

WEEK 23 WORKSHEET

Subject: Applied Technology

Year/Level: 13

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|---------------------------------|---|
| Strand: 6 | AT 13.6: Applied Engineering |
| Sub Strand | AT 13.6.1 Carpentry & Joinery |
| Content Learning Outcome | AT 13.6.1.1 Develop practical skills in carpentry & joinery works relative to building Windows, doors and fittings & fitments. |

LESSON NOTES

Chapter 5: Applied Engineering

Carpentry and Joinery

Outcome

After completing this strand students will be able to:

- Classify and disseminate with applied engineering skills.
- Demonstrates competences incorporated in tasks, projects and other artifacts.

Safe Working Practice

Health and safety is a vital part of all construction work. All work should be completed in a way that is safe not only for the individual worker, but also for the other workers on the site, people nearby and the users of the building.

Accident, first aid and emergency procedures and reporting

When an accident happens, the _ first thing to do is to be sure the victim is in no further danger, without putting yourself at risk. As well as reporting accidents, _near misses‘ must also be reported. (A _near miss‘ is when an accident nearly happened but did not actually occur.) These might identify a problem and prevent accidents from happening in the future. The accident book is completed by the person who had the accident or someone representing the injured person. You will need to enter some basic details, including:

- who was involved, what happened and where
- the date and time of the accident and any witnesses
- the address of the injured person
- What PPE was being worn and what ‘first-aid treatment was given.

Risk assessments and method statements

Step 1: Identify the hazards.

Step 2: Identify who is at risk.

Step 3: Calculate the risk from the hazard against the likelihood of it taking place.

Step 4: Introduce measures to reduce the risk.

Step 5: Monitor the risk. A method statement takes information about significant risks from risk assessments and combines them with the job specification to produce a practical and safe working method for the workers to follow for tasks on site. The hazard book can also be used to identify tasks and produce risk assessments.

Health and hygiene -One of the easiest ways to stay healthy is to wash your hands on a regular basis to prevent hazardous substances from entering your body. You should always clean any cuts you may

get to prevent infection. Welfare facilities should be provided for employees. These include toilets, washing facilities, drinking water, and storage and lunch areas. Health effects of noise Damage to hearing can be caused by one of two things:

- **Intensity** – you can be hurt in an instant from an explosive or very loud noise which can burst your eardrum.
- **Duration** – noise doesn't have to be deafening to harm you; it can be a quieter noise over a longer period e.g. a 12-hour shift.

Safe handling of materials and equipment

- Feet shoulder width apart, with one foot slightly in front of the other.
- Knees bent with the back straight and arms as close to the body as possible.
- Grip must be 'firm, using the whole hand and not just the 'finger tips. These are the correct techniques to use when lifting:

1. Approach the load squarely, facing the direction of travel.
2. Place hands under the load and pull it close to your body, lifting using your legs, not your back.
3. When lowering bend at the knees, not the back.

Safe storage and handling of tools and equipment Tools

All tools need to be stored safely and securely in suitable bags or boxes to protect them from weather and rust. When not in use they should be safely locked away.

| Type | Storage and handling issues |
|-------------------|---|
| Bricks and blocks | Largely pre-packed in shrink-wrapped plastic and banded using either plastic or metal bands with edges protected by plastic strips. Store on level ground close to where they are required and stack on edge in rows no more than two packs high. Take from a minimum of three packs and mix to prevent changes in colour in natural brickwork. |
| Paving slabs | Normally delivered in wooden crates, covered in shrink wrapped plastic, or banded and covered on pallets. Do not stack higher than two packs. Store outside and stack on edge to prevent lower slabs being damaged by the weight of the stack. Store on firm, level ground with timber bearers below to prevent damage to edges. |

Aggregates cement and plaster

They should be stored on a concrete base, with a fall to allow for water to drain away. Cover aggregates with tarpaulin or plastic sheets. Both cement and plaster are usually available in 25 kg bags. Bags are made from multi-wall layers of paper with a polythene liner. Do not puncture the bags before use. Store in a ventilated, waterproof shed on a dry floor, and no higher than five bags.

Wood and sheet materials

| TYPES | STORAGE AND HANDLING |
|-----------------------------|--|
| Car casing timber | Store outside under a covered framework, on timber bearers clear of the ground, vegetation-free to reduce ground moisture absorption. Use piling sticks between each layer of timber to provide support and allow air circulation |
| Joinery grade and hardwoods | Store under full cover with ventilation to prevent build-up of moisture. Store on bearers on a well-prepared base |
| Plywood and sheet materials | Store in a dry, well-ventilated environment. Stack at right angles on timber cross-bearers, spaced close together to prevent sagging. Do not lean them against walls as this makes the wood bow. For faces, place these against each other to minimize risk of damage. Keep different sizes, grades and qualities of sheet materials separate. |

Adhesives

All adhesives should be stored and used in line with the manufacturer's instructions. They are usually stored on shelves, with labels facing outwards, in a safe, secure area (preferably a lockable store room). It is important to keep the labels facing outwards so that the correct adhesive can be selected.

Paint and decorating equipment

| Type | Storage issues |
|----------------------------|--|
| Oil- and water-based paint | Store at a constant temperature in date order (new stock at the back) on clearly marked shelves with the labels turned to the front. Regularly invert to prevent settlement or separation of ingredients, and keep tightly sealed to prevent skinning. Water-based paint should be protected from frost to prevent freezing. |
| Powdered materials | Heavy bags should be stored at ground level. Smaller items should be stored on shelves with loose materials in sealed containers. Protect from frost, moisture and high humidity. |

Basic working platforms

Fall protection

| Type of fall protection | Description |
|-------------------------|--|
| Harnesses and lanyards | A harness is attached to the worker and a lanyard to a secure beam/eyebolt. If the worker slips, they will fall only the length of the lanyard |
| Safety netting | Used on the top floor where there is no point for a lanyard. Nets are attached to the joists to catch any falling workers. |
| Air bags | Made from interlinked modular air mattresses that expand together to form a soft fall surface. Ideal for short-fall jobs |

Stepladders and ladders

Ladders should only be set up on ground that is firm and level. All components should be checked fully before use.



| Type of ladder | Safety issues |
|----------------|--|
| Wood | Check for loose screws, nuts, bolts and hinges. Check tie ropes are in good condition. Never paint as this will hide defects |
| Aluminum | Avoid working near live electricity supplies. |
| Fibre glass | Once damaged, this type of ladder cannot be repaired and must be replaced. |

Using a stepladder

Stepladders should only be used for work that will take a few minutes to complete. When work is likely to take longer, use a sturdier alternative.

Using ladders

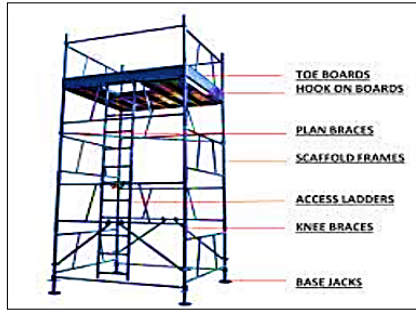
Ladders are not designed for work of a long duration and should be secured in place. One hand should always be free to hold the ladder and you should not have to stretch while using it. You should also observe the following points when erecting a ladder:

- Ensure that there is at least a four-rung overlap on each extension section.
- never rest on plastic guttering as it may break, causing the ladder to slip.
- If the base of the ladder is exposed, ensure it is guarded so it is not knocked.
- Secure the ladder at top and bottom. The bottom can be secured by a second person, but they must not leave while the ladder is in use
- The angle of the ladder should be a ratio of 1:4 (or 75°) – see Figure 1.07.
- the top of the ladder must extend at least 1 m, or ‘ five rungs, above its landing point

Scaffolding

Tubular scaffold is the most commonly used type of scaffolding within the construction industry. There are two types of tubular scaffold:

- Independent scaffold – free-standing and does not rely on the building to support it.
 - Dependent scaffold – attached to the building via poles (putlogs) into holes left in the brickwork. The poles stay in position until work is complete and give the scaffold extra support. Mobile tower scaffolds
Mobile tower scaffolds can be moved without being dismantled. They have lockable wheels and are used extensively by many different trades. They are made from either traditional steel tubes and fittings or aluminum, which is lightweight and easy to move. The aluminum type of tower is normally specially designed and is referred to as a 'proprietary tower'. A 'low tower' scaffold is designed for use by one person at 2.5 m height. Tower scaffolds must have a 'firm and level base. The stability of the tower depends on the height in relation to the size of the base:
- For use inside a building, the height should be no more than three and a half times the smallest base length



Working with electricity

There are two main types of voltage in the UK. These are 230 V and 110 V. The standard UK power supply is 230 V and this is what all the sockets in your house are. Contained within the wiring there should be three wires: the live and neutral, which carry the alternating current, and the earth wire, which acts as a safety device. The three wires are color-coded as follows to make them easy to recognize:

Live – brown Neutral – blue

Earth – yellow and green. 230 V has been deemed as unsafe on construction sites, so 110 V must be used. This is identified by a yellow cable and different style plug. A transformer converts the 230 V to 110 V. In domestic situations a portable transformer should be used.

Dealing with electric shocks

Always disconnect the power supply if it is safe to do and will not take long to __nd. Touching the power source may put you in danger.

Using appropriate personal protective equipment (PPE)

Personal protective equipment (PPE) forms a defense against accidents or injury. PPE should be used with all the other methods of staying safe in the workplace.

Fire and emergency procedures

Fires can start almost anywhere and at any time, but a fire needs all the ingredients of __the triangle of __re‘ to burn. Remove one side of the triangle, and the __fire will be extinguished. Fire moves by consuming all these ingredients and burns fuel as it moves. Fires can be classified according to the type of material that is involved:

- Class A – wood, paper, textiles, etc.
- Class B – € flammable liquids, petrol, oil, etc.
- Class C – € flammable gases, liquefied petroleum gas (LPG), propane, etc.
- Class D – metal, metal powder, etc.
- Class E – electrical equipment. There are several different types of __re extinguisher and it is importantthat you learn which type should be used on each class of __ fires.

| Fire extinguisher | Color band | Main use | Detail |
|---------------------|------------|--------------|--|
| water | Red | Class A fire | Never use for an electrical or burning fat/oil re. Water will conduct electricity and 'explode' oil and fat res. |
| foam | cream | Class A fire | Can also be used on Class B res if no liquid is flowing and on Class C res if gas is in liquid form. |
| Carbon dioxide(co2) | black | Class E fire | Can also be used on Class A, B and C res. |
| Powder | blue | All classes | Commonly used on electrical and liquid res. Powder puts out the fire by smothering the flames. |

What to do in the event of a fire

During your induction you will be made aware of the ' fire procedure and the location of 'fire assembly points. These should be clearly indicated by signs, and a map of their location displayed in the building. On hearing the alarm make your way calmly to the nearest muster point. This is so that everyone can be accounted for and prevents someone searching for you.

Safety signs and notices

There are many different safety signs, but each will usually ' t into one of four categories:

- Prohibition signs – these tell you that something MUST NOT be done.
- Mandatory signs – these tell you something MUST be done.
- Warning signs – these signs are there to alert you to a specified hazard.
- Safe condition signs (often called information signs) – these give you useful information like the location of things (e.g. a 'first aid point).

STUDENT ACTIVITY

1. Draw and label the parts of scaffolding.

THE END