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Supporting workforce literacy

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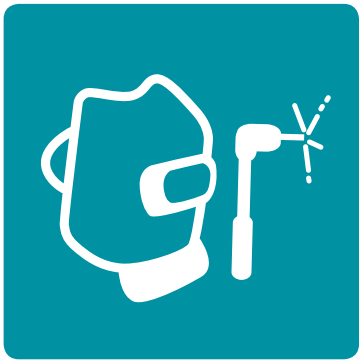

LITERACY PROFILE:

Metal Fabricator/ Welder

- **Reading**
- **Writing**
- **Speaking and listening**
- **Numeracy**
- **Critical thinking**
- **Technology**

Reading tasks

"Read" implies that the person reads and understands.

Read signs and short texts

- Safety signs
- Capacity of lifting equipment
- Brief notes on whiteboard / blackboard – job instructions, reminders
- Dials and gauges on welding and gas equipment
- Colour codes of gas bottles
- Hazchem class codes
- Site safety notes

Read charts, tables and graphs

- Data tables – tools, components, parts, sizes e.g. drill chart
- Road maps

Read forms on job

- Job sheets – instructions for job, often containing numerical codes (may be on computer, standard format)
- MSDS for gases
- Hot work permit
- On-site safety boards
- Confined space entry permit

Read plans

- Engineering drawings (both handwritten and computer generated) including abbreviations, symbols, technical terms, 2D and 3D representations
- Site plans

Read memos and notices

- Posters, information and notices on notice board – may include health and safety information, production information, social activities information

Read instructions

- Evacuation instructions
- Quality system information
- Sections of manufacturers' manuals for welders, grinders, other equipment
- Machinery checklists (not common)
- Company health and safety manual

Read employment related documents

- Pay slip
- Employment contract
- Company standards or rules about employment

Read training material

Company arranged training

- Site safe training
- Fire extinguisher training
- Forklift training

Apprenticeship training

- Competenz training manual and practical assessment record
- Off job training provider materials (can be face-to-face or distance)
- Engineering textbooks

Reading skills

Interpret information from graphical material e.g. tables, price lists, maps, diagrams, pie charts, bar charts.

Use a key to read graphic material on maps, tables, charts.

Follow written instructions (including diagrams).

Use a reference source, e.g. index, manual, table.

Recognise the features of a range of texts, e.g. job sheet, MSDS, manufacturer's manual, job procedure.

Predict what will be contained in a text.

Skim a text for "gist".

Scan text / table / label to find specific piece of information.

Identify the main points from a page of text.

Read text thoroughly and summarise key points in own words.

Make inferences based on what training material does not say.

Report accurately on the information read.

Recognise number formats, e.g. serial numbers, job code numbers.

Underpinning knowledge / understanding

Common vocabulary and abbreviations.

Technical vocabulary and abbreviations.

Mastery of other skills such as word recognition, interpreting meaning.

Writing tasks

Sign off documents to confirm read and understood

- Induction documents
- Permits

Write short notes

- Notes to inform others (may be on whiteboard or on paper)

Complete forms independently

On job

- Job sheets
- Job safety analysis form
- Hot work permit
- Confined space entry permit
- Incident reports
- Accident reports

Employment related

- Job application form
- Employee details form
- Leave application form
- Tax code declaration
- Timesheet

Create drawings or sketches

- Create own sketches and notes to supplement any written job instructions

Write for training / learning purposes

- Keep notes during training
- Keep records of completed work for practical assessment – sketches, descriptions, photographs of work completed
- Write assessment answers for apprenticeship training, other training

Writing skills

Sign name on forms to indicate understanding (form of binding agreement).

Write simple correct text in appropriate places and in appropriate formats on job sheets and forms e.g.
- stay on the line
- use recognisable spelling and abbreviations
- use legible lettering.

Make sketches that clearly represent job requirements
- longer and shorter parts represented correctly
- geometric shapes represented clearly
- correct abbreviations used
- exact or accurate figures included.

Write notes and short sentences
- use recognisable spelling
- use diagrams and sketches to clarify points
- write points in a logical order
- use punctuation
- attempt to use correct tenses and verb / subject agreement.

Take notes from material read.

Write short answers to assessment questions
- handwriting must be legible
- abbreviations can be used
- spelling must be correct
- grammar and punctuation must be understandable but do not need to be 100% correct.

Speaking and listening tasks

Note: Heavy dependence on oral communication to deliver work instructions and on job training

- Listen to oral instructions from supervisor
- Listen and respond to requests from co-workers e.g. for assistance
- Listen to verbal explanations and training
- Listen to presentations from management and others (company meetings)
- Ask questions to clarify oral instructions, requests or explanations from co-workers, supervisor
- Report where work is up to
- Ask for assistance when needed
- Discuss design and manufacturing issues with supervisor, other workers
- Discuss installation of items on site with site foreman
- Communicate in noisy environment using hand signals, gestures, lip reading
- Communicate with co-workers (team work) during day-to-day work situations
- Communicate with customers /subcontractors when installing fabricated items on site
- Answer oral questions during formal assessments
  - on-job assessment
  - practical welding test
  - block course assessment

Speaking and listening skills

Speak clearly.

Ask for help if necessary.

Give information in a sensible order.

Use suitable body language.

Use hand signals and gestures to communicate in noisy environment.

Use questioning techniques including using open / closed questions to gain information, check understanding and encourage further discussion.

Use active listening skills e.g.
- repeat message back to sender
- summarise instructions in own words
- following techniques e.g. saying "aha" or "okay" as you follow what someone is saying.

Use language appropriate to situation and person.

Discuss topics which are appropriate in work context.

Underpinning knowledge / understanding

Communication is a two way process.

There is a range of spoken language styles which change with purpose, topic and audience.

There are ways of making positive and negative statements.

There are ways of initiating and concluding conversations.

Summarising can be used for checking and clarification.

Pronunciation and tone can affect the communication process.

Messages are conveyed by body language and facial expressions.

There are barriers to communication, especially cross cultural communication.

Numeracy tasks

- Identify parts by their alpha numeric codes
- Estimate time needed to carry out job
- Estimate amount of materials needed to complete job
- Measure out materials to plan specifications
  - length
  - thickness
  - dimensions
- Use correct sizes of bolts and fastenings (gauge)
- Interpret 2D and 3D representations on engineering drawings (spatial awareness, geometric shapes)
- Complete calculations required for job specifications e.g. exact quantities of materials required for job
- Length required for pipe / bar running at 45 degree angle
- Estimate weight of objects so these can be moved safely
- Calculate and record time spent on jobs
- Set up and use welding equipment at correct temperature

Numeracy skills

Measure accurately using metric measuring systems
- weight
- length
- width
- diameter
- height
- pressure.

Allow for tolerances in measurements (+ / - 1mm to 2mm).

Add, subtract, multiply and divide whole numbers and decimal numbers.

Convert fractions to decimals and decimals to fractions.

Multiply and divide by scale factor.

Use 12 or 24hr clock to measure and record time.

Use Celsius temperature scale (weld temperature).

Recognise common angles such as 15, 30, 45, 90 degrees.

Measure angles accurately.

Calculate values using formulae:
- area
- volume
- perimeter
- trigonometry.

Interpret numerical information contained in graphs and tables.

Recognise geometric shapes
- triangle
- square
- circle
- rectangle
- cube
- cylinder
- cone
- pyramid.

Recognise and use geometric concepts
- straight
- square
- parallel
- flat
- round
- perpendicular.

Recognise and use 2D and 3D representations.

Be aware of difference between imperial and metric measurements.

Underpinning knowledge / skills

Numeracy skills are dependent on people understanding the concepts and principles that underpin an action. This profile focuses on the skills required for the job role.

Examples of underpinning knowledge / skills might include:
- understand decimal numbers and decimal places
- understand what numerical concepts mean and what they are used for
- recognize a range of formats for presenting data e.g. pie graph, pictogram, bar chart
- round numbers up and down
- count on and count back to reach required number.

Critical thinking tasks

- Work out order in which to complete a job
- Identify when assistance is needed
- Work with others to move heavy items around confined spaces
- Select the correct method to cut, bend and weld different metals
- Select correct equipment and tools to use to do the job effectively
- Decide how to lay out materials for cutting to produce as little waste as possible
- Deal with contingencies
  - weld not to standard
  - problems with equipment
  - part cut too short, too long
  - injuries
  - OSH hazard identified
- Understand principle that "time is money" and spend appropriate amounts of time on jobs
- Determine best way to load finished products on to a truck for delivery – considering load weight, height and width

More experienced apprentices will:

- Identify if there is some problem with a drawing / plan and act to correct – may involve talking to supervisor or engineer
- Decide if final product meets quality standards
- Review welds sent back for rework – identify faults

Critical thinking skills

Apply knowledge of professional trade practice to work carried out.

Apply knowledge of safety requirements / principles to work practice.

Identify if you have enough knowledge and skill to take action on own.

Identify when you need assistance from others.

Understand production and quality assurance process and the implications of this for your work role.

Use problem solving methodology e.g.
- identify issue
- identify possible solutions
- determine best outcome
- decide on plan of action
- carry out plan.

Apply knowledge of time required to complete tasks to schedule work activities.

Visualise an object from a drawing or plan and use this to plan the order in which to complete the job.

Apply knowledge of efficient work practices to determine the most effective way to complete the job.

Recall and follow specified procedures to deal with contingencies.

Technology related tasks

- Use computer to read computer-aided design (CAD) drawings
- Use computer to sign on and off jobs
- Use computer to record time in and time out
- Scan job barcode into computer system

Technology skills

Operate a computer
- start the computer
- log-in if needed
- start appropriate application
- exit appropriate application
- turn off computer.

Identify elements of computer applications and the function of the element e.g. menus and menu options, command buttons, icons, toolbars.

Identify appropriate computer application for task
e.g. spreadsheet, word processor, e-mail, web browser, drawing, company systems.

Operate computer application(s).

Enter or update data using a computer (using keyboard, mouse or other input devices).

Underpinning knowledge

Understand links between computer displays and job tracking systems.

Apply knowledge of organisation policies about computer use when using the computer system.

Notes:

This profile relates to metal fabricator/welders and is based on roles from a number of companies.

The profile represents a combined skill set. Individuals will have strengths and weaknesses across the areas of workplace literacy described in the profile. Metal fabricator/welders will also use different combinations of the skills identified depending on where they are at in their training.

Different companies may require staff to use slightly different subsets of skills from the profile. In some instances companies may have additional tasks and skills required of their staff. The differences will depend on the company systems and management structure.

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