Pearson BTEC Level 1 Award in Health and Safety in a Construction Environment (QCF) – Workbook

ALWAYS LEARNING

PEARSON

Pearson BTEC Level 1 Award in Health and Safety in a Construction Environment (QCF)

Level 1: 4 credits

Learner name:	
Learner registration number:	
Centre name/number:	
Assessor/tutor name:	
Your job role (if applicable):	
Main organisation: (This will either be the organisation the learner is employed by or, if the learner is not currently employed within the construction sector, an organisation they are familiar with.)	
UNIT SIGN OFF I confirm that the answers given within this workbook are my own work. Learner signature: Date:	
I confirm that the evidence in this workbook has been assessed against the assessment criteria for this unit and has judged for validity, authenticity, currency, reliability and sufficiency. Assessor/tutor signature: Date:	

Assessment guidance

You are likely taking this qualification because you are already working in Construction or you want to get a job in this great industry. This qualification is all about you working safely for yourself, your workmates and people who may be around you.

You don't have to be working in Construction to do the qualification. Some of the activities might ask you about your workplace but you can give general answers that show you know what to do wherever you are working.

The final grade for this assignment will be pass or fail, there is no further grading. To achieve a pass, you must complete the requirements of the assessment criteria, which are noted clearly by each task as evidence activity.

You must complete the workbook tasks by yourself.

There will be a glossary of key terms at the end of the workbook. Key terms will be highlighted in **bold** throughout.

BTEC Level 1 Award in Health and Safety in a Construction Environment (QCF) – Workbook

Learning outcome 1: Know the principles of risk assessment for maintaining and improving health and safety at work

How you will be assessed

The activities in this workbook will get you to look at the hazards and risks in the construction workplace.

Complete all the evidence activities. They will need to be assessed and passed before you can complete this learning outcome.

Extra learning

You may also find some case studies with additional questions to help you with your learning.

Getting started

Construction sites are **hazardous** places. Work is taking place on the ground, overhead on ladders and scaffolding, and below the ground level in **trenches** and holes. There is also traffic and often, no real roads or pathways for the vehicles to run along. Even if the construction work is being carried out away from an actual construction site, an extension to a house for example, there are still serious **hazards** and **risks**.

It is important to know what the hazards and risks are in your workplace, and before starting any job. Hazards are things that could cause an accident, for example, an extension lead that has been stretched across a walkway. Risks are the chances of the accident happening. In this example, the hazard is the extension lead, the risk is that someone will trip over the lead and injure themselves.

Some of the main hazards are:

- Working at height, on scaffolding, ladders and other access equipment. Workers can fall, or drop tools and other objects on people working below.
- Working in trenches and other **excavations**. The sides of a trench can collapse, the trench can become flooded, and people can fall in. Also there is the danger that vehicles can drive too close to the edge and cause a collapse, or drop into the trench.
- People suffering from trips and falls. Although it is hard to keep a work area clean and tidy, you should try to keep it clear of anything that would cause someone to fall and injure themselves.
- The outbreak of fire. Some jobs have to use heat, for example, welding and cutting. The flame from a torch could set fire to flammable material, such as paper and cardboard. There might also be gas bottles containing explosive gases, such as oxygen and acetylene.

1.6 Typical hazards and risks

Here is an example of how dangerous construction work can be.

Case study

Two painters were sent to paint the steel girders in the roof of a warehouse. The painters set up an extending ladder and put the top of the ladder against the highest part of the first girder. The girder was the only place where the ladder was in contact with the building.

As the painter climbed the ladder, he became more and more frightened; when he was halfway up, the ladder started to bend under his weight. This meant that the top of the ladder was sliding down the girder, so that even less of it was touching the girder. By the time he reached the top, he was almost too frightened to work.

Although he was very nervous, he managed to paint the steel work. He reached as far as he could in either direction, by leaning over and stretching out his arm.

At last, he was finished and set off down the ladder. He made it to the ground and stepped away. A moment later, a fork lift truck came round the corner and collided with the ladder, which was pushed over and broken. The painter had a very lucky escape!

Questions

1 Was using this ladder a safe way to climb up and paint the girder?

2 Was there another way that the painters could have done this job?

3 What is the safe way to set up and use a ladder?

Evidence activity 1.6

List some of the hazards and risks you will find on a construction site. Describe the type of accident that they could cause.

For example:

Work situation	Hazard	Accident
Resources	*Uneven scaffolding boards*	*An uneven scaffold board could cause someone to fall from height*
Equipment		
Resources		
Obstructions		
Storage		
Services		
Wastes		
Work activities		

Evidence activity

1.3 Accidents that could cause injuries

List three construction related accidents that could be **fatal**

1

2

3

List three construction related accidents that would probably result in a **minor injury**

1

2

3

Evidence activity

1.1 and 1.2 The regulations

These **regulations** are **statutory** – which means that you must do what they tell you to do. They all tell us about risk assessments and method statements, which you will look at later in the workbook.

1 What are the three main regulations that cover all aspects of working safely?

1

2

3

2 In no more than two or three sentences, explain what each of the regulations say about risk assessments and method statements – a first example is given below

Regulations	Summary
Health and Safety at Work Act	*Employers must make their workplaces safe.*

There are other regulations that we have to work within. You need to know what these are before you can write a risk assessment or method statement, because these regulations will tell you how to work safely.

All work is covered by the Health and Safety at Work Act, however there are other regulations that tell us how to safely carry out specific jobs.

Which of these regulations apply to the following types of work (there may be more than one set of regulations for some of these jobs)?

1 Welding a large metal pipe
example The Confined Spaces Regulations and Control of Substances Hazardous to Health (COSHH) Regulations
2 Painting a soffit board
3 Using adhesive to glue down a carpet
4 Moving a bundle of metal pipe from the storage container to the work area
5 Changing fluorescent tubes in a large workshop area
6 Installing temporary lighting on a construction site

Now add your own examples from your own work role and tell us which of those specific regulations, such as the Working at Height Regulations or COSHH would apply to those jobs.

Evidence activity

1.1 Risk assessment and method statements

Write a brief description of a risk assessment, what is it for, how is it put together?

A risk assessment is…

Here is an example of a method statement.

Case study

A new false ceiling had to be installed on all four floors of a four-storey office block. The office could not shut down during the week. Three companies made bids for the work. The company that actually got the job put in the method statement below.

Method statement

Address:

Jack Smith Ltd

Office block 1

The Street

The Town

Description of the work

To replace the false ceiling at the address above. This includes:

- all tiles
- all the supporting grids
- the hanging grid fixings

Health and safety

Main hazards:

- working at height
- falling objects
- electric shock
- dust and debris
- loss of concentration due to tiredness

All workers to wear PPE

Scaffolding to be used for access

110V or battery power tools only to be used

Regular rest breaks to be taken

Precautions

- all desks to be covered with dust sheets
- all areas between desks to be cleared of objects or furniture
- all computing equipment to be shut down

Working plan

Work to take place over four weekends.

One floor to be completed over each weekend.

1 All office staff to leave by 5pm on Friday.
2 Scaffolding team to move in at 5:30pm.
3 Cover desks with dust sheets.
4 Erect scaffolding.
5 Electrical team to begin work removing lights at 8pm on Friday.
6 Ceiling team to begin removing existing ceiling 10pm on Friday.
7 All work team to rest when complete.
8 Ceiling team to begin installing new ceiling at 7am on Saturday – work until ceiling complete.
9 Electrical team to re-fit lights as each area of ceiling is completed.
10 Scaffolding team to dismantle and clear scaffolding between 8am and 3pm on Sunday.
11 Final clear up and restoration completed by 6pm on Sunday.

Evidence activity

1.1 Method statement

Read the scenario below and write down the things that you would need to put into a method statement for this job. You do not have to write the method statement itself, just explain what it needs to cover.

You have to change a lamp in a busy shopping mall. The lamp is in the main concourse and several metres above floor level. It is Christmas and the mall is open twenty-four hours for three days, so you will not be able to work without the public being present. Also, the power to the lamps is the only power that can be switched off. There has to be light to keep the public safe. There is no parking outside the mall, which fronts onto the main street.

Notes:

The method statement needs to give step-by-step instructions on how to carry out this job safely and with as little disruption to the shopping mall as possible.

For the risk assessment on the following page, break the project down into small jobs and think about the hazards they bring and how you would minimise those hazards. Keep it brief and to the point. Use numbered points if you like.

Method Statement

Evidence activity

1.1 Risk assessment

Now you have explained what the method statement should cover, complete the risk assessment form on the next page. Think carefully about the difference between a risk and a hazard and the sort of risks and hazards you would face in this job.

In the 'severity' column answer how serious the injury could be:

(1) very serious, will probably need to go to hospital

(2) serious, but can be dealt with by a first aider

(3) a minor injury.

For the likelihood column put if you think there is

(1) a strong chance it will happen

(2) a fair chance it will happen

(3) a small chance that it will happen.

Risk Assessment

Task	Hazard	Risk	Who it affects	Severity	Control	Likelihood
Carrying materials into the shopping mall	*Lifting and carrying heavy items*	*Back injury*	*The person carrying the item*	*1*	*Two people to lift items* *Use trolley to carry items* *Use safe manual handling*	*1*

Evidence activity

1.7, 1.8 and 1.9 Reporting accidents

No matter how careful we are, accidents will sometimes happen.

1 Identify the regulations that tell us what should be done if an accident happens?

2 What do these regulations actually tell us to do in the event of an accident?

3 You are working on a construction site and you notice a colleague trip on loose rubble and injure his ankle. The worker is lying on the ground, in pain. What steps should be taken straight away? And afterwards (you don't have to describe the actual first aid needed for the worker)?

What to do to prevent an accident happening

1 Who is the Health and Safety Executive (HSE)?

2 What powers does it have?

3 What are the actions that the HSE can take if:

1	It discovers a specific breach of health and safety
2	It discovers something extremely dangerous
3	Someone has been killed on the site

Evidence activity 1.4

4 Write down three things that could happen if we don't prevent accidents or ill health at work?

Example: *People who work for the company don't feel safe anymore*

1

2

3

Evidence activity

1.5 A near miss

Sometimes an incident is described as a near miss.

1 What is a 'near miss'?

2 Give an example of a near miss you have seen or experienced. Or give an example of one that could occur on a construction site.

3 If you are not **competent** in your work, what risk would there be to you and your colleagues

Learning outcome 2: Know the importance of safe manual handling in the workplace

How you will be assessed

The activities in this section will test your knowledge of safe manual handling.

Complete all the evidence activities. They will need to be assessed and passed before you can complete this learning outcome.

Extra learning

You may also find some case studies with additional questions to help you with your learning.

Getting started

Although the regulations for manual handling tell you that it is best not to lift and carry objects, there are times when you don't have a choice. The important thing is to lift and carry things safely so that you don't injure yourself. Lifting things that are too heavy, or lifting objects awkwardly, can cause back injuries or strain your muscles. There is also the danger of dropping items on your feet. Heavy items can break bones.

The Health and Safety Executive (HSE) Manual handling at work guidelines show that the heaviest weight a man should try to lift is 25kg and the heaviest weight for a woman to lift is 16kg. Remember, this is a guide. There are no regulations about this. If it feels too heavy, then you should not try to lift it.

There is equipment to help you lift heavy or awkward objects. This ranges from simple wheelbarrows and sack barrows to machinery such as forklift trucks and cranes. All of this equipment has its own hazards and needs to be operated correctly by people who have been trained to do so.

Manual equipment, such as wheelbarrows, must be used with care because lifting and pushing it could cause back or muscle strain. Also, pushing wheelbarrows over trenches and at height can result in falls or material being tipped over other people working in the area.

Protective clothing (PPE) should be worn when lifting and carrying objects. This includes gloves and protective footwear. Gloves will protect you from cuts and grazes from any sharp edges. The protective footwear will protect your feet if you drop a heavy object on them. You should remember that some of the items you carry might be hazardous to your skin or lungs, if you touch them or breathe them in; for example, a bag of cement. In these cases, you should wear the correct PPE, for example, protective overalls and face mask.

Evidence activity

2.1 Why is safe manual handling important?

It matters how you lift and carry objects. Give three reasons why it matters:

1

2

3

Evidence activity

2.2 Injuries and ill health caused by poor manual handling

Case study

A labourer was carrying mortar from the cement mixer to the bricklayers using a wheelbarrow. A trench had been dug for the electrical and water supplies to be laid. The labourer had to push the heavy wheelbarrow round the end of the trench to get to the bricklayers. It was a long way and he was getting fed up with the journey. He found a plank of wood, which looked wide enough and strong enough for the wheelbarrow, and laid it across the trench. He did not fix the plank at either end. Instead, he laid it on the ground.

Everything was okay for the first three trips. The plank bent in the middle but it didn't snap, and it saved a lot of time and effort.

The labourer had not noticed that each time he pushed the loaded wheelbarrow onto the plank it pushed the wood a little way across the gap. On his fourth trip, the labourer accidently pushed the plank to the edge of the trench. When he was halfway across, the soil under that end of the plank gave way.

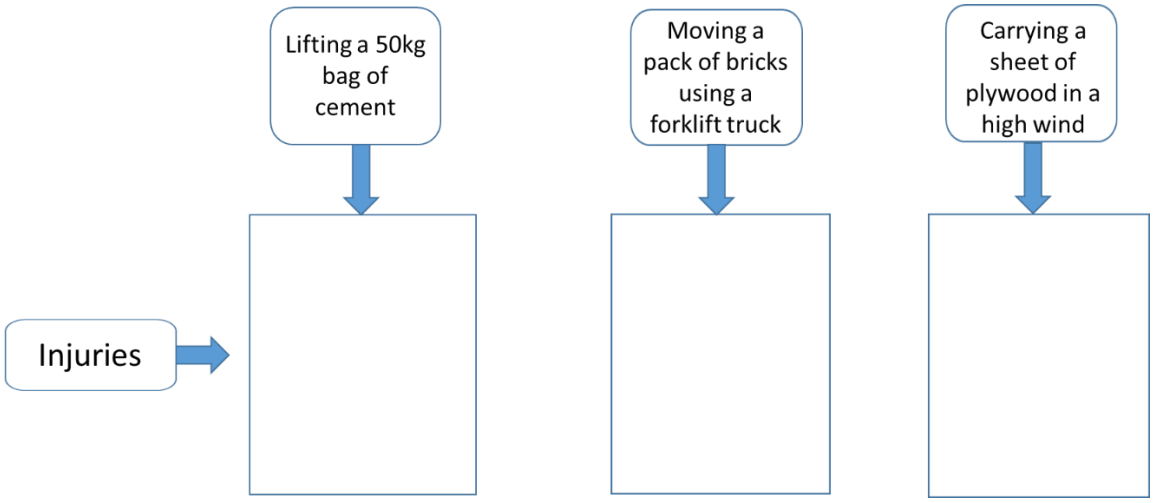
The wheelbarrow and the labourer were tipped into the trench. The handles of the wheel barrow flew upwards as it fell and struck the labourer in the chest. The handles cut him deeply and broke three of his ribs. Luckily, there was no one working in the trench.

Questions

1 Who was put at risk by his temporary 'bridge'?

2 How could he have made the crossing over the trench safer?

Complete the chart below by entering the type of injury that could result from the three different lifting operations.



Evidence activity

2.3 The regulations about lifting and carrying

1 What are the two main sets of regulations that cover lifting and carrying?

1

2

2 Try to sum-up in a sentence or two what each of the regulations says about your responsibility.

Regulation	Summary

3 What is 'lifting equipment'?

4 Name two things you should do before using lifting equipment:

1

2

Evidence activity

2.4 Safe lifting

Write a help card for people to use when lifting heavy objects. Keep the card short and simple. You can write it as a set of points.

Remember!

When you lift an object

1 Keep your back straight

2 Bend your legs

3

4

5

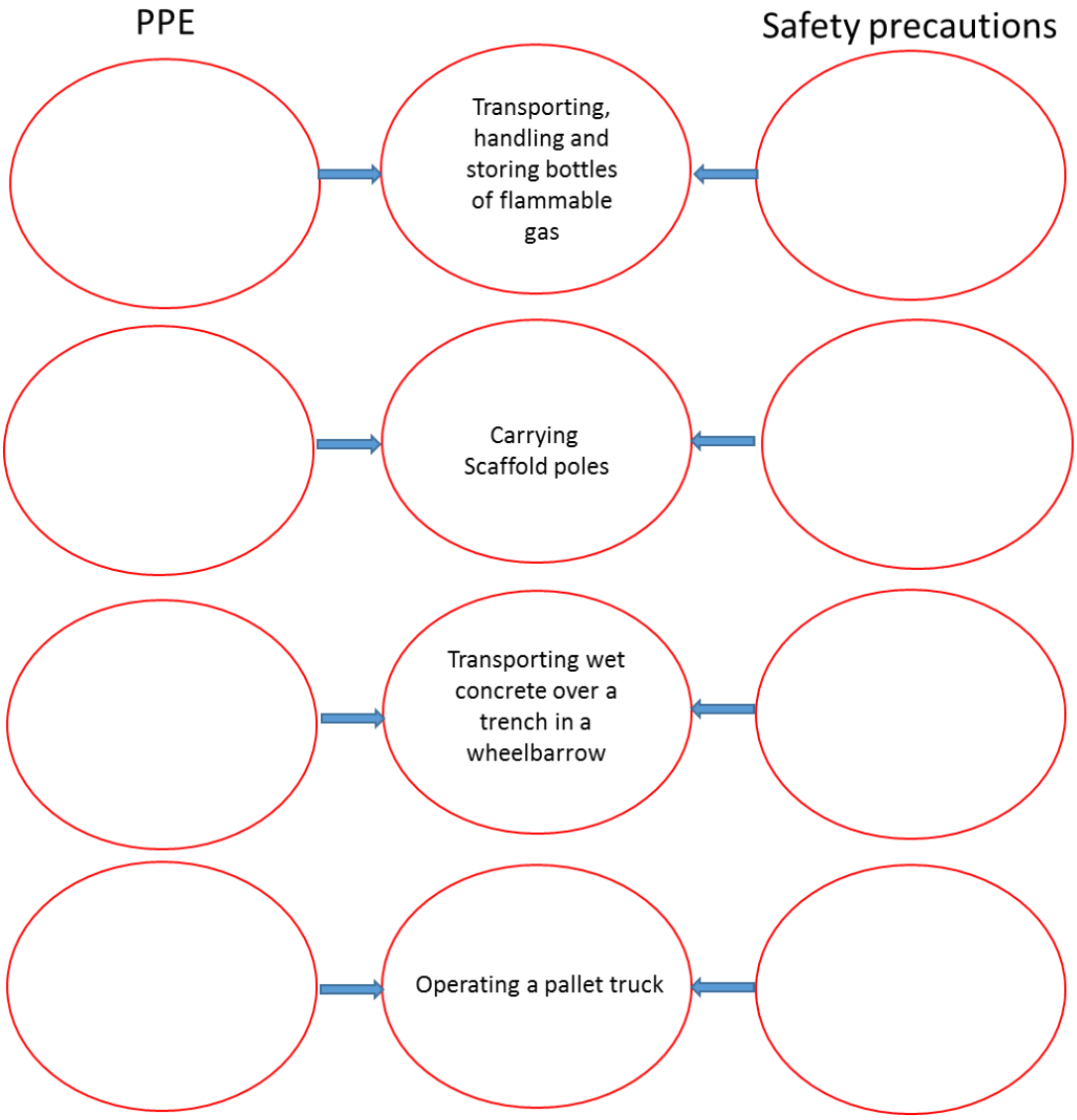
6

Evidence activity

2.5 Protecting yourself (using PPE and safety equipment)

Wearing and using PPE and safety equipment properly makes manual handling safer and healthier.

Fill in the blanks for each of the manual handling operations given below.



Evidence activity

2.6 Using mechanical lifting equipment

List and describe four items of lifting and carrying equipment, and how you would use them safely.

1

2

3

4

Evidence activity

2.7 Reporting a problem

Describe what you would do in the situation below.

Case study

The job is running behind schedule. The site urgently needs to be cleared so that a tarmac drive can be laid and the landscaping finished around a new care home. The site is a mess. Because everyone was late finishing their part of the project, there has been no time to keep the place tidy. You have been told to use a forklift truck to shift as much rubble and debris as you can. You have not been trained to drive a forklift. The vehicle itself is battered and damaged. There have been a number of **faults**, including the failure of the hydraulics that operate the forks.

Also, the area is not suitable for using a forklift truck.

There are a number of steps you should take to try to solve this problem. If one of these steps does not work, what would the next step be each time?

Example.

I will ask to talk to the supervisor.

I will make sure that I know exactly what I want to say. I might even practice this before I talk to him or her.

I will explain why I cannot drive the fork lift truck. It would be helpful if I have an idea of my own on how to clear the rubble.

If this doesn't work I will …

Learning outcome 3: Know the importance of working safely at height in the workplace

How you will be assessed

The activities in this section will get you to look at working safely at height in the construction workplace. You will need to show you understand what working at height means, what your responsibilities are, the hazards and risks and how to avoid them.

Complete all the evidence activities. They will need to be assessed and passed before you can complete this learning outcome.

Extra learning

You may also find some case studies with additional questions to help you with your learning.

Getting started

The Work at Height Regulations 2005 say that you should not work at height unless there is no other way to carry out a job. Working at height is dangerous because there is a risk that you could:

- fall - if the fall is from a great height, it could be fatal
- drop objects on the people below.

The regulations also say that working at height is when you are high enough off the ground to injure yourself if you fall. So, even working on a platform or stepladder, or a step-up, is considered to be working at height.

You should always use the correct equipment to work at height. This equipment is called access equipment. Examples of access equipment are:

- ladder
- scaffolding
- mobile platform.

All access equipment should be in good working order and used correctly. It should also be the right equipment for the job. Only trained people should set up and use access equipment.

The area below the access equipment should be kept clear of people who do not have to work there. People who do work in those areas must wear hard hats to protect them from falling objects.

The other thing you should think about when working at height is the surface you are working on, for example, a fragile roof that could give way when you step onto it.

The activities in this section will test your knowledge of working at height, using different types of access equipment and on different types of job.

Evidence activity

3.1 What is working at height?

Write a simple description of working at height.

You are working at height when you…

Evidence activity

3.2 Employee's responsibilities

State four things that you are legally responsible for when you work at height.

When you work at height, you must…

1

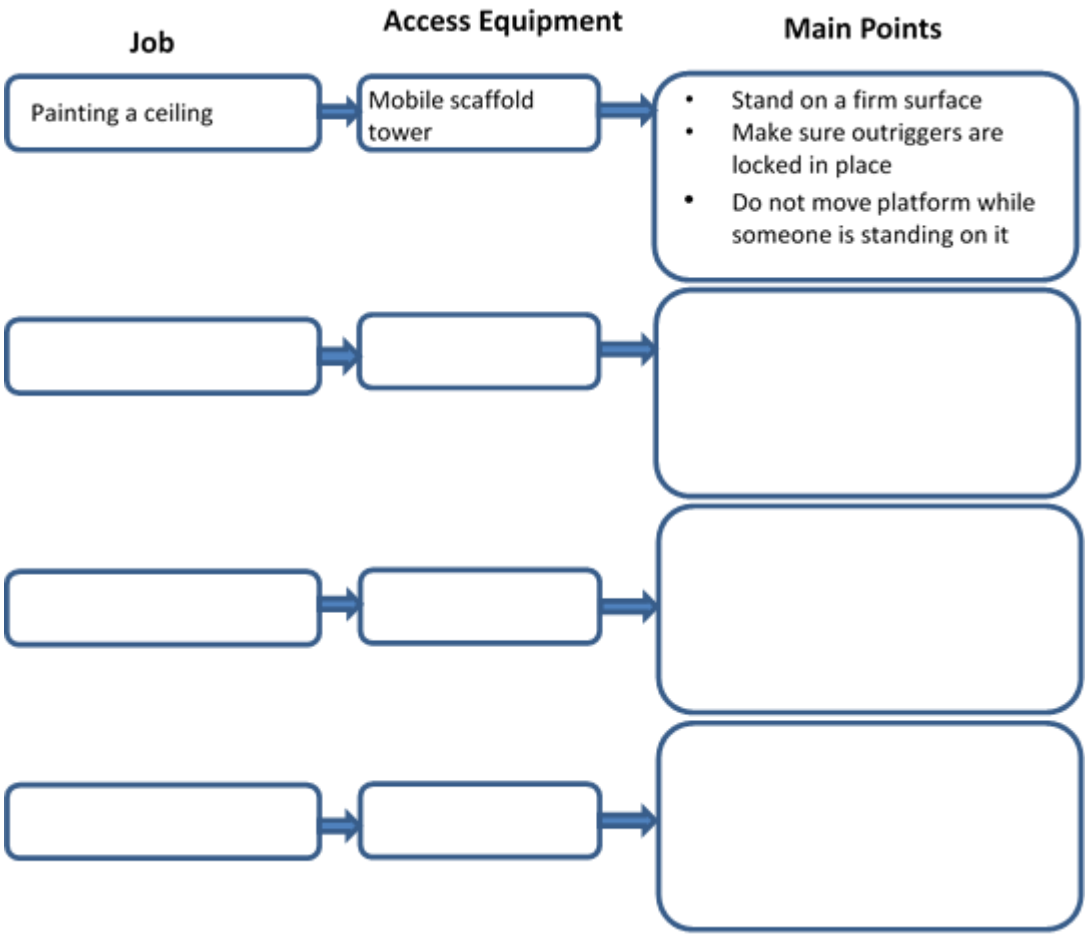
2

3

4

Fill in the boxes below. One set of boxes has been filled in as an example.

Correct and safe use of equipment – main points



Case study

A ridge tile needed to be replaced on the roof of a farm building. The roof was fragile and pitched at a steep angle. Working on his own, the self-employed builder only had a normal extending ladder on his van. The builder parked a dumper truck so that it faced the side of the building. The bottom of the ladder was jammed into the bucket of the dumper. The ladder itself was laid against the roof. It did not reach to the top of the roof where the ridge tile needed to be fitted. Dragging the new tile behind him, the builder climbed over the tractor and onto the ladder. He climbed the ladder as far as he could, then reached up and hooked his fingers into the fan fixing. He used this to pull himself up the remaining distance.

Questions

1 Was this a safe way to carry out this job?

2 What type of ladder should the builder have used?

3 What other access equipment could he have used?

4 What were the hazards and risks in the way he did this job?

Evidence activity

3.5 Regulations that control working at height

What is the regulation that tells you how to use access equipment safely?

Evidence activity
3.3 and 3.4 Working at height risks and hazards, and how to control them

Complete the risk assessment below. The first hazard has been completed for you as an example.

Hazard	Risk	Who would an accident affect?	How severe would an accident be?	Control
Trailing leads	*Tripping and falling* *Electric shock*	*Everyone* *Everyone*	*2* *3*	*Fix leads to scaffold poles where possible, with cable-ties.* *Use 110V or battery tools*
Dropping tools and debris				
Stability of ladders				
Overhead cables				
Fragile roofs				
Scaffolds				
Internal voids				
Equipment				
The working area				

You may find it useful to think of five jobs that you do while you are working at height and complete the risk assessment below for those hazards.

Job	Hazard	Risk	Who would an accident affect?	How severe would an accident be?	Control
Painting an upstairs window frame	*Using tools and paint while on a ladder*	*Falling because you only have one hand free to hold onto the ladder*	*You*	*Serious*	*Use scaffolding instead of a ladder*
1					
2					
3					
4					
5					

Learning outcome 4: Know risks to health within a construction environment

How you will be assessed

The activities in this section allow you to show that you understand the hazards and risks to your health that can be found in the workplace. It will also show that you know how to handle and store chemicals, and that you understand the dangers of working with asbestos.

Complete all the evidence activities. They will need to be assessed and passed before you can complete this learning outcome.

Extra learning

You may also find some case studies with additional questions to help you with your learning.

Getting started

Remember that we are talking about *health* and safety. In the other units, we have talked about staying safe at work. In this unit we will talk about staying healthy.

Many chemicals, and other materials used on building sites, can be harmful to your health. Some can burn the skin, others can cause breathing problems and others can cause fires.

The Control of Substances Hazardous to Health (COSHH) Regulations tell us how to handle these **substances** safely. They tell us to carry out risk assessments, to read the instructions and to do what they say.

An important point is that chemicals, and other substances, must be stored properly. This helps to stop fire breaking out, or people being injured or made ill, if a chemical is spilled. Also, some substances must never be stored with others.

Another thing that can cause ill-health is poor hygiene. You should always wash your hands before you eat. There must be proper toilets and washing facilities on a construction site. The toilets should be away from the eating area.

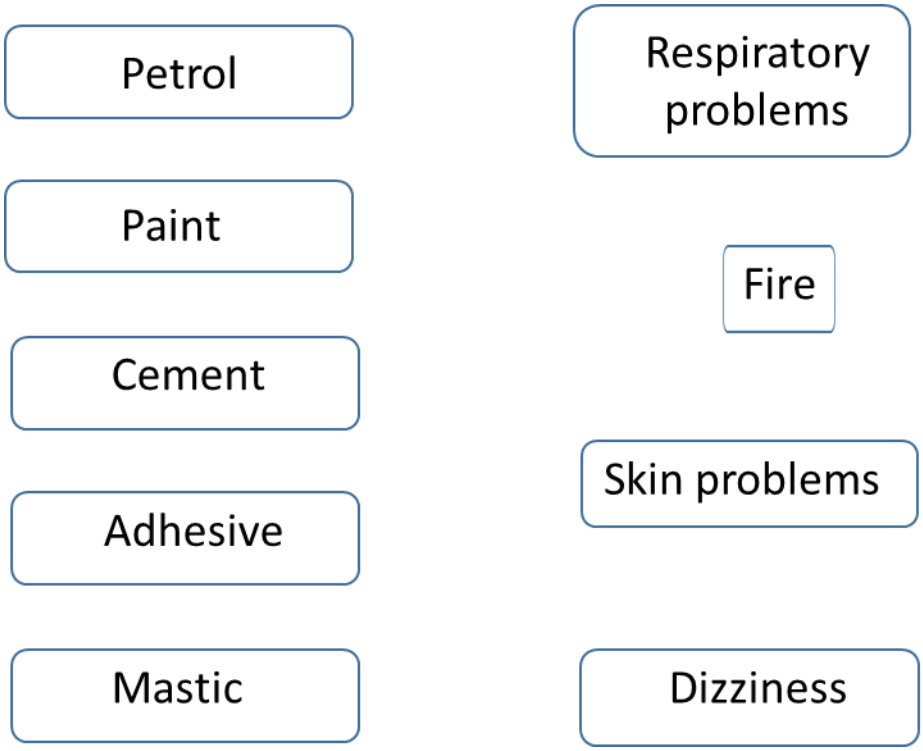
Taking drugs and alcohol can cause you to stop concentrating, and might put you and your workmates at risk. Many sites do not allow anyone to work there if they have been taking drugs or drinking alcohol.

Asbestos is a serious hazard for people working in the construction business. There are special **precautions** to be taken if you find asbestos anywhere and you should never try to remove it yourself. This can only be done by trained people who have a license from the local authority to work with asbestos and to take it away.

Evidence activity

4.1 List substances hazardous to health under current regulations

Match the hazardous substances to their hazards. There may be more than one hazard for each substance.



Can you think of any more substances and their hazards?

Evidence activity

4.2 Common risks to health within construction

What are the health risks caused by the following tasks? An example has been given for the first one but there may be more than one risk for each task.

Task	Health risk
Working below scaffolding	*Head injury from falling objects*
Lifting and carrying bricks from a wheelbarrow to the bricklayer	
Walking around an area where a site is being levelled and prepared for building works	
Using a pneumatic drill for two days without a break to do other jobs	
Working in an area where floorboards are being lifted and replaced	
Working in a place where asbestos is being removed	
Working on a very muddy site in the rain	

Evidence activity

4.3 Hazards linked with using drugs and alcohol on site

Prepare a short talk on the dangers of using alcohol and drugs while working on a construction site. There are some headings and points to think about on the next sheet to help you get started.

You can write your notes in the table below. You don't need to write every sentence, but make a set of notes or bullet points to remind you about what to say.

Imagine you've been asked to do this as part of an induction for people working on your construction site.

SITE INDUCTION TALK: THE DANGERS FROM ALCOHOL AND DRUGS ON A CONSTRUCTION SITE
INTRODUCTION
• Who I am/What I do
• What I am going to talk about
THE RULES
Talk to your supervisor to find out what your company's policy is concerning bringing or taking alcohol and drugs on site.
HOW ALCOHOL AND DRUGS CAN AFFECT YOU
Keep this simple.
• Dizziness
• Not able to concentrate etc.
THE RISKS
• Falling from height
• Dangers from machinery and plant etc.
HOW IT PUTS YOUR WORKMATES AT RISK
If you can't keep yourself safe, is it going to affect the way you keep your workmates safe?

Your notes

Introduction

The rules

How alcohol and drugs can affect you

The risks

How alcohol it puts your workmates at risk

Evidence activity

4.4 Correct storage of combustibles and chemicals on site

Explain for each of the situations on the following page:

a Why it is dangerous?

b What could have happened?

c What should have been done?

1 The last person to use a petrol can to fill a site generator has just left it outside the site hut next to a pile of wood waste.

a

b

c

2 Someone has left a bottle of white spirit open in the workshop after cleaning paint brushes

a

b

c

3 The carpet layers have moved into an area and are using a strong glue to fix the carpet in place. It is winter and all the doors and windows have been closed to keep the area warm.

a

b

c

4 A storage container has been used to store the welders' oxygen and acetylene bottles. They have been laid on their side next to cardboard cartons of electrical fittings. The container is full up and it is hard to find items, so things are constantly being moved around.

a

b

c

Evidence activity

4.5 The importance of personal hygiene within a construction environment

Design a poster that can be placed around the construction site. It doesn't have to include pictures but could be a simple, effective set of bullet points. For example:

Wash your hands!

Soap and water will protect you against…

1

2

3

4

Remember…What you touch now, you'll eat later!

Evidence activity

4.6 and 4.7 Asbestos and asbestos waste

Read the case study below, then create an Asbestos Management Plan for dealing with the asbestos hazard.

Case study

A farm building is being converted to the shop and checkout area for a new garden centre. The interior has been clad and re-floored. The roof is in good condition and it was thought that it did not need to be replaced; however, a closer inspection showed that it is made of asbestos. There is also a wall that separates the barn into two halves and this must be left in place.

Keep your plan simple. Remember, it needs to contain the following:

- Who is responsible for dealing with the asbestos?
- Where is the asbestos?
- What has to be done to make the building safe?
- Can the asbestos be left in place – if so, what needs to be done to keep it safe?
- Who needs to know about this and how do you let them know?

You can find a sample Asbestos Management Plan at:
http://www.hse.gov.uk/asbestos/assets/docs/managementplan.pdf

Write down your answers to these questions:

1 Why is asbestos dangerous?

2 How can it affect your health?

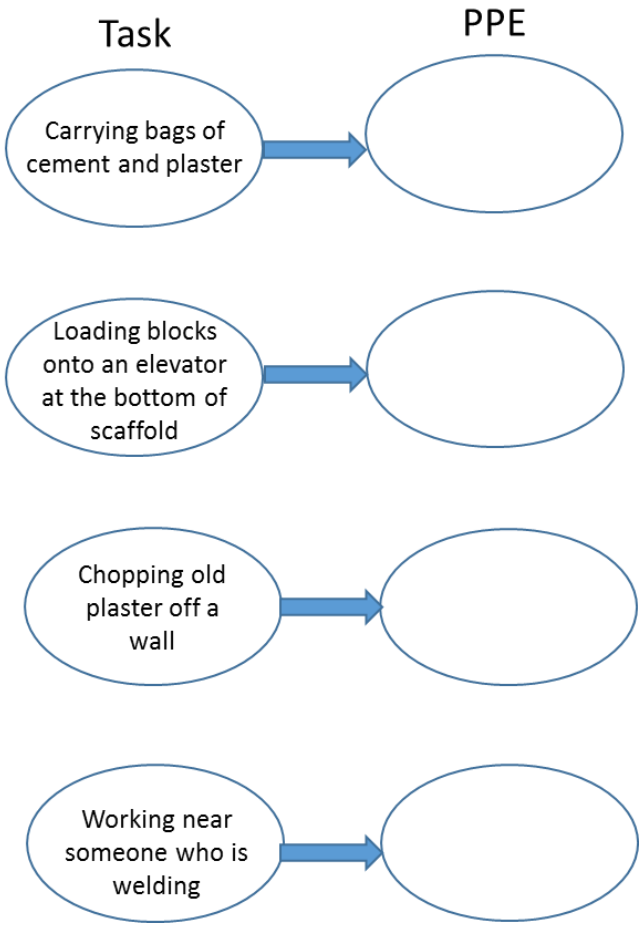
3 What are the two main types of asbestos?

4 Who should remove and handle asbestos?

Evidence activity

4.8 PPE worn for handling hazardous materials

Which items of PPE must be worn in the following situations?



Learning outcome 5: Know the importance of working around plant and equipment safely

How you will be assessed

The activities in this section will get you to look at how you can protect yourself from injury when using or working near machinery.

Complete all the evidence activities. They will need to be assessed and passed before you can complete this learning outcome.

Extra learning

You may also find some case studies with additional questions to help you with your learning.

Getting started

Machinery is used on most construction sites. This can be anything from an electric drill to a large earthmoving machine. Machinery is dangerous and even the smallest item of equipment can cause serious injuries. For example, an electric drill can cause an eye injury from the dust and grit thrown out from the hole it drills. Moving machinery can collide with you, or drop objects onto you.

Machinery can be grouped into three types:

- equipment – tools, such as drills and grinders
- machines – for example, cement mixers and pneumatic drills
- plant – for example, diggers, dumpers, bulldozers.

All of the above should be used only by people who have been trained to use them properly. You should never 'play around' with this type of machinery. Everyone using machines must wear the correct PPE, for example goggles, gloves and ear defenders.

Plant is like traffic on a busy street. It is even more dangerous because on many construction sites there are no marked-out roads, so plant can drive anywhere. Apart from hitting people, these vehicles can also fall into trenches or collide with scaffolding and other access equipment. Additionally, the vehicles can tip over, injuring the driver.

Welding equipment and grinders produce hot sparks, and arc welders make a light so bright that it can damage your eyes.

Evidence activity

5.1 Injuries from moving machinery

1 What is moving machinery?

2 In the table below, give some examples of moving machinery and say what injuries they could cause. An example has been given for you.

What is moving machinery?	
Moving machinery	**Injuries it could cause**
Dumper	*It can roll over if used on a steep slope. Injuries can include broken bones and crushing.*

Evidence activity

5.2 Hazards and risks when using plant and equipment

The hazards and risks in the use of construction plant during building can be high.

For each of the plant items featured in the diagram, state the hazard and potential risk they could cause.

Plant	Hazard	Risk

1. 360° Excavator

2. Concrete breaker

3. 110 volt hammer drill

5.3 Keeping a safe distance from plant, machinery and equipment

Case study

A welder was getting ready to weld the pipes that had been laid in a trench by the side of a busy road. There was pressure to get the work done as soon as possible. The trench and pipe were not finished and a digger was operating close to where the welder began to set up his equipment. The welder had been warned to wait until the digger was finished but he was impatient and eager to start work. He had to crouch down to work. Because he was in front of the digger and quite close to it, the digger driver couldn't see him. The digger arm swung round and the bucket struck the welder's head. Sadly the welder was killed. The welder had been wearing a hard hat but the force of the blow from the large, steel bucket was too violent for the hard hat to protect him.

Questions

1 If the welder had no choice but to start work, what should he have done before entering the trench?

2 Was the welder right to work alone in that trench?

Evidence activity 5.3

Why do you need to keep a safe distance from the area where people are carrying out the following tasks? In each case, why would it be dangerous to simply enter the area? If you need to enter the area, what precautions should you take?

1 The boiler room for a new college, where welders are arc-welding pipes for the heating system.

Why is it dangerous?

Precaution

2 A pneumatic drill is being used to break up concrete

Why is it dangerous?

Precaution

3 A bulldozer is levelling a piece of ground. You need to get past to carry out some work on the other side of the bulldozer.

Why is it dangerous?

Precaution

Evidence activity

5.4 and 5.5 Method statements for using plant

1 What is a method statement?

2 How does it help to make a job safer?

Case study

A busy construction site has a large amount of moving plant. The site is an old warehouse that is being demolished and the area around it is being cleared and levelled so that work can begin on a new factory.

Write a method statement for the safe use of plant at the construction site and explain how this will keep people safe. Use the headings below.

Details of the job (address, brief description)

What sort of plant will be used?

What will the plant be used for?

Who should operate the plant?

What safety precautions will be needed to eliminate or control the hazards and risks?

You might like to create a safety poster for people working near plant and equipment. Show at least four ways of keeping people safe.

Where plant and equipment is in use …

Example: HI-VIS MUST BE WORN!

1

2

3

4

Evidence activity

5.6 Warning signs and symbols

Find pictures of, or sketch, the warning signs that would be used for the following:

1 There is a risk of head injury.

2 The location of the fire exit.

3 You are not allowed to smoke in this area.

4 There is high voltage equipment in this area.

Glossary of key terms

Term	Definition
Asbestos	Hazardous material used in buildings in 1950s to 1990s
Competence	Being able to carry out a task skilfully, safely and efficiently
Excavation	Digging using plant equipment
Fatal	Causing death
Fault	Weakness or error in equipment or materials
Hazard	Something that can cause an accident
Hazardous	Dangerous
Injury	Physical damage or hurt
Minor	Small, not serious
Precaution	An action to stop something dangerous happening
Regulation	A law or rule giving instructions for behaviour and actions
Risk	The chance of an accident happening
Statutory	You must do what is asked of you
Substance	Something that is real and can be touched
Trench	Type of excavation, generally deeper hole