BCATS

BUILDING, CONSTRUCTION AND ALLIED TRADE SKILLS

Being safe L1

Unit Standard 24352 (v3), **Level 1**

Demonstrate & apply knowledge of safe working practices & use PPE during the construction of a BCATS project. 2 CREDITS

BCITO buildingpeople

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Introduction

This handbook introduces you to how to keep safe while you work on a Building, Construction, and Allied Trades Skills (BCATS) project. You will learn how to do this as you prepare for and work on your project.

Safety is every single person's responsibility. Everyone has a role in preventing accidents and harm. The best safety measure is a careful worker. Form safe working habits, wear and use correct safety equipment, and think how what you do affects the safety and wellbeing of others.

Basic safety rules include:

- think - always think about possible hazards and act accordingly
- make a habit of always wearing appropriate PPE
- do not wear loose or dangling clothing or jewellery, which can get caught in machinery
- tie back long hair before operating machines, or wear a hat. If hair gets caught in a machine, it will either be ripped out or peeled from your scalp.

How you will be assessed

You will be assessed through a combination of practical and written work.

To achieve this unit standard, you need to safely complete a BCATS project. Your teacher/tutor will tell you which project(s) to complete.

You need to show your teacher/tutor that you can:

- read and/or listen to the instructions for a job and check anything you are not sure about
- work out what hazards (dangers) there are and explain what you will do to stop them happening
- work out what personal protective equipment (PPE) you need to use and use it
- check, clean and store the PPE, and tell your teacher/tutor if anything is wrong with it
- carry out the job safely and correctly.

Your teacher/tutor needs to verify that they saw you do all these.

Your teacher/tutor will also give you an Assessment Record Sheet to record the PPE you used, why you used them, and what hazards they were controlling.

Glossary of terms

Term	Meaning
Accident	An event that causes a person harm.
Decibel	The unit for measuring noise.
Ear protection	Ear plugs or ear muffs worn to protect the wearer's hearing from exposure to excessive noise levels.
Eliminate	To remove completely.
Emergency	A sudden unforeseen situation requiring immediate attention.
Eye protection	Safety goggles or face masks worn to protect the eyes from injury.
Hard hat	A helmet designed to protect the head from injury.
Harm	Illness, injury, or both; includes physical or mental harm caused by work-related stress.
Hazard	Anything that can cause harm, including a person's behaviour.
Hazard identification	Recognising that a hazard exists and identifying a method for controlling the risk.
Isolate	To prevent people from being exposed to a hazard. This is a method of minimisation control.
Minimise	To reduce the risk of harm to a person.
Sun protection factor (SPF)	A measure of how long sunscreen will protect you from sun-burn.

Job specifications

The first stage in any BCATS project is to get or develop the job specifications. These are instructions about:

- what the project is
- how the project is to be done.

Information in the job specifications includes:

- materials, for example:
  - material type – e.g. plaster board
  - material brand – e.g. Winstone Gibraltar Board
  - material size – e.g. 16mm.
- finishes, for example:
  - finish type – e.g. paint, stain.

The job specifications are designed to ensure that the project meets the customer's and minimum quality requirements.

Using the job specifications

It is important to:

1. read through the written specifications and ask questions if unsure of meanings and/or expectations
2. check that the working drawings and written specifications provide all the information needed to make the project
3. listen to the oral instructions and check that:
   - they match the written specifications
   - you understood them. Ask questions to check your understanding is the same as your teacher/tutor's meaning.

Hazards

Hazards (dangers) continually change because of what people do or do not do, and because work you do one day will be different from the work you do another day.

The Health and Safety at Work (HSW) Act 2015 and its regulations set out the minimum legal obligations for identifying and controlling hazards in workplaces (including schools).

Identifying hazards

Anyone in charge of a workplace must have a good way to identify hazards. Anyone who is going to be working in the workplace needs to be consulted, trained and involved in the process of identifying and controlling the hazards.

Everyone should be provided with information about the hazard identification procedures, which may include:

- information about hazards that are known to be in the workshop or on the project site
- the process you must follow to identify hazards.

There are several ways to identify potential hazards. It is best to use all or at least a combination of them.

Physical inspection

This is the most practical of all hazard identification methods. It involves common sense and observation.

- Every time before starting work, take the time to check and think about the environment you will be in.
- Check equipment before using it to make sure all required safety guards are in place and the equipment is in good working order.
- Following a break, such as lunch, take a few steps back from the task and check to see whether everything is still where it should be. This is sometimes called the '5 by 5 method' – take 5 steps back and take 5 minutes to look around the working area.

Task analysis

Identify the tasks or project to be carried out and the hazards involved at each step. The best time is before you start work. Think about what needs to be done and likelihood of each of the hazards occurring while carrying out that particular job. Use your job specifications to help do this.

Area analysis

Using plans of the site and planned workflows, divide the site into identifiable areas, such as workshops, stores, plant and equipment, or the BCATS project area. Then identify the hazards area by area, paying particular consideration to the design of the workplace, the work programme and environmental and ergonomic factors.

Process analysis

Identify hazards associated at each stage of a particular process. This is best done at the planning stage, when work flow and work programmes can be considered along with all other available information about design, work methods and products (from the manufacturers' data sheets).

Occupation (trade) analysis

Identify the hazards associated with specific trades or occupations who may also be working on the job; for example, carpenter, electrician, blocklayer, painter etc.

Hazard types

A hazard is any activity, situation or substance that can cause harm. Hazards can be identified as:

Physical, for example:

- objects that could fall or be tripped over
- electrical hazards
- dust from sawing wood and other materials
- noise
- light.

Chemical, for example:

- paints, varnishes
- glues
- solvents and cleaning materials.

Biological, for example:

- unhygienic toilets
- no/poor cleaning of work surfaces and hands
- infectious diseases.

Ergonomic, for example:

- poor lifting technique
- computer use for Occupational Overuse Syndrome (OOS)/Repetitive Strain Injury (RSI)
- workstation set up
- height of benches/desks, chair height/design.

Psycho-social, for example:

- risky and hazardous behaviour
- stress/fatigue
- violence/bullying/intimidation
- workload.

Controlling hazards

Hazards are controlled in two main ways:

1.	**Eliminate it** (remove the hazard) – for example, prevent falls by working on the ground.
2.	**Minimise it** (lessen the hazard) – for example, use safety nets, safety harnesses. Minimise includes isolating the hazard (separating the hazard from the worker), such as through installing guardrails. The actual means of controlling the hazard will depend on the hazard and the situation.

Personal Protective Equipment

Eye protection

An eye injury only needs to happen once to blind a person for life. Other eye injuries can take longer to affect vision permanently. Chemicals can destroy your vision in seconds and dust can cause infection, discomfort, and blindness.

You need to be able to identify potential eye hazards and select and use the correct type of protection to minimise the chance of an eye injury. This means wearing safety glasses or goggles in most cases.

You also need to wear eye protection when working close to anyone who is creating a hazard, e.g. someone grinding steel.

The major causes of eye injuries are due to:

- being struck in the eye by flying particles and objects, e.g. a nail ricocheting off a hammer face
- being hit in the eye by moving or stationary objects, e.g. walking into a piece of timber protruding from a rack
- toxic splashes, fumes and dust coming into contact with the eye, e.g. eye contact with molten metals, hot liquids or corrosive chemicals
- exposure to welding flash, laser beams, infrared radiation, laser reflection.

In accidents where the eye is penetrated, approximately:

- ⅓ result in blindness
- ⅓ result in a loss of vision
- ⅓ make a full recovery.

Think about how the loss or damaging of your sight would affect your life. What would it do to your career opportunities, sports, social relationships, and being able to drive a car?

Case study

A worker had to have his eye removed after an incident involving a corrosive cleaning product. He was decanting a cleaning product when a piece of tubing flicked him in the eye. The corrosive product and the impact of the tubing left him with such bad damage that his eye had to be removed. Scarring also meant he could not be fitted with a prosthetic eye.

WorkSafe successfully prosecuted his employer for not isolating the hazard entirely by setting up a system where the cleaning product didn't have to be decanted in the first place. Eye protection would also have prevented the injury. – *WorkSafe 2018*

Eyes – protective equipment

Injuries from dust particles can vary from mild irritation to complete loss of the eye itself, often from secondary infection.

Properly fitting safety glasses or goggles can help to prevent these injuries.

1. If you are grinding, using a circular saw or router, wear safety glasses/ goggles. The main hazard to your eyes will be particles being flung into your eyes.
2. Shaded safety glasses to protect your eyes from glare must be worn when brazing, using an oxy-acetylene set.
3. For arc welding, a welding helmet with the correct lenses must be worn.
4. Fixed and mobile screens should also be set up to protect other people from injuries. This would include any situation where there is a chance of bystanders being injured by objects flying off the job or radiation from welding operations.
5. Some glue contains corrosive substances, such as alkalis or acids that can cause chemical burns and permanently damage your eyesight. The eye becomes bloodshot with itching, burning pain and loss of vision. When using these glues you need to wear goggles or a full-face shield to protect your eyes.

Eyes – emergency action

A well-equipped first aid kit is also required in all work places and workshops. The standard first aid items for treating eye injuries include:

→ eye wash, to flush any foreign objects out of the eye

→ eye patch and sterile bandages.

»	If sand, dirt or small debris gets into your eyes do not rub them. This can scratch the outer surface of the eye and cause further damage. Rinse the eye thoroughly with eye wash or water. If the particle doesn't wash out, lightly bandage the eye and go to the hospital or doctor.
»	If a foreign object penetrates the eye, never attempt to remove it. Call for urgent medical assistance.
»	For blows to the eye, gently apply a cold compress to reduce pain and swelling. Avoid putting pressure on the eye.
»	Should a chemical splash your face, the first course of action is to immediately flush the face under running water. Call for urgent medical assistance.

Head protection

A hard hat is a helmet designed to protect the head from injury. It must be worn at all times where there is a risk of head injuries from objects falling or collision with fixed objects, tool or plant.

Respiratory protection

Toxic dust and chemical fumes that are produced in a BCATS environment have the potential to injure people.

Setting up and using an efficient extraction system is essential. Adequate ventilation, to produce airflow around the job, is also important.

Where it is not possible to remove all impurities, it is important to use appropriate and efficient respiratory equipment to protect your lungs.

Wood dust

Breathing wood dust can be hazardous. It can irritate your nasal passages, causing sneezing or nosebleeds. Some imported timbers are quite toxic.

Fine dust can get through your nose and become lodged in the passages of your lungs causing pneumonia and long term damage.

Protection	Use the extraction system and wear a dust mask over the nose and mouth.

Demolition and renovation

Be particularly wary of fibrolite and other similar asbestos-based products used in older buildings. These contain very fine fibres that may be inhaled and become lodged in your lungs. These fibres can cause cancer and other respiratory problems.

Protection	Use special protective equipment when handling or cutting them.

Arc welding/welding

Arc welding produces fumes and vapours. How toxic they are depends on the type of welding, the material being welded, and the airflow around the operator.

Protection	Wear an appropriate respirator. Check that the model is suitable for the type of welding e.g. welding galvanised, mild steel will require a different level of protection that when TIG welding stainless steel.

Chemicals, fibre-glass and spray painting

These produce fumes, vapours and fine particles that the operator needs to be protected from.

Protection	Wear a respirator fitted with filters appropriate to the job. Dust masks are not suitable. • Check the filters regularly to ensure that they are not clogging up and changed as necessary. • Always spray in a properly constructed spray booth.

Two-part systems (for example 'two-pot' varnishes and paints) contain highly toxic chemicals that are particularly dangerous. They require specialist equipment to be worn, especially when spraying.

Protection	You must wear a special breathing apparatus that has its own pure air supply and wear fully-protective clothing to prevent any of the paint from coming into contact with your skin.

Note:

If you do not wear the correct safety protection when working with these products, you run the risk of developing lung diseases, cancer and other serious health-related problems.

Consider how respiratory damage would affect your ability to play sport, as well as to live a healthy lifestyle. Always wear the appropriate protection equipment, even on the smallest of jobs.

Hearing protection

Work sites can be noisy. You need to wear hearing protection even when machines are fitted with noise-suppressing covers.

Your ears can be protected by wearing:

- Ear plugs fit inside your ears and are disposable. They are often more practical than earmuffs when used in conjunction with safety goggles and/or a hardhat. However, they create extra waste and can be unhygienic when inserted with dirty hands.
- Ear muffs fit over your ears. They are easy to fit and generally offer better protection than earplugs.

Measuring noise levels

Noise levels are measured in decibels (dB). The effects of noise will vary with distance from source but exposure to noise above 80dB has the potential to damage hearing.

Source	dB level	Notes
-	15dB	Average hearing threshold
Soft whisper	30dB	Acceptable
Normal speech	60dB	Acceptable
Heavy city traffic	85dB	Possible damage threshold – below this level an 8-hour day can be worked without using hearing protection devices
Belt sander	90dB	Damage after prolonged exposure
Router / Grinder	100dB	Damage after 15 minutes
Circular saw	105dB	Damage after 10 minutes
Chain saw / Rock Band	110dB	Damage after 2 minutes
Sand blasting	115dB	Damage after 30 seconds
Jet engine	130dB	Above 130dB (A) will cause damage if unprotected
Other	155dB	Instant pain and damage above this level

When to use ear protection

- Select and use the class of hearing protection that is most suitable for the noise you are likely to be exposed to.
- Legally, people must wear ear protection when working in a noise level above 85dB.

Ear muffs are rated according to the level of protection that they provide. A class 5 ear muff will offer the best protection.

Hearing protection class	Equivalent continuous sound level (8 hours)
1	Less than 90dB(A)
2	90-95dB(A)
3	95-100dB(A)
4	100-105dB(A)
5	105-110dB(A)

Checking ear protection

Ensure that the hearing protection is properly fitted:

- Ear muffs should cover the ear.
- Ear plugs should sit properly in the outer ear. A poor fit will not provide sufficient protection.

Always check that your chosen hearing protection is clean and in good condition.

Class 5 ear muffs

Class 4 ear muffs

Ear plugs

Signs of hearing loss

The early signs of hearing loss may include a ringing sound in your ears or a slight muffling of sound. If this occurs, it is likely your hearing has been permanently damaged.

Even if you already have some hearing loss, wearing ear muffs will reduce any further loss.

Consider how the loss or partial loss of your hearing would affect your ability to use the telephone, be involved in a conversation, listen to music, watch television, meet people and play sport.

Skin protection

Sun - Many construction jobs will involve prolonged exposure to the sun. Sunburn is uncomfortable and has dangerous long-term side effects. However, you can protect yourself by wearing suitable clothing, a hat and sunscreen when working outside.

Sunscreen and sun block provide effective protection from the effect of the sun's harmful ultraviolet (UV) rays. They have a sun protection factor (SPF) rating. Follow the information on the product label.

Chemicals and irritants - Barrier creams can provide limited protection against the effects of solvents and chemicals that cause dermatitis or other allergic reactions.

An allergic reaction like dermatitis can be triggered by contact with a skin irritant, e.g. MDF dust and solvents. It usually shows up as swelling, redness and itching that may develop into blistering and cracking if left untreated.

The best treatment for allergies of this kind is to avoid contact:

- → Ask to be moved to another job.
- → Wear gloves and apply barrier creams regularly.
- → Wash affected areas regularly to get rid of any dirt and contamination.
- → Use hand lotion to replace lost skin oils.

Hand protection

There is a wide range of hand protection available for different jobs.

- → *Leather gloves* protect against cuts and burns.
- → *PVC gloves* protect you against chemicals.
- → *Cotton gloves* protect finished surfaces from marks caused by the oils in your skin.
- → *Leather or reinforced poly-cotton gloves* provide protection from sharp edges and coarse surfaces when stacking timber and materials.

PVC gloves

Reinforced poly-cotton gloves

Leather welding gloves

Leather gloves

Always check that all machine safety guards are fitted correctly.

Protective clothing

Protective clothing is designed to help keep the wearer protected and comfortable. Wear protective clothing appropriate to the conditions and the type of work.

Appropriate protective clothing is needed:

- around machinery, such as circular saws and lathes
- outside, for protection from the sun and the weather
- when near heat or sparks
- when spraying paint or fibre-glass
- when carrying tools.

When working outdoors you will need to prepare for varying conditions with:

- wet weather gear
- sun block, and a hat
- durable clothing and a leather apron on building sites.

When welding you need to be protected from heat and sparks with:

- overalls – for complete body protection
- appropriate face protection – to protect eyes, nose and mouth
- a welding jacket – for extra protection.

When working in dirty and dusty environments:

- bib overalls or dustcoats for less dusty jobs
- complete overalls for dustier or dirty operations
- appropriate face protection – to protect eyes, nose and mouth.

Machine operators should wear:

- close-fitting clothing. Do not wear ties or baggy sleeves. Tie long hair back and make sure hoodie strings are tucked inside the clothing.

Spray painting or fibre-glassing requires:

- overalls for complete body protection from paint, over-spray and chemicals
- appropriate breathing protection.

Protection from falling objects:

→ a hard hat.

Note:

High visibility vests are bright yellow or orange and usually have reflective strips to ensure that the wearer can easily be seen by plant operators. This can reduce the possibility of injury from moving vehicles and equipment.

Protective footwear

The most appropriate footwear for a construction area is sturdy but comfortable industrial footwear.

Safety shoes and boots have steel caps, strong leather uppers and non-skid soles. The steel caps protect your feet from falling objects and from injuries from accidentally kicking or tripping over hard objects.

Never wear sandals or jandals in work areas because they offer minimal protection to your feet.

Boots are designed for use in a range of situations including:

→ wet areas

→ construction site/workshop

→ welding

→ on-site fitting.

Gum boot

General purpose lightweight boot

High-laced steel-capped boot

Safety shoes

Non-skid, anti-fatigue mats are designed for use in situations where people are standing for long periods of time, e.g. in front of machines. They help to minimise foot and leg fatigue, varicose veins and back pain.

Care and maintenance of personal protective equipment

It is extremely important to care for and maintain your personal protective equipment (PPE).

Poorly fitting and unmaintained PPE is uncomfortable to wear, unlikely to protect against the identified hazard, and often exposes the wearer to additional hazards.

Keep all PPE clean and well maintained. This includes:

- cleaning the lenses of safety glasses daily or, in a school environment, after each use
- sterilising respiratory protection equipment and changing filters regularly
- cleaning ear muffs and checking the pads for damage
- replacing ear plugs
- checking gloves for tears or damage
- washing overalls and keeping clothing clean and tidy
- cleaning and inspecting the soles of safety boots/shoes
- checking that hard hats are in good condition and free of cracks or splits
- reporting any defects or damage to your teacher/tutor/supervisor/employer.

IMPORTANT	
»	Those on worksites have their own PPE and do not share it with anyone else. In a school environment you will likely have to share all but your shoes. Always check that shared PPE is clean and safe before using it and clean it every time you've finished using it.
»	Store all personal protective equipment in a clean, safe and easily accessible location.
»	Select a sterile location for respiratory equipment.
»	Maintain personal hygiene – no-one enjoys working next to a dirty, smelly person who doesn't even wash their hands.