



FURNITURE MAKING

NTQF Level I

Learning Guide -09

Unit of Competence: - Prepare Surfaces for Finishing

Module Title: - Preparing Surfaces for Finishing

LG Code: - IND FMK1 M09 LO1-LG-26

TTLM Code: - IND FMK1 M09 TTLM -0919v1

LO 1:- Prepare for work

Instruction Sheet	Learning Guide #-26
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This learning guide is developed to provide you the necessary information regarding the following **content coverage** and topics –

- Determination of purpose of preparation of surface for finishing
- OHS requirements
- select tools and equipments with engineering control
- Preparation of selective work area for the task
- identify Workplace procedures for surface preparation

This guide will also assist you to attain the learning outcome stated in the cover page.

Specifically, upon completion of this Learning Guide, **you will be able to –**

- Identify Characteristics of the surface and surface coating materials,
- Observe OHS requirements, including personal protection needs,
- Select Tools and equipment require are with relating engineering controls.
- Identify Workplace procedures for surface preparation.

Learning Instructions:

1. Read the specific objectives of this Learning Guide.
2. Follow the instructions described in number 3 to 7
3. Read the information written in the “Information Sheets 1”. Try to understand what are being discussed. Ask you teacher for assistance if you have hard time understanding them.
4. Accomplish the “Self-check 1” in page 04
5. Ask from your teacher the key to correction (key answers) or you can request your teacher to correct your work. (You are to get the key answer only after you finished answering the Self-check 1).
6. If you earned a satisfactory evaluation proceed to “Information Sheet 2”. However, if your rating is unsatisfactory, see your teacher for further instructions or go back to Learning Activity #1.
7. Submit your accomplished Self-check. This will form part of your training portfolio.

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Information Sheet-1	Determination of purpose of preparation of surface for finishing
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Surface preparation is the essential first stage treatment of a substrate before the application of any coating. The performance of a coating is significantly influenced by its ability to adhere properly to the substrate material. It is generally well established that correct surface preparation is the most important factor affecting the total success of surface treatment. The presence of even small amounts of surface contaminants, oil, grease, oxides etc. Can physically impair

Prepare includes preparing the wood's surface and wood conditioning. Before you start a refinishing or finishing project, be sure that the wood's surface is dry and free of old finishes in poor condition, paint, wax, grease, polish dirt or other foreign matter. If you plan to stain (we'll talk about staining later), the surface must usually be completely free of old finishes.

Duce coating adhesion to the substrate

1.1.1. Determination of purpose of preparation of surface for finishing

A quality **surface** finish is impossible to obtain if you don't prepare the wood properly. Most woodworkers dread (dread: feel extremely frightened the preparation steps) and skips (skip: move with small hopping steps) through them and get a poor finish as a result. Others spend more time and effort than they need to scraping, sanding, patching, steaming out dents, and more sanding. Both extremes are probably due to a lack of understanding of what needs to be achieved. Therefore, preparing the surface of wood for finishing is the first and an important operation before applying (coating) finishing material

Sanding is an extremely important operation in the process of making any piece, in that the quality of the finish will make a great difference to the final appearance.

A bad finish will spoil the effect, no matter how well the earlier stages of the construction process have been carried out. .

The best abrasive paper for most sanding operations is garnet paper, which wears much less quickly than glass paper.

Aluminum oxide paper is harder still and excellent for sanding very dense hardwoods.

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Self-Check -1	Written Test
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Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

1. _____ Is the essential first stage treatment of a substrate before the application of any coating?

.

A, Surface preparation B surface treatment C surface contaminants D All

2 write the surface contaminants at list two?

Note: Satisfactory rating - 2 points

Unsatisfactory - 2below point

Answer Sheet

Score = _____
Rating: _____

Name: _____

Date: _____

Short Answer Questions

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Occupational health and safety (OH&S) is an important part of your job. Maintaining the health and safety of yourself and others is as important as anything else you will do while you are at work.

Working safely means working smarter. It involves:

- being concerned about hazards
- keeping your work area organize
- use personal protective equipment and clothing

OHS requirements

Personal protective

- **Eye Protection:** Use safety glasses, chemical goggles or face shield as appropriate,
- **Hand Protection:** Use heat resistant leather gloves,
- **Protective Clothing:** Use long sleeved apron (shop jacket) overalls, fastened at neck and wrists,
- **Foot wear:** Wear chemically and hared sole impervious safety shoes/boots,
- **Ear protective:** Use safety ear pull, for highly noise,
- **Noise protection:** Use safety dust music and dual cartage

❖ **Hazards**

As with any other job in the industry, measuring and calculating has its own set of hazards. You need to be aware of these specific hazards and take proper precautions as you go about your work. Avoiding or eliminating the hazards at work is what OH&S is all about.

- You need to be aware of these specific hazards and take proper precautions as you go about your work. Avoiding or eliminating the hazards at work is what OH&S is all about.

Finishing Safety:

- When in lab, wear your safety glasses.
- Wear Proper clothing.
- Wash hands immediately after use of any finish.
- Keep solvents away from heat.
- Use in a ventilated room.
- After using any finish, close all containers and put away properly.
- Clean up any spills that may be a hazard in the lab.



Workspace and Supplies

Before starting any prepare surface wood finishing project, it is important to have a proper workspace and supplies. When creating the ideal area, keep the following in mind:

- The work station must have adequate light.
- Always work in a well ventilated area.
- The workspace should be dry and warm. If the area is cool or damp, it may alter the dry times indicated on the labels.



Self-Check -2	Written Test
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Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

1. What is the symbol of OHS?

2. Write personal protective equipment at list 5?

3. How to Avoiding or eliminating the hazards at work?

Note: Satisfactory rating – 3 points

Unsatisfactory - below 3 points

Answer Sheet

Score = _____

Rating: _____

Name: _____

Date: _____

Short Answer Questions

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There are a number of items frequently used in wood finishing projects. This list does not include all the supplies needed, but what is most commonly used. Always consult the label of the Min wax[®] products you are using to see if special application tools are required.

Rags	Stir Sticks
Brushes	Safety Glasses
Sandpaper	Rubber Gloves
Paper Towels	Drop Cloths or Newspapers

Repairing wood major wood defect

Dent and open place in the wood are especially noticeable if left uncouched. Most cases the defect

Requires more repair work than just sanding

Dent; if the wood fiber is not broken the dent can be removed easily. You can raise the small

Dent by applying a drop of warm water in the spot

Open defect: open defect that should be filled. Included crack, split, and open joint. This defect can be repaired with different types of filler, cord, stacked plugs, or stick shellac.

For best results and your own safety, always read and follow all label warnings and instructions carefully.



Brushes

Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

1 Write wood finishing tools at list 5?

- 1 _____
- 2 _____
- 3 _____
- 4 _____
- 5 _____

2 .What is the different between Dent and Open defect?

Note: Satisfactory rating - 2 points

Unsatisfactory - below 2 points

Answer Sheet

Score = _____

Rating: _____

Name: _____

Date: _____

Short Answer Questions

Information Sheet-4	Preparation of selective work area for the task
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Sufficient clear space needs to be allocated to ensure employees have the full range of movement required to do the job and can move without injury.

The space allocated for employees within a workplace needs to be appropriate to the work performed.

Work area: Workplace design and layout needs to enable workstations to be accommodated in the safest configuration. Workstations need to provide clear space for employees.

The clear space needs to be exclusive of desks, benches, machinery and any other fittings

Before starting any wood finishing project, it is important to have a proper workspace and supplies. When creating the ideal area, keep the following in mind:

- The work station must have adequate light.
- Always work in a well ventilated area.
- The workspace should be dry and warm. If the area is cool or damp, it may alter the dry times indicated on the labels.

Self-Check -4	Written Test
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Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

1. What are you doing before starting any wood finishing project?

2. Write the clear space needs to?

Note: Satisfactory rating - 2 points

Unsatisfactory - below 2 points

Answer Sheet

Score = _____

Rating: _____

Name: _____

Date: _____

Short Answer Questions

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Preparing the surface of wood for finishing is the first operation before applying a finishing material, it is best to know/understand the procedures. Generally there are three steps to prepare the surface of wood for finishing. These are: **Cleaning, leveling, and smoothing.**

Basic Wood Preparation Procedures for Finishing

Spot sanding before finishing. If minor marks have been noticed, those areas need to be spot sanded with grit sandpaper.

Surface sanding before finishing. After any marks have been addressed, you need to even out the entire surface of the wood for uniform stain and finish acceptance. Surface sanding must always be done even if no spot sanding is required. Flat sand the entire piece with a flat sand block, again going with the grain in over-lapping strokes.

It's best to position the surface being sanded horizontally, but sometimes that is not an option. However, it is very important that the entire wood surface is evenly sanded. I recommend #150 to #180 grit sandpaper depending on the wood species

Hand sanding vs. power sanding. We have found that power sanders are good for sanding severe problems, but a power sander can get you into trouble fast and can leave permanent sanding marks if not used properly. Hand sanding works much better for the final surface sanding.

Cleaning After sanding, the wood needs to be brushed or blown off. Always use clean, dry air, as water spotting can occur if moisture is present in the air line. A second visual inspection should now be done. If the wood appears ready, you should start the finishing process at this time. If the wood is left unfinished for more than 24 hours, surface re sanding may be necessary. Always test stain on sample pieces prior to finishing

:

Identification the selective tools/ equipment's for preparation of surface finishing:

1. .There is a number of items (Tools and equipment's) frequently used in wood finishing projects.
This list does not include all the supplies needed, but what is most commonly used.
2. .Safety Glasses Brushes Sandpaper
3. Gloves Drop Cloths or Newspapers .rags, brushes, rubbing pads, and spray gun
4. Sand paper, chisel, sponge, hand plane. Scraper jointer surface planer & sander
 - a. **Jointer:** - The main function is to produce a smooth, square edge and face on a piece of lumber& to surface one face of a board as long as the cutter head of the jointer is wider than the board.
 - b. **surface planer:** The main function is to produce a smooth, square edge and face on a piece of lumber& to surface one face of a board and produce a uniform thickness of the stock
 - c. **Scraper:** - A sharp scraper in the hands of an experienced worker can produce a surface so smooth that it is hard to duplicate even with very fine sand paper
 - d. **Sand paper:** is paper used for the purpose of sanding and smoothing stoke sanding is done with coat abrasive (commonly called sanding paper or abrasive paper
 - e. **.Gluing:** - assembling the parts of a project with glue can affect the finish because glue acts as a sealer that will prevent subsequent finishing materials from penetrating in to the wood. If glue is smeared on the face of a board & not completely removed, a lighter colored blemish will appear in the finish
 - If you use too much glue it will deep & also over the face
 - If too little glue is used the joint will be weak
 - So it is important to use just the right amount of glue
 - ❖ The best way to remove glue before sanding is to let it dry & then shave it from the surface using a sharp chisel /scraper
- 1 Hand planer:** - is the best way to remove mill marks, however, a belt sander can also be used on boards with only slightly apparent marks.
 - A plane shaves a thin slice of wood off the face of the board.
 - The blade should be sharp & slightly round at the corners
 - The corners are rounded to prevent them from digging in to the wood

The step in these Preparation Preparing surface to finishing Are as follows

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- i. Check all surfaces to see that all marks have been removed with the hand plan or scraper
- ii. Remove all glue mark on surface especially around the joint
- lii .raise dent in the wood by marking the dents area moist with water
- iv. Fill small knot, whole check or other defect with wood plastic or dough
- V. smooth the surface with sand paper.

❖ **Wood Fillers:** - wood fillers are used for the purpose of leveling the surface of wood by filling the open pores or cavities in the cell. When the pores are filled the wood surface is smooth, hand and ready for any finish .All woods are composed of fillers or cells. While growing, these cells are filled with water sap, or resin .When the wood is seasoned and dried the cells are filled with air. In the open grain woods, the pores or cavities in the cell are fairly large, while in close grain woods, the cells are very small, the fiber being closely woven together. The close-grain woods are often finished without the use of filler. The filler should be transparent as possible in order to preserve the natural color beauty of the wood.

1. Types of wood Fillers

There are 2 common types of wood filler, namely

- ◆ Liquid filler (on **close grain wood**)
- ◆ Paste filler (**on open grain wood**)

❖ **Liquid filler:** - Liquid filler is transparent-It is usually used on close grain wood.

Liquid filler is made of drying oils varnish, turpentine. Japan, and A coarse material such as, silica or substrate, such ascent Starch, china clay, whitens carbonate or magnesia. Liquid fillers are

Applied to wood evenly length wise of the grain, as in varnishing and without being rubbed off if they contain much varnish, they Should be allowed to dry.

❖ **Past Filer:** Paste fillers are made from ground silicon linseed oil, turpentine Dryers and colors. They are used to fill open-grain wood.

❖ **Removing Glue from the Wood**

Here are some tips to help you avoid getting glue on the wood:

- Don't put excessive amounts of glue in the joints. Only when gluing up boards edge to edge should you apply glue liberally. In this case you will want squeeze-out to indicate that you've applied enough glue and tightened the clamps adequately.
- Cut your mortises or dowel holes a little deeper to allow excess glue to collect at the bottom instead of being squeezed out.
- Cut a chamfer around the edge of your mortises and a countersink in your dowel holes to hold excess glue and to keep it from squeezing out (Photo 2-20). You can cut the chamfer with a chisel or rasp and the countersink with a needle-nose rasp, a countersink bit, or an oversized drill bit, used carefully so it doesn't cut too deeply.
- Have both a damp and a dry cloth nearby so you can remove any glue you might get on your hands. Wipe your hands with the damp cloth, and then quickly dry them so you won't wet the wood.

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There are two ways to remove glue from the wood:

- Re-dissolve it and wash it off.
- Scrape or sand it off. .

Removing Glue Splotches after Staining

- **Remove glue by scraping** not sanding
 - Sanding forces glue into the wood causing an imperfection.
 - Repair dents with a damp cloth and a hot iron.
 - A smoothing plane like the one below is used is used to provide a smooth surface to the wood. This hand tool removes any surface blemishes or marks

❖ **Scrapers**

The fastest, cleanest, safest, and most enjoyable tool to use for removing mill marks and other defects in wood is the scraper. There are two kinds: the hand scraper, which you hold directly in your hand, and the

Cabinet scraper, which is held in a cast-iron body that has a flat sole and two handles. (There is also the common paint scraper; however, this tool has limited use in woodworking.) Both scrapers are misnamed because they don't scrape the wood at all but rather slice very thin shavings.

.Every cabinetmaker there had several hand scrapers in his tool kit. I was employed as the shop finisher at the time and was taught to use the hand scraper to remove cured runs and sags in my finishes and to cut back and level a finish rapidly in order to create a mirror-flat surface. The hand scraper cuts off ribbons of finish far faster than sandpaper can scratch the finish off. It doesn't gum up the way sandpaper does, and it's more economical.

To use the hand scraper, hold it between the thumbs and forefingers of both hands at an angle of about 50 to 70 degrees above the wood surface or until you feel the burr on the scraper edge catch. Then push it away from you or pull it toward you, cutting a ribbon. You can also shift one hand to the reverse position and scrape sideways, perpendicular to your body. If dust is your only product, the scraper is not sharp.

Hand scrapers: can also be used to smooth contoured surfaces: A straight hand scraper will follow a convex curve, and a French-curved scraper will get into concave contours.

The cabinet scraper cuts the same way as the hand scraper. However, the cabinet scraper has a flat sole, which makes it easier to maintain a level surface . I find it particularly useful when I want to even the raised edges of glued-up boards that didn't come together flat. I begin by **Either scraper** is more forgiving than a hand plane. Because of the high cutting angle, a scraper tends not to tear the grain; you don't have to worry as much about grain direction, swirls, or knots. You can scrape with, against, or across the grain

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SANDING AND SMOOTHING

Sanding: Sanding: This is the name given to the process of smoothing timber by actually “*scratching*” the surface with abrasive (sand) paper

•Why do we sand the surface and edges:

- To remove machine marks
- Smooth surface for good “feel”
- Promote adhesion for finish
- Raising the Grain
- It opens the pores of the wood to accept more stain and finish
- method of sanding:

Sanding flat surfaces

Stand beside the bench, so that you can rub your sanding block in straight strokes parallel with the grain. Sweeping your arm in an arc tends to leave cross-grain scratches. Cover the surface evenly, keeping the block flat on the wood at all times "" especially as you approach the edges of the work, or you may inadvertently round over sharp corners.



Sanding end grain

Before sanding end grain, stroke it with your fingers to determine the direction of the fibers. It will feel smoother in one direction than the other. To achieve the best finish, sand in the smoothest direction.



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Sanding small items

It is impossible to clamp and sand small items using conventional methods. Instead, glue a sheet of sandpaper face-up on a flat board and rub the work piece across the abrasive.

Sanding edges

It is particularly difficult to retain sharp corners when sanding narrow edges. To keep your sanding block level clamp the work upright in a vice and, holding the block at each end, run your fingertips along each side of the work as you rub the abrasive back and forth. Finally, stroke the block lightly along each corner to remove the arise and prevent splinters.

Sanding moldings

To sand a molding, wrap a strip of sandpaper round a dowel or a shaped block. Alternatively, use a foam-backed abrasive or an impregnated nylon-fiber pad.

For a successful sanding operation, follow these basic steps:

1. Always use a backing block for hand sanding - wrap your sandpaper around a flat block of wood or similar material.
2. Using moderate pressure, sand only in the direction of the grain.
3. Change the sandpaper often. If the abrasive becomes clogged, it will not function properly and may scratch the wood

There are two different grades of sandpaper on the market;

- Commercial
- Industrial.

The commercial grade is commonly available at hardware stores and home project centers.

The industrial grade is usually available only through industrial supply stores.

There are three main components to sandpaper;

- the abrasive grain(grit),
 - the backing material, and
 - The Adhesive bonding agents.
- Industrial grade sandpaper uses higher quality components as well as tighter manufacturing tolerances.

The abrasive grain (grit)

- Industrial grade sandpapers use abrasive grit material that is stronger and less likely to break down or wear out. Higher quality grits are often very finely graded to ensure consistency.

Backing Material

- Commercial grade sandpapers tend to use Kraft paper or low-grade fabric as a backing material. Higher grades of backing material are often made from fine cottons or polyesters.

Bonding Agent

- The bonding agent is the glue that attaches the abrasive to the paper's backing. Lower grades of sandpaper are often made from hide glue, which doesn't hold up well with heat or moisture. Higher-grade bonding agents such as phenol resin are used for industrial grade sandpapers.

❖ **There are two kind of Sandpaper coat "Open-coat" and "Closed-coat"**

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- Open-coat sandpaper has gaps and open spaces between the grits that helps prevent clogging by giving the sawdust a place to go. Sandpapers can also be **open coat**, where the particles are separated from each other and the sandpaper is more flexible. This helps prevent clogging of the sandpaper
- Open-coat is most often used for woodworking. The spaces in the sandpaper can cover 40-60% of the sandpaper's surface.

Grades of abrasives & their function :

With extra coarse grit abrasive (36 - 40).

With coarse grit abrasive (50 - 60)

Heavy material removal on extremely thick surfaces, rough sanding or paint stripping.

Removes: machine marks, glue marks, pen/pencil marks and burn marks.

With medium grit abrasive (80-100)

Medium material removal and pre-paint finishing

Removes: scratches from the coarse grit.

- grit abrasive (280-320)

Sanding between fin with fine grit abrasive (120-150)

Light material removal and pre-paint finishing.

With very fine grit abrasive (180-220)

Finish sanding and sanding between coats.

- with extra fine ish coats.
- with super fine grit abrasive (360-600)

Backing Material:

- “A” - lightweight paper, very fine grit, hand sanding, flexible.
- “B” - lightweight paper, hand sanding
- “C and “D” - medium weight, for sheets and discs or random orbit sanders
- “E” and “F” - heavyweight, discs and belts
- “J”- cotton cloth, designed for flexibility
- “X” - cotton cloth, heavy-duty sanding belts

“Combination” - reinforced heavyweight paper, discs and drums used in floor sanding

. Types of abrasives

The main modern abrasives used in the wood trades (four types of abrasives are used in woodworking):

1. **Flint** - least expensive sandpaper. Flint has sharp edges but dulls fast because of low Toughness and durability. Good for woodworking operation

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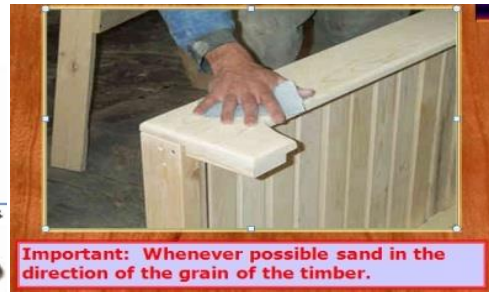
2. **Garnet-** is for hand and machine sanding and is made from natural crushed garnet stone for sanding wood ~ harder than glass or flint papers, provides sharp cutting edges ~ cuts quick, long lasting ~ does not build up heat that may burn finishing's or the wood. Excellent for cabinet makers in both soft and hardwoods and those who require a good smooth finish.
3. **Aluminum oxide** this is made from bauxite, carbon and iron filings, Fused together in an electric furnace .very hard and durable abrasive grains good for sanding metals and hard woods
It is used chiefly for machine and portable power tool sanding but is also available for hand sanding and in particularly, dense hardwoods. . The white form is dyed orange for wood finishing
- 4, **Silica carbide:** this is made from silicon (sand) and carbon, fused together in an electric furnace
Once used chiefly for the leather trade and metalwork with some uses in sanding floor surfaces.
Commonly known as 'wet and dry' paper. Now more available for hand an
- 5, **Emery paper or cloth-** Use them wet or dry according to the maker's instructions, for cleaning and finishing metal. Emery is tough but tends to clog easily. Use cloth on curved surfaces - tear off a strip and hold an end in each hand, working it back and forth

Abrasive	Color	Durability	uses
Flint	Orange or red	low	Hand sanding soft wood or Hand painting wood
Garnet	Dark brown	medium	Or light machine sand all wood
Emery	Gray or tan	high	Polishing metal not stand to wood
Aluminum oxide	Black	Medium height	Hand machine sand on all material
Silicon carbide	Black	High	Hand machine finishing

❖ Shapes

Sandpaper comes in a number of different shapes and sizes:

- sheet: usually 9 by 11 inches, but other sizes may be available
- Belt: usually cloth backed, comes in different sizes to fit different belt sanders.
- Disk: made to fit different models of disc and random orbit sanders. May be perforated for some models of sanders. Attachment includes pressure sensitive adhesive (PSA) and "hook-and-loop" (similar to Velcro). rolls: known as "shag rolls"
by many contractors sponge: for tight plastic



Hand Sanding

Sanding by hand is almost a lost art, but I've always enjoyed it and found it a very effective way to sand wood. You can hold the sandpaper directly in your hand, or you can wrap the sandpaper around a block made of cork, felt, rubber, or wood. If you use a wood block, glue a piece of 1/4-inch cork, felt, or rubber onto the bottom to provide a cushion behind the sandpaper to reduce clogging. A chalkboard eraser or a material like ceiling tile can also be used to back your sandpaper.

Belt sanders: will remove a lot of wood very fast. This can be an advantage when wood removal is the goal. But when you're trying to achieve flatness and smoothness, a belt sander is a dangerous tool to use. You must keep the sander flat on the surface, moving at all times, and avoid even the slightest rocking motion side-to-side or front-to-back-or the sander will dig into the wood, leaving hollows or ridges. Make one mistake with this tool on solid wood, and you may find yourself spending hours correcting it, especially if, as is often the case, you don't notice the problem until you apply the finish. Veneer should never be belt-sanded. Except for those instances where I really do want to remove a lot of wood quickly,

Orbital pad sands

Are much tamer than belt sanders, but they're also much less effective. Because this sander works with an orbital motion, it inevitably leaves small orbital scratches on

The 85 wood surfaces. These scratches are almost invisible until you put on a stain and finish. Then they scream at you. To reduce the scratching, don't set the sander down on the wood until it's running at full speed, and don't slow the sander down by pressing on it. Sand to what would normally be your finest grit if you were hand sanding. Move the sander back and forth slowly in the direction of the grain, and check often to make sure no splinter or other foreign object has become lodged between the sandpaper and the wood, as this will leave deeper orbital scratches. It's almost always wise to finish off by hand with fine sandpaper and a sanding block, sanding in the direction of the grain.

Personally, I find the orbital pad sander too slow, and I don't use mine very often. But pad sanders are very popular with many woodworkers.

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Random-orbit sanders, which incorporate an orbital as well as a revolving movement, fall between belt sanders and pad sanders for their ability to remove wood. They are not as aggressive as belt sanders and are far more effective than pad sanders. Random-orbit sanders are also far less likely than belt sanders to gouge the wood and somewhat less likely than pad sanders to leave scratches in the wood. For most sanding operations a random-orbit sander is the best machine choice.

Sponging: beauty& clearance of the grain can be secured by sponge with water

This is done in order to dampen and raises the grain on all surface that are to be finish

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Self-Check -5	Written Test
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Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

1 Write the generally three steps to prepare the surface of wood for finishing?

- . 1, _____
- 2, _____
- 3, _____

2 Write the two Types of wood Fillers?

3 What's the difference between "Open-coat" and "Closed-coat"?

4 write the two different grades of sandpaper on the market

Note: Satisfactory rating - 4 points

Unsatisfactory - below 3 points

Answer Sheet

Score = _____

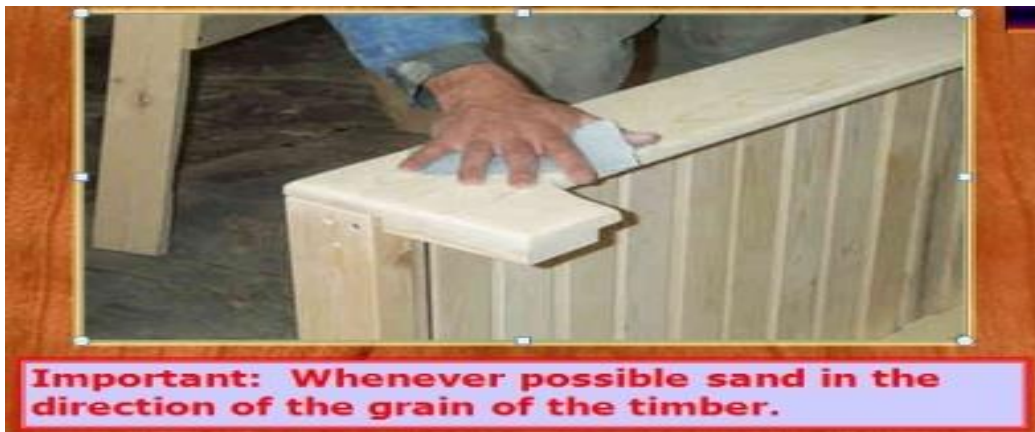
Rating: _____

Name: _____

Date: _____

Short Answer Question

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How to sanding by hand:**TITLE:** how to sanding by hand**PURPOSE:** It is often necessary to preparing the surface and smoothing the surface**CONDITIONS:** Make sure that the sand paper rough and the project is free from sharp materials, machine you are using.**EQUIPMENT, TOOLS AND MATERIALS:** Sand paper, Portable sander**Pre caution;**

- Keep your hands away from the dangerous area.
- Always keep the safety guard & safety cloth
- Make sure that the surface free from shaping tools
- Always return to select type of sand paper

Quality criteria;

- ✓ Smooth sanding
- ✓ Make the project is surface or prepare

Operation Sheet 2	Preparation Preparing surface to finishing
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Procedures for:-The step in these Preparation Preparing surface to finishing Are as follows

Step 1- Check all surfaces to see that all marks have been removed with the hand plan or scraper

Step 2- Remove all glue mark on surface especially around the joint

Step 3- Raise dent in the wood by marking the dents area moist with water

Step 4- Fill small knot, whole check or other defect with wood plastic or dough

Step 5- Smooth the surface with sand paper and make sure to imitate the surface

.

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List of Reference Materials

1- BOOKS

Sam Allen “Wood Finisher’s Handbook” sterling publishing com. Inc. 1984.

Wood Finishing with George Frank Sterling publishing Co. Inc. New York 1988.

Bob Flexner “Understanding Wood Finishing” The reader’s Digest Association, Inc. 2005.

Any Woodwork & Carpentry and Joinery books.

2- WEB ADDRESSES (PUTTING LINKS)

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FURNITURE MAKING

NTQF Level I

Learning Guide -27

Unit of Competence: - Prepare Surfaces for Finishing

Module Title: - Preparing Surfaces for Finishing

LG Code: - IND FMK1 M09 LO2-LG-27

TTLM Code: - IND FMK1 M09 TTLM -0919v1

LO 2: Prepare surfaces

Furniture Making Level I	Version:1 September 2019	Page 27 of 51
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This learning guide is developed to provide you the necessary information regarding the following **content coverage** and topics –

- Surface preparation according to job specification for finishing/coating
- Coating materials
- Repairing wood surface defects/report

This guide will also assist you to attain the learning outcome stated in the cover page.

Specifically, upon completion of this Learning Guide, **you will be able to –**

- Prepare **Surfaces** coating materials or finishing and workplace procedures.
- Surface preparation is checked for conformity with job specifications throughout the process.
- Rectification of surface preparation faults.
- Inspect and approve Products are for suitability for further processing.
- Rectifier and/or report Defects are in accordance with workplace procedures.

Learning Instructions:

1 Read the specific objectives of this Learning Guide.

2 Follow the instructions described in number 3 to 7.

3 Read the information written in the “Information Sheets 1”. Try to understand what are being discussed. Ask you teacher for assistance if you have hard time understanding them.

4 Accomplish the “Self-check 1” **in page -**.

5 Ask from your teacher the key to correction (key answers) or you can request your teacher to correct your work. (You are to get the key answer only after you finished answering the Self-check 1).

6. If you earned a satisfactory evaluation proceed to “Information Sheet 2”. However, if your rating is unsatisfactory, see your teacher for further instructions or go back to Learning Activity #1.

7. Submit your accomplished Self-check. This will form part of your training portfolio

Preparing surface to finishing means Planning, scraping, and sanding are all good ways to prepare the surface of project preparing before finishing .The first and the most important step in the finishing a product is to produce remove all. Defects included dent chipping pencil marker machine mark, glue and sketcher.

The first step should always be a thorough examination of the surface to be painted, checking for peeling and faded paint, dirt, chalking, grease, cracking, knots, bare areas, mildew, rust, nail stains and structural problems. All surfaces, whether painted or unpainted, must be clean, free from shine, sound and dry prior to finishing.

2.1 Surface preparation according to job specification

Things to Consider Before Preparation Begins

Visual in section, the most important step. Before the finishing starts, you should conduct a thorough visual inspection of the wood under well-lit conditions. Look for any shipping or handling mars, dents, or problems that will affect the finishing system. Any problems need to be noted and attended to with spot or scuff sanding. Large dings may require additional work besides sanding.

Storage Where and how was the wood stored (this includes temperature, moisture, and humidity)?

Moisture What is the moisture content of the wood that you are about to finish?

Temperature What is the temperature of the finishing room or finishing area? Heat is not always a good thing; most stains and finishes work best in mild conditions. I recommend a temperature range of 55°F to 75°F. Any cooler and you can run into complications; any warmer and your finishes tend to dry too fast and may not flow out

❖ Steps in achieving a good prepared wood surface

To achieve good prepared wood for a finish follow these four steps.

- 1 Select an appropriate wood material for the work square & surface properly, prepare details accurately according to the design, assemble carefully using; only enough amount of glue, appropriate clamps, and pieces of wood.
- 2 Remove all excess glue, use a sharp chisel to remove carefully all traces of the around the joints.
- 3 Inspect the surface carefully for dents /irregularities.
- 4 Scrap & sand the surface thoroughly

2.1.1. GENERAL SURFACE PREPARATION

- Proper surface preparation is one of the most important steps in a successful paint job because paint most readily adheres to a clean, smooth surface. The presence of dirt, dust, grease, flaking paint, holes, or cracks severely detracts from paint's ability to form a strong, long-lasting bond with a surface.

Surface Contaminants

- Dirt
- Oil
- Grease
- Curing compounds
- Sealers
- Paint
- Surface treatment
- Dried glue
- Dents
- Chips Scratches

LOOSE AND PEELING PAINT

- Remove as much loose and peeling paint by scraping, wire brush or power-washing the surface.

Feather-sand rough edges smooth until they blend with bare surface.

DIRT, GREASE, OIL, CHALK AND UNDER-EAVE DEPOSITS

- Remove these deposits by washing with a detergent solution (TSP) or commercial cleaner recommended for cleaning painted surfaces using a sponge or brush. Protected areas, such as under eaves and overhangs, need special attention to remove invisible deposits that can promote a premature peeling problem. After washing, thoroughly rinse with clean water and allow drying. Power-washing is also a fast, effective method of removing dirt, chalk, etc. If a power-washer is used, follow the manufacturer's recommendations and warnings.

Mildew

- Spotty patches that look like dirt, but do not come off when scrubbed with detergent solution, are probably mildew.
- Mildew can occur on any side of the timber, but is more likely to grow in shaded (out of the sun) areas or behind shrubbery. It can easily be identified from other forms of discoloration by applying a few drops of bleach. If mildew is present, the black, gray or brown color will bleach out and disappear within one or two minutes. Mildew must be killed and removed before repainting. If the mildew is not completely removed, the active spores will continue to grow and may almost immediately begin to reappear on a recently repainted surface. Where mildew is present, apply a solution of one part household bleach and three parts water, or use a commercial mildew remover. It is mandatory to wear rubber gloves, goggles, long-sleeved shirt and long pants to protect eyes and skin when using a mildew remover. CAUTION!! DO NOT MIX BLEACH WITH AMMONIA OR DETERGENTS CONTAINING AMMONIA. Follow specific instructions if a commercial mildew remover is used.

RUST

- Remove all rust by sand blast, wire brush, sponge, sandpaper or naval jelly (rinse thoroughly).

Wood preparation

- The first & one of the vital steps in producing a fine finish on wood is wood preparation. If the wood is not smooth & free from blemishes, it will not finish well.

Preparing wood to accept a finish begins as soon as the project is started.

- One of the first steps in building any project from new wood project is squaring & surfacing the stock.
- Assembling the pieces with glue is one operation that has a very derogatory affect on the final finish, if it is not done carefully.
- Glue spots on the wood are difficult to remove & cause light areas in the finish that don't accept stain evenly, sanding is another procedure that can make /break a fine finish

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Preparing Surface

- Remove excess glue
- Remove Mill Marks
- Correct dents, chips or gouges;
- Using hot steam,
- Wood fillers may be needed, such as a wood patch.

General Tips:

- The surface to be finished must be dry and not showing signs of rot. If it has recently rained or looks like it may start to rain, avoid painting or staining outdoors.
- The surface must be clean and free of dirt, oils, peeling paint or stain.
- Generally speaking, the temperature should be above 50 degrees. Check the can's label for ideal application temperatures.
- Latex paints can be applied over oil based paints, but for best results oil-based paints shouldn't be applied over latex.

Surface preparation according to job

1. Smooth the surface using a well sharpened smoothing plane.
2. Where possible raise the grain by applying water to the surface.
3. Where there are blemishes that are not too deep, scrape the surface with hand scraper.
4. Remove any traces of glue from the surface by scraping and sanding.
5. Remove any grease and oil by sponging with a lacquer thinner or benzene.
6. Stains that are not removed by sanding may be bleached with oxalic acid or commercial Bleaches.
7. Fill nail holes, cracks or open joints with filler such as plastic wood, glue mixed with saw dusts, Stick shellac or putty. The color of filling material must match the finished color of the Wood to be polished.
8. Sanding the surface thoroughly using rough, medium and smooth grades respectively. Use a sand paper block for flat surfaces and large curves. Sand along the grain of the wood To avoid scratches.
 - 9 Remove any dust from the surfaces and from the pores of the wood by brushing thoroughly

Self-Check -1**Written Test**

Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

1. What is preparing surface to finishing?

2. What are you doing Before Preparation Begins

Note: Satisfactory rating - 2 points

Unsatisfactory - below 2 points

Answer Sheet

Score = _____

Rating: _____

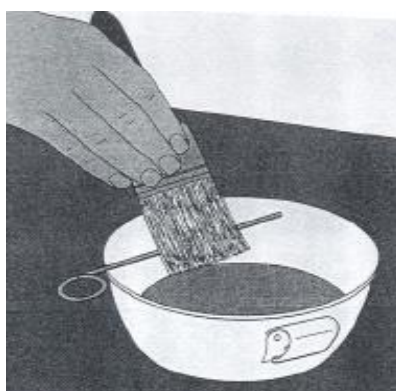
Name: _____

Date: _____

Short Answer Questions

2.2.1 Wood Stains

Any substance which can give color to the wood is called a stain. Stain is a transparent finish. It is put on wood to produce a particular color and decorative qualities of the valuable species of wood. In addition, it is applied to improve its appearance and add color, to bring out the grain, to preserve it, and sometimes to imitate the more expensive wood. The most important quality of a stain is its color.



✓ **Stains are classified according to the solvents used in making them. here are five type of stain**

- i) Water stain
- ii) Oil stain
- iii) Spirit stain
- iv) Non: grain-raising stain
- v) Chemical stain

I. **Water stain**: are those which are composed of coloring mater soluble in water and which have water
Which as principal part of liquid

❖ **Advantage of Water stain**

- Water stain penetrate much more deeply in to the wood do either oil or sprite stain
- water stain is powder very soluble especially in hot water
- it is possible and safe apply water
- Water stain are cheap than any kind of stain ,because the solvent water coast in solvent is less than turpentine alcohol and sprit
- Water stain is dry quickly

❖ **Disadvantage of Water stain**

- The use of water is sponging and remove the glue
- sanding cannot be done over Water stain surface

II. **Oil stain**: oil stain is easily to apply and do not raise the grain

Oil stain is the common method of color wood for custom made project they are also easily of stain to apply.

Even experienced finisher can achieve an attractive stained that not stack streaked with dark colors

There are a few disadvantages to oil stain .because line seed oil or other type of oil it is vehicle oil

- Oil stain does not penetrate as deeply as water stain.

There are **two** type of oil stain .these are penetrating and **pigmented**

Penetrating oil stain is more **transparent** than penetrating stain.

III. Non grain stain

Non grain stain is made up of the same to water stain and does not raise the grain the advantage is similar to water stain. You need to not wet and sand the wood before to the apply NGS stain

IV Sprit stain

Sprit stain: is alcoholic, bright beautifying color wood can be produce by sprite stain

❖ **Five reasons to use stain**

- I. bring out the grain –by increasing contrast between light and dark colors
-stain en hence the natural beautifying of wood
- II. Make surface a uniform in color-stain well correct un evenness color
- III. Make deferent
- IV. wood look like the same :-stain help match the color in deferent kind of wood this make

The project look it is made from one wood

V. Make cheap wood s look like expensive

VI. Creative special effects

Stain	Advantage	Disadvantage	Application
Water stain	Easily to apply Rich transparent Color excellent Does not bleed	Raise grains which required Sponging and sanding sizing before Staining Required very light sanding After stating Does not raise the grain Dry quickly	Brush spray
Sprit	Bright color Quickly during	Difficult to apply evenly color fades with ex to light Slight grain raise Tendency to bleed	Brush spray
No n grain resin stain	Easily to apply Rich transparent Color excellent Does not bleed	Raise grains which required Sponging and sanding sizing before Staining Required vary light sanding After stain Does not raise the grain Dry quickly Difficult to apply	
Pigment		Does not raise the grain Raise grains which required Easily to apply	

❖ **Bleaching**

Bleach is solution Used to remove the color from wood they contain strong chemicals

There are three basic reasons for bleach to need

- ✓ Make darken color to light
- ✓ Make the wood uniform in color- good finish do not have light and dark color
- ✓ Remove stains –remove to natural stain acid and mineral stain are the most common stain remove by bleach

Self-Check -2	Written Test
---------------	--------------

Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

1. What is the different between Oil stain and Sprit stain?

2. Write Based on the solvents use in making them stains are classified into five groups

1 _____ 2 _____ 3 _____

4 _____ 5 _____

Note: Satisfactory rating - 3 points

Unsatisfactory - below 3 points

Answer Sheet

Score = _____
Rating: _____

Name: _____

Date: _____

Short Answer Questions

2.3 Repairing wood surface defects

- ❖ A **dent** is an indentation [a notch or recess] in wood where the fibers have been crushed, but not broken or cut, or removed. If the wood fibers have been cut or removed, the void is called **gouge**

Tips on fixing dents and gouges

- ❖ Dents can be fixed /treated by steaming them out, either with water or alcohol.

If you use water,

- Place a few drops into the dent and let the water sink in a few seconds.
- With a damp cloth over the spot to protect the wood from burning/scorching, place a hot iron over the dent and hold it there for a several seconds.
- As the iron heats the water, it converts to steam, expanding the crushed fibers in the process.
- Repeat the process if the dent doesn't come out completely the first time.

If you use alcohol,

- With a small brush or tooth pick, place a drop of denatured alcohol into the dent.
- Now, touch a lit match to the alcohol, and it will burn with an almost invisible flame. Once again the heat expands the crushed fibers.
- The alcohol will go out within a couple of seconds and will not have time to scorch/burn the surrounding wood.
- Be certain you stick to one drop of alcohol at a time to prevent scorching, and keep some water handy just in case.
- In most cases, the raised dent will be level enough. So that just a small amount of sanding will erase it completely.
- However, if the dent doesn't come out completely, you should treat it as if it were a gouge.

❖ Gouges have to be filled with some type of wood putty to bring them level with the surrounding wood. To make this:

- Press the putty into the gouge, so that it is slightly higher than the rest of the surface.
- The putty will shrink as it dries, so adjust the amount of excess accordingly.
- Test the putty's dryness. If the putty gives your thumb nail, let it dry some more. If the putty is hard and dry, you can sand the spot smooth and level to the rest of the surface.
- **Open defect:** open defect that should filled included crack split and open joint this defect
- can be repairing with deferent type of filler collard stacked plugs or stick shellac

REPAIRING SUPERFICIAL DAMAGE

Superficial wear or surface deterioration is the most common type of damage and is the easiest to repair. There are three ways to repair this kind of damage:

- Apply a coat of paste wax or oil/varnish blend to the surface and wipe off the excess.
- Rub the surface of film finishes with steel wool or rubbing compounds to cut through the damage or dullness and expose unaffected finish below.
- Apply another coat of the original finish, or apply French polish or padding lacquer on top of the damaged finish, to cover up the problem

Self-Check -3	Written Test
----------------------	---------------------

Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

1 writes the three (3) ways to repair this kind of damage?

1, _____

2, _____

3, _____

2 What is a dent?

Note: Satisfactory rating - 2 points

Unsatisfactory - below 3 points

Answer Sheet

Score = _____

Rating: _____

Name: _____

Date: _____

Short Answer Questions

PURPOSE: It is often necessary to the surface preparation of the to give project and to make uniform colors.

EQUIPMENT, TOOLS AND MATERIALS: Paste filer, brush thinner .glue and sand paper...Brush

CONDITIONS:-Make sure that the project perfectly and correct thinners , sanding and cleaning the surface

PAINTING PAINT AND ENAMEL

procedure:

the stapes in applying basic finishing material:-

- Prepare a smooth surface.
- Clean the surface with a stiff brush, or a wet cloth.
- Thin the paste filler with turpentine if it is too thick.
- Apply the paste filler by brushing evenly along or across the grain.
- When the filler begins to set, rub it with a piece of soft cloth across the grain to prevent the filler from being lifted out of the wood pores.
- Rub again with a clean, soft cloth to remove all excess oil and filler.
- Clean out all corners with a pointed hard wood stick (pot knife).

Pre caution;

- Keep your hands away from the dangerous area.
- Always keep the safety cloth &PPC
- Make sure that the surface fine sanding
- Hold the brush firmly.

Quality criteria:-the surface is smother_and high aesthetic value Finishing material to paint and make sure to imitate the surface.



FURNITURE MAKING

NTQF Level I

Learning Guide -28

Unit of Competence: - Prepare Surfaces for Finishing

Module Title: - Preparing Surfaces for Finishing

LG Code: - IND FMK1 M07 LO3-LG-28

TTLM Code: - IND FMK1 M09 TTLM -0919v1

LO 3: Clean work area and maintain equipment

This learning guide is developed to provide you the necessary information regarding the following **content coverage** and topics –

- Methods of properly collecting and storage of materials
- Maintenance & lubrication of equipments
- Report defective equipments inspected for quality products

This guide will also assist you to attain the learning outcome stated in the cover page.

Specifically, upon completion of this Learning Guide, **you will be able to –**

- Pack, store and label prepared products.
- Clean and inspect Equipment use is for serviceable condition and stored appropriately.
- Identify Unserviceable equipment is tagged, faults are and appropriate personnel are inform.

Learning Instructions:

1 Read the specific objectives of this Learning Guide.

2 Follow the instructions described in number 3 to 7.

3 Read the information written in the “Information Sheets 1”. Try to understand what are being discussed. Ask you teacher for assistance if you have hard time understanding them.

4 Accomplish the “Self-check 1” **in page -**.

5 Ask from your teacher the key to correction (key answers) or you can request your teacher to correct your work. (You are to get the key answer only after you finished answering the Self-check 1).

6. If you earned a satisfactory evaluation proceed to “Information Sheet 2”. However, if your rating is unsatisfactory, see your teacher for further instructions or go back to Learning Activity #1.

7. Submit your accomplished Self-check. This will form part of your training portfolio

Information Sheet-1	Methods of properly collecting and storage of materials
---------------------	---

3. Introduction

Safe work practices should be followed at all times. A clean work area is an important part of having a safe work environment. On completion of each job the assembly area should be cleaned, this includes the removal of all waste material, the floor cleaned (swept/vacuumed) if necessary and all tools and equipment returned to their allocated storage area

Cleaning up:

Thinner or gun clean for immediate clean up including your spray gun.

IMPORTANT: Remember Diamond Finish Clear Coat must be cleaned up before it dries. It cannot be removed by any solvent once cured.

Always wear protective gloves to avoid skin contact and temporary staining. If skin contact accidentally occurs, immediately remove with #1 Thinner or lacquer thinner followed by soap and water. If Finish Clear Coat should stain your skin, only the course of time will remove it. When all the parts are assembled, your work area needs to be cleaned ready for the next job.

Clean work shop site/area

- Always clean the work shop after done/ work.
- Separate workshops e.g.:- finishing machine, assembling, main store, and office & class room.
- Remove out wastage raw material in the container.
- After using equipments & tools clean with sponge, rage, oil , turpentine & greases.

2.1. Methods of properly collecting and storage of materials

Tools and equipment should be safely stored according to work place procedures. Generally, this will mean returning items to their allocated place. This could include shadow boards, cabinets, cupboards, power tool cases, cutter blocks, drill bit containers, benches or storage racks. Tools and equipment must be put away so that they can be easily located and accessed.

Self-Check -1	Written Test
---------------	--------------

Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

1 What is important of clean work area?

2 what the use of Methods of properly collecting and storage of materials?

Note: Satisfactory rating - 2points

Unsatisfactory - below 2 points

Answer Sheet

Score = _____

Rating: _____

Name: _____

Date: _____

Short Answer Questions

Information Sheet-2	Maintenance & lubrication of equipments
---------------------	---

3.1. Maintenance& lubrication of equipment's

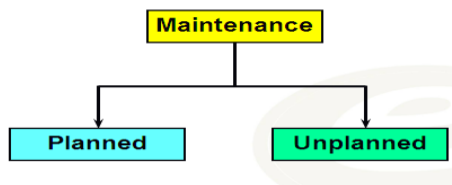
What is 'maintenance'?

Maintenance includes all technical, administrative and managerial actions during the life cycle of an item — *a work place (building), work equipment or means of machinery* — intended to keep it in, or restore it to, a state in which it can perform the required function protecting it from failure or decline.

1. Importance of maintenance

- To All equipment required for production is operating at 100% efficiency at all times.
- To production capacity, productivity and business profit
- To Equipment breaks down leads to inevitable loss of production.
- To An improperly maintained machine will require expensive and frequent repairs,

Type of maintenance



3.2. Planning maintenance

Explain Planning of jobs or Job-planning can occur at any stage during the life of a works order or maintenance job.

Equipment procedures, documents, skills or equipment can easily be focused upon. A work order cannot be considered planned until all of these have been considered,

Planning of maintenance jobs basically deals with answering two questions,

“What” and **“How”** of the job; *i.e.*

. “What jobs/ activities are to be done” and “how those jobs and activities are to be done”.

- The maintenance jobs for development of appropriate job plans using most suited techniques, tools, materials and special facilities etc.
- As the job planning forms the basic foundation, over which the efficiency and cost of further actions (e.g. scheduling, execution and control etc) depends,

3.3, UN planning maintenance

In such maintenance, repair is done after failure has already occurred. The equipment is allowed to run undisturbed till it fails. Off-course lubrication and minor adjustments (for pressure and flow etc) are done during this period. Only when the equipment fails to perform designated functions or comes to a grinding halt, any maintenance or repair job is taken.

CLEANING MAINTENANCE

Cleaning maintenance is the cleaning of equipments, components, working tools, hands tool or working gloves and workplace etc, before taking repairs, during and after repairs is of main importance, but is often not given due consideration.

Cleaning is often considered “donkey’s job” and is left to some unskilled worker to decide and do. But the type and extent of cleaning is purely a technical requirement, depending on the subsequent jobs to be done.

Self-Check -1	Written Test
---------------	--------------

Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

1 What is 'maintenance'?

2 write the Type of maintenance

1, _____

2, _____

Note: Satisfactory rating - 3 points

Unsatisfactory - below 3 points

Answer Sheet

Score = _____

Rating: _____

Name: _____

Date: _____

Short Answer Question

Report defective equipment's inspected for quality products

On completion of each job it is important that all the equipment you have used be cleaned and checked for serviceability before being stored. Equipment that is faulty or damaged should be tagged and reported to supervisor or appropriate person. A suitable logging system should be used to identify Equipment or materials that need to be serviced, repaired, removed, replaced or considered unsafe

Self-Check -3	Written Test
----------------------	---------------------

Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

1 What is Report defective equipment's inspected for quality products?

Note: Satisfactory rating - 3 points

Unsatisfactory - below 3 points

Answer Sheet

Score = _____
Rating: _____

Name: _____

Date: _____

Short Answer Questions

List of Reference Materials

BOOK

- Unpublished handout which will be given in due time of the course.
- Working with wood
- general wood work