

Order form: For new resources available for 2019 (Note: All prices are GST inc.)

WACE: Career and Enterprise	Printed text	e-version master	Total
Career and Enterprise Foundation 11 (2017)	_____ @ \$49.50	_____ @ \$595	_____
Career and Enterprise Foundation 12 (2016)	_____ @ \$49.50	_____ @ \$595	_____
Career and Enterprise General 11 (2016)	_____ @ \$52	_____ @ \$660	_____
Career and Enterprise General 12/ATAR 11 (2016)	_____ @ \$55	_____ @ \$660	_____
Career and Enterprise ATAR 12 (Jan 2017)	_____ @ \$59.50	_____ @ \$770	_____

Careers, Work Education & Personal Development	Printed text	e-version master	Total
Career Pathways 2ed. 2016	_____ @ \$35	_____ @ \$440	_____
Work Experience Journal 2015	_____ @ \$22	_____ @ \$165	_____
Work Placement Journal 2015	_____ @ \$27.50	_____ @ \$220	_____
Personal Development Activity Planner: Introductory 2015	_____ @ \$25	_____ @ \$165	_____
Personal Development Project Planner: Advanced 2015	_____ @ \$27.50	_____ @ \$220	_____

Industry-Specific Resources	Printed text	e-version master	Total
Retail - Foundation 2014	_____ @ \$33	_____ @ \$165	_____
Retail - Intermediate 2014	_____ @ \$33	_____ @ \$165	_____
Community Services - Foundation 2015	_____ @ \$33	_____ @ \$165	_____
Community Services - Intermediate 2015	_____ @ \$33	_____ @ \$165	_____

Industry and Enterprise (New editions 2019)	Printed text	e-version master	Total
*I&E Unit 1: Workplace Participation 4ed. 2019	_____ @ \$35	_____ @ \$550	_____
*I&E Units 1&2: Towards an Enterprising You 5ed. 2019	_____ @ \$49.50	na	_____
*I&E Units 3&4: Towards an Enterprising Australia 4ed. 2019	_____ @ \$66	na	_____

VCAL/ Applied Learning Resource Sets	Printed text/workbook	Printed activities book	CD Master text/workbook	CD Master activities book	Combined CD master sets	or license with master e version
*Literacy Foundation 2ed (Updated for 2019)	_____ @ \$35	_____ @ \$27.50	_____ @ \$250	_____ @ \$99	or _____ @ \$330	or _____ @ \$440
*Literacy Intermediate 4ed (Updated for 2019)	_____ @ \$35	_____ @ \$27.50	_____ @ \$250	_____ @ \$99	or _____ @ \$330	or _____ @ \$440
*Literacy Senior 2ed (Updated for 2019)	_____ @ \$35	_____ @ \$27.50	_____ @ \$250	_____ @ \$99	or _____ @ \$330	or _____ @ \$440
*Numeracy Foundation 2ed (New for 2019)	_____ @ \$49.50	_____ @ \$27.50	_____ @ \$250	_____ @ \$99	or _____ @ \$330	na
*Numeracy Intermediate 2ed (New for 2019)	_____ @ \$49.50	_____ @ \$27.50	_____ @ \$250	_____ @ \$99	or _____ @ \$330	na
*Numeracy Senior 2ed (New for 2019)	_____ @ \$49.50	_____ @ \$27.50	_____ @ \$250	_____ @ \$99	or _____ @ \$330	na
PDS Foundation 2018	_____ @ \$35	_____ @ \$27.50	_____ @ \$165	_____ @ \$77	or _____ @ \$220	na
PDS Intermediate 3ed. 2016	_____ @ \$35	_____ @ \$27.50	_____ @ \$165	_____ @ \$77	or _____ @ \$220	na
PDS Senior 2ed. 2016	_____ @ \$35	_____ @ \$27.50	_____ @ \$165	_____ @ \$77	or _____ @ \$220	na
WRS Foundation 2014	_____ @ \$35	_____ @ \$27.50	_____ @ \$165	_____ @ \$77	or _____ @ \$220	na
WRS Intermediate 3ed. 2016	_____ @ \$35	_____ @ \$27.50	_____ @ \$165	_____ @ \$77	or _____ @ \$220	na
WRS Senior 2ed. 2014	_____ @ \$35	_____ @ \$27.50	_____ @ \$165	_____ @ \$77	or _____ @ \$220	na
Totals						

Add Postage: CD-only orders = \$6 Melb metro printed books = \$12
 Regional Vic and interstate 1 book = \$13, 2-4 books = \$15 Contact me for larger orders.
 *I recommend Express Post of \$18 for up to 4 VCAL, Industry-Specific or Careers etc. books; or for 2 CAE books or 2 I&E books. (More for larger orders.)

Postage amount \$ _____	Grand Total \$ _____
-------------------------	----------------------

Order Details

Name: _____

Position: _____

e-mail: _____

School: _____

Address: _____

Order No: _____ Approx. Amount \$ _____ ABN: _____

DELIVER Educational Consulting
 PO Box 40, Moonee Vale 3055 Ph & Fax (03) 9939 1229 ABN 80 922 381 610
 Check for samples at: www.deliverededucation.com.au michael@deliverededucation.com.au

Applied Numeracy Project 9

Contents

9.01 Unit 2: Introduction.....192	9.11 Transformation Process202
9.03 Numeracy-based Project Plan..194	9.15 Efficiency and Productivity206
9.05 Industry Stages.....196	9.17 TBC208
9.07 Industry Classification198	

Activities:	p.	Due date/Done?	Comment
9.02A Unit 2: Introduction	192		
9.04A Numeracy-based Project Plan			
9.06A Industry stages			
9.08A Industry classification			
9.10A Industry classification			
9.10C			
9.11A Inputs			
9.12B Processing			
9.13C Outputs			
9.14D Transformation process			
9.16A Productivity			
9.17			

Comments:

9.01 Unit 2: Introduction

Unit 2

Welcome to your studies of Unit 2: Numeracy Intermediate. Throughout Unit 1 you built up a considerable suite of numerical skills over the course of the unit. Those skills were related to these four broad areas of numeracy.

- ⇒ Numeracy skills and processes
- ⇒ Financial literacy
- ⇒ Planning and organising
- ⇒ Measurement, representation and design

You also demonstrated the ability to apply these skills to relevant practical personal and work-related contexts.

For Unit 2 you are required to further develop your numeracy knowledge and skills by applying your numeracy skills to an introductory investigation of a industry area related to your VET studies and/or your employment.

Numeracy-based Project Plan

Essentially you will design and undertake a **Numeracy-based Project Plan** into your selected industry area using these four broad focus areas of numeracy.



The Numeracy-based Project Plan (or plans) will require you to develop:

- ✓ the **aims** of your project plan
- ✓ the expected **numeracy skills** you will **investigate** and **apply** in your project plan
- ✓ the **timelines** for completion related to planning, investigating, drafting, submitting and reviewing your project plan, and
- ✓ the methods that you will use as part of your project plan to **measure** and **review** your successful achievement of the outcomes.

In order to satisfy the overall requirements of your Numeracy-based Project Plan you will have to do a number of specific investigative **Applied Numeracy Projects (ANP)**.

There are range of other requirements you have to meet such as; identifying and applying relevant **software tools** and **devices**, determining the **communication media** and **methods** you expect to use, as well as dealing with **obstacles** and **barriers** and other issues that may be relevant to your specific industry and personal circumstances.

Over the next few lessons your teacher will give you much more information so that you can start to plan and organise your Numeracy-based Project Plan. So make sure your record all the relevant information in the activities and pro-formas in this resource, as well as in your own workbooks as required.



1. In one sentence, describe what you are required to do for Numeracy Intermediate: Unit 2.

2. List the 4 broad focus areas of numeracy that will be part of your investigation.

1.	2.	3.	4.
----	----	----	----

3. What is the term for the special investigative projects that you will do?

4. Complete these words that relate to the requirements that you will need to address when developing your Numeracy-based Project Plan.

A	S	I	R
So	Co	O	& B

5. List the industry that is most closely related to your ET studies. Briefly outline key activities of the industry, and some of the main work tasks that occur within that

<p>1.</p> <p>Key activities:</p> <p>Main work tasks:</p>	<p>2.</p> <p>Key activities:</p> <p>Main work tasks:</p>
<p>3.</p> <p>Key activities:</p> <p>Main work tasks:</p>	<p>4.</p> <p>Key activities:</p> <p>Main work tasks:</p>

9.03 Numeracy-Based Project Plan

Requirements

In order to satisfactorily complete your **Numeracy-based Project Plan** you have to select, investigate and report on 6 enquiry-based tasks related to your chosen industry. So the 'big picture' steps that are required are as follows.

- ☐ Select an industry-area related to your VET program.
- ☐ Develop one (or more) investigative Numeracy-based Project Plan(s) related to this industry area.
- ☐ Select 6 enquiry-based tasks to investigate for your Numeracy-based Project Plan(s). We are going to refer to these investigations as your **Applied Numeracy Projects (ANP)**.



Enquiry based-tasks

For your Numeracy-based Project Plan you are required to choose and investigate 6 enquiry-based tasks. You must then report on your findings from your investigations in the end of those.

There are a range of suggested enquiry-based tasks listed in the Numeracy Intermediate Curriculum Planning guide. Your teacher may have structured your learning program based on these pre-determined enquiry-based tasks forming the basis for your investigation.

You must ensure that you choose at least one enquiry-based task that is related to each of those numeracy **focus areas** of:

1. Number
2. Measurement
3. Financial Numeracy
4. Probability and Statistics

Alternatively, you might be able to develop one or more of your own tasks (from each of these 4 focus areas) that are more suitable or relevant for your particular industry. You will need to negotiate this with your teacher to ensure that you choose a task (or tasks) that provide enough scope for you to satisfy the elements associated with the learning outcomes for Unit 2.

You must also ensure that you choose at least one Numeracy-based Project Plan(s) task that is related to each of the 3 **industry stages** of:

- a. **inputs**
- b. **processing**
- c. **outputs**

6 enquiry-based tasks

4 focus areas

3 industry stages

Preview
Draft
Do Not
Copy

For example, Jude is doing a VET course linked to the Retail Trade industry.

Jude is planning to investigate Measurement and Financial Numeracy for the **inputs** stage; Number and Measurement for the **processing** stage; and Financial Numeracy, and Probability and Statistics, for the **outputs** stage.

Jude has covered all 4 focus areas and each of the 3 industry stages.

Roderik is doing a VET course linked to the Construction industry. Roderik is planning to investigate Measurement for the **inputs** stage; Number, Measurement, and Financial Numeracy, for the **processing** stage; and Number, and Probability and Statistics, for the **outputs** stage.

Roderick has also covered all 4 focus areas and each of the 3 industry stages - but in a different configuration from Jude.



Preview

Numeracy-based Project Plan

A

So let's clarify your unit requirements right from the beginning. Answer the questions in the boxes and this will be a step-by-step guide to your unit requirements.

a. What is the correct title of what you have to complete for Unit 2? **I must complete a:**

b. The industry you select to investigate for your project must be linked to which 2 applied situations? **My selected industry must link to:**

c. How many enquiry-based tasks do you need to select? **I must select ___ enquiry-based tasks.**

d. You must select at least 1 enquiry-based task from each of these 4 focus areas. **The four focus areas are:**

e. You must ensure that at least 1 enquiry-based task comes from each of these 3 industry stages.

The three industry stages are:

a. _____
b. _____
c. _____

9.05 Industry Stages

Transformation process

All enterprises produce goods, services or a combination of goods and services. The production of goods and services involves the **transformation process**.

The transformation processes that turn inputs into outputs can better be described as the enterprise's production process. Enterprises must ensure that they manage their resources efficiently so as to generate the highest return on each of their materials, human (labour), financial (capital) and technological investments.

Production processes vary significantly from industry to industry. But in essence all organisations are involved in production. They all 'make' something using various processes, whether this be a good, or a service.



Industry stages

The Numeracy-based Project Plan uses the term **industry stages** to describe **Inputs**, **Processing** and **Outputs**.

a. Inputs

The first stage involves sourcing and using inputs such as raw materials, consumables, labour and other resources.

For example, a chef can use meat and vegetables to make meals, a carpenter will use timber to build a house frame and a barista will use coffee beans and milk to make coffee. These materials are consumables, as well as labour, the inputs.

This is a different way of showing a transformation process. Does it make sense and communicate information clearly? And could you develop a similar graphic?

Image: popaukropa/Depotphotos.com



b. Processing

The processing stage combines labour, skills and expertise as well as the use of tools, equipment, machinery and technology to turn inputs into a usable good or service.

For example, the chef will use their skills and expertise (using various processes and equipment) to turn the ingredients (goods inputs) into a restaurant meal (a service).

The carpenter will use their skills and expertise (using various processes and equipment) to turn the materials (goods inputs) into a house frame (also a service).

And the barista will use their skills and expertise (using various processes and equipment) to turn the materials (goods inputs) into a quality coffee (once again also a service).

c. Outputs

Outputs are the final stage which sees the production of a good or service. Outputs are then sold to consumers and/or other producers as goods or services.

For example, the chef uses industry-specific practical and manual processes and varied inputs to prepare a meal (the output) for sale to a chef in a restaurant.

The carpenter uses industry-specific practical, manual and technical processes and relevant inputs to complete the house frame (the output). This frame might be for a consumer who is having their house renovated; or for another producer, such as a building firm that is making dozens of houses on a new housing estate.

And the barista uses industry-specific practical and manual processes and relevant inputs to make a coffee (the output) for a waiter to deliver. Note: The making of coffee is actually a service.

Preview
Draft

Do Not

Industry stages A

Consider the types of work tasks and activities that workers in your industry regularly do, as part of the transformation process for each of the 3 industry stages. Describe these as concise statements.

Inputs	Processing	Outputs

Copy

9.07 Industry Classification

5-stage industry classification

An **industry** is a group of work settings, businesses or organisations that are involved in the production of the same or a similar product. Industries may be classified in different ways; there isn't one correct method that applies. For your Numeracy-based Project you are required to investigate the industry that is most closely related to your VET studies (or work). So it is important that you understand the industries that exist within the Australian commercial world and how different industries are classified.

The 3-stage model is the traditional method of industry classification that you might already be aware of. Formerly, only **primary**, **secondary** and **tertiary** industry sector classifications were used. But the tertiary sector has become huge

So as the commercial world has become more sophisticated we can use the **5-stage model of industry classification** which breaks tertiary down into further classifications.

5 Stage Industry Classification

Primary industry

Organisations involved in the production of raw materials. This involves farming, logging, fishing, mining, etc..

The output from these industries is often referred to as commodities, e.g. coal, iron-ore, tin, zinc, wheat, beef, gold, aluminium, etc.. These commodities are purchased by other businesses and then used to manufacture other goods and services.

Secondary industry

Organisations involved in the manufacture of goods and services.

Raw materials are combined with labour, capital and enterprise to produce goods, either for intermediate use (bread for a café), or for final consumption (bread for retail shoppers).

Secondary production takes place in factories, mills, smelters, refineries and other capital-intensive workplaces.

Tertiary industry

Organisations involved in the provision of services and utilities. These service providers use intermediate goods and/or other services to provide final services. e.g. Woolworths uses cash registers, stock, equipment and other goods, as well as transport services, admin services, financial services etc, to provide their service of retail shopping.

Generally all service industries are classified as belonging to the tertiary stage, however, this tertiary stage can be further broken down into 4th and 5th stages.

Quaternary industry

An extension of the tertiary sector, quaternary organisations focus on the supply and provision of information.

This may include media, education, finance, consultancy, business services and so on.

Quinary industry

A further extension of tertiary, organisations in the quinary sector provide services that 'replace' or substitute for domestic duties.

This may include health-care, hospitality, household services, personal services and so on.

Other industry classifications

Sometimes when we read about the commercial world, or hear people online or in the media talking about their enterprise, organisation or industry, they might say they are in the fast-food industry, the frozen seafood industry, the sports marketing industry or even the sock industry!

Now, these industry stakeholders are not incorrect; but they are using arbitrary classifications based upon the nature of their organisation. This way of classifying their industry relates directly to the nature of their organisation. So we should bear in mind that organisations can also be classified into industries by what they 'do'. This might be especially relevant when you are talking to people who run their own businesses such as micro and small operators.

1. By product...

The type of product they produce

- ⇒ Fast-food: McDonald's
- ⇒ Transport: Linfox
- ⇒ Food: SPC

2. By sub-sector...

The sub-sector they operate in.

- ⇒ Hospitality: McDonald's
- ⇒ Road transport: Linfox
- ⇒ Canned food: SPC

3. By function...

The function of the business.

- ⇒ As a restaurant: McDonald's
- ⇒ Providing logistics: Linfox
- ⇒ Food processing: SPC

I'm going through an identity crisis! Do I work in the fast-food, hospitality, restaurant, retail, accommodation and food services or some other industry?

4. By 'what they do'...

How they operate/what they do.

- ⇒ Retail: McDonald's
- ⇒ Business services: Linfox
- ⇒ Manufacturing: SPC

Preview
Draft
Do Not
Copy

Industry classification 1 A

Classify each of these industries according to the 5-stage method. Do this also for the industry that best matches your VET studies.

Retail trade	Manufacturing	Agriculture	Medical	Your industry
Transport	Construction	Business Services	Restaurant	

9.09 Industry Classification

Which industry?

In order to determine the industry that you will investigate for your Numeracy Project you might have to use the official industry **ANZSIC** classification system.

The ANZSIC classification system uses 19 different industry titles and letters to classify all enterprises in Australia, such as *G: Retail Trade*.

These 19 industries are then further classified into industry sub-sectors that more closely relate to the types of goods or services that enterprises within this classification actually make or provide.

e.g. *G: Retail Trade* - includes sub-sectors such as:

- ⇒ *G39: Motor Vehicle & Motor Vehicle Parts Retailing*
- ⇒ *G40: Fuel Retailing*
- ⇒ *G41: Food Retailing*
- ⇒ *G42: Other Store-Based Retailing and Non-Store Retailing*
- ⇒ *G43: Retail Commission-Based Buying &/or Selling.*

Some of these sub-sectors are then further broken down.

e.g. *G41: Food Retailing* generally broken down into:

- ⇒ *G411: Supermarket & Grocery Stores*
- ⇒ *G412: Specialised Food Retailing*
- ⇒ *G413: Liquor Retailing*

Many VET training packages are closely aligned with these industry classifications and make sure you correctly 'name' your industry.

ANZSIC Industry Classifications

A: Agriculture, Forestry and Fishing	L: Rental, Hiring and Real Estate Services
B: Mining	M: Professional, Scientific and Technical Services
C: Manufacturing	N: Administrative and Support Services
D: Electricity, Gas, Water and Waste Services	O: Public Administration and Safety
E: Construction	P: Education and Training
F: Wholesale Trade	Q: Health Care and Social Assistance
G: Retail Trade	R: Arts and Recreation Services
H: Accommodation and Food Services	S: Other Services
I: Transport, Postal and Warehousing	
J: Information Media & Telecommunications	
K: Financial and Insurance Services	

B Industry classification II

Classify each of these industries according to the ANZSIC method. Do this also for the industry that best matches your VET studies.

Retail trade	Manufacturing	Agriculture	Medical	Your industry
Transport	Construction	Business Services	Restaurant	

Industry names

Sometimes when we read about the commercial world or hear business owners on the radio, TV or online talking about their enterprise they might say they are in the fast-food industry, the frozen seafood industry, the sports marketing industry, the comic book industry or even the sock industry!

These people are describing the industry they belong to by using a term that relates directly to the nature of the goods and services they produce or provide.

So if you have been working or undertaking work placement as part of your VET course your boss might use an 'informal' name to classify their industry. This might be especially the case for people who run their own business enterprises. So you might be better to name your selected industry this way - especially if you are going to obtain a lot of research material from people in work settings who use these industry names.

✎ So now that you know these different methods, what is the name of your industry?

Preview

Draft

Do Not

Copy

C

9.11 Transformation Process

Introduction

Over the next 3 sections you will investigate the transformation process in much more detail. As you already know, the **transformation process** involves turning various **inputs** into **outputs** (goods and service) by using a range of production or service-provision processes which of course make up the **processing** stage.

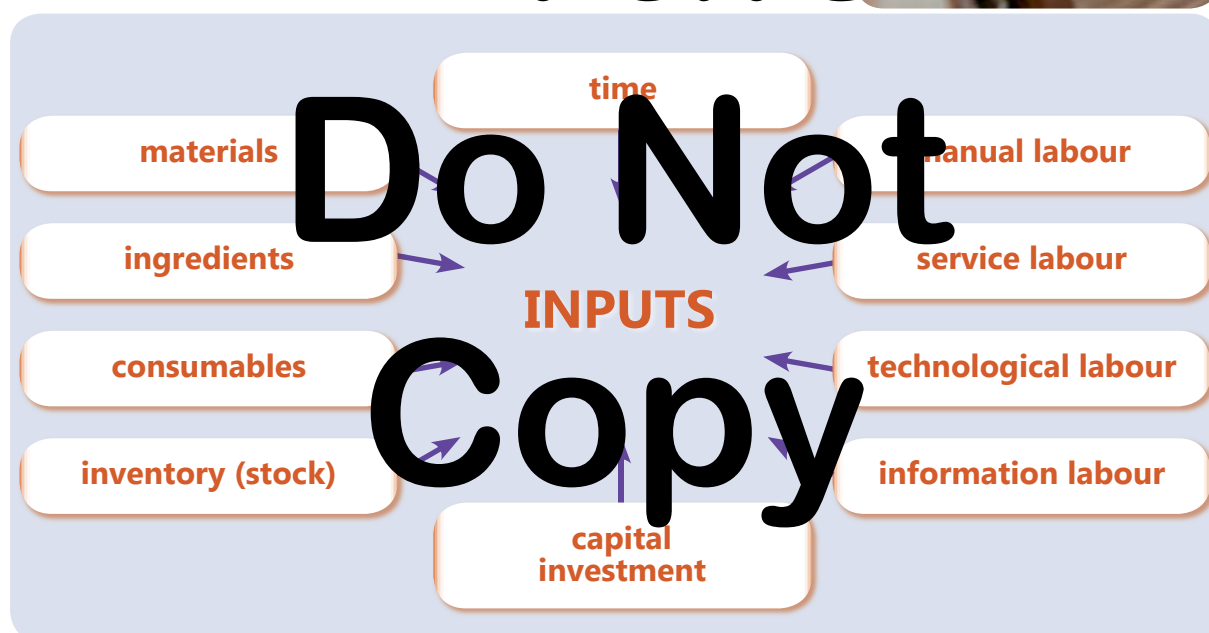
For your **Applied Numeracy Project** you are required to investigate and report on how numeracy skills are applied in the inputs, processing and outputs stages for an industry that matches your VET studies.

Image: Goodluz/
Depositphotos.com

Inputs

Inputs are the resources that are used by enterprises as part of their production process, or as part of their service-provision process. Inputs include materials and stock as well as labour, tools, equipment and machinery, technology, capital investment, time and information.

For example, a carpenter in the construction industry will use timber and other materials including stocks of small consumables such as fixings. They will use hand and power tools and they might use also digital measuring technological devices, all part of capital investment. Of course they will use their time and expertise as well as the information needed to perform the work.



A Inputs



1. List the key inputs usually required by a tradie (your choice).
2. List the key inputs usually required by a fitness instructor.
3. List the key inputs usually required for an occupation of your choice.
4. Share and discuss with your class.

Processing

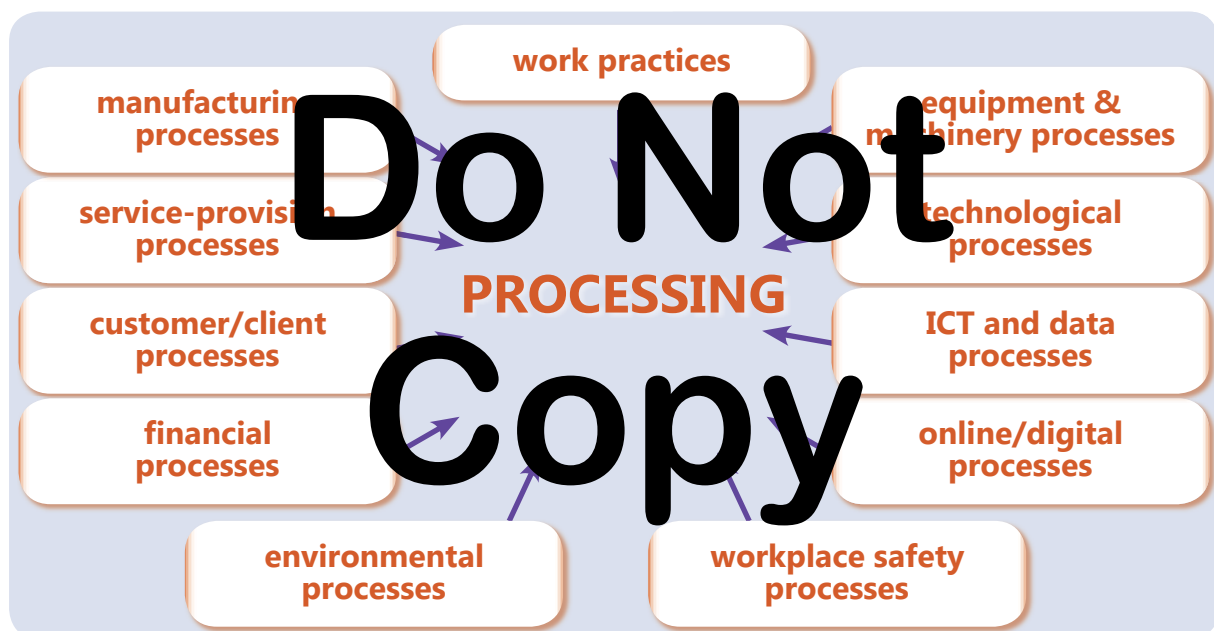
Processing involves combining varied resources so as to produce a good or service. Processing can involve manufacturing, refining, cooking and combining raw materials into other goods (finished products). *For example, a miller processing wheat into flour and then an industrial baker processing flour into bread.*

Processing also occurs in thousands of different services that are provided throughout the commercial world including transport, retail, ICT, business services, media, personal services, education, health and medical, community services as well as many, many more.

The processing stage uses various processes (naturally), systems, work practices and other methods to create and produce goods or services.

Most enterprises involve processing, as this is the stage where many inputs are combined to create a product (an output), as efficiently and safely as possible.

Preview
Draft



Processing

B

1. List the different processes involved in turning beef cattle into sausages!
2. List the processes involved in a courier firm organising and delivering parcels.
3. List the key processes regularly undertaken for a work setting of your choice.
4. Share and discuss with your class.



9.13 Transformation Process

Outputs

Outputs are generated at the final stage of the transformation process after all the varied inputs have been turned into goods or services.

Outputs can take the form of **consumer goods** and **consumer services** which are sold to consumers.

Examples of consumer goods include thousands of grocery items, clothing, cars, books, computers - the list is virtually endless. Consumer services include a cafe that produces a coffee for customers, a hairdresser that provides a cut and style for clients and a school that provides educational services for students. This list is also virtually endless!

However, many enterprises produce goods and services that are sold to other enterprises that form part of a new production process. These **producer goods** and **producer services** happen as **B2B** transactions and may take the form of processed materials, stock (inventory), direct services and indirect (or support) services.

For example, an industrial baker might sell stocks of bread rolls to cafes who make lunches. A carpenter might work as a service contractor on a housing estate building house frames for a property developer and builder. A ICT specialist might be hired in to assist a school to develop a new student database. And a car parts manufacturer might make headlights and other parts that are exported to overseas car makers.

Image: .shock/Depositphotos.com



Industrial bakeries can produce 10s of thousands of units of output each day (and night).



C Outputs



1. List the outputs usually produced by a cafe.
2. List the outputs usually produced by a frozen food manufacturer.
3. List the outputs usually produced by an enterprise of your choice.
4. Share and discuss with your class.

1. What is the transformation process? Give an example.

2. What role do inputs have in the transformation process? Explain using 2 different examples.

3. What role does processing have in the transformation process? Explain using 2 different examples.

4. What role do outputs have in the transformation process? Explain using 2 different examples.

5. Use examples to explain the difference between a consumer good or service, and a producer good or service.

6. Draw a diagram to illustrate the transformation process for a workplace in an industry in which you are interested. This might be a mindmap, a chart a series of graphics - you choose the design to best represent the ideas you want to communicate this.

9.15 Efficiency and Productivity

Efficiency

One of the key goals of enterprises and workers involved in the transformation process is to achieve efficiency.

The relationship between time and money is a relationship based on efficiency. **Efficiency** refers to how quickly, or how cost-effectively tasks are completed.

Some people are more efficient than others. This means that they get things done faster. This might also mean that they complete tasks more **cost-effectively**. This can make them more productive workers.

However, being efficient doesn't always result in a high level of **quality**. Sometimes greater efficiency means a drop in quality, more rejects and waste, and bad service.

So how well do you use your time? Are you using it efficiently? And perhaps more importantly, how efficiently

are you using other people's time, especially your boss's?



Appropriate tools and equipment, as well as the training and skills to use these, can improve efficiency.

Image by alexaarts/iStock/Thinkstock

Productivity

We measure efficiency by calculating productivity. **Productivity** simply measures the **ratio of outputs**, compared to the **ratio of inputs**. Not don't be fooled into thinking that this sounds a little bit complicated. Productivity is a very easy concept. Out versus in.

For example, if it takes one chef one hour to prepare 30 pizzas, then this chef has a productivity rating of 30 pre-prepared pizzas per hour. The chef achieves an output of one pizza every two minutes.

Another example might show that it takes a team of two carpenters five days each to put up the complete timber framing on a 30 square house. So the framing of this 30 square house will be completed in 10 working days. That's a productivity rating of two workers achieving six squares per day. On an average, each worker is completing three squares per day.

One final example might see a car wash attendant clean six standard-sized vehicles per hour by hand; or 18 per hour with a high-pressure hose. This means that the use of the hose increases productivity by 200% from 1 car per hour versus six cars per hour. Technology has made this employee much more (three times more) productive.

Calculating productivity

Productivity is a measure of the ratio of outputs, compared to the ratio of inputs. Common work-related output/input measures are per/worker, per/\$ or per/hour.

e.g. Freya sews 25 collars per hour in a clothing factory.

$$\Rightarrow \text{Productivity} = \frac{25 \text{ (collars)}}{1 \text{ hour}} = 25 \text{ units (collars) per hour (25 collars/hr)}$$

e.g. Freya is paid \$20 per hour.

$$\Rightarrow \text{Productivity} = \frac{25 \text{ (collars)}}{\$20} = 1.25 \text{ units (collars) per dollar. (1.25 collars/\$)} \\ \text{(and 1 whole collar 'costs' 80c) (\$0.80/collar)}$$

NUM
SUPER
SKILLS

Productivity A

1. In one sentence describe the meaning of productivity. In another sentence give a numerical example to support your explanation.

2. Calculate the productivity of each worker per week per hour. They each work a 38 hour week (with 2 holiday days and 1 day RDO every 4 weeks).

Dragha can make 60 pairs of shoes in a day.	Kai can make 8 pairs of shoes per hour.	Leni is able to serve 92 customers each 4 hour shift.
Abel is able to serve 22 customers per hour.	Sal can lay 1.5 metres of pipe per hour.	Tini can roll 90 mini spring rolls every 2 hours.

3. Describe what might either speed up or slow down a worker's productivity.

4. List some productivity measures that might be relevant for your industry.

**Preview
Draft
Do Not
Copy**

Numeracy-Based Project Plan¹⁰

Contents

10.01 PODR Planning.....210	10.09 My Project Plan - Software
10.03 My Project Plan - Planning	10.10 My Project Plan - Planning
10.05 My Project Plan - Organising	10.11 My Project Plan - Reporting
10.07 My Project Plan - Doing	

Activities:	p.	Due date/Done?	Comment
10.01A PODR the past	210		
AT1a Numeracy-based Project - Planning			
AT1b Numeracy-based Project - Organising			
AT1c Numeracy-based Project - Doing			
AT1d Numeracy-based Project - Software Tools & Devices			
AT1e Numeracy-based Project - Reporting			

Comments:

10.01 PODR Planning

Achieving goals

So as you now know, for this unit you are required to complete a large, ongoing project over an extended number of weeks. This means that you have to achieve a long-term goal - your **Numeracy-Based Project Plan**.

Many people find it daunting to have to plan and organise themselves so that they are doing the right things, at the right times, so as to achieve a long-term goal. So at first glance, it may seem difficult to achieve long-term objectives or goals. But you're not like that!

As a VCAL (or other applied learning/vocational) student you have experienced, through your other studies, (such as Personal Development Skills and Work Related Skills) that the best way to deal with a significant or long-term goal is to break it down into a series of smaller, achievable, bite-sized objectives.

The Plan-Organise-Do-Review process can help you tackle any task or activity. The **Plan-Do-Review** process is a four-stage process that comes easily. This is why it's such a simple and useful tool when planning and making decisions. These are the four **PODR** steps.

1. Work out and **plan** just what it is you are trying to do (your goal) and also how to best get it done.
2. Then **organise** yourself and any resources you need to successfully complete the task.
3. Complete and **do** the task.
4. Monitor and **review** your work output and make any changes and adjustments if necessary.

The PODR Process is a continuous process. Planning leads to organising, which leads to doing, which leads to reviewing, which leads back to planning and so on. Also, each of the four stages of the Plan-Organise-Do-Review process are not discrete. As part of planning you might be organising, which naturally leads to doing, and also involves checking things - which is part of reviewing; and so on.

What you need to remember is that for everything you need to do for your Numeracy-based Project Plan just think: Plan-Organise-Do-Review.

"We've used PODR before to help us tackle big project goals. Doesn't mean we're experts. But it does mean we have experience and know how to get started; and also how to break goals down into objectives that we can tick-off."

Image: Highwaystarz-Photography/iStock/Thinkstock



PODR Planning Process

1. Plan

- ⇒ Work out just what it is you are trying to do.
- ⇒ Write down your overall goal, and also how you might be able to achieve this goal.
- ⇒ It is good to be able to write this in one or two short sentences.

e.g. Develop your overall Numeracy-based Project Plan to achieve your project goal in consultation with your teacher.

2. Organise

- ⇒ Break your overall goal into a series of smaller, achievable, bite-sized objectives.
- ⇒ Develop an action plan, including a timeline, to achieve each of these smaller objectives on a task-by-task basis.
- ⇒ Organise yourself, any resources you need and any other people needed to successfully complete each task.

e.g. Work out all the required tasks, resources, people and timelines needed to achieve the ongoing objectives of your project.

3. Do

- ⇒ Undertake the ongoing weekly or day-to-day activities needed to actually perform each task.
- ⇒ This is where everything comes together.
- ⇒ The doing phase could be quite short; especially if you have planned and organised yourself effectively beforehand.

e.g. Undertake your investigation of 6 enquiry-based tasks in the workplace on an ongoing basis. In class organise and analyse your findings; and later draft and prepare your final report(s).

4. Review

- ⇒ Monitor what you've achieved, evaluate your outcomes for quality and make any changes and adjustments if necessary.

Note: Each of the 4 stages of Plan-Organise-Do-Review are not discrete so you could be reviewing throughout the whole activity process, and not just at the end.

e.g.

NUM
SUPER
SKILLS

Preview
Draft
Do Not
Copy

PODR the past A

As a class discuss examples where you have previously developed and used skills related to planning, organising, doing and reviewing.

Your teacher will help the class come up with a list of the most important PODR skills that you should focus on using for you Numeracy-based Project Plan.



10.03 My Project Plan

Numeracy-based Project Plan

The next few pages feature a series of planning pro-formas that will assist you to manage your **Numeracy-based Project** through the **planning, organising, doing** and **reviewing** stages. It is important to note that you are not likely to complete all 5 stages of your plan in one go, straight away. Rather, you are likely to come back to certain stages further on in the unit as you carry out the various tasks associated with that stage.

1A: Planning - Develop your project plan
In consultation with your teacher.
⇒ Select your industry.
⇒ Choose your 6 enquiry-based tasks to investigate.
⇒ Develop your overall plan.

1B: Organising - Design your project plan
Develop your ongoing timeline.
⇒ Explain: How you will use:
✓ numerical skills
✓ software tools and devices
✓ other skills.
⇒ Describe your methods to communicate your data.
⇒ Discuss potential issues and problems.
⇒ Determine the need to work with others.

1C: Doing - Apply a range of numerical skills to investigate your industry
Research 6 enquiry-based tasks.
⇒ Choose numerical processes to find and collect data.
⇒ Collect relevant data.
⇒ Apply problem-solving strategies.
⇒ Estimate, calculate and compare the data.
⇒ Analyse the data.

1D: Planning, organising, doing and reviewing - Represent your data using software tools and devices
Use software tools & devices.
⇒ Describe those you could use and advantages and disadvantages.
⇒ Explain which might best represent the data.
⇒ Use these to represent and communicate your data
⇒ Evaluate these for showing and representing your findings.

1E: Doing and reviewing - Communicate your findings from your investigation
Communicate your results effectively.
⇒ Using mathematical language.
⇒ Using mathematical symbols and conventions.
⇒ Using suitable software and tools.
⇒ Communicate to a relevant audience.
⇒ Evaluate your performance.

AT1a Numeracy-based Project - Planning

This the **first stage** of developing your Numeracy-based Project whereby you start to **plan** your **overall project**.

Complete this planning pro-forma. Your teacher will help and guide you in developing your plan. But you could also try to independently complete as many sections as you can. List due dates and tick-off tasks when done and checked.



Once you have consulted with your teacher about the suitability of your choices then redraft your Numeracy-based Project Plan.

1a: Planning - Develop your Numeracy-based Project Plan (LO1 a-d)					
Requirement		Information/Explanation		Due dates/Done	
What is my overall goal?					
a.	Select your industry area.	Inputs: Enquiry-based tasks I will investigate are:			
b. & c.	Consult with your teacher and choose 6 enquiry-based tasks to investigate.	Processing: Enquiry-based tasks I will investigate are:			
Have you chosen at least: <input type="checkbox"/> 1 for each of the 3 industry stages , and <input type="checkbox"/> 1 from each of the 4 Numeracy focus areas ? Tick these off.		<u>Number</u> Inputs: <input type="checkbox"/> Processing: <input type="checkbox"/> Outputs: <input type="checkbox"/>	<u>Measurement</u> Inputs: <input type="checkbox"/> Processing: <input type="checkbox"/> Outputs: <input type="checkbox"/>	<u>Financial Numeracy</u> Inputs: <input type="checkbox"/> Processing: <input type="checkbox"/> Outputs: <input type="checkbox"/>	<u>Probability & statistics</u> Inputs: <input type="checkbox"/> Processing: <input type="checkbox"/> Outputs: <input type="checkbox"/>
d.	Develop a plan with: <input type="checkbox"/> your aims <input type="checkbox"/> required numeracy skills <input type="checkbox"/> your overall timeline <input type="checkbox"/> measurement outcomes				

10.05 My Project Plan

AT1b Numeracy-based Project - Organising

This is the **second stage** of developing your Numeracy-based Project. It focuses mainly on the 'organising' phase (which flows on from planning). This is the stage when you start to **organise yourself** and any **resources** so that you can undertake **your specific investigations** for your overall project.



Your teacher will guide you in developing your plan, but first try to complete this independently. List due dates and tick-off when done and checked. Consult your teacher about the suitability of your choices then redraft this stage of the Numeracy-based Project plan.

1b: Organising - Design your Numeracy-based Project Plan (LO1 e-j)			
Requirement		Information /Explanation	Due dates/Done
e.	Develop your timeline for completion including ongoing drafting and reporting stages.		
f.	Identify: <input type="checkbox"/> numerical skills & processes <input type="checkbox"/> software tools & devices <input type="checkbox"/> other skills you will use. Explain why you have chosen to use these.		
g.	Describe how you will use software tools and devices to present your data.		
h.	Describe the communication media and techniques that you will use to present your data.		
i.	Identify and discuss issues and problems that might prevent you from doing your investigation effectively.		
j.	Work with others when and where required, to develop your plan.		

Preview
Draft
Do Not
Copy

1b: Project Timeline

Create your project timeline here. Break the project timeline into 1 week intervals.
List key tasks and milestones you will need to achieve.

**Preview
Draft
Do Not
Copy**

10.07 My Project Plan

AT1c Numeracy-based Project - Doing

This the **third stage** of developing your Numeracy-based Project. It focuses mainly on the ‘doing’ phase (which of course flows from planning and organising).

This is the stage when you will **do** your **investigative Applied Numeracy Projects** as part of your overall Numeracy-based Project.



Your teacher will help and guide you in developing your plan, but try to complete as many section as you can independently. List due dates and tick-off when done and checked. Once again consult your teacher about the suitability of your choices then redraft this stage of the Numeracy-based Project plan.

1c: Doing - Apply a range of numerical skills to investigate your industry (LO2 a-f)

Requirement	Information	Explanation	Due dates/Done
a. Research your enquiry-based tasks.			
b. What numerical processes will you use to collect data for each of these 6 enquiry-based tasks?			
c. Collect relevant data related to these 6 enquiry-based tasks. Apply techniques that such as estimation, computation and technology .			
d. What numerical problem-solving strategies will you use in your investigation. How will you use these; and why?			
e. Use the data to make estimates and calculations . Describe what your estimates and calculations suggest.			
f. Use 1 or more methods to analyse the data related to each of the 6 enquiry-based tasks.			

1c: Doing - Apply a range of numerical skills to investigate your industry (LO2 a-f)	
<p><i>Enquiry-based task 1:</i></p> <p>Description:</p> <p>Numerical processes:</p> <p>Key data:</p> <p>Problem-solving strategies:</p> <p>Data estimates & calculations:</p> <p>Analysis of data:</p>	<p><i>Enquiry-based task 2</i></p> <p>Description:</p> <p>Numerical processes:</p> <p>Key data:</p> <p>Problem-solving strategies:</p> <p>Data estimates & calculations:</p> <p>Analysis of data:</p>
<p><i>Enquiry-based task 3</i></p> <p>Description:</p> <p>Numerical processes:</p> <p>Key data:</p> <p>Problem-solving strategies:</p> <p>Data estimates & calculations:</p> <p>Analysis of data:</p>	<p><i>Enquiry-based task 4</i></p> <p>Description:</p> <p>Numerical processes:</p> <p>Key data:</p> <p>Problem-solving strategies:</p> <p>Data estimates & calculations:</p> <p>Analysis of data:</p>
<p><i>Enquiry-based task 5</i></p> <p>Description:</p> <p>Numerical processes:</p> <p>Key data:</p> <p>Problem-solving strategies:</p> <p>Data estimates & calculations:</p> <p>Analysis of data:</p>	<p><i>Enquiry-based task 6</i></p> <p>Description:</p> <p>Numerical processes:</p> <p>Key data:</p> <p>Problem-solving strategies:</p> <p>Data estimates & calculations:</p> <p>Analysis of data:</p>

Preview
Draft
Do Not
Copy

10.09 My Project Plan

AT1d Numeracy-based Project - Software Tools & Devices

This the **fourth stage** of planning your Numeracy-based Project. It focuses on ‘planning’, ‘organising’, ‘doing’ and ‘reviewing’ related to **software tools** and **devices** you plan to use, and will use, for collecting, organising and analysing your data and information during your **Applied Numeracy Projects**.

Complete this planning pro-forma. Your teacher will help and guide you in developing your plan, but try to complete as many sections as you can independently. List due dates and tick-off when done and checked.

Once you have consulted with your teacher about the suitability of your choices then redraft this stage of your Numeracy-based Project plan.

1d: Planning, organising, doing and reviewing - Represent your data using software tools and devices (LO3 a-e) Requirement Information on/expected outcome Due dates/Done		
a.	Describe the software tools and devices that you could use to show the data from your investigation of the enquiry-based tasks.	
b.	Discuss advantages and disadvantages of these software tools and devices in representing your collected data.	
c.	Explain which software tools and devices are most likely to best represent the data you have collected; and why .	
d.	Use the software tools and devices to represent and communicate the data you have collected for your investigation into the 6 enquiry-based tasks.	
e.	Evaluate the effectiveness of your chosen software tools and devices in showing and representing your findings.	

Numeracy-based Project - Reporting AT1e

This is the **final stage** of planning your Numeracy-based Project. It focuses on 'doing' and 'reviewing' related to your **reporting of the results** based on the data and information you collected during your **Applied Numeracy Projects**.

Complete this planning pro-forma. Your teacher will help and guide you in developing your plan, but try to complete as many sections as you can independently. List due dates and tick-off when done and checked.

Once you have consulted with your teacher about the suitability of your choices then redraft this final stage of your Numeracy-based Project plan.

1e: Doing and reviewing - Communicate your findings from your investigation (LO4 a-e)		
Requirement	Information, explanation	Due dates/Done
a. Communicate your results effectively using appropriate mathematical language.		
b. Communicate your results effectively using appropriate mathematical symbols and conventions.		
c. Communicate your results effectively using suitable software and tools.		
d. Communicate your results to a relevant audience (as negotiated with your teacher).		
e. Evaluate your performance in this investigation including: ??? ??? ??? ??? ???		

Preview
Draft
Do Not
Copy

Name:		Dates:	
Industry:			
Tasks - AT: Design Numeracy-based Project Plan	Re- quired	Due by	Done
Teacher initials			
Stage 1a:			
	<input checked="" type="checkbox"/>	<input type="text"/>	<input type="text"/>
	<input checked="" type="checkbox"/>	<input type="text"/>	<input type="text"/>
	<input checked="" type="checkbox"/>	<input type="text"/>	<input type="text"/>
Stage 1b:			
	<input checked="" type="checkbox"/>	<input type="text"/>	<input type="text"/>
	<input checked="" type="checkbox"/>	<input type="text"/>	<input type="text"/>
	<input checked="" type="checkbox"/>	<input type="text"/>	<input type="text"/>
Stage 1c:			
	<input checked="" type="checkbox"/>	<input type="text"/>	<input type="text"/>
	<input checked="" type="checkbox"/>	<input type="text"/>	<input type="text"/>
	<input checked="" type="checkbox"/>	<input type="text"/>	<input type="text"/>
Stage 1d:			
	<input checked="" type="checkbox"/>	<input type="text"/>	<input type="text"/>
	<input checked="" type="checkbox"/>	<input type="text"/>	<input type="text"/>
	<input checked="" type="checkbox"/>	<input type="text"/>	<input type="text"/>
Stage 1e:			
	<input checked="" type="checkbox"/>	<input type="text"/>	<input type="text"/>
	<input checked="" type="checkbox"/>	<input type="text"/>	<input type="text"/>
	<input checked="" type="checkbox"/>	<input type="text"/>	<input type="text"/>
Reporting			
⇒ Prepare and submit your final report.	<input checked="" type="checkbox"/>	<input type="text"/>	<input type="text"/>
⇒ Prepare a report to the class (if required).	<input checked="" type="checkbox"/>	<input type="text"/>	<input type="text"/>
⇒ Present your final report to the class (if required).	<input checked="" type="checkbox"/>	<input type="text"/>	<input type="text"/>
Additional information:			
Signed: _____ Date: _____			

Industry Stages - Inputs 11

Contents

11.01 Inputs.....	222	11.15 Inputs - Equipment.....	
11.03 Inputs - Materials.....	224	11.23 Assessment Task	
11.09 Inputs - Labour	230		

Activities:	p.	Due date/Done?	Comment
11.02A Resources	223		
11.04A Inputs - Materials	225		
11.06B Inputs - Materials in action	227		
11.07 ANP: Inputs - Materials Investigation Pro-forma	229-230		
11.10A Inputs - Labour	231		
11.12B Inputs - Labour in action	233		
11.13 ANP: Inputs - Labour Investigation Pro-forma	234-235		
11.17A Inputs - Equipment	239		
11.19 ANP: Inputs - Equipment Investigation Pro-forma	240-241		
11.21 ANP: Inputs - Overall Investigation Pro-forma	243		
AT2 Applied Numeracy Project - EBT: Inputs	244-246		

Comments:

11.01 Inputs

Inputs

Inputs refer to the varied **resources** used by enterprises as part of their **production process** or **service-provision** process. The main categories of resources that you should investigate for your **Applied Numeracy Projects** are:

- ⇒ **materials**: both raw and processed
- ⇒ **labour**: worker skills, expertise and time
- ⇒ **equipment**: tools, equipment, machinery and technology
- ⇒ **capital**: money invested by the enterprise
- ⇒ **information**: knowledge, experience, expertise and analysis.

Image: OtnaYdur/
Depositphotos.com



Efficiency

One of the issues surrounding inputs is the achievement of efficiency in the use of resources. This means that enterprises use various numerical techniques to measure productivity. These measures or key performance indicators may focus on materials productivity, labour productivity and other industry-specific measures.

So when you are investigating work settings within your chosen industry you should be aiming to collect numerical data and information that will enable you to measure **productivity**. For example:

- ☐ measure physical materials or count stock and other inputs
- ☐ estimate and calculate labour time and find out and calculate labour costs
- ☐ calculate and show different proportions of materials, labour and other inputs
- ☐ estimate and calculate total materials, labour and other input amounts and total \$ cost
- ☐ calculate average materials, labour and other input amounts and \$ costs
- ☐ compare and analyse materials, labour and other input amounts and \$ costs
- ☐ calculate materials, labour and other input usage and productivity ratios.

Applied Numeracy Projects

In relation to inputs you might investigate one or more of the following.

- ☐ **Amounts** of inputs used in goods production or service provision. (N)
- ☐ **Ratios** of inputs used for goods production or service provision. (M)
- ☐ **Cost** of inputs used in goods production or service provision. (FN)
- ☐ **Comparison of trends** in inputs for goods production or service provision. (P&S)
- ☐ **Amounts** and/or **ratios** of **different categories** of inputs used.
- ☐ **Changing ratios** of inputs used for specific goods or services.
- ☐ **Comparison of different types** of inputs used for varied goods or services.
- ☐ **Ratios of waste** in inputs generated in goods production or service provision.

You might also investigate industry-specific, inputs-related issues in negotiation with your teacher.

Resources A

Consider a hamburger, favourite fast food of many people and staple product of the big chains, McDonald's and Hungry Jacks. Work in pairs to identify all of the resource inputs that go into the production of a hamburger for sale in a fast food outlet. Group these according to the 5 resource categories.

Materials

Labour

Preview
Draft
Do Not
Copy

Equipment

Capital

Information

Image: rozelt/
Depositphotos.com



11.03 Inputs - Materials

Materials

Materials as part of the transformation process can include **raw materials**, **processed materials**, **stock** (inventory) and other **consumables**.

Raw materials

Raw materials are resources that are still close to their original state as when they were farmed, grown, harvested or extracted. Key examples include:

- ⇒ fresh fruit and vegetables
- ⇒ grains and other food crops
- ⇒ livestock and herds
- ⇒ fish and seafood

- ⇒ fibre crops
- ⇒ wood and forestry resources
- ⇒ mineral resources
- ⇒ coal, crude oil, natural gas and other fossil fuels.

Key industries include agriculture, forestry, fishing and mining.

Processed materials

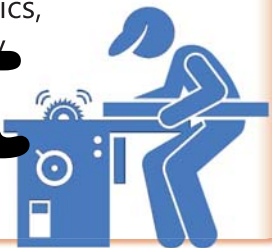
Processed materials are resources that have been turned into a more usable form as part of a transformation process. Some examples include:

- ⇒ canned fruit, chopped vegetables
- ⇒ flour and processed grains
- ⇒ food products
- ⇒ meat and meat products
- ⇒ fish and seafood products
- ⇒ cotton and wool products
- ⇒ timber
- ⇒ steel, aluminium and concrete
- ⇒ refined oil, petrol, gas and electricity.

Key industries include:

- ✓ milling such as food processing, fibre processing or timber processing
- ✓ refining and smelting such as metals processing and fossil fuel (oil) refining
- ✓ manufacturing including food, petrochemical, fabric, clothing, furniture, electronics, vehicles and many other examples.

Image adapted from: Jeremy/Depositphotos.com



Stock (or inventory) refers to both raw and processed items that are supplied and sold at wholesale and retail. This is commonly called **trading stock**.

Stock also refers to materials that are used by enterprises to make their goods, or to provide their services (known as **production stock**).

e.g. Flour for bakers, timber for cabinet makers, hair care products for hairdressers, food ingredients for a cafe and computer parts for computer suppliers.

Examples include:

- ⇒ fresh food and vegetables supplied by wholesalers, markets and retailers
- ⇒ manufactured items supplied by wholesalers, markets and retailers
- ⇒ products for sale in shops e.g. groceries, clothing, household items.

Key industries include:

- ✓ retail trade, wholesale trade, and personal services that also sell stock
- ✓ all industries for the use of 'production stock'.

Consumables

Consumables are all the other material inputs that any enterprise naturally uses up as part of the production of goods or the provision of services.

Enterprises don't sell these consumables in their current form, otherwise they would be treated as stock. Instead they use consumables as a part of the transformation process.

Consumables could include office supplies, petrol, electricity, screws and nails, cleaning products, packing boxes, and other incidental but important,

items, where these are not the key items of stock for sale.

e.g. Petrol is a consumable for a delivery service, but naturally is stock for a petrol station.

Office supplies are consumables for almost every business but are stock for a newsagent.

Screws, nuts, bolts and other small fixings would be consumable for a carpenter but stock for a hardware store.

Preview

Inputs - Materials A

Consider the industry area for your Numeracy-based Project Plan. Outline the types of inputs of materials that are commonly used by enterprises in that industry.

Industry	Enterprise
What do they do: i.e. sell, produce or provide?	
Materials: Classify these as raw materials (RM) or processed materials (PM).	
Stock: What stock items do they buy up or sell? Consider & production stock and trading stock.	
Consumables: What other items do they use up as part of their operations?	

Draft

Do Not

Copy

11.05 Inputs - Materials

Numeracy in action

One of the most relevant areas for you to investigate for the **inputs stage** of your Applied Numeracy Projects is the amounts, and the costs, of **materials inputs**. All enterprises use materials as inputs to one extent or another, including **raw materials**, **processed materials**, **trading stock**, **production stock** and other **consumables**. Enterprises need to be able to track the **amounts** and **costs** of the inputs they use.

- As a class work through these checklists and see which might apply to the industry (and enterprises and work settings) you are investigating for your Applied Numeracy Projects. Also keep in mind that the numerical data and information from your investigations might naturally be related to one or more of other focus areas (e.g. Number and Measurement or Number and Financial Numeracy) and/or related to another industry stage.

Number

Inputs - Materials

- ☐ How much materials inputs.
- ☐ How many materials inputs.
- ☐ Different types of materials inputs.
- ☐ Different stock inputs.

Measurement

Inputs - Materials

- ☐ Sizes of materials inputs.
- ☐ Weights of materials inputs.
- ☐ Lengths of materials inputs.
- ☐ Volume of materials inputs.
- ☐ Ratios of materials inputs.
- ☐ Ratio of different types of stock.

Financial Numeracy

Inputs - Materials

- ☐ \$ costs of materials inputs.
- ☐ \$ costs of different materials inputs.
- ☐ \$ costs of stock inputs.

Probability & Statistics

Inputs - Materials

- ☐ Changes in amounts, measures and costs over time.
- ☐ Comparison of amounts, measures and costs for different workers.
- ☐ Comparison of amounts, measures and costs for different goods, services, tasks or projects.
- ☐ Comparison of amounts, measures and costs with other firms.
- ☐ Possible/likely changes in the future.

ANP Example: Chicken chicken'

Pol is going a VET course in hospitality and works at Chicos Chicken Barn in the Accommodation and Food Services industry. He works mainly in the kitchen but sometimes on registers. Pol sees lots of boxes of fresh and frozen food come in to the place each day, but he would like to know just how much these amounts really are. He thinks that knowing this will help him if he ever has to handle ordering food in his future career.

Pol is going to estimate how much food the that Chicos' normally uses per week. Pol is going to organise his information according to different types of food inputs including chickens, patties, buns, nuggets, chips and salad items.

Pol will do some research and then compare actual amounts to his estimates.

Pol is thinking that he might calculate the total weight of each of these food input categories and create daily, weekly and annual averages. These could be shown on a pie chart or bar graph.

Pol thinks he might choose 3 weekly-based tasks or inputs, but needs to check first with his teacher, as some information might better match the processing stage.

✓ **Inputs - Materials: Number**

Estimating and counting different food ingredient amounts and totals.

✓ **Inputs - Materials: Measurement**

Estimating, calculating, totalling and comparing the total weight of inputs of different types of food ingredients daily and weekly.

✓ **Inputs - Materials: Financial Numeracy**

Estimating and calculating the \$ costs of stock inputs and the costs for different food ingredient categories daily and weekly.

Inputs - Materials in action B

Consider the example of Pol and Chico's Chicken Barn. What type of numerical techniques, information and skills do you think he is going to use for his ANP?

Estimating and counting different food ingredient amounts and totals.	Estimating, calculating, totalling and comparing total weight of inputs of types of food ingredients daily and weekly.
Numerical techniques:	Numerical techniques:
Numerical information:	Numerical information:
Numerical skills:	Numerical skills:

11.07 Inputs - Materials

ANP Inputs - Materials Investigation

If you are investigating an industry area that uses materials extensively as part of its production or service-provision process then you should complete this **ANP: Inputs - Materials Investigation** pro-forma.

Some possible numerical processes and techniques are listed below to guide you. Industry areas and related workplace settings that are more suitable for a **materials inputs focus** for your ANP are as follows.

- ☐ Primary industries such as agriculture, forestry or fishing, e.g. a farm; or mining.
- ☐ Secondary industries such as manufacturing, milling, smelting or refining. e.g. A factory producing either intermediate goods (such as timber) or finished goods such as (furniture).
- ☐ Construction industry firms such as carpentry, plumbing, plastering, bricklaying, concreting, roof-sheeting, electrical engineering, etc.
- ☐ Retail trade and wholesale and firms dealing in different types of goods.
- ☐ (Accommodation and) food services using materials as ingredients.
- ☐ Personal services firms that use consumables, e.g. hairdressing & beauty therapy.

- ✓ **Identify numerical processes to collect data (and information).**
- ✓ **Use numerical techniques and technologies to organise and use the data.**
- ✓ **Estimate, calculate, summarise, analyse and communicate using the data.**

Classifying different types of materials.

Measuring different types of materials.

Working out costs of different materials.

Classifying different types of consumables.

Measuring different types of consumables.

Working out costs of different ingredients.

Classifying different types of stock.

Measuring different types of stock.

Working out costs of different stock.

Counting amounts of different types of materials.

Counting amounts of different types of consumables.

Counting amounts of different types of stock.

Working out cost of materials in total.

Working out costs of ingredients in total.

Working out costs of stock in total.

Describing different ingredient ratios, proportions or costs.

Describing different materials ratios, proportions or costs.

Examining waste amounts, ratios and costs.

Comparing materials costs from different suppliers.

Comparing materials costs over time.

Applied Numeracy Project: Inputs - Materials Investigation		ANP Inputs - Materials
Inputs: EBT Focus area: ANP 1	Inputs: EBT Focus area: ANP 2	
Numerical processes I will use to collect data and information.		
Numerical techniques and technologies I will use to organise and use the data		
Preview		
Estimates related to the data & information		
Draft		
Do Not		
Copy		
Summary information about the data & information		
		ANP Inputs - Materials

11.09 Inputs - Labour

Labour

Labour refers to the human effort that goes into the transformation process and includes the skills of workers, the level of worker expertise and of course the time and its associated labour cost that a worker puts into a task. The cost of labour is a key input into the transformation process. For many enterprises, especially services involving significant human effort, labour is the biggest input cost!

Labour: Time and cost

Time is a key measure of labour as an input. One way to measure time as a labour input is calculating the amount of labour hours or people-hours required for different job tasks.

e.g. A supermarket might need 800 people-hours a week for checkout, 120 hrs/week for the deli and another 400 hrs/week for other job roles.

Time can then be conveniently measured in \$, especially when dealing with wage-earning workers. You can simply multiply the number of hours worked, by the wage rate for different workers.

e.g. It takes 2 warehouse workers, 4 hours each to process and pack a large order. If each worker earns a wage of \$20/hour then the total wage cost for this job = \$160.

But keep in mind that some workers cost more than others. Or perhaps it might be better to say that some workers cost less (are cheaper) than others!

Labour as an input is also more efficient if workers are busier.

e.g. If a chef only makes 20 meals on a slow night they'll still be paid the same as if they were making 100 meals on a very busy night. So if the chef is paid \$200 for their night's work this means that the slow night costs:

\Rightarrow \$10/meal (\$200/20 meals) in chef food cost time, versus
 \Rightarrow \$2/meal (\$200/100 meals) on the busier night.

Labour time and/or cost can be counted or calculated by:

- \Rightarrow how many workers are needed
- \Rightarrow how many labour hours are required
- \Rightarrow which types (skill levels) of workers are needed
- \Rightarrow \$ cost of labour hours for a job
- \Rightarrow \$ cost of different levels of workers required for a job
- \Rightarrow average \$ cost of workers for a job
- \Rightarrow average hourly, weekly or task cost of labour for a salary worker
- \Rightarrow various productivity ratios related to any or all of the above.

So which of these measures do you think would suit your industry investigation?



Image:
auriso/Depositphotos.com

Labour: Skills and expertise

Workers are required to perform various tasks as part of the transformation process. This means that workers need to be skilled so as to properly and safely carry out their duties as efficiently as possible.

Formal and informal training, including both on and off-the-job training is a key factor in developing a skilled workforce. Investment in training develops workers who are better skilled and more capable of performing their work tasks. This creates a better 'return' on labour costs, improving the transformation process through improved quality and efficiency.

Different tasks may require various levels of expertise including highly skilled workers, supervision and management, professional support, and even outsourced expertise. These all come at a higher labour cost.

Input issues to consider related to this include:

- ⇒ cost of training
- ⇒ paying more for better skills
- ⇒ some job tasks have higher labour costs due to expertise needed
- ⇒ learning labour is more expensive and requires more expertise
- ⇒ paying salaries vs paying wages.

Preview

Draft

Inputs - Labour A

Choose 2 enterprises from your industry area. Outline the different types of labour inputs that these enterprises might normally use as part of their operations.

Enterprises:		
What do they do: i.e. sell, produce or provide?		
Common job tasks required: e.g. Pre-cutting all salad items.	Labour inputs needed: e.g. At least 1 worker to do this before opening, for 3 hours.	Other skills/expertise needed: e.g. Might need a supervisor.

Do Not Copy

11.11 Inputs - Labour

Numeracy in action

Another important area for you to investigate for your Numeracy Project is the amount and cost of **labour inputs**. All enterprises rely on the labour of workers to produce goods or provide services. This labour can include work needed for the usual day-to-day job tasks, as well as higher level skills and expertise for more complex tasks. Enterprises need to be able to track the amount, cost and types of the labour inputs they use.

As a class work through these checklists and see which might apply to the industry (and enterprises and work settings) you are investigating for your ANP.

And again, the numerical data and information from your investigations might naturally be related to one or more of other focus areas (e.g. Number and Measurement or Number and Financial Numeracy) and/or related to another industry stage.

Number

Inputs - Labour

- ☐ Total number of workers.
- ☐ Total number of work hours.
- ☐ Amounts of different types of labour inputs.
- ☐ Amounts of different types of labour hours.

Measurement

Inputs - Labour

- ☐ Time as an input.
- ☐ Labour cost as an input.
- ☐ Labour hours in total; and/or per worker.
- ☐ Labour hours at different times and for different days.
- ☐ Labour hours for different job tasks or job classifications.
- ☐ Productivity ratios of labour hours per job task per worker, per day, etc..
- ☐ Productivity ratios of labour costs/job task, /worker, /day, etc..

Financial Numeracy

Inputs - Labour

- ☐ \$ costs of labour inputs.
- ☐ \$ costs of different labour inputs.
- ☐ \$ costs of outsourced labour inputs.
- ☐ Productivity ratios.

Probability & Statistics

Inputs - Labour

- ☐ Changes in labour amounts and costs over time.
- ☐ Comparison of labour amounts and labour costs for different workers.
- ☐ Comparison of labour amounts and labour costs for different tasks or projects.
- ☐ Comparison of labour amounts and labour costs with other firms.
- ☐ Possible/likely future changes in labour amounts and labour costs.

ANP Example: Counting me in

La is working at Nugget's News and Lotto as part of the Retail Trade industry. She hopes to one day run her own retail shop so she wants to know more about the business side of retail operations.

First off La is going to estimate the total number of workers, the number of hours each worker usually works a week and then the total number of work hours. Then she will use the weekly roster to calculate a more accurate count.

La is then going to look at the different labour costs for workers in the Retail Trade industry. She is going to estimate hourly wages for trainees, part-time staff, full-time staff, the manager and casual rates.

La will then research the actual wage rates using the Retail Industry award, and compare these to her own workplace.

La is going to classify different workers according to the cost of their labour, i.e. the part-time sales assistant compared to the manager. She is then going to show the comparison on a bar graph.

Pol has decided to choose 2 EEs for inputs related to Labour.

✓ **Inputs - Labour: Number**

Total number of workers and total number of work hours.

✓ **Inputs - Labour: Financial Numeracy**

Estimating and calculating costs of labour inputs.

Consider the example of La at Nugget's News and Lotto What type of numerical techniques, information and skills do you think La is going to use for her ANP?

Total number of workers and total number of work hours	Estimating and calculating \$ costs of labour inputs.
Numerical techniques:	Numerical techniques:
Numerical information:	Numerical information:
Numerical skills:	Numerical skills:

11.13 Inputs - Labour

ANP Inputs - Labour Investigation

When you are investigating industry areas all enterprises rely on **labour** as part of their production or service-provision process. So you should complete this **ANP: Inputs - Labour Investigation** pro-forma.

Some possible numerical processes and techniques are listed below, but note: All industry areas and their related workplace settings are suitable for a **labour inputs focus** for your ANP. Some examples include:

- ☐ All labour-intensive people and community services such health, caring, education, community services, emergency services and many others.
- ☐ Information and professional services such as media, ICT, accounting, finance, legal, marketing, engineering and many others.
- ☐ Labour-intensive manufacturing such as high-value fashion clothing.
- ☐ Construction industry firms that rely on labour-intensive skills and expertise.
- ☐ Retail trade and wholesale trade (they are the biggest employing industry).
- ☐ Accommodation and food services of all types.
- ☐ Personal services, arts and recreation and all other industry areas.

- ✓ **Identify numerical processes to collect data (and information).**
- ✓ **Use numerical techniques and technologies to organise and use the data.**
- ✓ **Estimate, calculate, summarise, analyse and communicate using the data.**

Classifying different types of workers.

Measuring labour time overall.

Working out costs of different labour.

Classifying different levels of workers.

Measuring labour costs per job/task.

Counting numbers of workers overall.

Counting numbers of workers, worker hours in total and equivalent full-time workers.

Counting amounts of workers and worker hours for specific types of workers.

Counting amounts of workers and worker hours for specific types of jobs.

Working out cost of labour in total.

Working out cost of management labour.

Working out costs of outsourced labour.

Comparing costs of apprenticeship labour.

Comparing costs of traineeship labour.

Comparing costs of junior labour.

Comparing labour costs from different sources.

Calculating different labour productivity ratio and measures.

Comparing internal labour costs with out-sourced labour costs.

Comparing full-time, part-time and casual labour costs.

Comparing labour costs over time.

Applied Numeracy Project: Inputs - Labour Investigation		ANP Inputs - Labour
Inputs: EBT Focus area: ANP 1	Inputs: EBT Focus area: ANP 2	
Numerical processes I will use to collect data and information.		ANP Inputs - Labour
Numerical techniques and technologies I will use to organise and use the data		
Preview		
Estimates related to the data & information		
Draft		ANP Inputs - Labour
Do Not		
Copy		
Summary information about the data & information		

11.15 Inputs - Other

Other inputs

There are a range of other inputs (besides materials and labour) that are part of the transformation process. These include categories such as **equipment inputs**, **capital inputs** and **information inputs**. All enterprises use these other inputs in various amounts in combination with materials and labour.

For many of you it might be better to focus on these other inputs as part of the processing stage (which is the next stage) of your Applied Numeracy Projects. However, some of you might be investigating an industry that relies heavily on one or more of these other categories of inputs as opposed to materials. For example:

- ⇒ a service industry such as telecommunications relies heavily on the use of equipment inputs (e.g. technological equipment) rather than inputs of materials
- ⇒ a service industry such as finance and insurance relies heavily on the use of capital inputs (e.g. financial investment) rather than inputs of materials
- ⇒ a service industry such as media relies heavily on the use of information inputs (e.g. publications and digital entertainment) rather than inputs of materials

It is important that you realise that all industries rely heavily on the use of labour as an input and this makes for a very useful focus throughout your investigation. Enterprises in all industries also use capital inputs to set up and fund their operations, but it is probably best that you don't make capital inputs the focus of your investigation. Rather, you can focus on what enterprises use the capital for, such as buying tools, equipment, machinery and technology.

Image: wellphoto/iStock/Thinkstock



Equipment inputs

Equipment inputs usually include all of the various tools, equipment, machinery, vehicles and technological devices and systems used to produce and provide goods and services.

Enterprises across all industries invest in practical, useful and often state-of-the-art equipment so as to produce their goods or provide their services.

Equipment varies greatly: compare coal mining with a beauty salon, an airline operator with a mobile auto-electrician, and even a fish farmer with a child-care centre.

Equipment is usually industry-specific and enables workers to efficiently perform work tasks required by enterprises in a specific industry. e.g.

- ⇒ A nailgun is an essential tool for construction industry workers who deal with timber.
- ⇒ A commercial oven is an essential item of equipment for a chef in the restaurant industry.
- ⇒ A delivery van is a vital item of machinery for parcel couriers in the transport industry.
- ⇒ An EFTPOS and digital sales terminal is vital technology for sales assistants in the retail industry to process transactions.

So for your ANP, you might choose to investigate the cost of the various types of equipment required for particular enterprises in your industry.

Some types of equipment might be used in almost any industry. But this equipment may require modifications, or the use of specialised software and apps, so that it can be used effectively for tasks required in that industry. e.g. Computers, mobile devices, motor vehicles and other 'universal' equipment.

Enterprises purchase equipment by using capital funds (i.e. money invested in the business).

This is especially relevant when new enterprises start-up as they will have to spend a lot of money on equipment at this formative stage.

This might make for an interesting enquiry-based task for your ANP; i.e. investigating start-up equipment costs as an input for a new enterprise in a particular industry.

Enterprises also upgrade equipment as they grow. Enterprises might have to upgrade to keep up with competitors and industry trends. In order to fund (or finance) this upgrade they might invest more capital in the enterprise, or borrow money, or use retained earnings, i.e. use part of their profit to buy new equipment. This could also make for a potential enquiry-based task for your ANP.

Capital input

Capital represents all the money that an enterprise invests to start-up and/or to purchase tools, machinery, plant and equipment, technology and so; on an ongoing basis. Capital can also be represented by owner's equity which is accumulated by keeping profits in the enterprise (retained earnings). It is better that you deal with capital as an input in terms of the equipment that an enterprise invests in.

However, if you are dealing with a start-up enterprise within your industry for your ANP then you might investigate capital as an input.

Alternatively, if your VET course or work placement is related to the Finance and Insurance industry then capital would be a key input to investigate.

And finally, if you are investigating not-for-profit community services, or arts and creative industries, then capital is also a potential input to investigate as it might be sourced through grants, government funding and even crowdfunding.

Information inputs

There is an increasing range of enterprises in different industries have to source and purchase information as an input.

Of course the Information Media and Telecommunications industry is a key example. Broadcasters have to 'purchase' their content - just like you purchase ingredients for a hamburger!

Many specialist ICT developers sell their services (e.g. consultancy and advice, or perhaps software and apps) as products that could be classified as information inputs.

Many enterprises operating in the Professional, Scientific and Technical Services industry have to buy information such as pre-prepared research, data analysis and specialist information services from industry professionals (i.e. outsourcing).

So if your VET studies or work is related to these industries then you might investigate information as an input - just like a restaurant would use food ingredients, or a manufacturer would use raw and processed materials.

11.17 Inputs - Equipment

Numeracy in action - Equipment

An area that you might investigate for the inputs stage of your Numeracy Project is the types and cost of **equipment inputs**.

All enterprises use rely on various **equipment, tools, machinery, technology, devices** and **vehicles** in order to produce goods or provide services. Enterprises invest significant funds (**capital**) into purchasing equipment for use by workers. Enterprises in all industries also have to **update equipment** in line to keep up with industry changes, ongoing **innovation** and the emergence of **new technologies**, including digital technologies.

Also keep in mind that the numerical data and information from your investigations might naturally be related to one or more of other focus areas) and/or related to another industry stage. So perhaps, it might be better for you to investigate equipment as part of the processing stage (the next stage) of your Applied Numeracy Projects.

As a class work through this checklist and see which might apply to the industry (and enterprises and work settings) you are investigating for your ANP.

Number

Inputs - Equipment

- ☐ Types of equipment; and overall totals (audit).
- ☐ Counts of tools (audit).
- ☐ Counts of other types of equipment.
- ☐ Classification of different types of equipment.
- ☐ Comparison of equipment used by different types of workers.

Measurement

Inputs - Equipment

- ☐ Size of equipment.
- ☐ Weight of equipment.
- ☐ Lifespan of equipment (time).
- ☐ Measuring devices: Tools and equipment used for measuring.

Financial Numeracy

Inputs - Equipment

- ☐ \$ costs of equipment in total.
- ☐ \$ costs of specific types of equipment, e.g. tools.
- ☐ \$ costs of replacing equipment.
- ☐ \$ costs of new equipment.

Probability & Statistics

Inputs - Equipment

- ☐ Comparison of costs of different types of equipment.
- ☐ Comparison of costs of equipment with other firms.
- ☐ Comparison of past costs with current costs of equipment.
- ☐ Investigation of potential future equipment costs.

ANP Example: Tool up to start up

Kev is investigating the Construction industry for his ANP. He understands that tradies are expected to have some of their own tools, light equipment and a vehicle, so he is going to investigate these equipment costs as inputs for an apprentice tradie.

Kev is wondering what type of equipment a plumber would need if they are going to take a chance and work for themselves. So Kev is then going to compare his findings for an apprentice, to the equipment needed by a plumber if they are going to start up their own business. He has worked with a few self-employed plumbers so that's where he is going to get his information.

Kev is going to research and estimate the total cost of the equipment for an apprentice. Kev is then going to investigate the tools and equipment a self-employed plumber might need to operate independently, and then compare these costs to his previous findings.

This sounds like a very interesting and informative investigation and Kev is keen to make a video presentation for the class when it comes to final assessment.

After discussing with his teacher, Kev will choose 2 NBIs for equipment inputs.

- ✓ **Inputs - Equipment: Plumber**
Comparison of types and amount of equipment used by different workers (in this case an apprentice vs self-employed).
- ✓ **Inputs - Equipment: Financial Numeracy**
Calculating the costs of equipment in total and \$ costs of specific types of equipment.



Image: photography33/Depsoitphotos.com

Preview
Draft
Do Not
Copy

Inputs - Equipment A

Choose an enterprise from your industry and outline the different types of equipment inputs that it might normally use as part of its operations.

Enterprise:		
Equipment: Tools & ???	Equipment: Machinery	Equipment: Technology

11.19 Inputs - Equipment

ANP Inputs - Equipment Investigation

If you are investigating a capital-intensive industry area that extensively uses equipment as part of its production or service-provision process you should complete this **ANP: Inputs - Equipment Investigation** pro-forma.

Some possible numerical processes and techniques are listed below to guide you. Industry areas and related workplace settings that are more suitable for an **equipment inputs focus** for your ANP are as follows.

- ☐ Primary industries such as agriculture, forestry or fishing, e.g. a farm; or mining.
- ☐ Secondary industries that are capital-intensive such as manufacturing, milling, smelting or refining.
- ☐ Construction industry firms such as carpentry, plumbing, plastering, bricklaying, concreting, cabin-making, electrical, engineering.
- ☐ Retail and wholesale trade, repair and maintenance and food services.
- ☐ Information and professional services such as media, communications, ICT firms, accounting, finance, legal, marketing, engineering and many others.
- ☐ Human services such as education, medical, caring, emergency services.
- ☐ Personal services e.g. hair and beauty and other services e.g. automotive.

- ✓ **Identify numerical processes to collect data (and information).**
- ✓ **Use numerical techniques and technologies to organise and use the data.**
- ✓ **Estimate, calculate, summarise, analyse and communicate using the data.**

Classifying different types of equipment.

Measuring different types of equipment.

Working out costs of different equipment.

Counting amounts of different types of tools.

Counting amounts of different types of equipment.

Counting amounts of different types of machinery.

Working out costs of specific tools.

Working out costs of specific machinery.

Working out costs of specific vehicles.

Working out total costs of tools.

Working out total costs of machinery.

Working out total costs of vehicles.

Working out cost of equipment in total.

Calculating the cost of replacing equipment.

Comparing labour and equipment costs.

Comparing equipment costs from different suppliers.

Comparing the costs of second-hand with new equipment.

Comparing equipment costs over time.

Applied Numeracy Project: Inputs - Equipment Investigation		ANP Inputs - Materials
Inputs: EBT Focus area: ANP 1	Inputs: EBT Focus area: ANP 2	
Numerical processes I will use to collect data and information.		
Numerical techniques and technologies I will use to organise and use the data		
Preview		
Estimates related to the data & information		
Draft		
Do Not		
Copy		
Summary information about the data & information		
		ANP Inputs - Equipment

11.21 ANP: Inputs Investigation

ANP Inputs (Overall) Investigation

Use the **Inputs (Overall) Investigation** to guide your Applied Numeracy Project investigation into work settings or workplaces within your industry.

- ☐ Identify the **key types of inputs** in this **industry context**, and how these are used.
- ☐ Identify the **numerical processes** to **collect** relevant **data** and information.
- ☐ Identify the **numerical techniques** to **use** the collected **data** and information.
- ☐ Use the collected data and information to **make estimates**.
- ☐ Use the collected data and information to **make calculations**.
- ☐ Develop **summary** statements to **describe** the key **data** and information
- ☐ Analyse the key **data** and information - make **inferences** and **conclusions**.
- ☐ Other: i.e. the most suitable way to communicate the data and information.

ANP Inputs		Applied Numeracy Project: Inputs (Overall) Investigation	
Name(s):		Date:	
Industry:		Workplace:	
Inputs: (Consider materials, labour, equipment and/or other inputs) Key examples and types involved and how these are used.			
Inputs: (Materials, labour, equipment, other) Numerical processes I can/will use to collect <u>estimates</u> of data & information.		Inputs: (Materials, labour, equipment, other) Numerical techniques I can/will use to make <u>estimates</u> using data & information.	
Inputs: (Materials, labour, equipment, other) Applied examples of <u>estimates</u> using these numerical processes and techniques.			

Applied Numeracy Project: Inputs (Overall) Investigation (cont.)	
Inputs: (Materials, labour, equipment, other) Numerical processes I can/will use to do <u>calculations</u> using the data & information.	Inputs: (Materials, labour, equipment, other) Numerical techniques I can/will use to do <u>calculations</u> using the data & information:
Inputs: (Materials, labour, equipment, other) Applied examples of <u>calculations</u> using these numerical processes and techniques.	
<p>Preview</p> <p>Draft</p> <p>Do Not</p>	
Use the estimates and/or calculations to develop descriptive summary statements.	
Analysis based on the estimates and/or calculations: What are some key <u>conclusions/inferences</u> you can make from the data?	
Other: How the data and information might best be communicated. (e.g. Numbers, words, visual, etc..)	

11.23 Assessment Task

AT2 Applied Numeracy Project - EBT: Inputs

Overview

For your whole-of-unit **Numeracy-based Project** you have to select 6 **Enquiry-based Tasks** (EBTs) to investigate across the three industry stages of:

- ☐ **inputs,**
- ☐ **processing, and**
- ☐ **outputs.**

You must select at least 1 EBT for each of these stages.

Your EBTs must also cover all four focus areas:

- ☐ Number
- ☐ Measurement
- ☐ Financial Numeracy and
- ☐ Probability and Statistics

Consider

- ⇒ It is best to select 2 EBTs related to **inputs** (or perhaps 3 if you are investigating an industry that uses lots of inputs) for your **Numeracy-based Project**.
- ⇒ It is best to select no more than 2 of the focus areas of Number, Measurement, Financial Numeracy or Probability and Statistics (at least 1).
- ⇒ Some EBT focus areas for inputs will naturally complement one another. e.g. Number and Measurement, or Number and Financial Numeracy.

So complete the summary table below to indicate the EBTs you will be investigating for your **Numeracy-based Project**.

We will use the term **Applied Numeracy Project (ANP)** to refer to your undertaking and completing each of your 6 EBTs. So 6 x ANPs = 1 **Whole-of-unit Numeracy-based Project**.

Numeracy-based Project				
Name:		Dates:		
Industry:				
Workplace(s)				
Industry Stages	Focus area: Number (N)	Focus area: Measurement (M)	Focus area: Financial Numeracy (FN)	Focus area: Probability and Statistics (PS)
Inputs				
Processing				
Outputs				

PODR: Applied Numeracy Project - Inputs

In order to successfully complete this **Applied Numeracy Project (ANP)** for the **inputs industry stage** you should make use of the **PODR: Process** to successfully manage these tasks.

- ⇒ **Planning** and **organising** yourself, timelines, industry contacts, devices and software, and any other resources you need to undertake your investigation.
- ⇒ **Doing** the investigation including making estimates, performing calculations, using technology and software to access, record, collate and organise data and information; and dealing with problems that may arise in collecting or analysing the data and information.
- ⇒ **Reviewing** your progress in each EBT as part of your ANP on an ongoing basis, making adjustments (problem-solving); and then reviewing your overall performance across the entire whole-of-unit Numeracy-based Project.

Required: Applied Numeracy Project - EBT Inputs

- a. Choose your **focus area** and negotiate the suitability of this with your teacher.
- b. Use PODR to plan and organise your investigation into **inputs** for this focus area. This involves:
 - ⇒ anticipating the **types** of numerical **inputs** and **calculations** you will need to do
 - ⇒ determining the most suitable numerical **processes** and **techniques** to **gather data** and **information** from your industry and (workplaces) so that you can do these estimates and calculations.
- c. Apply numerical and problem-solving techniques to **gather your data** and **information** accurately, professionally and safely (the doing phase); including evaluating, accessing and using suitable devices and software.
- d. Choose and apply appropriate estimates, calculations and numerical techniques to:
 - ⇒ organise and collate the data and information
 - ⇒ produce descriptive statements about the data and information
 - ⇒ analyse the data and information, and
 - ⇒ draw conclusions (inferences) from the data and information.
- e. Undertake a **review your performance** on this ANP.

ANP Stage 1

Choose your focus area. Negotiate suitability with your teacher.

ANP Stage 2

Use PODR to plan and organise your investigation.

Anticipating type of estimates and calculations; select the numerical processes and techniques to gather your data and information.

ANP Stage 3

Apply numerical processes and problem-solving techniques to gather your data and information.

Evaluate and use suitable devices and software.

Stage 4

Use your collected data and info to:

TBC

Stage 5:

Self-assess and review how well you did. Make improvements for your next ANP.

11.25 Assessment Task

Name:		Dates:		Industry Stage: Inputs	
Industry:				EBT#	
Workplace(s):					
Tasks - AT: Applied Numeracy Project - Enquiry-based Task		Re-quired	Due by	Done	Teacher initials
Stage 1: Design Numeracy-based Project					
i. Negotiate appropriate industry and workplace(s) with teacher.	✓				
ii. Select EBTs from each industry stage, and each focus area.	✓				
iii. Develop draft of Numeracy-based Project Plan.	✓				
iv. Get teacher feedback and finalise Numeracy-based Project Plan.	✓				
Stage 2: Undertake research for your ANP by applying numeracy skills					
i. Undertake your research for this EBT into inputs.	✓				
ii. Outline the processes you will use to collect data and information.	✓				
iii. Estimate, calculate and use technology to collect data and info.	✓				
iv. Apply numerical problem-solving tools and techniques as needed.	✓				
v. Use data and information to perform estimation and calculation.	✓				
vi. Use data and information to make inferences and conclusions.	✓				
vii. Use data and information and make inferences and conclusions.	✓				
viii. Analyse the data and information.	✓				
Stage 3: Use appropriate software tools and devices					
i. Describe software tools and devices that might best represent the data and information.	✓				
ii. Describe advantages & disadvantages of using these software tools and devices.	✓				
iii. Explain why you have chosen to use these software tools and devices; and use evidence to justify your choices.	✓				
iv. Use appropriate software tools and devices to handle the data and information you have collected.	✓				
v. Evaluate the software tools and devices you used and their effectiveness for collecting, collating and communicating.	✓				
Stage 4: Reporting					
⇒ Prepare a draft for your final report (Refer p.???)	✓				
Additional information:					
Signed: _____ Date: _____					

Industry Stages - Processing 12

Contents

12.01 Processing 248

Activities:

p. Due date/Done?

Comment

Preview
Draft
Do Not
Copy

Comments:

12.01 Processing

Processing

Processing refers to all of the actions and activities that are used by enterprises to produce goods and services as part of their **production process** or **service-provision process**. Processing involves combining productive resources to produce an output, i.e. a good or service. All production processes combine **inputs**, **labour** and **capital** inputs that are managed and coordinated through **enterprise** to create outputs.

Some **transformation processes** are inherently **labour-intensive** and rely on significant **human effort** and **expertise** to produce a product, e.g. teaching and education.

Other production processes are very **capital-intensive** and make use of significant investment in **technological processes** in order to produce products, e.g. mining.

One of the key issues related to processing is the achievement of **efficiency** in the use of resources. This means that enterprises use various numerical techniques to estimate and measure efficiency and productivity. So when you are investigating work settings within your chosen industry, you should aim to collect numerical data and information that will enable you to measure processing **efficiency**.



Applied Numeracy Project

In relation to processing you might investigate one or more of the following.

- ❑ **Amounts** and **ratios** of various resources used in goods production or service provision processes. (N)
- ❑ **Measurement** devices, techniques and units used in goods production or service provision processes. (M)
- ❑ **Cost** of wages and salaries as part of goods production or service provision processes. (FN)
- ❑ **Comparison of trends** related to goods production or service provision. (P&S)
- ❑ **Costs** of different processing types, methods and systems.
- ❑ **Changing ratios** of labour vs capital investment used in processing.
- ❑ **Measurements** of processing time, productivity, efficiency and waste.

You might also investigate industry-specific, processing-related issues in negotiation with your teacher.

Let's revisit the hamburger, one of Australia's biggest selling fast foods (estimates average consumption at about 1 per day for all Australians; 750+ million p.a!). Work in pairs to identify the main processing activities for these 4 categories) that go into producing and selling a hamburger in a fast food outlet.

Image: rozelt/
Depositphotos.com



Labour processes (including processing materials inputs)

Preview

Equipment and machinery processes (including processing materials inputs)

Draft Do Not

**ICT and data processing
(including processing materials inputs)**

Safety processes

(including processing materials inputs)

Copy

12.03 Processing - Goods

Processing - Primary and secondary industries

Goods production industries involve primary production, goods manufacturing, industrial manufacturing (such as steel) and construction (which is also a service industry).

Primary production

Primary processes are normally capital-intensive using a lot of equipment and technology supported by labour expertise.

Some farming processes can need a lot of labour at certain times of the year, e.g, harvesting and picking, whereas others require day-to-day farm labourers e.g. dairy.

Primary producers and miners make use of many diverse practical, manual and technical processes needed for their day-to-day, and longer term operations.

Primary production involve processes such as:

- ✓ sowing
- ✓ growing
- ✓ raising
- ✓ harvesting
- ✓ fishing
- ✓ catching
- ✓ logging
- ✓ mining
- ✓ extracting



Images adapted from:
Jeremy/Depositphotos.com

Images adapted from:
bubaone/Depositphotos.com

Do Not

Manufacturing - Goods

Manufacturing processes are normally capital-intensive supported by labour expertise.

Manufacturers might make consumer products (e.g. bread, shoes or furniture) or industrial products (flour, leather or steel).

Manufacturing combines many diverse practical, manual and technical processes, along with information processes and safety process.

Productivity targets are a key consideration in manufacturing including keeping unit cost as low as possible.

Goods manufacturing involves varied processes such as:

- | | |
|-----------------|------------------------|
| ✓ making | ✓ building |
| ✓ manufacturing | ✓ assembling |
| ✓ milling | ✓ brewing |
| ✓ refining | ✓ printing |
| ✓ tanning | ✓ cooking (industrial) |
| ✓ smelting | ✓ weaving |
| ✓ refining | ✓ knitting |
| ✓ slaughtering | ✓ sewing |
| ✓ butchering | |
| ✓ crafting | |

Construction

The construction industry makes goods and also provides services.

Technically many large structures that are made are goods; such as houses, buildings and civil projects (e.g. bridges, roads, etc.).

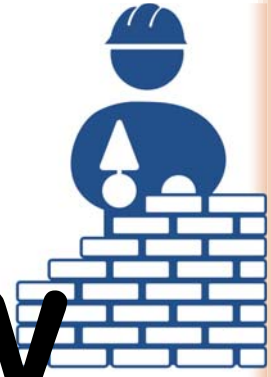
However, many of the workers involved in construction provide services to build a smaller component or section of a larger structure.

A house frame might be built offsite, and technically this is manufacturing; but it is fine to include this as an example of a construction 'good' in this is your industry area.

Construction combines diverse practical, manual and technical processes, along with information processes and safety process.

Some key construction 'goods' processes are:

- ✓ making
- ✓ assembling
- ✓ building.



Preview

Draft

Processing - Goods A

Do Not Copy

12.05 Processing - Goods

Numeracy in action

For your Numeracy Project it likely that you will investigate more than one enquiry-based for the processing stage.

All enterprises combine a range of process to produce their products. **Goods processing** focus on the measurement, development, use and application of processes involving materials (raw or processed), ingredients, stock and other consumables. Enterprises set and monitor targets related to cost ratios, materials and labour productivity, waste reduction, safety and other measures.

As a class work through this checklist and see which might apply to the industry (and enterprises and work settings) you are investigating for your Applied Numeracy Project.

Number

Processing - Goods and materials

- ☐ Amounts and totals of materials involved in processing overall.
- ☐ Amounts and totals of materials involved in processing for different items or processes.
- ☐ Amounts and totals of different resources needed for overall processing; and for varied processes.

Measurement

- ☐ Description of the different measuring units, tools and devices required.
- ☐ Explanation of measurement techniques for common work tasks.
- ☐ Calculations that are required for different processes.
- ☐ Time-based measures and requirements in the production process.
- ☐ Measurements of productivity and efficiency rates.
- ☐ Amount of waste generated by amount, weight or time.

Financial Numeracy

Processing - Goods and materials

- ☐ Calculation of total processing costs.
- ☐ Calculation of processing costs per item for different products.
- ☐ Calculations of productivity and efficiency rates in dollars.
- ☐ Estimates and calculations of cost of waste generated.

Probability & Statistics

Processing - Goods and materials

- ☐ Comparison with industry benchmarks and guidelines.

Applied Numeracy Project: Example

Preview Draft Do Not

Processing - Goods B

Consider the example of ... What type of numerical techniques, information and skills do you think he is going to use for his ...?

Time-based measures and equipment in the production process.	Processing costs (materials and labour \$) per item for different products.
Numerical techniques:	Numerical techniques:
Numerical information:	Numerical information:
Numerical skills:	Numerical skills:

DRAFT

NUMERACY INTERMEDIATE 2ed. - FOR VCAL AND APPLIED LEARNING

Written by Michael Carolan. Copyright © 2018 DELIVER Educational Consulting and its licensors. All rights reserved.

12.07 Processing - Goods

ANP Processing - Goods Investigation

If you are investigating an industry area that mainly makes physical products or goods as part of its production processes, such as manufacturing and goods construction; or one that deals with raw materials and natural resources, such as agriculture, forestry, fishing, and mining; then you should complete this **ANP: Goods Investigation** pro-forma.

Some possible numerical processes and techniques are listed below to guide you. Industry areas and related workplace settings that are more suitable for a **goods processing focus** for your ANP are as follows.

- ☐ Manufacturing firms of all types that turn raw materials, production stock and other physical inputs into other products such as factories, mills, refineries, smelters and commercial food and beverage production.
- ☐ Construction industry firms that build and construct dwellings, commercial buildings, industrial buildings or civil construction.
- ☐ Firms involved in growing, harvesting, collecting or extracting natural resources and commodities using agriculture, forestry, fishing, and mining processes.

- Processing - Practical Skills**
- ✓ **Identify numerical processes to collect data (and information).**
 - ✓ **Use numerical techniques and technologies to organise and use the data.**
 - ✓ **Estimate, calculate, summarise, analyse and communicate using the data.**

**Do Not
Copy**

Applied Numeracy Project: Processing - Goods Investigation		ANP Processing Goods
Processing: EBT Focus area: ANP 1	Processing: EBT Focus area: ANP 2	
Numerical processes I will use to collect data and information.		ANP Processing Goods
Numerical techniques and technologies I will use to organise and use the data.		
Preview		
Estimates related to the data & information.		
Draft		
Do Not		
Copy		
Summary information about the data & information.		

12.09 Processing - Services

Processing - Services

The majority of economic activity and employment in Australia is within service industries. Service processes can vary widely depending on the nature of the service that occurs.

For example, consider the difference between aged-care services, education and training services, and computer network development services. And what about the different service processes offered by a chef, hairdresser, a police officer and a media producer?

We can classify services according to these 5 categories. However, some services may cross over into more than one category, especially people and community services.

⇒ **Practical services**

⇒ **Goods-trading services**

⇒ **Information services**

⇒ **People services**

⇒ **Community services**

So what type of service does your industry provide?

Preview

Practical services

Practical services involve processes such as:

- ✓ making
- ✓ serving
- ✓ cooking
- ✓ repairing
- ✓ building
- ✓ supplying
- ✓ delivering
- ✓ transporting
- ✓ installing
- ✓ crafting.

Practical services provide a tertiary service such as food and hospitality, public and private transport, couriers and construction.

Many service providers tend to use capital-intensive processes combined with varying amounts of labour inputs.

Many practical service-providers step in and take over the tasks that people can't, don't or won't do themselves, such as car repairs, household maintenance and even home-delivery of meals!

Many of these services involve the use of materials inputs, combined with technical labour expertise, such as in food services and construction.

More than 40% of all young employees aged 15-24 work in accommodation and food services enterprises dealing with food and/or hospitality.

Some key examples of product-based services include:

- ⇒ food services
- ⇒ arts and crafts
- ⇒ water, gas and electricity supply
- ⇒ hotels and accommodation
- ⇒ home maintenance
- ⇒ transport
- ⇒ couriers
- ⇒ construction
- ⇒ automotive repairs.



Images adapted from:
depositphotos.com

Goods-trading services

Goods-trading services involve processes such as:

- ✓ selling
- ✓ buying
- ✓ retailing
- ✓ wholesaling
- ✓ trading.



The two key types of good-based services are wholesale trade and retail trade. More than 30% of all young employees aged 15-24 work in retail trade, and over 15% of the total workforce is employed in retail.

Retailers such as supermarkets, clothing stores and milk bars use face-to-face and online processes to offer and sell products (stock) to customers.

Wholesalers supply stock and supplies in bulk to manufactures, retailers and other enterprises.

These goods-trading service providers use varied equipment, shop fittings, warehouses and digital and technological ICT to support their retail or wholesale operations.

The use of human labour is often a key component of the process, especially in face-to-face retail.

Preview

Information Services

Information services are a growing area of service-provision due to economic growth and continued digital innovation.

Information services can involve capital-intensive technological systems. High level ICT design and development expertise can be used to create and deliver information and data services. (e.g. Media streaming and communications products).

Professional information services provide high quality expert knowledge and data. (e.g. ICT, business, financial marketing and legal advice).

Consumers are switching to digital services to access media products as data, rather than buying physical products. e.g. streaming music and films rather than buying CDs and DVDs.

Enterprises often buy-in information services and data that are developed and delivered by outsourced specialists or contractors. e.g. ICT, finance, business advice and analytics.

Some key examples of information-services include:

- ⇒ media
- ⇒ digital entertainment
- ⇒ telecommunications
- ⇒ ICT services
- ⇒ offline and online services
- ⇒ multimedia and app-based services
- ⇒ data analytics
- ⇒ professional and business advice
- ⇒ banking and finance
- ⇒ legal advice
- ⇒ marketing advice
- ⇒ engineering advice
- ⇒ scientific advice
- ⇒ health and medical advice
- ⇒ research and development
- ⇒ design services
- ⇒ education and training services.



Image adapted from:
vectorsmarket/Depositphotos.com

12.11 Processing - Services

People services

People services are usually labour-intensive and focus on the provision of a service directly to a person, e.g. hair and beauty, fitness training and even life coaching; or to a group of people e.g. education and training.

Many community services are also people-focused including education, care providers, medical and many government services.

People services will usually make use of equipment and technologies to assist and support workers to provide their services to other people.

For example:

- ⇒ a hairdresser or barber will regularly use specialised tools and equipment
- ⇒ teaching will use ICT devices and classroom fixtures
- ⇒ practical education and TAFE training might take place in workshops, studios or kitchens
- ⇒ health and medical facilities will use diagnostic, and treatment equipment
- ⇒ childcare, aged-care and disability services care all have lots of extensive facilities equipment.



Image adapted from: [leremy/Depositphotos.com](https://www.depositphotos.com/10711032/13012817/stock-photo.html)

Draft

Community services

Community services are often (but not exclusively) supplied by not-for-profit enterprises in areas such as:

- ⇒ health and medical services
- ⇒ aged-care
- ⇒ child-care
- ⇒ disability services
- ⇒ emergency services
- ⇒ government services
- ⇒ charities and welfare groups
- ⇒ religious organisations
- ⇒ arts and recreation services.

Many community services are provided to people on an individual basis.

However, some broaden to whole-of society services, such as police, fire-fighting, defence, and government services.

Some community services are environmentally-focused, or involve outdoor participation and recreation. As a result, the use of tools, equipment and other work-related technologies is used to varying degrees by workers who perform community services.

Consider the reliance on equipment by emergency paramedics, doctors and nurses in hospital, search and rescue workers and the Airforce.

This varies in comparison with the equipment used by charities, religious bodies and a local arts program.

But of course, it's the quality of the people that deliver these services that is important.



Image: [michaeldb/Depositphotos.com](https://www.depositphotos.com/10711032/13012817/stock-photo.html)

ANP: Processing - Services

Investigate the **processing activities** for your chosen industry. Complete this table. You could investigate a range of enterprises or work settings.

Industry:	Enterprises/work settings:
What do they do: i.e. sell, produce or provide?	
How materials are processed.	
Use of labour in processing.	
Use of equipment and machinery in processing.	
Use of information in processing.	
Other information	

Preview

Draft

Do Not

Copy

12.13 Processing - Practical Services

Numeracy in action

For your Numeracy Project it likely that you will investigate more than one enquiry-based for the processing stage.

All enterprises combine a range of process to produce their products. Enterprises in industries that provide **practical services** focus on the measurement, development and application of processes involving materials (raw or processed), ingredients, stock and other consumables. Enterprises set and monitor targets related to **cost ratios, materials and labour productivity, waste reduction, safety targets** and other measures.

As a class work through this checklist and see which might apply to the industry (and enterprises and work settings) you are investigating for your Applied Numeracy Project.

Number

Processing - Practical Services

- ☐ Amounts and totals of materials/ingredients involved in processing overall.
- ☐ Amounts and totals of materials/ingredients involved in processing for different items or processes.
- ☐ Amounts and totals of different resources needed for overall processing; and for varied processes.

Measurement

Processing - Practical Services

- ☐ Description of the different measuring units, tools and devices required.
- ☐ Explanation of measurement techniques for common work tasks.
- ☐ Calculations that are required for different processes.
- ☐ Time-based measures and requirements for the production process.
- ☐ Measurements of productivity and efficiency rates.
- ☐ Amounts of waste generated by amount, weight or time.

Financial Numeracy

Processing - Practical Services

- ☐ Calculation of total processing costs.
- ☐ Calculation of processing costs per item for different products.
- ☐ Calculations of productivity and efficiency rates in dollars.
- ☐ Estimates and calculations of cost of waste generated.

Probability & Statistics

Processing - Practical Services

- ☐ Comparison to industry benchmarks and guidelines.
- ☐ Comparison to past statistics.

Applied Numeracy Project: Example - Chicken chicken'

Pol, working at Chicos Chicken Barn in the Accommodation and Food Services industry, wants to analyse the processing stage in more detail. This will help him develop higher level industry-specific skills for later in his career.

Pol is going to measure and record the time taken to produce different menu items. So he will estimate and then measure prep times.

Then he will investigate and record the correct cooking temperatures and times, as well as the safety guidelines related to cooking chicken.

He will also investigate regulations about how long cooked foods can sit before being discarded. He thinks he might show this information in an infographic.

Pol is then going to investigate the costs involved in preparing and making foods. First he will estimate ingredient costs per menu item (e.g. for a chicken burger), Then he will try to find out more exact information to do accurate calculations.

To work out labour costs Pol will be processing the food he will calculate kitchen, food prep and cooking labour and then split it for the different items. He will then allocate these as a proportion over the number of items sold. e.g. If they sell 50 chickens per day and total 'kitchen' labour cost is \$100, then that's a labour cost of \$2 per chicken. He can add this to the materials cost.

But Pol knows that he is going to have to split the labour costs over many different items, because a cook has to have things in the oven, patties on the grill, and chips and nuggets in the fryer, all at the same time.

Pol has decided to choose 2.5 hrs for processing.

✓ **Materials Processing: Measurement**

Time-based measures and requirements in the production process.

✓ **Materials Processing: Financial Numeracy**

Processing costs (materials and labour \$) per item for different products.

Processing - Product-Based Services B

Consider the example of Pol and the Chico's Chickens. What type of numerical techniques, information and skills do you think he is going to use for his ANP?

Time-based measures and requirements in the production process.	Processing costs (materials and labour \$) per item for different products.
Numerical techniques:	Numerical techniques:
Numerical information:	Numerical information:
Numerical skills:	Numerical skills:

12.15 Processing - Practical Services

ANP Processing - Practical Services

If you are investigating an industry area that uses or makes physical products extensively as part of its service process then you should complete this **ANP: Practical Services Investigation** pro-forma.

Some possible numerical processes and techniques are listed below to guide you. Industry areas and related workplace settings that are more suitable for a **practical service processing focus** for your ANP are as follows.

- ☐ Construction industry firms such as carpentry, plumbing, plastering, bricklaying, concreting, cabinet-making, electrical, engineering, etc..
- ☐ (Accommodation and) food services using materials as ingredients.
- ☐ Personal services firms that use consumables, e.g. hairdressing & beauty therapy.

Preview

Draft

- ✓ Identify numerical processes to collect data (and information).
- ✓ Use numerical techniques and technologies to organise and use the data.
- ✓ Estimate, calculate, summarise, analyse and communicate using the data.

Do Not Copy

Applied Numeracy Project: Processing - Practical Services Investigation		ANP Processing Practical Services
Processing: EBT Focus area: ANP 1	Processing: EBT Focus area: ANP 2	
Numerical processes I will use to collect data and information.		ANP Processing Practical Services
Numerical techniques and technologies I will use to organise and use the data.		
Preview		
Estimates related to the data & information.		
Draft		
Do Not		
Copy		
Summary information about the data & information.		

Number

Processing - Services

☐

Preview

Draft

Measurement

Processing - Services

☐

Do Not

Financial Numeracy

Processing - Services

☐

Copy

Probability & Statistics

Processing - Services

☐ C

Applied Numeracy Project: Example - Counting me in

La, working in the newsagency as part of the Retail Trade industry is going to estimate how much stock the newsagency usually sells in a week and then collate the results according to different types of stock and amounts.

She will create a pie chart to represent the 'typical' types of sales that constitute a normal week's trading. She is then going to create a proportional formula that represents this sales data.

La is also going to research the cost of these stock items and do a comparison between cost and retail price. She will show these comparison amounts on a bar graph. She is then going to create a formula that represents this data.

La is going to have to do a lot of recording and estimating because she is not going to be able to calculate exact stock and \$ amounts. She will need support from her manager to find out these amounts.

Preview Draft Do Not

Processing - Services B

Consider the example of La. What type of numerical techniques, information and skills do you think he is going to use for his A?

<i>Numerical techniques:</i>	<i>Numerical techniques:</i>
<i>Numerical information:</i>	<i>Numerical information:</i>
<i>Numerical skills:</i>	<i>Numerical skills:</i>

12.19 Processing - Other Services

ANP Processing - Other Services

If you are investigating an industry area that uses processes to buy and sell goods, provides services for people and/or the community, or deals mainly with information processes then you should complete this **ANP: Other Services Investigation** pro-forma.

Some possible numerical processes and techniques are listed below to guide you. Industry areas and related workplace settings that are more suitable for a **service processing focus** for your ANP are as follows.

- ☐ Construction industry firms such as carpentry, plumbing, plastering, bricklaying, concreting, cabinet-making, electrical, metals, etc..
- ☐ Accommodation and food services (i.e. hospitality, pub, clubs, hotels, etc.).
- ☐ Retail and wholesale trade (i.e. goods trading services).
- ☐ Business and professional services (i.e. financial, legal, marketing, admin., etc.).
- ☐ People and community services (i.e. health, medical, caring, community, etc.).
- ☐ Public services (i.e. education, emergency, government, defence, welfare, etc.).
- ☐ Personal services (i.e. hairdressing, beauty therapy, health and fitness, etc.).
- ☐ Arts and recreation services (i.e. sport, arts, dance, recreation, etc.).
- ☐ Information and ICT services (i.e. computing, communications, design, media, etc.).

Processing - Other Services

- ✓ **Identify numerical processes to collect data (and information).**
- ✓ **Use numerical techniques and technologies to organise and use the data.**
- ✓ **Estimate, calculate, summarise, analyse and communicate using the data.**

Preview
Draft
Do Not
Copy

Applied Numeracy Project: Processing - Other Services Investigation		ANP Processing Other Services
Processing: EBT Focus area: ANP 1	Processing: EBT Focus area: ANP 2	
Numerical processes I will use to collect data and information.		ANP Processing Other Services
Numerical techniques and technologies I will use to organise and use the data.		
Preview		
Estimates related to the data & information.		
Draft		
Do Not		
Copy		
Summary information about the data & information.		

12.21 Assessment Task

AT2 Applied Numeracy Project - EBT: Processing

Overview

For your whole-of-unit **Numeracy-based Project** you have to select 6 **Enquiry-based Tasks** (EBTs) to investigate across the three industry stages of:

- ☐ **inputs,**
- ☐ **processing, and**
- ☐ **outputs.**

You must select at least 1 EBT for each of these stages.

Your EBTs must also cover all four focus areas:

- ☐ Number
- ☐ Measurement
- ☐ Financial Numeracy and
- ☐ Probability and Statistics

Consider

- ⇒ It is best to select 2 EBTs related to **inputs** (or perhaps 3 if you are investigating an industry that uses lots of inputs) for your **Numeracy-based Project**.
- ⇒ It is best to select no more than 2 of the focus areas of Number, Measurement, Financial Numeracy or Probability and Statistics (at least 1 in each).
- ⇒ Some EBT focus areas for inputs will naturally complement one another. e.g. Number and Measurement, or Number and Financial Numeracy.

So complete the summary table below to indicate the EBTs you will be investigating for your **Numeracy-based Project**.

We will use the term **Applied Numeracy Project (ANP)** to refer to your undertaking and completing each of your 6 EBTs. So 6 x ANPs = 1 **Whole-of-unit Numeracy-based Project**.

Numeracy-based Project				
Name:		Dates:		
Industry:				
Workplace(s)				
Industry Stages	Focus area: Number (N)	Focus area: Measurement (M)	Focus area: Financial Numeracy (FN)	Focus area: Probability and Statistics (PS)
Inputs				
Processing				
Outputs				

PODR: Applied Numeracy Project - Processing

In order to successfully complete this **Applied Numeracy Project (ANP)** for the **processing industry stage** you should make use of the **PODR: Process** to successfully manage these tasks.

- ⇒ **Planning** and **organising** yourself, timelines, industry contacts, devices and software, and any other resources you need to undertake your investigation.
- ⇒ **Doing** the investigation including making estimates, performing calculations, using technology and software to access, record, collate and organise data and information; and dealing with problems that may arise in collecting or analysing the data and information.
- ⇒ **Reviewing** your progress in each EBT as part of your ANP on an ongoing basis, making adjustments (problem-solving); and then reviewing your overall performance across the entire whole-of-unit Numeracy-based Project.

Required: Applied Numeracy Project - EBT Processing

- a. Choose your **focus area** and negotiate the suitability of this with your teacher.
- b. Use PODR to plan and organise your investigation into **processing** for this focus area. This involves:
 - ⇒ anticipating the **types** of numerical **estimates** and **calculations** you will need to do
 - ⇒ determining the most **suitable** numerical **processes** and **techniques** to **gather data and information** from your industry and (workplaces) so that you can do these estimates and calculations.
- c. Apply numerical and problem-solving techniques to **gather your data and information** accurately, professionally and safely (the **doing phase**), including evaluating, accessing and using suitable devices and software.
- d. Choose and apply appropriate estimates, calculations and numerical techniques to:
 - ⇒ organise and collate the data and information
 - ⇒ produce descriptive statements about the data and information
 - ⇒ analyse the data and information, and
 - ⇒ draw conclusions (inferences) from the data and information.
- e. Undertake a **review your performance** on this ANP.

Stage 5:

Self-assess and review how well you did. Make improvements for your next ANP.

12.23 Assessment Task

Name:		Dates:		Industry Stage: Processing	
Industry:				EBT# <input type="text"/>	
Workplace(s):					
Tasks - AT: Applied Numeracy Project - Enquiry-based Task		Re- quired	Due by	Done	Teacher initials
Stage 1: Design Numeracy-based Project					
i. Negotiate appropriate industry and workplace(s) with teacher.		<input checked="" type="checkbox"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
ii. Select EBTs from each industry stage, and each focus area.		<input checked="" type="checkbox"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
iii. Develop draft of Numeracy-based Project Plan.		<input checked="" type="checkbox"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
iv. Get teacher feedback and finalise Numeracy-based Project Plan.		<input checked="" type="checkbox"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Stage 2: Undertake an inquiry process for your ANP by applying numeracy skills					
i. Undertake your research for this Enquiry-based Task.		<input checked="" type="checkbox"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
ii. Outline the processes you will use to collect data and information.		<input checked="" type="checkbox"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
iii. Estimate, calculate and use technology to collect data and information.		<input checked="" type="checkbox"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
iv. Apply numerical problem-solving tools and techniques to solve problems.		<input checked="" type="checkbox"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
v. Use data and information to perform investigations and calculations.		<input checked="" type="checkbox"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
vi. Use data and information and make inferences and conclusions.		<input checked="" type="checkbox"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
vii. Analyse the data and information.		<input checked="" type="checkbox"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Stage 3: Use appropriate software tools and devices					
i. Describe software tools and devices that might best represent the data and information.		<input checked="" type="checkbox"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
ii. Describe advantages & disadvantages of using these software tools and devices.		<input checked="" type="checkbox"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
iii. Explain why you have chosen to use these software tools and devices; and use evidence to justify your choices.		<input checked="" type="checkbox"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
iv. Use appropriate software tools and devices to organise data and information you have collected.		<input checked="" type="checkbox"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
v. Evaluate the software tools and devices you used and their effectiveness for collecting, collating and communicating.		<input checked="" type="checkbox"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Stage 4: Reporting					
⇒ Prepare a draft for your final report (Refer p.???)		<input checked="" type="checkbox"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

Additional information:

Signed: _____

Date: _____