

BA SANGAM COLLEGE
YEAR 9
BASIC TECHNOLOGY
WORKSHEET 2

Subject: Basic Technology	Year/Level: 9	
Week: 2	Lesson 1	Date:
Topic: Geometry (Ellipse)		

LESSON PREPARATION:

- Prepared lesson notes
- Prepared follow up work

PREVIOUS LEARNING/PRIOR KNOWLEDGE:

Students have prior knowledge on the term circle, the geometrical skills on how to use the drawing instrument for drawing and the elliptical shapes.

LESSON OBJECTIVES:

At the end of the lesson, students should be able to:

- Acquire knowledge and skills in the correct use of drawing instrument for the drawing of ellipse.
- Recognize and select the correct technical drawing instrument to draw the ellipse.
- Develop skills in geometrical construction methods in making ellipse.

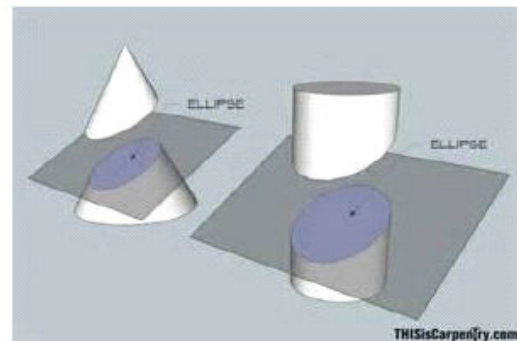
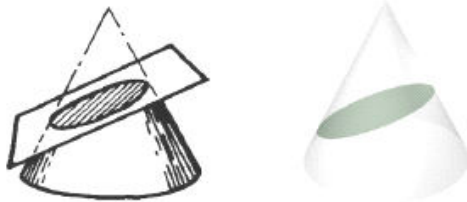
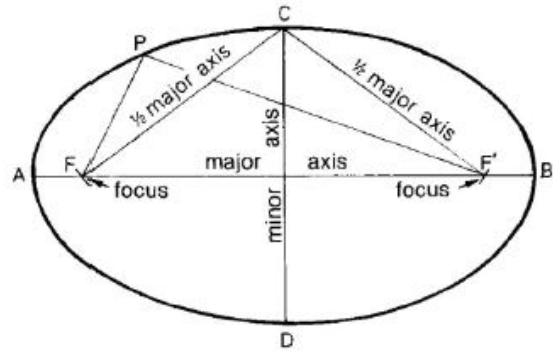
LESSON NOTES:

Ellipse:

An ellipse is a closed symmetrical curve with a changing diameter which varies between the major axis and the minor axis. An ellipse may be defined geometrically as the curve traced out by a point (P) which moves so that the sum of its distances from two fixed points (F and F') is constant and equal to the major axis.

In the diagram shown on the right AB is the major axis; CD is the minor axis and F, F' are the focal points. To find the focal points, take half the major axis either from C or D then strike an arc to cut either side of the major axis.

An ellipse is also the true shape formed by an inclined cutting plane passing through both the sides of a cone or a cylinder.



Construction of Ellipse:

Method 1: Concentric Circle Method

Step 1:

Draw a circle from the center “O” using the radius OA of the major axis.
Major axis- the longest line that runs horizontally.

Step 2:

Draw a circle from the center “O” using the radius OC of the minor axis.
Minor axis- the shortest line that runs vertically.

Step 3:

Divide the large circle into twelve equal parts.

Step 4:

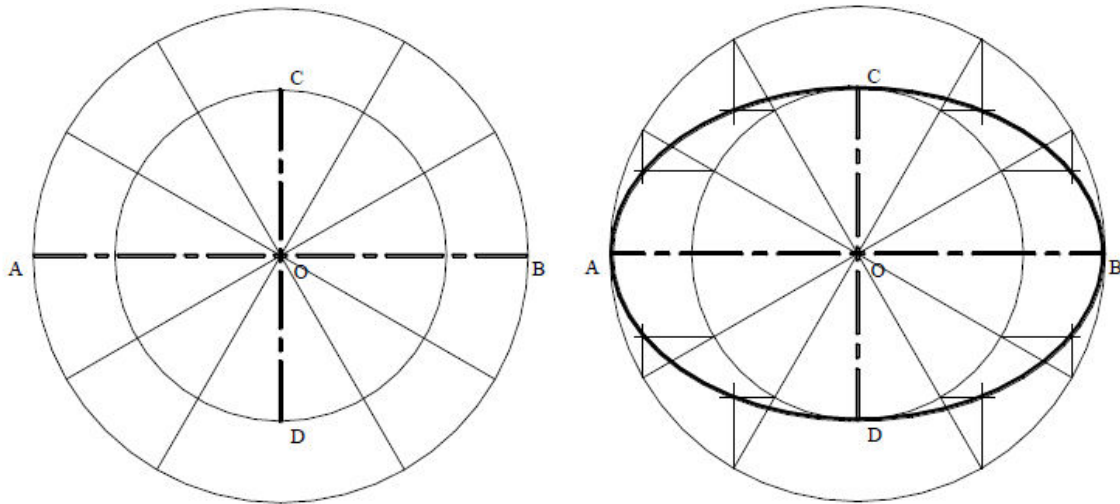
From the 8 points of the larger circle, draw line perpendicular to the major axis AB inwards.

Step 5:

From the 8 points of the smaller circle, draw lines perpendicular to the minor axis CD outwards.

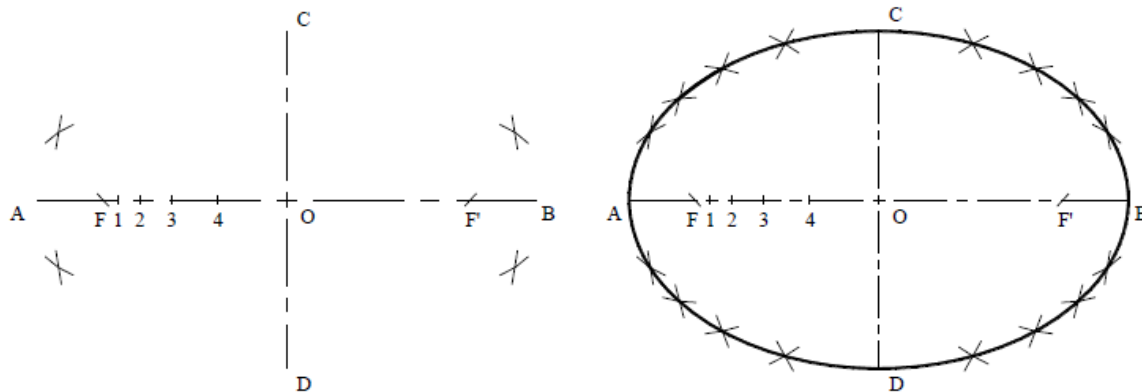
Step 6:

From the intersection of the two lines of each divisor, draw a smooth curve to get the ellipse.



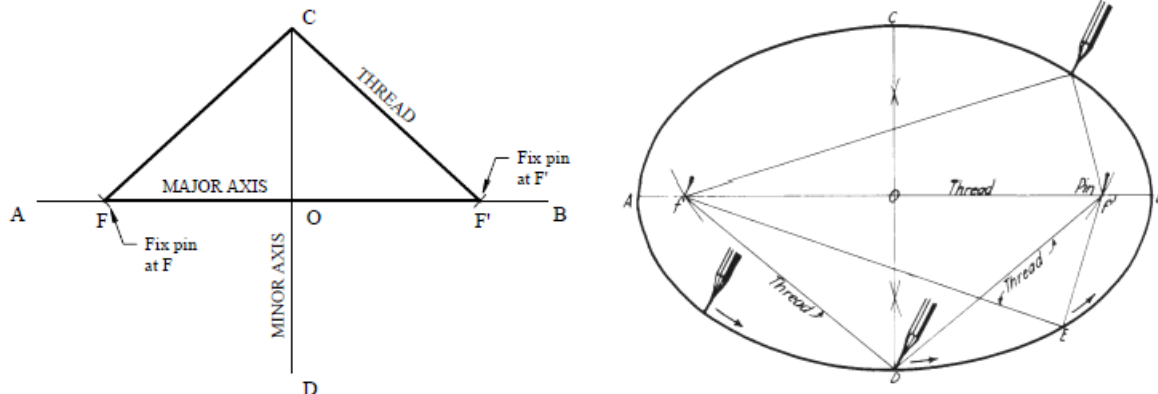
Method 2: INTERSECTING ARCS METHOD. Given the major axis AB and the minor axis CD.

1. Locate the two focal points F & F' by using OA as the radius, Then strike an arc on either side of the major axis from C .
2. Select points 1, 2, 3 & 4 between F & the centre.
3. Using radius A^1 and centre F & F' , draw arcs in each of the four quadrants.
4. With radius B^1 and centre F & F' , draw arcs to intersect each of the arcs drawn.
5. Using radius A^2 and centre F & F' , draw arcs in each of the four quadrants.
6. With radius B^2 and centre F & F' , draw arcs to intersect each of the arcs drawn.
7. Repeat the above steps for points 3 & 4 from A & B with centres F & F' .
8. From the intersection of the arcs, draw a smooth curve to get the ellipse.



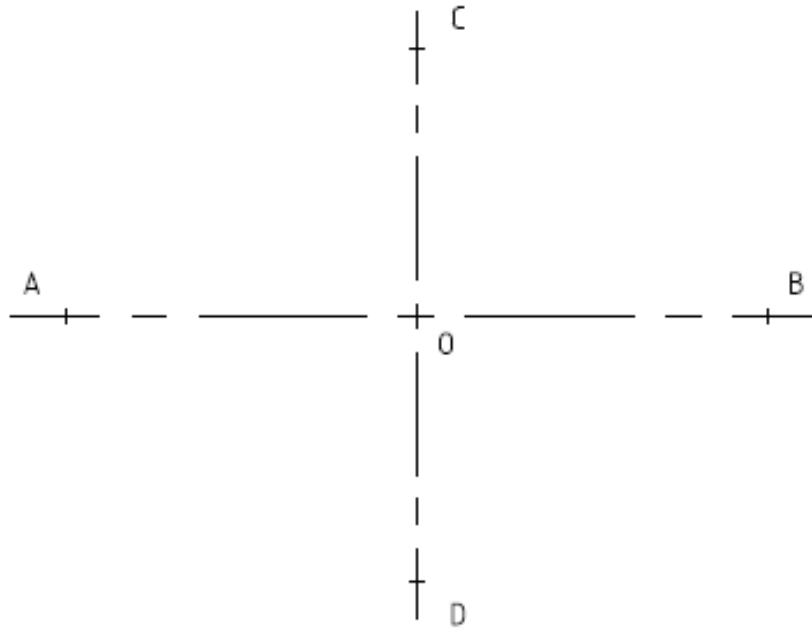
Method 3: PIN AND THREAD METHOD. Given the major axis AB and the minor axis CD.

1. Locate the two focal points F & F' by using OA as the radius Strike an arc on either side of the major axis from C .
2. Fix two pins on the two focal points F & F' .
3. Place a piece of thread round the two focal points and tie it to form a triangle on either point C or D .
4. Attach a pencil to the inside of the thread and hold it firmly.
5. Keeping the thread tight, move the pencil all around to trace the ellipse.



STUDENTS ACTIVITY:

- Given: A major axis AB and minor axis CD
Required: Construct an ellipse using concentric circle method.



Reference:

Year 9 Basic Technology Textbook, Year 9 Basic Technology Workbook, MEHA.

INDUSTRIAL ARTS DEPARTMENT LESSON PLAN

Subject: Basic Technology	Year/Level: 9	
Week: 2	Lesson 2	Date:
Topic: Hand Tools and Appliances (Holding and Supporting Tools)		

LESSON PREPARATION:

- Prepared lesson notes
- Prepared follow up work

PREVIOUS LEARNING:

Students have prior knowledge on the term holding and supporting and some of the tools that will be covered in this lesson are very simple and effective.

LESSON OBJECTIVES:

At the end of the lesson, students should be able to:

- Identify the basic holding and supporting tools, their parts and their uses.
- Develop the skills in the use of this holding and supporting tools.
- Acquire practical skills and knowledge with holding and supporting tools.

TEACHING RESOURCES:

- Lesson notes

FOLLOW UP WORK:

- Students activity

LESSON NOTES:

Classification of Tools:

All the hand tools may be generally divided into classes or groups according to their uses. The main groups of tools which you will be introduced to are classified as follows:

1. **Holding and supporting tools** - These tools are used to hold or support the job while working on it.
2. **Geometrical tools** - These tools are used for measuring, marking, testing and setting out the work.
3. **Abrading and Cutting tools** - These tools are used for reducing the timber to required sizes and shapes.
4. **Percussion and impelling tools** - These tools are used to drive nails, screws, chisels and take out nails and screws.
5. **Boring tools** - These tools are used to bore holes.

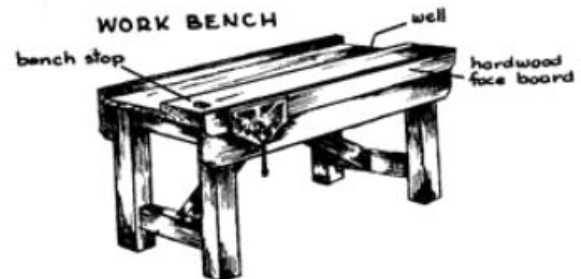
In this book, the hand tools have been split into their different categories. This is done for ease of reference and for you to be able to understand and use these tools effectively in completing your tasks and projects.

Holding and Supporting Tools:

Wood work Bench:

A very essential equipment for any wood workshop. Take care of the bench at all times so that the surface remains smooth and level.

The work bench is used for supporting your practical work piece or project while you work on it and during various other operations in completing your tasks and projects.



Bench Appliances:

Bench Well

It is the middle part of the bench top which forms a storage space called the 'well'.

It is used for storing the tools which are in use.

Bench Stop

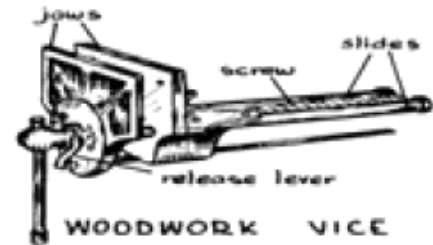
It is an adjustable wooden support slotted and fitted on the end of the bench usually on both sides. It is set slightly lower than the thickness of the timber being planned.

It is used to block and prevent the timber from sliding away while planning on the bench.

Bench Vice

is made of metal and fitted with wooden guards and checked and assembled to the bench usually one on each side.

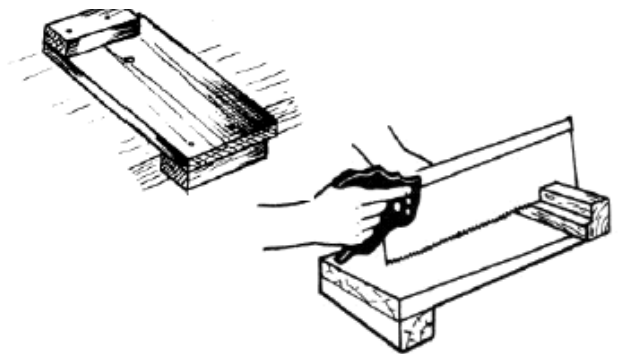
The vice is used to hold your job piece while you work on it; cutting, chiseling, sanding, assembling, etc.



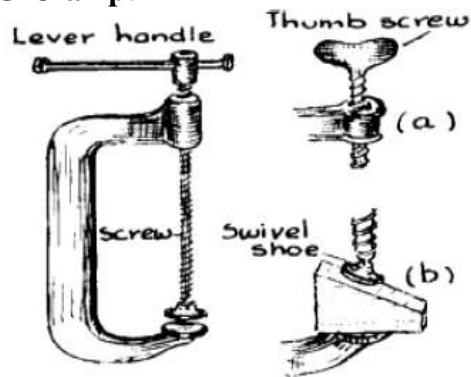
Bench Hook:

It is made of wood and designed to hook over the bench top.

It is used for holding the timber while you saw or chisel on the bench and at the same time preventing the bench top from damage.



G-Cramp:



It is an essential holding device made of metal which is shaped in the form of a 'G'.

It is used for holding down the piece of timber on the bench while you work on it and also used to hold together glued pieces of timber and projects left for drying.



STUDENTS ACTIVITY

- Name the three bench appliances and state the uses of each appliance.

- The tool that is used to support practical work or project while working on it is called _____.
- A bench appliance that is used to block and prevent the timber from sliding away while planning on the bench is called _____.
- The tool that is used for holding down the piece of timber on the bench while working on it is called _____.
- _____ is used for holding the timber while sawing or chiseling.
- What part of the woodwork vice holds the work piece while working on it?

- Identify the main purpose of holding and supporting tools.

Reference:

INDUSTRIAL ARTS DEPARTMENT LESSON PLAN

Subject: Basic Technology	Year/Level: 9	
Week: 2	Lesson 3	Date:
Topic: Hand Tools and Appliances (Geometrical Tools)		

LESSON PREPARATION:

- Prepared lesson notes
- Prepared students activity

PREVIOUS LEARNING:

Students have background knowledge on the term geometrical tools, as some of the tools that will be discuss in the lesson are common tools like rulers, pencil and etc.

LESSON OBJECTIVES:

At the end of the lesson, students should be able to:

- Identify the basic geometrical tools, their parts and their uses.
- Develop the skills in the use of this geometrical tool.
- Acquire practical skills and knowledge with geometrical tools.

TEACHING RESOURCES:

- Lesson notes

FOLLOW UP WORK:

- Students activity

LESSON NOTES:

Geometrical Tools:

Measuring and marking tools for basic woodworking are those that are used for measuring, marking out, setting out and testing a job. It is constantly used for measuring and marking. It is essential that measurements are correct and pieces are worked on to finished sizes. If they are not, the project might not fit properly and will not be as good. Remember to follow one simple rule *“measure twice and cut once”* and you will not go wrong.

Steel Ruler:

It is a handy measuring tool to have when making precise measurements on wood.

It is used to measure pieces to length, measure the side and end dimensions and for checking edges and surfaces for flatness.



Pencil:

It is an important marking tool. Pencils are useful in marking where appearance is important as it can be easily rubbed off or sanded.

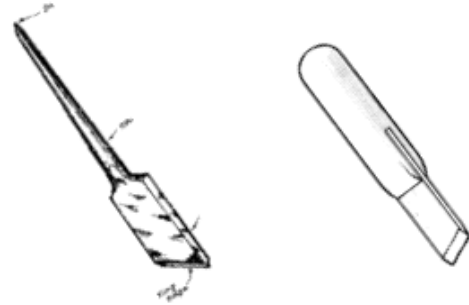
It is used for marking out on timber for lengths, face marks, waste wood and numbering of pieces for assembly.



Marking Knife:

It is a simple tool which makes a more permanent line than what a pencil does.

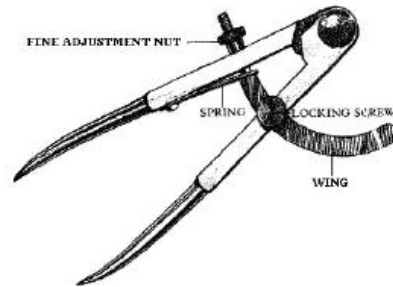
It is used where a fine and accurate cut line is required for marking joints and other more detailed markings on timber. It also cuts veneer, leather and card board.



Wing Compass:

Has two steel points in the form of a divider and opened by the means of a wing.

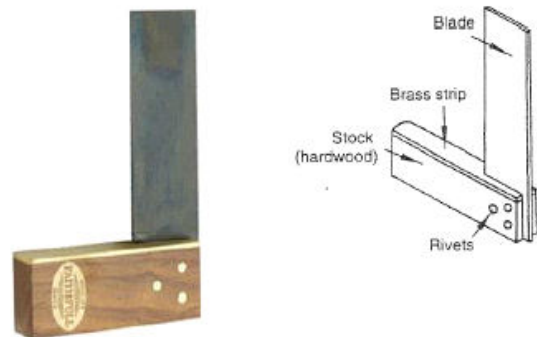
It is used for setting out and marking arcs and circles for designed work pieces.



Try Square:

The blade of all the squares are made of steel and secured to the stock by means of rivets. The inside edge of the wooden stock has a brass plate fitted to prevent wearing and splitting.

It is used for marking lines at right angles on a piece of timber, testing timber surfaces for square and marking out square lines on the work piece.



Sliding Bevel:

Has a wooden stock fitted with an adjustable blade through a slot in the stock and held by means of wing nuts for locking the blade at a certain angle.

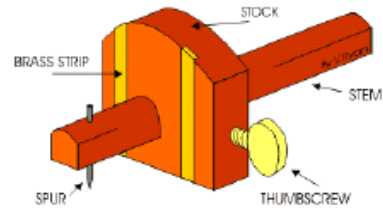
It is used for marking lines at any angle on a work piece and setting out, testing bevels and mitres.



Marking Gauge:

It comprises of a wooden stock slotted with a stem which is held by means of a thumbscrew.

It is used for making lines parallel to the face or working side or edge of timber.



STUDENTS ACTIVITY:

- Identify the main uses of geometrical tools.

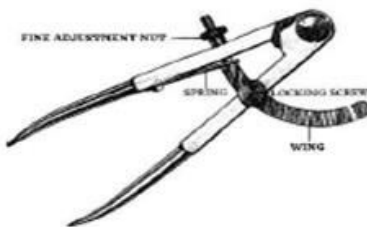
- Identify the names and uses of the geometrical tools given below:



a.

Name: _____

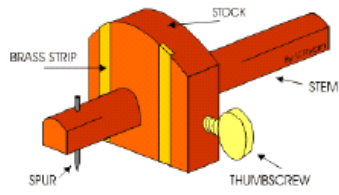
Uses: _____



b.

Name: _____

Uses: _____



c.

Name: _____

Uses: _____

Reference:

Year 9 Basic Technology Textbook, Year 9 Basic Technology Workbook, MEHA.