

SANGAM SKM COLLEGE - NADI
LESSON NOTES – WEEK 1
YEAR 11
APPLIED TECHNOLOGY

Strand	AT11.3: ENGINEERING MATERIALS
Sub-Strand	AT11.3.1 Working with Engineering Materials
Learning Outcome	Identify and exhibit knowledge on types and uses of readily available engineering materials.

ABRASIVE

- are shaped for various purposes.
- type: natural and synthetic
- available in wide variety shapes, often bonded or coated abrasives, including blocks, belts, discs, wheels, sheets, rods and loose grains.

Bonded abrasives

- composed of abrasive material contained within a matrix of fine aluminium oxide abrasive may comprise sintered material.



Sharpening stones, water stones or whetstones

- used to grind and hone the edges of steel tools and implements.
- process of using sharpening stone is called stoning.

A **grinding wheel** is expendable wheel composed of abrasive compound used for various grinding (abrasive cutting) and abrasive machining operations..

Coated abrasives

- comprises an abrasive fixed to a backing material such as paper, cloth, rubber, resin, polyester or even metal, many of which are flexible.
- Sandpaper is a very common coated abrasive.
- types :

Open coated (O.P); when the grains are spaced out, /Closed coat (C.L): when grains are close together,.



Exercise 1: sketch diagrams of a grinding wheel and a sharpening stone.

Reference site: <https://sharpenatool.com/wet-stone-sharpening-grinder/>

Type of abrasive backing

- i. Paper – for hand/ machine sanding
- ii. Cloth – for sanding belts.
- iii. Fibre – for machine sanding discs.

On the abrasive back, letters/ numbers represent type / weight of the backing.

Coarseness	Mesh or grit number	Application
very coarse	12,16,20,24,30	Rough shaping forming of stock
Coarse	36,40,50	For removing deep marks and imperfection
Medium	60,80,100	Medium sanding before exterior painting or as an intermediate stage before fine sanding
Fine	120,150,180	Last sanding prior to the application of stain or paint
Very fine	220,240,280,320,360,400,500,600	For rubbing and polishing finish after it has been applied and for cutting back surfaces between coats.

When ordering abrasives

State” grit size, backing (paper or cloth), open or closed coat, and type of abrasive e.g.100 sheets 120 –A garnet

Exercise 2: state what is written behind a belt sander belt or on sanding disc and what it means

Reference site: https://www.youtube.com/watch?v=dh5X-fFN4_4

Types of abrasives

Aluminium Oxide Cloth Sand Sheets./Emery Cloth Sand Sheets/Crocus Cloth Sand Sheets/Silicon Carbide Waterproof Sand Paper/Silicon Carbide Stearate Sand Paper Sheets/Garnet Finishing & Cabinet Sand Paper Sheets

Aluminium Oxide and Cabinet Sand Paper Sheets/.Sanding belts

Wheel dresser

Removes the glazed surface of the grinding wheel, which will allow new cutting surface exposed.



Exercise 3: select 3 types of abrasives from the list above and state its use

Reference site: <https://www.youtube.com/watch?v=2GwxykEvCkA>

Note: if you cannot print and paste the notes you can write in your note book. Answer all exercises in your note book.

SANGAM SKM COLLEGE - NADI
LESSON NOTES – WEEK 2 & 3
YEAR 11
APPLIED TECHNOLOGY

WEEK 2

Strand	AT11.3: ENGINEERING MATERIALS
Sub-Strand	AT11.3.1 Working with Engineering Materials
Learning Outcome	Identify and exhibit knowledge on types and uses of readily available engineering materials.

FINISHING

is process of applying to the surface after it has been prepared, by filling and smoothing, or otherwise, a thin coating of finish to render it durable, enhance its beauty or change its appearance.

Types:

Vanish

- transparent, hard, protective finish or film combination of drying oil, resin, and thinner or solvent.
- has little or no colour, is transparent, and has no added pigment

Paint

- any liquid, liquefiable, or mastic composition that, after application to a substrate in a thin layer, converts to a solid film.
- used to protect, colour, or provide texture to objects, stored/sold/ applied as liquid, but dries to solid.

Sealers

- lower strength, yet flexible, bonding agents used between substrates
- seal top structures to the substrate, and are particularly effective in waterproofing
- can provide thermal and acoustical insulation

Stain

- composed of same three primary ingredients as paint (pigment, solvent, and binder)
- Much like the dyeing or staining of fabric,
- designed to add colour to the substrate of wood and other materials while leaving the substrate mostly visible.

Greasing/Oiling

- applied to mechanisms that can only be lubricated infrequently and where lubricating oil would not stay in position.
- act as sealants to prevent ingress of water and incompressible materials.



Exercise 1: select 2 articles/objects at home and state with reasons the type of finish used in it

Corrosion Protection

- gradual destruction of materials (usually metals) by chemical reaction with their environment.
- degrades the useful properties of materials/ structures/strength/ appearance/ permeability.

What causes rust?

air (oxygen) and water (moisture) (known as oxidation) known as rust.

Paint Brushes

- oil paint brush, soak it for a day in linseed oil before using it.
- To clean : pour solvent in strong, clean plastic bag, and insert the brush.
- After cleaning dip them in a final rinse containing fabric softener.



Exercise 2:

- Sketch a paint brush and label its parts.
- Explain how you will clean paint brush at home after using it with oil base paint.

Reference site: <https://www.youtube.com/watch?v=H-H3D0m8bwU>

HARDWARE

- Fittings such as hinges and locks, used in cabinet work.

Hinges

Used on any article that swings, such as doors

Types:

Butt Hinge/ Back Flap Hinge/Rule Joint Hinge/Surface Hinges/T or Tee Hinges/Strap Hinges

LOCKS

Types:

Cupboard Lock/Drawer or Till Lock/Box Lock/Mortise Lock/Rim Lock



Exercise 3: sketch all the lock and hinges listed above

Reference: Year 11 Applied Technology Text Book

WEEK 3

Strand	AT11.3: ENGINEERING MATERIALS
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Learning Outcome	Identify and exhibit knowledge on types and uses of readily available engineering materials.

Escutcheons

An escutcheon is a metal fitting used to protect a keyhole.

CATCHES

Types:

Ball/Double Ball/Gripper /Inside Spring/Magnetic/ Ordering

BOLTS AND HOOKS

Types:

Barrel Bolt/Surface Bolt/Tower Bolt/Hasp and Staple/Cabin Hook/Cup Hook/Screw Eye

Exercise 4: sketch all the catches, bolts and hooks listed above

Reference: Year 11 Applied Technology Text Book

STAYS, BRACKETS AND CASTORS

Types:

Lid Support/Straight Stay/Shelf Bracket/Peg Castor/Tea Wagon Castor/Shepherd Castor

KNOBS, HANDLES AND PULLS

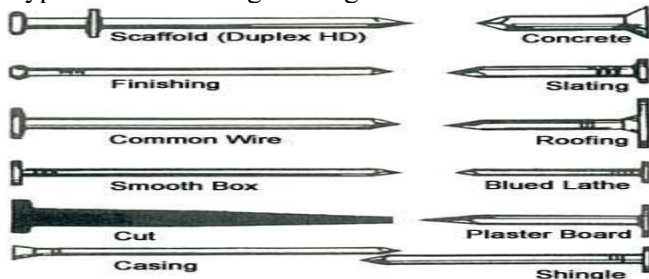
Types: Knob/Drawer Pull/Wooden Drawer or Door Pull/Handles



NAILS

Nails are used to hold wood parts together

Types: Box/Finishing/ Casing



RIVETS

A rivet is a permanent mechanical fastener used for fastening two or more pieces of metal together..

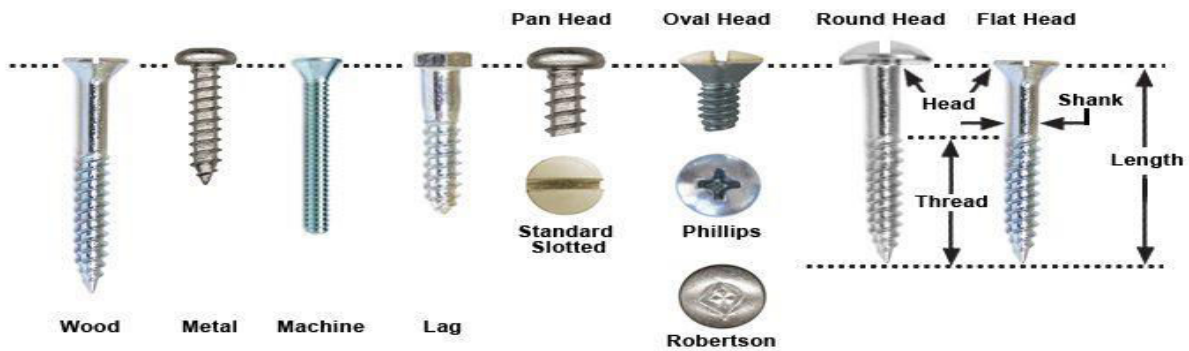
Exercise: sketch all the casters, nails and other hardware's listed above

Reference: Year 11 Applied Technology Text Book

Screws

Types: wood and sheet metal (difference is thread)

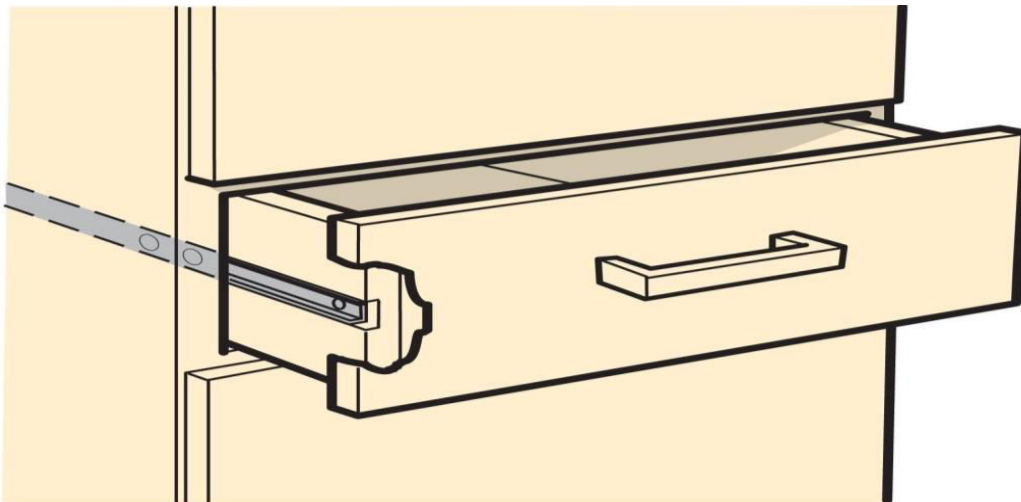
Parts: Head (gives name), shank (determines thickness) and thread (provides holding power)



Drawer slides

-used for smooth opening and closing

-fixed on the sides or at the bottom.



Exercise:

- (i) sketch screw and label its parts
- (ii) Explain with sketches how you will fix a drawer slide on the drawer.

Reference: Year 11 Applied Technology Text Book

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