) 4 500m c) 0.45m d) 0.045m
12. $\frac{3.4 + 2.8 + 1.6}{3}$	a) 6.7333 b) 7.8 c) 2.6 d) 3
a) $\sqrt{6^2 + 12^2}$	a) 180 b) 13.42 c) 12 d) 48
b) If you were out in the field, what would be the closest estimation to use for the following calculation: $\frac{8.9 \times 249}{51.42}$	a) $\frac{9 \times 250}{50}$ b) $\frac{8 \times 249}{50}$ c) $\frac{8 \times 240}{50}$ d) $\frac{90 \times 250}{51}$
c) If V = IR, find V when I = 0.02 and R = 0.03	a) 0.0006 b) 6.4 c) 6.04 d) 0.06

13. Using Pythagoras' Theorem, ($a^2 = b^2 + c^2$) calculate the length of the hypotenuse.  (not to scale)	a) 4.7m b) 0.47m c) 0.447m d) 4.477m
14. Calculate the length of the hypotenuse  (not to scale)	a) 1 550mm b) 900mm c) 15.50mm d) 1 565mm
15. Mike works 5 days a week, 8 hours a day. He also works overtime on a Saturday at 1 ½ the hourly rate for 6 hours. How much does Mike earn for the week if his hourly rate is $38.00 per hour?	a) $1,520 b) $1,745 c) $1,862 d) $1,925
16. Karl is saving his overtime pay for a holiday. His trip will cost $4,000. He has already saved $950. If he works overtime he can earn $36 per hour. How many hours overtime will he need to work to save the rest of the money? *(Note: Answer to the nearest hour)*	a) 67 b) 85 c) 92 d) 106
17. A worker completed four job tasks in one day. The time for each task was 1 hour 23 minutes, 2 hours 14 minutes, 38 minutes and 2 hours 56 minutes. Calculate the total time spent on these tasks.	a) 7 hours 11 minutes b) 6 hours 39 minutes c) 7 hours 46 minutes d) 6 hours 8 minutes

18. The materials for a job cost $2,414. Calculate the final price after a trade discount of 12%.	a) $289.68 b) $1,954.20 c) $2,124.32 d) $2,703.68
19. Calculate the length of the perimeter  	a) 423mm b) 585mm c) 680mm d) 830mm
20. Calculate the area in m^2  	a) 0.0311m^2 b) 17 100mm^2 c) 17.1m^2 d) 3.11m^2
21. Find the volume of the following shape  	a) 2678m^3 b) 26.78m^3 c) 2.678m^3 d) 0.2678m^3

22. The circumference of a circle is π x diameter (π is approximately 3.14) Find the circumference of this circle  	a) 9.27m b) 20.95m c) 295m d) 6.45m