BSB 7.0

BSBCRT611

APPLY CRITICAL THINKING FOR COMPLEX PROBLEM SOLVING

Aspire Learning Resources

BSBCRT611

Apply critical thinking for complex problem solving

Release 1

Learner Guide

Aspire Version 1.1

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BSBCRT611 Apply critical thinking for complex problem solving, Release 1

Level 1, 464 St Kilda Road
MELBOURNE VIC 3004 AUSTRALIA
Phone: (03) 9820 1300

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Contact details

Participant
Name:
Start date:
Phone number:
Email:
Work location
Name:
Address:
Postal address:
Workplace supervisor name:
Phone number:
Fax:
Email:
Registered Training Organisation (RTO)
Name:
Address:
Postal address (if different):
Phone number:
Fax:
RTO contact name:
Mobile:
Email:

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Before you begin

This Learner Guide is based on the unit of competency *BSBCRT611 Apply critical thinking for complex problem solving*, Release 1. Your trainer or training organisation must give you information about this unit of competency as part of your training program. You can access the unit of competency and assessment requirements at: www.training.gov.au.

How to work through this Learner Guide

This Learner Guide contains a number of features that will assist you in your learning. Your trainer will advise which parts of the Learner Guide you need to read, and which Practice Tasks and Learning Checkpoints you need to complete. The features of this Learner Guide are detailed in the following table.

Feature of the Learner Guide	How you can use each feature
Learning content	Read each topic in this Learner Guide. If you come across content that is confusing, make a note and discuss it with your trainer. Your trainer is in the best position to offer assistance. It is very important that you take on some of the responsibility for the learning you will undertake.
Examples	These highlight key learning points and provide realistic examples of workplace situations.
Practice Tasks	Practice Tasks give you the opportunity to put your skills and knowledge into action. Your trainer will tell you which practice tasks to complete.
Summaries	Key learning points are provided at the end of each topic.
Learning Checkpoints	There is a Learning Checkpoint at the end of each topic. Your trainer will tell you which Learning Checkpoints to complete. These checkpoints give you an opportunity to check your progress and apply the skills and knowledge you have learnt.

Foundation skills

As you complete learning using this guide, you will be developing the foundation skills relevant for this unit. Foundation skills are the language, literacy and numeracy (LLN) skills and the employability skills required for participation in modern workplaces and contemporary life.

The following table provides definitions for each foundation skill.

Foundation skill area	Foundation skill description
Learning	▪ Evaluates own performance to identify opportunities for improvement ▪ Makes a range of critical and non-critical decision in relatively complex situations, taking a range of constraints into account
Numeracy	▪ Interprets, analyses and presents numeric and financial information to identify patterns and trends
Oral communication	▪ Identifies and articulates ideas and requirements clearly and persuasively using techniques appropriate to audience and environment ▪ Participates in a verbal exchange of ideas and elicits the views and opinions of others by listening and questioning
Reading	▪ Gathers, interprets and analyses textual information when developing the proposal and monitoring operational performance
Writing	▪ Communicates relationships between ideas and information, matching style of writing to purpose and audience
Planning and organising	▪ Systematically gathers and analyses all relevant information and evaluates options in order to monitor performance and identify opportunities for improvement
Technology	▪ Uses main features and functions of digital tools to complete work tasks and access information

What do you already know?

Use the following table to identify what you may already know. This may assist you to work out what to focus on in your learning.

Topic	Key outcome	Rate your confidence in each section
Topic 1: Scope problem-solving processes	1A Complex issues in the workplace	❑ Confident ❑ Basic understanding ❑ Not confident
	1B Document objectives and risks	❑ Confident ❑ Basic understanding ❑ Not confident
	1C Research policies, procedures and legislation	❑ Confident ❑ Basic understanding ❑ Not confident
	1D Calculate resources and present to stakeholders	❑ Confident ❑ Basic understanding ❑ Not confident
Topic 2: Lead solution development process	2A Facilitate a session to generate solutions	❑ Confident ❑ Basic understanding ❑ Not confident
	2B Evaluate solutions	❑ Confident ❑ Basic understanding ❑ Not confident
	2C Apply decision-making processes to select most viable solution	❑ Confident ❑ Basic understanding ❑ Not confident
	2D Prepare a brief on the proposed solution	❑ Confident ❑ Basic understanding ❑ Not confident

Topic	Key outcome	Rate your confidence in each section
Topic 3: Refine solution for implementation	3A Develop a feedback register	❑ Confident ❑ Basic understanding ❑ Not confident
	3B Refine proposal based on feedback	❑ Confident ❑ Basic understanding ❑ Not confident
	3C Seek approval and evaluate your performance	❑ Confident ❑ Basic understanding ❑ Not confident

Topic 1 | Scope problem-solving processes

1A Complex issues in the workplace

1B Document objectives and risks

1C Research policies, procedures and legislation

1D Calculate resources and present to stakeholders

1A Complex issues in the workplace

A problem can be viewed as any question or matter involving doubt, uncertainty or difficulty; you will encounter and have to solve numerous problems every day in the workplace.

Every problem has two common features:

- Goal: the desired objective
- Barrier: whatever stands in the way of the desired objective.

All businesses and workplaces face issues. Some are more complex than others. Complex issues are difficult to define and there may be multiple potential solutions.

Some problems are more complex than others.

Simple problems

- Easy to define
- The problem does not change over time
- Expert help not required
- One ideal solution
- Example of a simple problem: the photocopier is jammed

Complex problems

- 'Messy' definition
- The problem may change or develop over time
- Expert help is beneficial
- Could be multiple potential solutions
- Example of a complex problem: staff have low morale

Example

Solving complex issues

A good example of this is described in a scenario by Bob Schoenberg in his 2007 book, *Critical Thinking in Business*.

A group of managers in an office were faced with a problem: many employees were arriving late for work. According to company policy, staff could be penalised for being late. The management group had reminded staff of their responsibilities, but the situation had not improved.

The managers decided to get tough: they sent out a company email stating that any staff member who arrived late on three or more occasions in a week would receive an official warning. The managers assumed this would solve the problem.

The next day, all 58 staff members arrived early for work, but there were only two lifts in the building, and one was broken. Throughout the week, the problems with the lifts continued but management stuck to their plan and all employees who were late three times in that week were given an official warning.

Three weeks later, staff were arriving to the office on time, even though there were ongoing problems with the lifts. However, the unwillingness of managers to listen to their staff had led to low morale and productivity had decreased.

The managers assumed the problem was simple: staff were arriving late to work. However, if they had spent some time exploring the problem, they would have discovered that:

- staff staggered their arrival times to account for the fact that the lifts were often crowded, slow or out of order
- some staff had reported the problem with the lifts to the building manager, but she had failed to resolve it
- most staff wanted greater flexibility in their working hours, but they were reluctant to push for it in case they were labelled 'troublemakers'.

In other words, the problem was not easy to define. There were multiple problems at play:

- poor infrastructure
- unresponsive building management
- a problematic work culture (where staff are afraid of raising concerns with management).

Similarly, there were multiple potential solutions:

- address the problems with the lifts
- set up a process whereby problems that are not addressed by building management are 'escalated' to the management group
- open up communication between staff and management to explore opportunities for greater flexibility in working hours.

The problem-solving process involves six key stages.

1. **Identify**	Acknowledging that there is a problem and identifying and defining the problem
2. **Structure**	Analysis to determine the goals and the barriers
3. **Looking for solutions**	Using the information gathered during the first two stages to generate possible solutions to the problem
4. **Making a decision**	Analysis of each of the potential solutions identified in Stage 3 and selecting the best one
5. **Implementation**	Acting on the chosen course of action
6. **Monitoring and feedback**	Reviewing the outcomes of the problem-solving process and evaluating the success of the solution

Critical and creative thinking

In the business sector, critical and creative thinking are especially useful because of the demands, complexity and fast-paced nature of business environments.

Creative thinking is often referred to as thinking 'outside the box'. It drives innovation and helps people challenge the status quo. People who think creatively are dynamic, daring, resourceful and hardworking.

Critical thinking involves thinking about our thinking in order to improve it. When you think critically, you do not take things at face value and ask questions such as:

- How can I see this with fresh eyes?
- What might I be assuming?
- Am I rushing to judgement?
- What am I missing?
- What matters most?

Critical thinking involves the application of intellectual standards. Intellectual standards are important to critical thinking because they ensure rational thinking, as opposed to thinking that is based on unreliable beliefs or flawed assumptions. These standards are used to assess what one thinks, hears, reads, sees and writes.

Clarity	Clear and understandable
Accuracy	Free from errors and distortion
Precision	Exact to the necessary level of detail
Relevance	Relevant to the matter at hand
Depth	Containing complexity

Breadth	Taking multiple viewpoints into account
Logic	Each part making sense
Significance	Considering the most important ideas and concepts
Fairness	Justifiable – not self-serving or one-sided

Critical thinking and problem-solving

The critical thinking process is a powerful problem-solving tool that involves interpretation of data, facts and experiences. It encourages people to widen their perspective, put aside preconceived notions and generate logical and sound solutions to problems.

The critical thinking process can be used at every stage of problem-solving.

Process	Description	Key questions to ask
State the question	▪ The question lays out the problem and guides our thinking. ▪ The problem or question should be clear and precise.	▪ What question am I trying to answer? ▪ Is the question clear? ▪ Should I be asking a different question?
Gather relevant and sufficient information	▪ Information (data, facts, evidence, experiences) is the foundation for reasoning. ▪ The information should be relevant to the problem that is being explored.	▪ What information do I need to answer this question? ▪ Is this information relevant to the problem? ▪ Have we left out any important information we need to consider?
Check assumptions	▪ Assumptions are the beliefs we take for granted. ▪ Identify assumptions and check whether they are justifiable.	▪ Am I assuming something I shouldn't? ▪ What assumption is leading me to this conclusion? ▪ What is this (question, conclusion, solution) assuming?
Consider different perspectives	▪ Everyone has a point of view – 'the place' from which they view something. ▪ Understand your own point of view and consider other relevant viewpoints.	▪ How am I looking at this situation? ▪ Is there another way to look at this situation? ▪ Have I tried to understand and appreciate the point of view of others?

Process	Description	Key questions to ask
Watch your inferences and develop conclusions	▪ Inferences are the conclusions we come to, based on available information. They are informed by assumptions. ▪ Inferences should logically follow from the evidence.	▪ Does this interpretation of the information make sense? ▪ Does our solution reflect the information we gathered? ▪ Are there other solutions that should be considered?
Test conclusions	▪ Test conclusions against relevant criteria.	▪ Does our solution meet the evaluation criteria we developed? ▪ Will our solution be looked upon favourably by relevant stakeholders (e.g. other teams, managers, customers)?

Identifying workplace issues

It is easy for most people to identify issues in their workplace. These may relate to any number of areas, including:

- communication
- morale and motivation
- retention and turnover.

Although it is easy to identify issues, we often view those problems in a limited and superficial way. For example, we notice problems relating to team morale, but overlook problems relating to technology or equipment that staff have to use to perform their job. Or we might assume that a problem relating to poor sales is due to a badly designed website, rather than an ineffective marketing strategy.

Therefore, it is important to spend some time thinking about the issues, rather than assuming you know exactly what the problems are, or which one is the most important.

One technique that can help choose an issue to work to solve was developed by Tim Hurson in 2018, called 'What's the Itch?'

1. Make a list of things that have a negative impact upon your work, team or your organisation.
2. Ask yourself: What's out of balance? What could be improved? (None of your 'itches' need to be justified or clearly defined. Don't analyse them too closely.)
3. If necessary, organise the itches according to themes (e.g. leadership, teamwork, technology).
4. Ask yourself:
   - Which itch/theme do you feel most strongly about?
   - Which itch/theme resonates most strongly for you?
   - Which itch/theme 'floats to the top'?
   - Which itch/theme would be most satisfying to resolve?

For the purposes of this unit, consider an issue that is within the scope of your role: that is, an issue which you could solve without stepping outside the expectations, duties and responsibilities of your role.

For example, if you are employed in your company to manage the marketing team, it would probably not be within the scope of your role to solve a problem that relates to processes used within the human resources team.

On the other hand, if you are working with the manager of the human resources team to address a problem that incorporates both the marketing and the human resources team, you may be in a position to solve the problem together.

Consulting with stakeholders about workplace problems

Another way of identifying and selecting workplace issues is to consult with stakeholders, such as: members of your team, other colleagues, managers and external stakeholders.

Because people tend to view their problems in a limited and superficial way, it is useful to consult with a diverse range of stakeholders. This will help you see different workplace problems from different perspectives.

When asking for the views and opinions of colleagues and other stakeholders, it is important to ask questions and actively listen to what they say. This will help you obtain useful information, assist in the process of building rapport and trust, and 'open up' the conversation. Here are some tips to help you do this.

Provide information upfront	▪ Begin by telling the person why you're asking them questions. ▪ Tell them how the information they give you is going to be used (e.g. to develop a learning strategy).
Get the tone right	▪ Use a casual tone when you are asking questions as it encourages people to be more forthcoming. ▪ Ask questions using a curious rather than critical tone.
Be respectful of responsibilities and privacy	Some information is commercially sensitive, or a colleague is not able to share information because of the requirements of their role or for privacy reasons. Be alert to respondents' body language – it may indicate that they are feeling uncomfortable about a question you have asked.
Use open- and closed-ended questions strategically	Use open-ended questions to allow for a response and closed-ended questions to clarify something the respondent has said.
Thank people	Thank people for their time and efforts and let them know what's going to happen next.

Actively listen	Active listening involves making a conscious effort to hear what another person is saying. It includes five key strategies, each of which can be demonstrated through various means of verbal and non-verbal communication: ▪ pay attention ▪ show you are listening ▪ provide feedback ▪ respond appropriately ▪ defer judgement.

Practice Task 1

Question 1

Which of the following are characteristics of a complex problem? Tick all that apply.

- ◯ Expert help will only make it harder.
- ◯ The problem may change or develop over time.
- ◯ Could be multiple potential solutions.
- ◯ The problem cannot be solved.

Question 2

Which of the following statements are correct? Select 'Yes' or 'No' for each one.

a) Critical thinking drives innovation and helps people challenge the status quo. » Yes » No

b) There are six steps in the critical thinking process. » Yes » No

c) The first step in the critical thinking process is to gather relevant and sufficient information. » Yes » No

d) Inferences are the conclusions we come to, based on the available information. » Yes » No

e) When choosing an issue to examine, it is important to clarify in your mind which is the theme you feel most strongly about, and which resonates as a problem. » Yes » No

Question 3

Explain 'active listening' and provide two examples with your response.

1B Document objectives and risks

Objectives are the desired outcomes of a task. Risk is the chance that an event will occur and will have an impact upon the objectives.

All projects have risks. Identifying and documenting the risks associated with a project helps businesses reduce the impact of unforeseen events.

Objectives will help you:

- monitor the progress of the task
- effectively structure and manage the task
- demonstrate to others that you have completed the task.

Identify objectives

The SMART principles are used to ensure objectives are clear, detailed and tangible.

Specific	Objectives should be clear and precise: who, what, where and when?
Measurable	Objectives should be quantifiable: How many? How much?
Achievable	Objectives should be achievable: How will you accomplish it? What steps need to be taken to accomplish the objective?
Realistic	Objectives should be practical: Is there the budget to do this? Is there enough time to do this? Do you (your team) have the knowledge and skills to do this?
Time-bound	Objectives should have a deadline: What needs to be achieved and by when?

Here are some examples of weak and strong objectives. The strong objectives have measurable outcomes and many have a time limit or deadline.

Weak	Strong
To work out how to better support new managers in their role	To provide the management team with three feasible solutions, by 31 September, to the problem of low levels of confidence among new managers
To solve the problem of low brand awareness	To identify four solutions that cost less than $3000 each, to be implemented by 31 September, to address the problem of low brand awareness
To get teams to talk to each other	To present three solutions to the managing director, by 31 September, to address the problem of poor communication between head office and the teams in the distribution centres

Identify risks

Business risks are typically grouped according to 'risk categories'. Some common risk categories and examples are listed below.

Risk categories	Risk examples
Financial	Budget control issues either over or under budget
Technology	Computer network failures
Legal	Laws and regulations that change during the course of the project
Security	Loss of intellectual property
Work health and safety	Workplace stress due to the pressures associated with the task
Staffing	Having the right staff available at the right time, such as the people with the best skills being available to cover shifts or during times of projects
Operations	Reputational risks for the business as a result of failure to deliver goods or services

A range of techniques can be used to identify the risks of a task, including brainstorming, checklist analysis and a SWOT analysis.

Documenting objectives and risks

The method used to document objectives and risks will depend upon your company's policies and processes.

Some options for documenting risks include a risk register or a risk management plan. Your task objectives could be documented in a project plan or brief.

When documenting task objectives, it is important to follow these three principles:

- Write in plain, simple language.
- Use action words – objectives – doing/achieving something.
- Include numbers (e.g. number of hours, days, amounts of money) to quantify objectives.

When documenting risks, you need to identify the:

- event that has an effect on the objective
- cause of the event
- result of the event.

For example:

> The lack of availability of required staff [*the event that has an effect on the objective*] caused by increased workload [*the cause of the event*] results in the project not being finished on time [*the result of the event*].

Example

Documenting organisational objectives

Orla works as an HR manager at Healing Hands, a company that provides in-home care services for older Australians and people with a disability.

Over the last two years, six long-term employees at the company have been promoted to management positions. Orla has noticed, however, that even though these employees were extremely efficient in their previous roles, all of them struggled with their management role and one of them even ended up leaving the company. Orla has decided to look for a solution to this complex problem.

To begin her project, Orla needs to document the objectives and risks of the task she is undertaking. She follows the SMART principles to write an objective that she and her manager are happy with:

> *To provide the executive team with three feasible solutions, by 31 September, to the problem of low levels of confidence among new managers.*

The objective is specific, measurable (three solutions) and time-bound (31 September). Orla's manager has confirmed that the objective is also achievable and realistic, given her current workload and responsibilities.

Orla then undertakes a SWOT analysis to identify the risks associated with the project. Based on this analysis, she identifies numerous risks and takes care to follow the standard outline for risk statements. So, for example, one of her risk statements reads:

> *A lack of input to the process by key stakeholders caused by a lack of interest leads to solutions that do not meet staff needs.*

Orla then documents the objectives and risks of the task in a project plan, which she submits to her manager for final approval, according to Healing Hands policy.

Practice Task 2

Question 1

Which of the following statements relate to documenting objectives and risks? Tick all that apply.

- ◯ Include numbers such as days or amounts of money to quantify objectives.
- ◯ They should demonstrate to others that you have completed the task.
- ◯ SMART principles ensure objectives are clear, detailed and tangible.
- ◯ Identify the event that has an effect on the objective.
- ◯ Risk identify the event that will occur and will have an impact upon the objectives.

Question 2

Identify three common risk categories and provide an example for each.

1C Research policies, procedures and legislation

When preparing to address a workplace issue, identify the relevant legislation, organisational policies and procedures.

The operations of a business are underpinned by legislation and industry regulations.

Here are some examples:

Area of business	Legislation examples
Staff obligations	*Fair Work Act 2009* and the Fair Work Regulations 2009 WHS legislation includes: ▪ WHS Acts ▪ regulations ▪ codes of practice. Commonwealth and state laws cover equal employment opportunity and anti-discrimination in the workplace. The *Privacy Act 1988* (Cth) regulates the handling of personal information about individuals.
Business operations	Australian Consumer Law WHS legislation, including: ▪ WHS Acts ▪ regulations ▪ codes of practice. *Cybercrime Act 2001* (Cth) *Corporations Act 2001* (Cth) *Financial Management and Accountability Act 1997* (Cth) Corporate governance

The policies and procedures developed by a business direct and guide staff on the ways they want things done. These are also underpinned by legislation.

Area of business	Organisational policies and procedures
Staffing	Codes of conduct, dispute resolutions, use of IT, conflicts of interest, staff development and training, induction, employee performance, training needs, recruitment, workplans etc.
Business operations	Customer service, complaints, feedback, communication, contracts, risk management, environmental policies, resource acquisition, financial process

Undertaking research

A range of methods can be used to undertake research into legislative and organisational requirements for a workplace issue.

Two examples of methods for gathering relevant information are desk research and stakeholder consultations.

Desk research involves reviewing existing information to better understand an issue. The sources you use to access existing information about organisational policies and procedures will probably be internal, whereas information about legislation could be internal or external.

Examples of internal sources	Examples of external sources
▪ Internal online databases or staff intranet ▪ Hard copies of documents kept in a prominent place in an office or space ▪ Instruction manuals produced for staff for particular areas or work tasks ▪ Colleagues and managers ▪ Specialised areas/departments such as finance, human resources or WHS	▪ Government websites including federal, state and local government ▪ Industry or business websites and peak body organisations ▪ Journal articles ▪ Industry and trade communications such as online networks

Using digital technology

Whenever you are gathering information from an external source – especially online sources – it is important to ensure the source is reliable.

A reliable source contains accurate, unbiased information. Assessing the reliability of sources is part of the process of analysing textual information.

Assessing the reliability of online sources is especially important because, unlike books and journals, online sources may not have gone through any form of review.

You can use these principles to help you interpret and analyse online information to ensure it is reliable. It should be:

- unbiased: opposing ideas, arguments and explanations are considered
- authored by people with relevant qualifications or expertise: such as qualifications and/or expertise in business
- current: contain up-to-date information
- in-depth and comprehensive: considers or is informed by a range of relevant theories and concepts, case studies and examples
- accurate: contains information that is correct, and the conclusions are informed by sound and reasonable arguments.

Navigating online research

Online sources of information are especially useful when undertaking research because the information is easily and immediately accessible. However, to access this information in an efficient way, you need some basic skills.

For example, when searching for information from online sources, you will need to use search engines. These include generic search engines, such as Google, as well as more sophisticated search engines; for example, those used for specialist academic databases such as EBSCO.

Understanding how to use the main features and functions of these search engines means you will be able to identify the most relevant information in the most efficient way.

Skills needed to effectively use search engines	Description of skills
Develop and refine keywords	▪ Make the terms you use as specific as possible. ▪ For example, instead of typing *health and safety laws*, type *Australian workplace health and safety laws.*
Exclude words from a search	▪ Use a minus sign before a word to exclude it from a search. ▪ For example, if you are getting a lot of information about workplace stress and you really want information about the laws around safe use of equipment, type the keywords and then *–stress.*
Use Boolean operators	▪ Boolean operators are simple words such as AND, OR, NOT that can be used to combine or exclude words in a search. ▪ For example, if you wanted information about legislation relating to workplace health and safety on building sites but not in Victoria, you could type *Australian workplace health and safety laws AND building sites NOT Victoria.*
Limit the search	▪ Use advanced search functions to limit your search to specific time periods (e.g. publications from the past 10 years), location or industry (e.g. manufacturing or textiles).

Consulting with others

In addition to desk research, speak with colleagues and stakeholders. For example, you may be aware of relevant legislation but not understand how to apply it to the problem you have identified, or to the problem-solving process.

There are likely to be people (either within the business or external stakeholders) who can provide you with reliable advice on these topics. These people may work in a particular department that specialises in an area such as human resources, finance, marketing, customer service, sales, distribution, warehousing etc.

Example

Using research to help solve problems

Buster is an indoor recreational facility for children. The facility employs 13 casual staff, including three team leaders and two full-time managers.

One of the team leaders, Gene, identifies an ongoing problem at Buster relating to external accreditation processes. While waiting for the accreditation process to be completed, some job candidates have turned down the offer of employment, which means that Buster has missed out on employing some potentially valuable staff.

Gene is hoping to come up with solutions to this problem, but he needs to do some research about legislation relevant to the problem, as well as relevant company policies and procedures.

He begins by doing some desk research, which confirms that the accreditation process is a legal requirement for employees who work with children. He also consults with the managers at Buster about any other relevant legislation, as well as organisational policies and procedures.

A range of Buster policies are relevant to the problem he has identified, including policies relating to induction, staff training and development and workplace health and safety.

Practice Task 3

Question 1

Describe a situation where knowledge of relevant laws would be needed as a part of the scoping of a workplace issue.

Question 2

Which of the following are reliable sources of information on legislation and organisational requirements? Tick all that apply.

- ◯ A government website that quotes its sources
- ◯ Online information, with conclusions informed by reasonable arguments
- ◯ An internal email about changes to WHS processes in the office
- ◯ Information sent via social media with no author
- ◯ An article authored by academic experts
- ◯ Information received from an industry network

1D Calculate resources and present to stakeholders

Resources include can include people, equipment, money and anything else that is required for a task to be completed.

A part of scoping the issue is to identify and factor in the resources required for a task. Once you have calculated the resources required to find a solution to the problem you have identified, you will need to present this information to relevant stakeholders, such as your supervisor, manager or other key decision-makers in your business. For some projects, the process of calculating resources should involve consulting with a number of different people, including staff who understand about work processes, the contingencies and problems that arise and the skills required for different tasks.

The following steps can be used to calculate resources.

Identify the activities required to complete the project	Break down each task into the activities required to complete it. This will provide details of the resources and time required to complete a project/task.
Estimate resources	Determine which resources are required to complete each of the required activities. This may include: ▪ the number of staff – newly employed, re-deployed from other areas, or existing staff but perhaps with different shifts or hours allocated to the project ▪ a budget of the money that will need to be spent on equipment, staff, technologies or other resources ▪ a list of equipment that may need to be purchased or re-purposed for the task.
Estimate timelines	Estimate the amount of time it will take to complete activities. Duration is expressed in numbers: specifically the number of hours, days, weeks or months it takes to complete an activity.

There are also many tools and techniques you can employ to help you estimate resources.

Judgement of experts	Ask experts and people who have performed similar types of work for their opinion on resources and time required.
Alternative analysis (not suitable to estimate duration)	There is usually more than one way to perform a task; an alternative analysis involves exploring different options for the number and type of resources used.
Published estimation data (not suitable to estimate duration)	In some industries, the findings of research will be available to assist with calculating resources.

Project management software	This software often includes features that help project managers to estimate resources and costs.
The bottom-up estimate	This involves breaking down large tasks into smaller tasks to get a more detailed understanding of all the resources and costs required. The resources and costs for each small task are then added up to obtain a total estimate.
The three-point estimate	This technique involves an estimation of the duration or cost of an activity from: ▪ a realistic perspective (e.g. 2 working days) ▪ an optimistic perspective (e.g. 1 working day) ▪ a pessimistic perspective (e.g. 6 working days). Then average out all three estimations (e.g. 2 + 1 + 6 = 9 / 3 = 3 days).

When estimating the time and resources that will be required, it is important to consider two key factors: (1) effort and (2) capacity and availability.

Effort

- Effort is the number of hours, days or weeks required to finish a project.
- Consider the following example: if you estimate that it will take you 12 hours to build a wall, then the effort is 12 hours (1 person x 12 hours).
- However, if it takes *two* people 12 hours to build a wall, then the effort is 24 hours (2 people x 12 hours). The number of people it takes to complete a project needs to be taken into account when estimating effort.
- Although the effort to build a wall might be 12 hours, the duration could be different because the *duration* of the task is the number of *work periods* it takes to undertake the task, excluding non-working hours, holidays and weekends.
- So, going back to the wall example, let's say your wall is scheduled to be built during a standard working week, when you work 8 hours per day. Then the duration of the task would be 1.5 days (12 hours divided by 8 hours = 1.5 working days)

Capacity and availability

- The duration of a task will also depend upon the capacity and availability of the required resources.
- Take another example: perhaps you have estimated it will take you eight hours to write a report. But perhaps you only have the capacity to work on the report two hours per day. The duration of the activity would therefore be four days (8 hours of total effort divided by 2 hours per day = 4 days).
- If you increased the available resources by, for example, bringing another person in to help you with writing the report, it wouldn't change the effort required – it would still take a total of eight hours – but you could potentially reduce the duration of the task.

Example

Determining resources to tackle problems

Arlette has an issue about which she wants her team's input, and she needs to calculate the resources required to get her team together to undertake a problem-solving session. She begins by identifying the activities involved:

- facilitating a session to generate ideas and evaluate solutions
- preparing a brief on the proposed solution
- developing a feedback register to record feedback on her proposal.

She now needs to systematically calculate the resources for each of these activities, including staff, equipment and money.

She decides to use the judgement of experts and the three-point estimate technique to calculate the cost of the first activity.

She speaks with a colleague who has undertaken similar sessions in the past. Taking into account the cost of the venue, the catering and staff time, she estimates that:

- from a realistic perspective, the cost of this activity will be $2000
- from an optimistic perspective, it will be $1800
- from a pessimistic perspective, it will be $2700.

When she averages out those three figures, she estimates that the cost of this activity will be $2133.

Presenting to stakeholders

Presenting information to relevant stakeholders is often required to obtain approval to access required resources.

The information can be presented as a part of a project plan that outlines completion dates and resource commitments, and can be used to monitor progress.

Project planning software can be used to draw up project plans. This type of software uses information such as lists of tasks, deadlines and milestones to create a visual representation of the project. This will help you and others understand:

- what needs to be done
- how long it is going to take, and
- the links between tasks.

Clear and persuasive presentations

Presenting a plan to senior staff requires some preparation and thought to ensure it is clear, persuasive and pitched at the right level for the audience.

Select an appropriate communication technique	The most appropriate technique will depend upon: ▪ the policies and procedures of your organisation ▪ organisational culture ▪ the nature of the workplace environment ▪ the needs and preferences of your audience. Consider what would be most appropriate to your audience and your workplace environment; for example, a senior manager may want to pre-read your plan before a meeting so they can prepare some questions.
Begin with the familiar	In a presentation, begin with a point that all audience members are familiar with, ideally something you all agree upon. This sets a positive tone for your proposal and has a powerful effect on the audiences' responses. If you can't find anything that you agree on, start by talking about the significance of the issue and note that, like all controversial issues, it generates debate and conflicting viewpoints.
Respect your audience	When we feel strongly about a plan and someone disagrees with it, it is common to view that person unfavourably. This makes persuasion difficult, and sometimes impossible. To generate a sense of genuine respect for your audience, it may help to remind yourself that disagreement reflects the complexity of the issue rather than the shortcoming of the person who is disagreeing.

Select the most appropriate tone	Tone is the mood or attitude suggested by a presentation. Certain tones are always inappropriate, including forcing your ideas you're your audience or using a mocking or sarcastic tone. Be calm, objective and courteous.
Emphasise the evidence for your view	The most important factor is not the clear and forceful statement of your view but the evidence on which the viewpoint rests. In this case, the evidence is the information you have from your calculations. Where required, you may need to point to and explain the techniques you used to evaluate resources and duration, and/or provide the data from those calculations.
Consider timing	While the problem you want solve is at the front of stakeholders' minds, seize that opportunity to present them with your information about finding a solution to the problem. Try and present your solution to stakeholders when they are not distracted by other pressing concerns.
Pay attention to your body language	Stand straight and use gestures freely and in a natural way. Avoid body language that indicates defensiveness.
Look at your audience	Try to give your audience the sense that you are speaking to them; shift your gaze from front to back and side to side. If you need to look at your notes, do so briefly. Be aware of any mannerisms of speech that may affect your ability to communicate with your audience.
Channel your energy	Giving a presentation to multiple people in a formal environment can be nerve-wracking. Instead of trying to eliminate your anxiety, channel your energy into enthusiasm for the solution you are proposing.
Present numeric information	Use graphs and charts to present numerical information – it makes the data easier to read and understand. Highlight the key pieces of information by using bold or coloured text. Rather than presenting a series of numbers, try to tell a story with the numbers. Talk about the context and the implications, and try and engage the audience.

Whatever technique you use for presenting information, make sure you provide your audience with an opportunity to ask questions and offer comments. This is useful because:

- they may be able to give you tips and advice on how to do the task in a more efficient way
- it encourages 'buy-in' to the project, which may be useful later when you're seeking approval to implement your solution.

Here are some strategies for responding to questions and challenging comments from an audience.

- Take some time before the presentation to consider what questions your audience might ask. Prepare answers to these questions in advance where you can.
- In situations where you are seeking support or approval, it is important to respond to all questions and challenges posed by the audience, even if they seem irrelevant. Left unanswered, these objections can pose a barrier to support.
- At the beginning of a formal presentation, indicate whether you would prefer to take questions during or after the presentation.
- If you're not sure you understand the question, repeat it and check that your interpretation is correct.
- If you don't know the answer to a question, say so and offer to find out. If the stakeholder accepts your offer, make sure you follow up after the presentation is completed.

Practice Task 4

Question 1

Which of the following are types of business document formats? Tick all that apply.

- ◯ An alternative analysis involves exploring different options for the number and type of resources used.
- ◯ Content analysis examines the resources already in use.
- ◯ A bottom-up estimate breaks down larger tasks into smaller tasks.
- ◯ A three-point estimate considers a realistic, optimistic and pessimistic estimate of resources.
- ◯ A regression estimate is a process that explores what would happen with little or no resources to work with.

Question 2

A set designer estimates that it will take her 10 hours to build the set for an upcoming play. However, she only has four hours per day to work on the task.

Assuming the set will be built over the course of a normal working week, when she works full-time, eight hours per day, what is the total duration of the task?

Question 3

Which of the following should be considered when choosing a technique for presenting information to stakeholders? Tick all that apply.

- ◯ Policies of your organisation
- ◯ Preferences of your audience
- ◯ The levels of stress among key stakeholders
- ◯ Culture of your organisation
- ◯ Nature of the workplace environment
- ◯ The quality of your workplace relationships

Summary

- Complex problems are difficult to define and could have multiple potential solutions.
- Creative and critical thinking are powerful problem-solving tools.
- Objectives should be expressed using plain and simple language, as well as action words and numbers.
- When documenting risks, identify the event that has an effect on the objective, the cause of the event and its consequences.
- When preparing to address a workplace problem, investigate relevant legislation and organisational policies and procedures that may have an impact the issue.
- Desk research and stakeholder consultation are two ways to identify relevant information about legislation and organisational policies and procedures.
- When calculating resources, consider the actions required to undertake the task as well as the duration of the task.
- A range of techniques can be used to ensure a presentation is clear and persuasive, including beginning with a familiar topic, emphasising evidence and paying attention to body language.

Learning Checkpoint 1

Scope problem solving process

Part A

1. Describe the difference between a simple and a complex problem and provide an example for each.

2. Which of the following are techniques to help identify workplace issues? Tick all that apply.

- ◯ Make sure issues are within the scope of your own job role.
- ◯ Choose a complex problem so you can get recognition as your department's 'problem solver'.
- ◯ Work through problems with colleagues and staff to make use of their knowledge and expertise.
- ◯ Identify issues that have organisation-wide solutions.
- ◯ Choose an issue with a simple solution to save on resources.

3. Draw a line to match the risk category on the left with the risk on the right.

» Legal	» Computer network failures
» Staffing risk	» Change to regulations that underpin a project
» Technology	» Loss of intellectual property
» Security	» Reputational damage
» Operations	» Not having the right staff available at the right time

4. Describe two types of information sources on organisational policies and procedures relevant to a workplace problem.

5. Explain why the reliability of online sources is important.

6. Identify and briefly describe three techniques used to estimate the cost and timelines for resources for an activity.

7. If it takes four people three hours to complete a brainstorming session, what is the total effort of the brainstorming session?

Part B

Read the case study and answer the question that follows.

Case study

Jalecia is an operations manager at Vegitor, a medium-sized vegetarian and vegan catering company. Jalecia has identified increasing transport costs as a complex problem for the company. She has discussed the problem with the senior management team, who have asked her to come up with some solutions to the problem.

Jalecia's problem-solving task must be completed by 1 November. The management team wants to see between three and five solutions to both problems.

1. Rewrite the following objectives to make them clearer, more tangible and specific.
   - Find some ways to decrease transport costs.
   - Come up with alternatives to current transport options.

2. Jalecia needs to present her calculations to her manager to get approval for her plan. Identify three things Jalecia should consider to ensure her presentation is clear and persuasive.

Topic 2 | Lead solution development process

2A Facilitate a session to generate solutions

2B Evaluate solutions

2C Apply decision-making processes to select most viable solution

2D Prepare a brief on the proposed solution

2A Facilitate a session to generate solutions

When using critical and creative thinking techniques, the facilitator also needs to be aware of and address the factors that undermine these styles of thinking.

When people from different backgrounds and with diverse skills come together to work on a problem, exciting new ideas often emerge. However, for the process to be effective, the group needs a good facilitator. The facilitator needs to provide clear instructions, creative an inclusive environment and manage conflict.

Techniques for generating solutions to problems

A range of critical thinking and creative thinking techniques can be used to generate solutions to problems.

To select a technique that is appropriate to your audience and the workplace environment, consider:

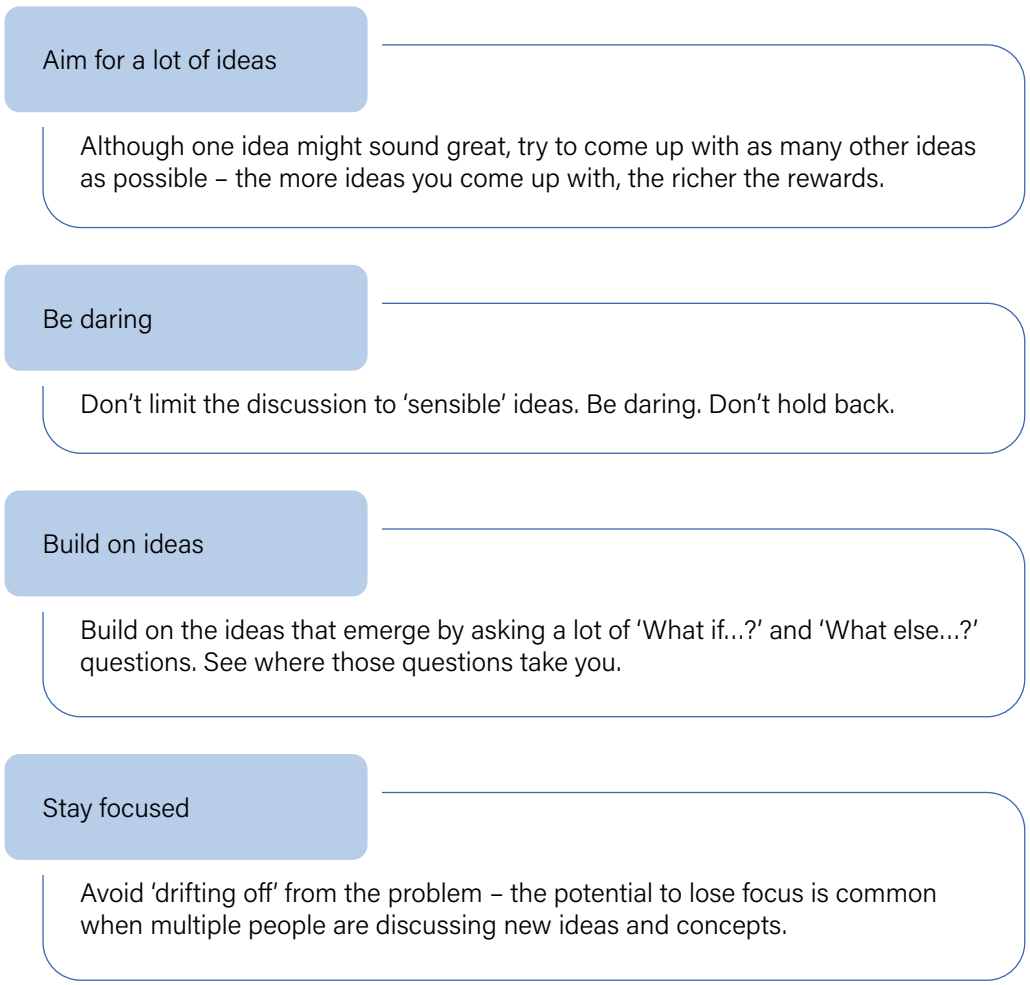
- *the participants' level of experience with critical and creative thinking*. If participants have not had much experience with critical and creative thinking, start off with a more common technique, such as brainstorming.
- *the participants' relationships with each other*. If participants know each other well, it may be easier for them to share ideas. If not, you may need to give participants more time to 'warm up'.
- *the nature of the workplace*. Think about the type of work undertaken in the business (e.g. creative, analytical). It is okay to introduce a creative technique in an industry or company that is not especially creative – you just need to give people time to adjust to it.

Brainstorming

Brainstorming is a well-known method for generating solutions to problems. However, it is also widely misunderstood and often poorly applied. To ensure it is done correctly, it is important to follow five basic rules.

Criticise nothing

People often feel nervous about sharing new ideas in a group. Criticising or mocking new ideas suppresses creative thinking; those people who have new ideas will be less likely to share them.



State the goal in different ways

Stating the goal in different ways involves 'increasing the size' of a problem to find a good solution. This technique involves a team working together to identify 4–5 potential goals to work towards, in a response to a specific problem, and generating solutions based upon those hypothetical goals.

For example, imagine a political party is campaigning for re-election. One of the major issues in the general population is a fear of crime. To win votes, the party needs to put forward a solution for dealing with this problem.

The team responsible for developing the party's policy gets together to generate solutions to the problem. By using this technique, they are aiming to view the problem from different perspectives to generate different goals and, thereby, a range of solutions.

The potential goal	Description of goal	Potential solutions to achieve the goal
Goal 1: Reduce crime	▪ This the most obvious goal and a common political response to a fear of crime in the community.	▪ Introducing tougher penalties ▪ Increasing the number of police on the street
Goal 2: Make life safer for citizens	▪ This goal emerged when the team looked at the problem from the point of view of potential victims of crime – those people who want to feel safe in their community.	▪ Providing better security for citizens ▪ Teaching citizens self-defence ▪ Organising neighbourhood anti-crime groups
Goal 3: Reduce the number of criminals	▪ This goal emerged when the team focused on *numbers* rather than *methods*.	▪ Deporting every criminal to another country ▪ Implementing preventative programs in schools to discourage a life of crime
Goal 4: Reduce the community's fear of crime	• This goal emerged when the team changed their perspective and looked at the problem from a sociological perspective. • Perhaps the fear of crime is out of step with the actual rates of crime in the community, suggesting that the problem is not so much crime itself but the *perception* of crime in the community	• Providing information to the community that shows the crime rate is actually very low • Introducing activities to increase a sense of community belonging and reduce the mistrust that drives the fear of crime

Some of the goals and solutions described in this example are clearly unrealistic. However, the aim of this technique is to generate solutions, *not* critique them. It may be that by coming up with different goals and seeing the problem from different perspectives, this technique leads to a unique solution.

Example

Facilitate a session to generate ideas

Augusto works at Clear Water, a small business that sells pool cleaning equipment and supplies. Recently Clear Water has experienced a downturn in sales due to multiple factors, including:

- increased competition
- unseasonably cold weather, and
- a gradually decreasing customer base due to the 'downsized' nature of suburban backyards.

The problem Clear Water faces is complex: the problem could change over time and there are multiple potential solutions.

Augusto facilitates a session to generate some solutions to the problem. The team use 'state the goal in four different ways' to get the ball rolling.

The identify four different goals:

1. Increase the number of customers coming to Clear Water (an obvious goal).
2. Increase the amount of money customers spend at Clear Water (an obvious goal).
3. Provide home delivery and installation services (based upon the customers' perspective).
4. Increase the number of products available on the Clear Water website (using numbers rather than methods).

Disney method

The Disney method is a commonly used method for creative thinking. It requires participants (either an individual or a group of people) to immerse themselves in the following roles:

- The *dreamer* embodies freedom and imagination and is happy to live in a world of ideas.
- The *realist* has feet on the ground, is hard-headed and focused, and wants to know how an idea can become reality.
- The *critic* is stern and unforgiving, refusing to ignore potential faults and weaknesses.

When using this technique, each person in a group takes turns embodying each of the three characters to generate new ideas. The person embodying the role thinks and acts in a certain way, posing key questions to the group.

The dreamer	Unlimited possibilities	Use your imagination to take ideas to their limits.	*If there were no restraints, what could we do to solve this problem?*
The realist	Transitioning from vision to reality	Consider what needs to be done to make an idea become real.	*Is this idea feasible? (cost, technology, expertise, resources)* *How could we make this idea real?*
The critic	Exposing the idea to real-life conditions	Identify flaws and weaknesses in the idea.	*What's missing?* *What's not working?* *What would my team / other teams / other companies think?*

Benefits of taking time to generate solutions

Generating solutions as a group takes time and effort. You might prefer to work alone and come up with a solution that makes sense and is quicker to identify. However, this approach means missing out on the collective knowledge and expertise of your team or colleagues. On your own there is no one to question your ideas or ask, 'What if?' Your decision may not end up being the best solution for the problem.

There are several advantages in taking time to generate solutions in a group setting.

- The greater the number of ideas that are produced, the higher the chance of coming up with a good idea.
- Taking time to explore potential solutions is necessary to the creative process. Safe ideas are easier to identify but time is required to come up with unusual and imaginative ideas.
- When there is sufficient diversity within a group, members can combine their knowledge and expertise to produce new ideas that draw upon unique perspectives.

Risks of taking time to generate solutions

Just as there are advantages for taking the time to generate solutions, there are also risks. One of the major risks is that the members of the group will be reluctant to participate in critical and creative thinking techniques.

A range of beliefs and behaviours pose a risk to critical and creative thinking, including:

- **conformity**. Not all conformity is bad. Harmful conformity is what we do when we go along with a group to avoid the risk of being different. Harmful conformity undermines creative thinking.

- **face-saving**. When someone is too proud to admit they are wrong they are face-saving. Face-saving inhibits clear and rational thinking because decisions are based upon pride and ego, rather than a rational consideration of the facts.
- **resistance to change**. Rejecting new ideas and perspectives is characteristic of a resistance to change. To engage in critical and creative thinking, we need to be able to suspend judgement long enough to give ideas the chance to 'prove themselves'.

Tips for facilitation

Here are some tips for facilitating a critical and creative thinking session to generate solutions to workplace problems.

- Be clear about the objectives and outcomes of the session.
- Get participants engaged by asking them to do some preparation beforehand. This might mean giving them some information about the problem, the objective or the techniques you are planning to use, to start the thinking process.
- When introducing a technique:
  - clearly explain the requirements for participants
  - give participants the opportunity to ask questions about the technique
  - employ active listening techniques when listening to and responding to participants' questions.
- Encourage participants to demonstrate respect for each other.
- Discourage any one person or group from dominating the conversation.
- Ask participants not to raise their voice or silence other people.
- Asking participants to be clear, direct and concise.
- Remind participants that productive group discussions occur when everyone is contributing ideas, sharing information and participating.
- Ask participants not to judge ideas based on their initial impressions or feelings and giving unfamiliar ideas (and the people who are proposing them) a 'fair hearing'.
- Decide upon a note-taking method such as a whiteboard, butcher's paper or digital tool. You may need someone to help you with note-taking.
- Help people who are struggling to make their point by:
  - restating your understanding of what their point is, or
  - asking them to give an example or explain their point further.

Practice Task 5

Question 1

Explain one of the things a facilitator must consider when determining what techniques to use during a critical thinking session with a group.

Question 2

Which of the following are basic rules of brainstorming? Tick all that apply.

- ◯ Be daring
- ◯ Criticise everything
- ◯ Build on ideas
- ◯ Stay focused
- ◯ Think rationally

Question 3

What are the three things a facilitator should do when introducing a critical or creative thinking technique to a group?

Question 4

When developing solutions to problems, which of the following beliefs and behaviours pose a risk to critical and creative thinking? Tick all that apply.

- ◯ Resistance to change
- ◯ Conformity
- ◯ Introversion
- ◯ Open-mindedness
- ◯ Face-saving

2B Evaluate solutions

Evaluating solutions is part of the fourth step in the problem-solving process. It occurs in the lead-up to the decision-making process.

Evaluating solutions involves the development and application of evaluation criteria, as well as an evaluation of the advantages and limitations of solutions.

It is a good idea to remind staff involved that no one solution will work for all problems and it is likely that any solution may require perfecting and adjusting to fit the problem once it is implemented. Once the team begins to discuss options, the disadvantages or flaws in a solution may become evident.

Developing evaluation criteria

Before evaluating solutions, decide on an evaluation criterion.

Developing evaluation criteria is important because it makes you consider the standards the solution must meet. An evaluation criterion helps:

- to ensure the process of selecting a solution is rational and objective
- to act as a 'boundary' to ensure that the solutions you consider are feasible and workable within your workplace.

The criteria used to evaluate solutions will depend upon the problem itself, the business and the workplace context. Some common evaluation criteria are listed below.

Common evaluation criteria	Example of criterion
Ease of implementation	The solution can be integrated into the organisation's systems, processes and infrastructure.
Costs	The solution will lead to cost savings.
Sustainability	The solution will work even if conditions change.
Employee morale	The solution has no foreseeable negative effects on employee morale.
Risks	The solution does not pose a risk to employee health and safety.
Ethics	The solution does no harm to the environment and/or broader community.
Organisational alignment	The solution aligns with the overall vision and mission of the business.

It is good practice to decide upon evaluation criteria before you start generating solutions. If you decide on evaluation criteria after you have generated solutions, there is a risk you may select criteria that enable your 'favourite' solution to 'rise to the top'.

However, it is not always possible to decide upon evaluation criteria before the solutions session and, when you start exploring solutions, you may identify additional important criteria.

Example

Evaluate solutions

Orla, a manager at a company that provides in-home care services, is working with her team to decide upon the evaluation criteria they will use to evaluate the solutions they generate to address a workplace problem.

The team thinks the following criteria are important:

- cost
- ease of implementation.

'What about if we think about it from a different perspective?' Orla says to her team. 'From the perspective of the executive management team, for example.'

They add another item to their list:

- organisational alignment.

'That's a good one,' Orla says. 'The executive team are unlikely to approve our solution if it doesn't align with the Healing Hands mission and vision.'

Use critical thinking processes

Critical thinking will help to ensure your decisions are based on rational and objective criteria.

This will increase the likelihood that your solution 'fits' the business, employees and workplace environment.

The table below lists some of the key aspects of the critical thinking process and examples of how these processes might influence a team's decision about evaluation criteria.

Critical thinking process	Examples of how critical thinking processes can influence decisions about evaluation criteria
Gather relevant and sufficient information	▪ It would be unwise to base your evaluation criteria on an assumption about organisational requirements and expectations. ▪ If you were unsure about organisational policies and procedures – or how they relate to the solutions you are proposing – you would need to gather that information before you finalise your evaluation criteria.
Check assumptions	▪ Perhaps you think criteria relating to employee morale are not important because your company has loyal and adaptable staff who would be happy to implement a solution if they believe it will benefit the company. ▪ What assumptions are leading you to this conclusion? For example, perhaps you are assuming that employee morale is as high now as it was six months ago, when the results from a staff survey were released. How do you know the situation hasn't changed?
Consider different perspectives	▪ Would the criteria be different if it were chosen by another team? ▪ For example, would a team whose work regularly requires high-level approval include criteria such as: *The solution must not delay or disrupt the existing approval process*? ▪ Or, would the IT team include criteria such as: *The technology required to implement and maintain the solution must be cost-effective*? ▪ Who is going to be affected by the solution? And, when seen from their perspective, what other criteria need to be included?

Evaluate solutions

The first step in evaluating the solutions is to eliminate those that unequivocally *do not* meet the criteria. For example, perhaps you and your team have identified six potential solutions to a problem. One of them does not align with your company's legal obligations, so this solution is eliminated.

The next step is to evaluate the remaining solutions, which includes a consideration of their advantages and limitations.

Advantages and limitations of solutions

The potential advantages and limitations of a solution are endless, depending upon the problem you want to solve and the environment where the solution will be implemented.

The decision-making criteria listed above could be used as the basis for examining the advantages and limitations of each solution. For example, you could use 'costs' as one of the factors to consider when examining advantages and limitations. Perhaps you have three solutions that you are considering:

- Solution 1 requires the business to purchase software that costs $1000.
- Solution 2 does not require any software and has minimal associated costs.
- Solution 3 would require staff to undertake a training course, which costs $2000.

The advantage of solution 2 is that it is low-cost. The limitation of solution 3 is that it is expensive. However, if you also examine the advantages and limitations from the perspective of employee morale, perhaps the advantage of solution 3 is that it provides employees with an opportunity for professional development.

When identifying the advantages and limitations of each solution, use the steps in the critical thinking process to help you assess each solution in a rational and logical way.

The *Six Thinking Hats* technique

Six Thinking Hats is a technique that can be useful when you are making decisions. It was developed by Edward de Bono, a leader in creative thinking techniques.

The technique is based on the idea that people have a preferred thinking style that can cause them to overlook solutions to problems. According to this technique, by taking on different 'thinking hats' (or thinking styles) we can look at problems from different perspectives and make better decisions. It can be used by an individual or a group.

White hat	▪ Focuses on information and objective elements relating to the idea ▪ Identifies gaps in knowledge ▪ Analyses trends and data
Red hat	▪ Focuses on feelings, hunches and intuition ▪ Looks at ideas using gut feelings and emotion ▪ Not required to justify feelings with logic
Black hat	▪ Focuses on weaknesses and shortcomings of an idea ▪ Commonly referred to as the 'devil's advocate' ▪ Considers the 'worst-case scenario'
Yellow hat	▪ Examines ideas from a positive and optimistic standpoint ▪ Looks at why ideas will work and why they are beneficial ▪ Considers similar past actions that have worked well
Green hat	▪ Focuses on creativity ▪ Considers possibilities and alternatives ▪ Thinks 'outside the box'
Blue hat	▪ Manages the thinking process ▪ Sums up what has been learned or presented ▪ Identifies ways of moving forward

Practice Task 6

Question 1

What are two benefits to developing criteria for evaluating solutions?

Question 2

When using the Six Thinking Hats technique, what is the role of the person wearing the green hat?

2C Apply decision-making processes to select most viable solution

There are numerous decisions to be made throughout the problem-solving process. One of the key decisions is: which solution will best solve this problem?

The decision-making process mirrors the problem-solving method. It involves:

1. identifying the problem
2. gathering relevant information
3. listing options and solutions
4. weighing pros and cons
5. weighing the risks
6. making the decision.

Much of this work has already been done during this unit, but it is useful to review the first five steps before you make your decision. One way to do this is to use the intellectual standards underpinning critical thinking to ensure you have everything you need to make a good decision.

This table lists the intellectual standards that apply to each step, and some sample questions.

Steps in decision-making	Intellectual standards that apply
Identify and agree on the issue or problem	▪ Clarity – Can you clearly state the problem? ▪ Precision – Can you describe the problem precisely?
Gather relevant information	▪ Relevance – What information is relevant to the problem? ▪ Accuracy – Are you able to verify that the information you have is accurate? ▪ Precision – Does the information contain enough facts and details to make it useful? ▪ Significance – What is the most significant or important information to aid in decision-making?
List options and solutions for the decision	▪ Clarity – Are the solutions clear to everyone involved making the decision? ▪ Relevance – Are the solutions relevant to the issue or problem? ▪ Fairness – Has everyone declared any bias or conflict of interest in relation to the proposed solutions?

Steps in decision-making	Intellectual standards that apply
Weigh the pros and cons of each option	▪ Depth – Which solutions address the complexities of the issue/problem? ▪ Breadth – Which solutions address the scope of the issue/problem? ▪ Logic – Do the proposed solutions make sense and will they address the core elements of the issue/problem? ▪ Fairness – Has everyone declared any bias or conflict of interest in the proposed solutions?
Weigh the risks in making the decision	▪ Clarity – Are the risks clearly defined? ▪ Accuracy – Are the risks accurate? ▪ Relevance – Are the risks relevant? ▪ Depth and breadth – Have the risks factored in the breadth and depth of the issue/problem?

Making decisions

Making decisions can be difficult. If the problem you have identified is truly a complex problem, there is unlikely to be one single 'perfect' solution.

It is useful to at this stage to consider the characteristics of the 'fair-minded' critical thinker. The fair-minded critical thinker is described by Elder and Paul as someone who is 'good at thinking and fair to others'. They make reasonable, rational and ethical decisions. Wherever possible, use these principles to guide your decision-making.

Intellectual independence

- Figuring things out for yourself
- Listening to others and deciding for yourself who and what to believe

Intellectual perseverance

- Not quitting
- Sticking to tasks even when they are difficult

Intellectual integrity

- Acting towards other in the same way you want them to act towards you
- Respecting other people and considering the feelings of others

Intellectual empathy

- Trying to understand who other people think and feel
- Trying to see things from another point of view

Intellectual humility

- Recognising that you don't know everything
- Acknowledging what you don't know

Intellectual courage

- Speaking up for what's right, even if it's not popular
- Examining your own thoughts and being willing to question your beliefs

Confidence in reason

- Avoiding superficial answers to complicated problems
- Trusting evidence, facts and reasoning

Fair-mindedness

- Trying to find out what is most fair
- Thinking about all the people involved, not just yourself
- Thinking before you act and not acting before you think

Barriers to effective decision-making

It is important to be aware of and avoid the factors that can pose a barrier to effective decision-making. The table below lists and describes some of these.

The example provided is a simple narrative to help demonstrate that these barriers look like in real life: a teenage girl is deciding whether to take an umbrella when she goes out. Through her comments and behaviour, she demonstrates all the barriers to effective decision-making.

Barrier	Description	Example
Over-confidence bias	▪ Overestimating one's ability or chance of success	▪ I'm very good at predicting the weather – it's not going to rain so I don't need to take an umbrella.
Recency and availability bias	▪ Relying on the most recent and readily available information, even though it may not be accurate	▪ My best friend just told me it is not going to rain, so I'm not going to take an umbrella.
Confirmation bias	▪ Relying on information that confirms our pre-existing beliefs and ignoring information that challenges those beliefs	▪ My mother and brother told me it is not going to rain, so I'm not going to take an umbrella. ▪ My father and sister told me it is going to rain, but they don't know what they're talking about.
Anchoring bias	▪ Favouring the first piece of information we learn	▪ My best friend told me first that it wasn't going to rain, so even though two out of four other people have subsequently told me it is going to rain, I still don't think it's going to rain.
Groupthink	▪ The tendency to make decisions in a group based upon consensus and without critical reasoning. Groupthink usually occurs in situations where questions and constructive criticism are silenced or discouraged.	▪ All my friends and I agree that it is not going to rain. ▪ Another friend told me it is going to rain but we all told her to shut up.

Example

Apply decision-making processes

Fisherman Joe is a medium-sized seafood producer based in a rural coastal area facing a complex problem: a lack of appropriately qualified job candidates. Fisherman Joe's human resources and strategy people have gotten together with the objective of working out how to attract high-quality, appropriately qualified job candidates to the Fisherman Joe plant.

The team members have come up with numerous solutions and evaluated each one in turn. They are now at the point of deciding between three options:

- start a marketing campaign targeting new graduates
- work with the local council on a strategy to encourage young families to the area
- support existing staff to increase the qualifications through remote learning.

Each member of the team is passionate about at least one of the solutions but are trying to be open-minded for the sake of objectivity. One member of the team, Janette, lists all the reasons why two of the options won't work.

Most of the members of the team nod their heads in agreement but one member, Fareed, speaks up against their preferred option. He understands that the rest of the team want him to agree with the solution they are most passionate about. But he also knows they risk rushing the process of making a decision because it is difficult. To avoid groupthink, he also knows it's important to speak up for what he believes in, even if it's not popular.

Practice Task 7

Question 1

List the steps from 1 to 6 in the decision-making process.

- ◯ List options and solutions
- ◯ Weigh pros and cons
- ◯ Make the decision
- ◯ Gathering relevant information
- ◯ Weigh the risks
- ◯ Identify the problem

Question 2

Use the intellectual standards underpinning critical thinking to identify a question you could ask to weigh the pros and cons of multiple solutions.

Question 3

Which of the following are barriers to effective decision-making? Tick all that apply.

- ◯ Confirmation bias
- ◯ Groupthink
- ◯ Anchoring bias
- ◯ Affirmation bias
- ◯ Mastery bias

2D Prepare a brief on the proposed solution

A business brief is a report that provides stakeholders with the information they require to make an informed decision.

The purpose of a business report is to provide a brief:

- summary of the issue
- overview of the relevance of the issue to the company
- highlight of the positive or negative implications
- recommendations for a course of action.

Depending on organisational requirements, the brief can be provided in a written report (using a template or sample of a previous report) and followed up with an oral presentation. Most business briefs include three key components and the content and word length for each component will vary according to the requirements of the organisation and the depth and complexity of the solutions. Here is a sample of the coverage of a brief.

Component	Description
Introduction	▪ Describes the purpose of the brief ▪ Explains why the issue or problem is important ▪ Provides key definitions
Background	▪ Provides background information ▪ Outlines the history of the issue or problem ▪ Describes how the issue or problem is relevant to the company ▪ Outlines advantages and disadvantages and supports each with evidence
Recommendations	▪ Provides 1–2 recommendations for a course of action based on the evidence. The recommendations are: – listed in numbered or bullet format – presented in order of importance, or in the order it appears within the background/analysis. ▪ Includes information about resources required to carry out recommendations such as staff, equipment and costs, supported by evidence (quotes or estimates).

Depending on organisational requirements, your business brief could also include a list of references and appendices for additional information, such as quotes or costings.

As highlighted above, much of the information should be supported by evidence. In the background section you could include, for example, a table or a graph that demonstrates a pattern or trend relating to the problem you have identified. Alternatively, you could refer the reader to more detailed evidence in the appendix.

Presenting the business brief

A business brief needs to be concise, clear and understandable.

If you are presenting your brief in an oral presentation, the guidelines outlined in the previous topic will help ensure your presentation meets these requirements.

After you present the business brief, ask the audience if they have questions and use the opportunity to elicit feedback. Take note of their feedback in case you need to refer to it when you are refining your solution.

Depending on organisational requirements, you may need to get approval from a supervisor or manager before you present your business brief to key stakeholders. This approval to go ahead may be a signed and dated document or an email.

The following principles can help you achieve the clear, concise and readable style necessary for a business brief.

Principles of business writing	Description of principles
Keep it brief	▪ Use short sentences. ▪ Cut out unnecessary words (e.g. don't say 'the issue was carefully considered', just say 'the issue was considered'). ▪ Avoid repetition. ▪ Avoid lengthy explanations.
Use simple, concrete language	▪ Don't use long words when a shorter word can be used instead (e.g. 'use' instead of 'utilise'). ▪ Be precise – avoid vague terminology such as 'the current circumstances'. ▪ Avoid 'flowery' language (i.e. elaborate and flamboyant language).
Avoid jargon	▪ Unless you are sure people understand what a word or expression means, avoid the use of jargon: that is, words or expressions that would not be familiar to people outside your organisation or sector. ▪ Jargon can 'cloud the message' you're trying to impart.
Use an active instead of a passive voice	▪ When the subject of a sentence is *performing the action*, you are using an active voice (e.g. Jane chaired the meeting). ▪ When the subject of a sentence *is acted upon*, you are using a passive voice (e.g. the meeting was chaired by Jane). ▪ Sentences written in an active voice are easier to understand than those written in a passive voice.
Use formatting	▪ Use headings, tables and bullet points so the document is easy to read.

Example

Prepare a brief on a proposed solution

Fareed is an employee at Fisherman Joe, a seafood processing company. He is responsible for writing a business brief outlining his team's proposed solution to the problem of a lack of available and appropriately qualified staff.

He sets the document out into three sections: introduction, background and recommendations. He includes some information in the background section about the benefits of supporting existing staff to enhance their qualifications, as well as important financial information about the social and economic benefits of this approach.

When it comes to writing up the recommendations, he takes care to ensure they are as clear and concise as possible:

- Provide a select group of staff with on-site accredited training designed to enhance their existing qualifications.
- Fund a scholarship program for two staff members to undertake remote tertiary study.

Practice Task 8

Question 1

Identify two pieces of information that should be included in the Background section of a business brief.

Question 2

Identify two principles that would meet organisational requirements for a business brief.

Summary

- Techniques used to generate solutions include brainstorming and the Disney method.
- Although developing solutions in a group can be challenging, taking the time to go through this process has numerous advantages.
- The beliefs and behaviours of staff can pose a risk to critical and creative thinking, including face-saving and resistance to change.
- Developing evaluation criteria to assess a solution is necessary because it helps to ensure the process of selecting a solution is rational and objective, and it also helps to 'contain' the solution.
- Common evaluation criteria include ease of implementation, costs and ethics.
- The Six Thinking Hats technique can be used to encourage team members to adopt different thinking styles.
- When making decisions it is important to reflect upon the qualities of the 'fair-minded thinker', which include intellectual courage and confidence in reason.
- Barriers to effective decision making include overconfidence and confirmation bias.
- A business brief provides stakeholders with information to make an informed decision and includes at the minimum an introduction, background and recommendations.

Learning Checkpoint 2

Lead solution development process

Part A

1. Identify two advantages of generating solutions in a group setting.

2. Which of the following statements about business briefs are correct? Select 'Yes' or 'No' for each one.

   a) A reference list is a key component of a business brief. » Yes » No

   b) A business brief should include at least three recommendations. » Yes » No

   c) Key definitions in a business brief should be included in the introduction section. » Yes » No

   d) An outline of the history of the problem should be included in the introduction section of the business brief. » Yes » No

   e) Organisational requirements determine whether the information in a business brief needs to be supported by evidence. » Yes » No

   f) It is important to use an active, rather than a passive voice, when writing a business brief.

Part B

Read the case study below and answer the questions that follow.

Case study

Bean A While is a mobile coffee cart business that is owned and operated by Dan, Ish and Amina. The cart travels to different sites in inner-city Melbourne, serving coffee and a range of baked goods.

The business has been operating for six months and although it has a loyal customer base, the team is trying to attract more customers and increase brand awareness. The problem is, they have very little money for a marketing strategy.

1. Ish is facilitating a session to generate some solutions to their problem. He's using the Disney method. As the facilitator, Ish needs to clearly explain the three roles used for this method so the team understands what is required and expected of them. In your own words, clearly explain one of the three roles used in the Disney method.

During a solution-generating session, the team come up with a range of ways to increase their customer base and brand awareness.

One of the potential solutions is to ask people to suggest and vote for different muffin flavours via social media. Whatever flavour gets the highest number of votes will be on sale the following week at the coffee cart. The team is using the Six Hats Technique to explore the advantages and limitations of the solution.

2. For each of the six coloured hats, identify one advantage or limitation of this idea.

White Hat	
Red Hat	
Black Hat	
Yellow Hat	
Green Hat	
Blue Hat	

4. The Bean A While team are now deciding on the best solution to the problem they identified. Draw a line to match each barrier to effective decision-making to its example.

» Ish says: 'I heard on the radio that social media is flooded with ads for mobile coffee carts, so I think we should scrap the social media solution.'	» Overconfidence bias
» Amina says: 'I found this article online which says that social media marketing strategies are a great option. I ignored the five articles that said they weren't a great option because they were stupid.'	» Recency and availability bias
» Dan says: 'I'm really good at singing and playing the guitar, so we should go with the solution that involves me singing and playing the guitar.'	» Confirmation bias

Topic 3 | Refine solution for implementation

3A Develop a feedback register

3B Refine proposal based on feedback

3C Seek approval and evaluate your performance

3A Develop a feedback register

Gather feedback about your solution from key people to refine it and ensure it has the best chance of success.

A feedback register is a way of recording data that is methodical and is systematically collected and reviewed. Feedback from stakeholders such as team members, staff in a department or external stakeholders can be collected formally of informally.

Formal feedback means using a tool (a record) to collect information, such as an online survey, focus group or face-to-face discussion where the discussion is recorded and analysed or summarised into a report. Informal feedback is more conversational and may happen over lunch or in a casual conversation, but the information can be just as important.

The type of feedback that is collected can vary.

- You may want to find out how well something or someone is performing and highlight areas for improvement.
- You may want to show your appreciation to a staff member for their contribution.
- You may want to encourage growth and personal development in staff.

A feedback register can be used for all types of feedback; however, for the purposes of this unit the feedback register is a tool that is used to record evaluation information collected from others. In other words, the feedback register will be used to record information about how well your solution works and where improvements might be needed.

You can gather two basic types of evaluation feedback.

- Quantitative data tells us how much, how many, how often.
- Qualitative data tells us about attitudes, perceptions, experiences and behaviours.

Types of data	Description of data type	Examples of questions that generate different types of data
Quantitative data	▪ Numerical data or data that can easily be converted into numbers ▪ Data that can be analysed using statistical analysis	▪ Please indicate, on a scale of 1 to 5, how satisfied you were with this app? ▪ On an average working day, how many times do you access the online staff hub?
Qualitative data	▪ Data expressed in words, pictures or text ▪ Data that is analysed by identifying patterns and meanings	▪ How would you use this app in your current role? (Please explain in your own words.) ▪ Are there any other comments or feedback you would like to provide on the staff hub?

Different types of registers

A feedback register could be:

- a spreadsheet
- an app
- an online tool or
- a software program.

Some feedback register tools can be used to record *and* collect feedback. For example, online survey tools commonly include features that allow the user to:

- distribute a feedback survey (via email) and
- record feedback data.

Some feedback register tools only record feedback. For example, you could collect feedback from people on a hard-copy feedback form and then manually enter the data into an electronic spreadsheet.

Other methods you can use to distribute your questions and to seek feedback may include conducting an interview, asking questions of staff in a team meeting, observing staff carrying out a task (a solution) and recording the outcomes, posting a request for information on social media app or placing a feedback form on the website or intranet site.

Benefits of a feedback register

The feedback register allows you to systematically gather information to help you revise and refine your solution.

The benefit of gathering feedback on your solution is that it will help to ensure the solutions meets the needs and expectations of key stakeholders, such as:

- clients and customers
- team members and colleagues
- managers.

Meeting the needs and expectations of stakeholders is important. If your solution is not acceptable to the people who are going to use it, it will be difficult to implement and may not fulfil the objective.

Example

Implementing a feedback register

A restaurant owner implements a new process designed to improve efficiency: waiters and waitresses are required to use a tablet to record customer orders, rather than the traditional pen-and-paper method. The data from the tablet is then sent automatically to the kitchen, where the orders are filled.

The restaurant owner assumes that the process will cut out the potential for miscommunication between the wait staff and the kitchen, leading to:

- fewer customer complaints about incorrect orders
- less food waste because incorrect orders are not being thrown out.

If the restaurant owner had gathered feedback from his staff before he implemented the new process, he would have learned that they didn't like it because:

- the tablet potentially damages the rapport between wait staff and customers
- without the face-to-face contact that comes about when wait staff call out orders to kitchen staff, wait staff have less exposure to the kitchen and kitchen staff don't know as much about what's happening 'on the floor'.

If the restaurant manager had gathered feedback before he implemented the process, he would have had the opportunity to refine and revise his solution.

Things to consider when developing a feedback register

If you are developing your own feedback register, such as a spreadsheet, you will need to develop or decide upon the method for collecting feedback before you develop your feedback register. For example, if you are going to use a paper-based form to collect feedback, develop the form first.

Whatever is included in your feedback form should also be included in your register. For example, perhaps your feedback form asks your colleagues to provide feedback regarding:

- what they like about a new process
- what they don't like about a new process, and
- what could be improved.

Your feedback register, therefore, should include sections where you can record feedback on each of these three questions (see below).

Respondent code	What respondents like	What respondents don't like	What could be improved
1			
2			
3			
4			
5			

Feedback software

A range of digital tools are available to help with the process of collecting and analysing feedback. They do this in several ways, including features that:

- provide a platform for stakeholders to:
  - make suggestions
  - share ideas
  - vote on or prioritise options
- provide opportunities for users to store and organise feedback
- allow users to create and distribute feedback surveys.

The benefit of using a digital tool is that it streamlines the process of data analysis. Digital tools may also be more convenient and easier for respondents to use.

Tips for gathering evaluation feedback

Here are some tips to help make the feedback process efficient and positive for everyone involved.

Keep it focused

Only ask questions that help you evaluate your solution. If you ask questions that are not relevant to your goal, you will end up with a lot of data that you cannot use.

Keep it brief

If you ask too many questions, people may lose interest and not complete the feedback.

Avoid leading questions

Your question should be neutral and not 'lead' the person to respond in a way that you want. An example of a leading question is: 'How is this tool better than the tool you currently use?' A slightly better question would be: 'How does this tool compare to the tool you currently use?' Better still: 'What do you think of the new tool?'

Make it anonymous

If you are a manager asking for feedback from your team, you can make the responses anonymous so employees will provide honest feedback.

Follow through

Follow up with a 'thank you for responding' message to those who provided feedback. If appropriate, provide some information on the outcome or how the information they provided was used/helpful.

Practice Task 9

Question 1

Which of the following statements are correct? Select 'Yes' or 'No' for each one.

a) A paper-based feedback form has the benefit of being quick to summarise antd provide a summary of comments. » Yes » No

b) A feedback register can record information about how well your solution works and where improvements might be needed. » Yes » No

c) Online survey tools allow you to distribute and record feedback data. » Yes » No

d) A feature of a feedback register is that it allows you to identify the appropriate respondents. » Yes » No

e) Digital software allows respondents to make suggestions, share ideas, vote on or prioritise options. » Yes » No

Question 2

Explain two things that you need to consider when gathering evaluation feedback from stakeholders.

3B Refine proposal based on feedback

The feedback you collect will provide a valuable insight into the refinements needed.

To identify insights from the information gathered, you will need to analyse and interpret the feedback data. Analysis is the process used to generate results. Interpretation is the process of concluding what those results mean. This process can turn a collection of comments and suggestions into something that is meaningful and can direct you to improvements. You can use the information to refine or revise the proposal for a solution. These insights will help ensure that the solution is practical and will meet the needs and expectations of staff you will be involved in its implementation.

Analysing quantitative feedback

There are many ways to analyse quantitative feedback. Some of these methods involve complex statistical calculations and others are more straightforward.

When analysing feedback to refine a solution, straightforward methods are probably the most useful and appropriate.

If you are using software to analyse your feedback, you may not need to do these calculations manually. However, it is useful to know what these terms mean and how they are calculated.

	What is it?	How is it calculated?	Example
Frequency	Frequency indicates how often something has occurred.	Frequency is calculated by counting the number of times an item appears in the data.	14 males and 16 females responded to a survey. ▪ The frequency of male respondents is 14. ▪ The frequency of female respondents is 16.
Percentage	Percentages indicate the amount, number, or rate of something in relation to the whole.	Percentages are calculated by dividing the frequency of the item by the total number and multiplying it by 100.*	From a total of 30 respondents, 12 respondents were employed full-time and 18 were employed part-time. ▪ The percentage of full-time employees is 12 / 30 x 100 = 40% ▪ The percentage of part-time employees is 18 / 30 x 100 = 60%

	What is it?	How is it calculated?	Example
Mean	The mean is the average score.	The mean is calculated by adding all the items together and dividing the total by the number of items in the set.	Five respondents reported on their level of satisfaction with a new tool by using a scale from 1 to 5. The levels of satisfaction were: ▪ Respondent A = 4 ▪ Respondent B = 2 ▪ Respondent C = 3 ▪ Respondent D = 4 ▪ Respondent E = 2 The mean is calculated by adding all the ratings (4+2+3+4+2 = 15) and dividing it by 5. The mean is 3.
Median	The median is the middle score.	The median is calculated by ordering items from lowest to highest and finding the exact middle.	Seven respondents reported on their level of satisfaction with a new process by using a scale from 1 to 5. The ratings are ordered from lowest to highest: 1 1 2 2 2 3 4 The median is the middle score = 2.

* Where the calculation results in a number with a decimal point it is common practice to 'round off' the number using the following rule: if the decimal is 0.4 or below, the number is rounded down; if it is 0.5 or above, the number is rounded up (e.g. 24.3 = 24%, 24.7 = 25%).

Using tables and graphs will help you (and others) interpret the data. When quantitative data is presented in tables and graphs it is often easier to identify patterns and trends.

Various types of graphs can be used, including bar graphs, pie charts and scattergrams or dot plots. The most appropriate graphic to use will depend upon what pattern or trend you are trying to identify.

Analysing qualitative feedback

Numerous software packages can be used to analyse qualitative data. However, qualitative data typically does not lead to clear conclusions, so the process of analysis – with or without software – is usually more time-consuming than for quantitative analysis.

Here are some methods that can be used to analyse qualitative feedback data.

	What is it?	How do you do it?
Thematic analysis	Thematic analysis involves the identification of common issues, ideas and opinions.	Read through all the qualitative data and identify common themes. Once you have identified themes, you can group and compare the data.
Frequency of themes	The frequency of a theme refers to how often a theme occurs in the data. The frequency of the theme tells you about the relative importance of the theme.	Give each theme a code and then calculate the number of times it appears in the data.
Case studies	A case study is an in-depth, detailed examination of a specific case. The case study can focus on a person, a team or a business.	Select a 'case' (e.g. a person, a team) which illustrates a key point or finding. Use the data to write a description of the case.

Interpreting data

When you interpret your feedback data, you are asking what the findings (the results of your analysis) are telling you about your solution and what refinements need to be made. For example, you might ask what the findings say about the:

- strengths and weaknesses of the solution
- the potential benefits and drawbacks of the solution (when compared to the current situation)
- how to improve the solution to meet stakeholder needs and expectations (e.g. employees, clients, customers, managers).

When you analyse data, you need to make decisions about which data is relevant and significant, and which is not. The refinements you make to your solution should generally be based upon patterns and trends in the data. For example, if one respondent out of 45 believed that your solution was too time-consuming, you would not refine your solution based upon that feedback because it does not indicate a *pattern*.

Using critical and creative thinking to interpret data

When interpreting data, you need to be objective. However, if you are especially passionate about an idea, this can be challenging. It may be difficult to accept the potential flaws in a solution that you have worked so hard to develop.

This is where critical and creative thinking can be useful. Ask questions about the data, drawing upon what you have learned about critical and creative thinking. Some examples of questions you could ask are provided below.

Am I overlooking or ignoring something?	▪ When you think critically, you consider information in a reasonable and rational way. ▪ For example, you do not ignore negative feedback because you believe the people who provided it are being vindictive or are jealous of your great idea. Rather, you consider the feedback objectively.
How might another person, team or group interpret this data?	▪ When you think critically and creatively, you consider things from multiple perspectives. ▪ For example, perhaps you believe that the data overwhelmingly supports your solution because 75 per cent of respondents are satisfied with it. However, if you were the manager of the HR department, perhaps you would ask about the data specifically from the HR team, which shows only 59 per cent of that team support the solution. From the HR manager's perspective, this would not be overwhelming support.
What assumptions am I making about the data?	▪ When you think critically, you question your own assumptions. ▪ For example, perhaps you have concluded that your solution is not worth pursuing because half of the people who provided feedback said they were not satisfied with it. Your assumption is that those people saw no merit whatsoever in your idea. However, even if half of the respondents were not satisfied with the current solution, they could still see merit in your idea and may be satisfied with a revised version.
What conclusions logically flow from the data?	▪ When you think critically, you are logical – you think about how things fit together and whether they make sense. ▪ For example, perhaps one of the key themes emerging from your qualitative data is that employees like a tool because it will save them time. A logical conclusion is that the tool may lead to greater efficiency. ▪ On the other hand, perhaps another key theme emerging from the qualitative data is that the tool may be difficult for new employees to understand. ▪ It would not be logical to conclude that your tool leads to greater efficiency for *everyone*. Rather, the logical conclusion would be that the tool saves time for established staff and that new employees may need training to learn how to use the tool efficiently.

Questions are based on Elder, L. & Paul, R. (2010) *The Thinker's Guide to Analytic Thinking* (1st edn). The Foundation for Critical Thinking: Tomales, California; and Ruggiero, V. R. (2004). *The art of thinking: A guide to critical and creative thought*. Pearson/Longman:

Example

Refine solution based on analysis of feedback

Sheridan is a team leader at a medium-sized screen-printing company. She has come up with an idea for using staff resources more efficiently during periods of low demand.

Sheridan has gathered feedback on her idea from multiple teams within the business now she needs to analyse it.

She begins by calculating the frequency of this data by adding the number of respondents from each team within the business. She then calculates the percentage by dividing the number of respondents from each team by the total number of respondents (53).

Branch	Number of Respondents	Percentage of respondents*
Office staff	11	21%
Warehouse staff	14	26%
Management	7	13%
Printing staff	21	40%
Total	53	100%

* Rounded to 100%

Now that Sheridan knows who has responded to her survey, she wants to know how satisfied they were with her proposal. She is going to analyse this data by team, beginning with the office staff.

Sheridan's question asked respondents to rate their level of satisfaction with the proposal using a scale from 1 to 5, where 1 = very dissatisfied and 5 = very satisfied. Here are the ratings from all 11 respondents from the office team.

Respondent 1	3
Respondent 2	4
Respondent 3	4
Respondent 4	5
Respondent 5	2
Respondent 6	2
Respondent 7	1
Respondent 8	3
Respondent 9	3
Respondent 10	2
Respondent 11	4

Refine solution based on analysis of feedback continued...

To calculate the mean, Sheridan adds all 11 ratings to get a total of 33, and divides that by 11 (the number of ratings). The mean is 33 / 11 = 3.

To calculate the median, Sheridan lists all 11 ratings from lowest to highest in a table.

1
2
2
2
3
3
3
4
4
4
5

As the median is the middle number, Sheridan counts down to find the sixth number in the list of 11 ratings. Sheridan undertakes the same calculations for all the four teams that responded to her survey. She then records this information in a table that she can refer to when she is refining her proposal.

Levels of satisfaction by team

	Office staff	Warehouse staff	Management	Printing staff
Mean levels of satisfaction	3	4	2	4
Median levels of satisfaction	3	3	2	4

Practice Task 10

Question 1

When analysing quantitative data, what is the difference between the mean and the median?

Question 2

Explain two methods used to analyse quantitative data.

Question 3

Identify three questions you could ask to help you think critically or creatively about your feedback data.

3C Seek approval and evaluate your performance

The second-last step in the problem-solving process is to implement the solution.

Before this can happen, you will need to get approval from relevant stakeholders, such as your manager, a management team, the board of directors or another key decision-maker within your company.

Many companies have a specific approval process that must be followed before work can start, finish or continue. The business approval process is a series of steps used to formally approve work such as project plans, budgets, invoices, purchases and marketing strategies.

Another key final step in the process is to evaluate your own performance. Evaluating how you performed during the complex problem-solving process will help you identify your own strengths, weaknesses and learning needs.

Features of business approval processes

Different businesses have different approval processes; however, most share the following features.

Submission

- The approval process usually begins with someone submitting something, such as a project plan, invoice or purchase order.

Approvers

- Approvers are the people who decide whether the submitted documents should be approved or rejected.
- If the document needs to be approved at various levels of the organisation (e.g. store manager, regional manager, executive managers), there will be a process for forwarding the document from one level to the next.

Permission levels

- Permission levels determine who can view, edit, reject or approve submissions.

Due dates

- Approval processes should have a deadline to ensure workflows are not disrupted or delayed.

Logs

- A log is used to record each step in the approval process.
- The benefits of a log are that it helps to make the approval process transparent and allows staff to view and track actions.

Types of approval processes

Approval processes can be manual or automated.

For example:

- a manual approval process involves completing a document or application and submitting it to the relevant authority, in person or perhaps via email or sending a link to its stored location in a shared folder. The employee is informed in person if their document or application has been approved.
- an automated approval process involves completing a document or application online, which is then automatically forwarded to the relevant authority. The employee is informed via an automated process (e.g. text message, email) if their document or application has been approved.

Approval processes can have both manual and automated aspects. For example, you may be required to submit a document in person and receive confirmation of approval via email. Or, you might need to submit a document online but be informed in person if that document has been approved.

Evaluating your own performance

To be honest and realistic about our performance, we need to be self-aware. That is, we need to have the ability to recognise and understand our emotions, motivations and effect on others.

Here are some steps you can take to help you evaluate your performance.

Ask for feedback	Request feedback from colleagues who participated in the process or individual activities (e.g. the solution-generating session).
Set aside time	Set aside adequate time to reflect upon your performance. Use this time to reflect upon comments or feedback you have received from others.
Use self-reflection tools and techniques	Use self-reflection tools and techniques. For example, the Johari Window is a tool that helps people to improve their self-awareness by clarifying what they know about themselves and how they appear to others.
Review organisational objectives	How have your efforts and achievements contributed to your company's objectives? Reflecting on this question will help you better understand the value of your work.
Identify next steps	Most of the work of self-evaluation involves looking back in time. What have you achieved? What could you have done better? However, self-evaluations also provide you with an opportunity to set some new goals and think about the future. How could you apply the skills you have learned? What steps will you take to address your weaknesses?

Critical thinking and analysis

Use critical thinking when you evaluate your own performance. In other words, think about your thinking as you reflect.

- What are you assuming when you receive feedback about how you have performed?
- Is what this person is telling you relevant to the issue you asked about? Are they talking about an activity or task that had nothing to do with the problem-solving process?
- Are you rushing to judgement? For example, have you already decided that you didn't do well? Have you taken time to reflect on your performance objectively?
- What are you overlooking or ignoring? For example, perhaps you have overlooked positive comments on your work and focused only on the negative.

Practice Task 11

Question 1

Which of the following are features of the approval process? Tick all that apply.

- ◯ Submission
- ◯ Downloads
- ◯ Advertising
- ◯ Due dates
- ◯ Logs

Question 2

Draw a line to match each term about the process for approvals its correct description.

» Approvers	» These record each step in the approval process so actions can be tracked.
» Submission	» These are the key decision-makers in a business who decide if the documents are to be approved or rejected.
» Logs	» This is a list of people who can access the documents at various stages in the approval process.
» Permission level	» The approval process begins with a project plan, invoice or purchase order.

Question 3

When we evaluate our own performance at work, we need to be self-aware. What is self-awareness? Tick all that apply.

- ◯ The ability to recognise and understand our past
- ◯ The ability to recognise and understand our emotions
- ◯ The ability to recognise and understand our motivations
- ◯ The ability to recognise and understand our effect on others
- ◯ The ability to recognise and understand our purpose

Summary

- A feedback register enables the systematic gathering of information.
- A range of digital tools are available to help with the process of collecting and analysing feedback.
- There are two basic types of feedback to collect: quantitative and qualitative.
- Quantitative data tells us how much, how many and how often, whereas qualitative data tells us about attitudes, perceptions, experiences and behaviours.
- Critical and creative thinking can help to ensure the process of interpreting data is objective.
- Business approval processes share common features, including permission levels, due dates and logs.
- To honestly and realistically evaluate our own performance, we need to be self-aware.

Learning Checkpoint 3

Refine solution for implementation

Part A

1. What is a feedback register and why is it used to record feedback about a solution?

2. Identify two features of digital feedback tools.

3. Explain each of the common features of a business approval process.

4. Identify two steps you can take to assist with the process of self-evaluation

Part B

Read the case study and answer the question that follows.

Case study

Richard works as a team leader at a large telecommunications company.

He has collected quantitative data about a solution he wants to implement to address a problem at his workplace.

Richard has used an online survey to collect data from 12 employees. When asked how satisfied they were with the proposed solution, respondents reported on a scale of 1 to 5, where 1 was very dissatisfied and 5 was very satisfied.

These are the results for this survey question.

Respondent A	4
Respondent B	3
Respondent C	4
Respondent D	2
Respondent E	1
Respondent F	3
Respondent G	1
Respondent H	3
Respondent I	4
Respondent J	4
Respondent K	5
Respondent L	2

1. Based on the data Richard has collected from all 12 respondents, what is the mean score?