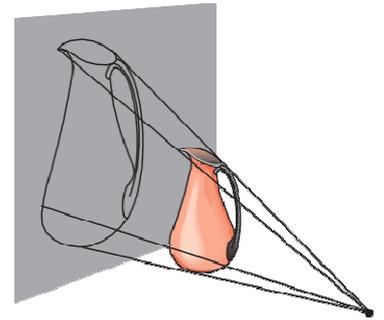
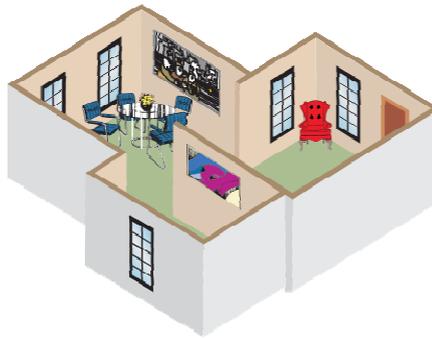


# Unit. GRAPHIC EXPRESSION

## 1. GRAPHIC EXPRESSION

Human beings have always expressed ideas through graphic representation, from cave paintings to computer-generated plans. Graphic expression is used in many different ways for many different purposes



The aims of graphic expression in Technology are:

1. To design our own objects, organise our ideas, check how pieces fit together and choose measurements for them.
2. To show our ideas to other people, with sketches and plans that they can understand and reproduce.

## 2. GRAPHIC MATERIALS

We use different tools for drawing. The choice depends on the type of drawing we want to do.

### Pencils

Pencils have a wooden case with a lead inside made of graphite and clay. The lead is softer or harder depending on the amount of graphite it contains. The most common grades are:

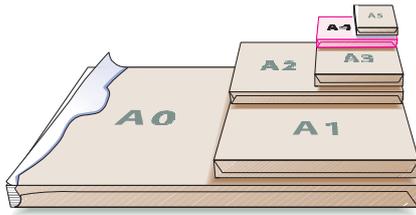
6H, 5H, 4H, 3H, 2H, H, HB, B, 2B, 3B, 4B, 5B, 6B

The hardest is 6H and the softest is 6B.



### Paper

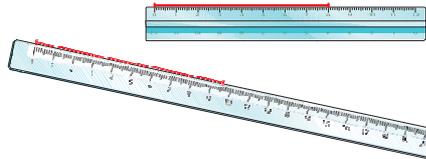
There are different sizes of paper. These sizes can also be called **formats**. In technical drawing, the most common formats are from DIN 'A' series.



Each format is calculated by dividing the previous format in half.

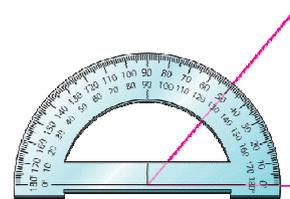
## Measuring tools

Ruler



Protactor

We use a protractor to measure and draw angles. A protractor is usually a semicircle with markings to show degrees from 0° to 180°.

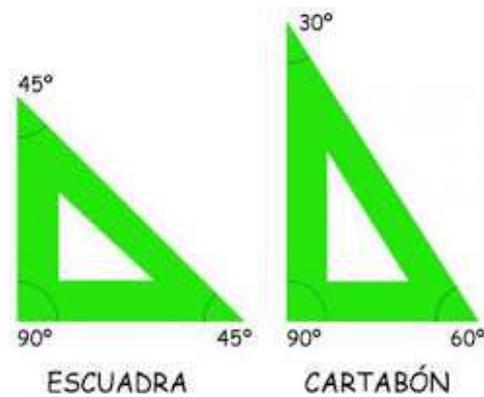


Set squares

Set squares are triangular 'rulers' for drawing parallel and perpendicular lines.

They come in two shapes:

- A right-angled isosceles triangle (**escuadra**) with 45°, 45° and 90° angles.
- A right-angled scalene triangle (**cartabón**) with 90°, 60° and 30° angles



Compass

This instrument is used to draw circles and arcs

## 3. HOW TO DRAW LINES

Drawing parallel lines

These lines never cross.

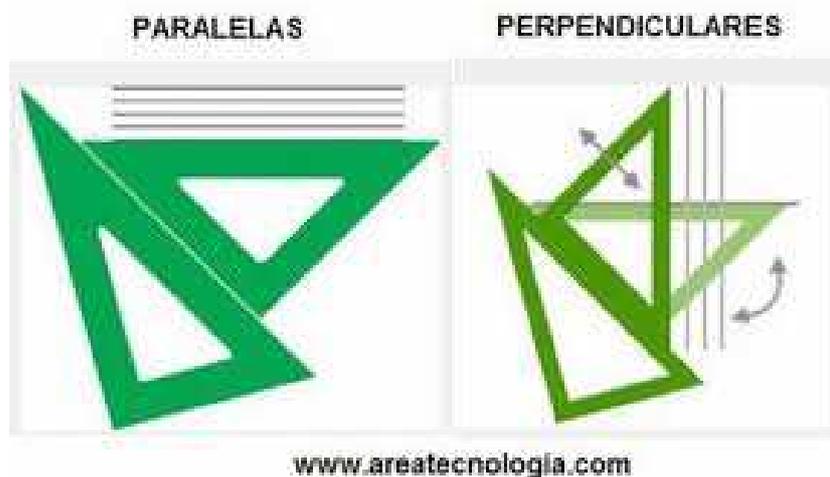
1. Draw a straight line.

2. Put the hypotenuse of the isosceles set square (escuadra) on the line.
3. Put the scalene set square (cartabón) on the other side.
4. Hold the scalene set square in place and move the isosceles set square up or down to draw a parallel line.

### Drawing perpendicular lines

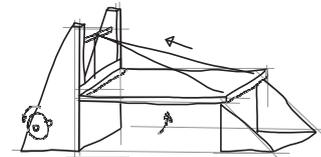
These lines touch and make an angle of  $90^\circ$ .

1. Draw a straight line.
2. Put the set squares in the same position as for parallel lines.
3. Turn the isosceles set square round and draw another line perpendicular to the first line.



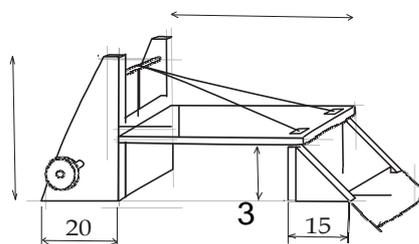
## 4. SKETCHES, DIAGRAMS AND PLANS

A **sketch** is an initial drawing which shows the fundamental elements of a design. It is created using only pencil, paper and rubber.



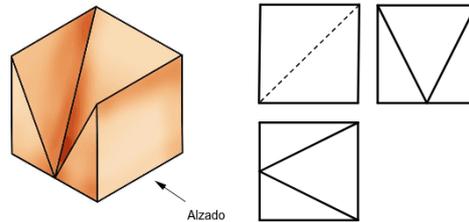
A **diagram** gives more specific information, including measurements, materials, ways of connecting pieces, etc. It is made freehand with a pencil

A **plan** uses drawing instruments such as rulers, set squares or compasses or even computers. A series of established rules must be followed: lines, scales, data table



## 5. REPRESENTATION OF OBJECTS

Objects can be represented in two different ways in technical drawing: through views or perspectives

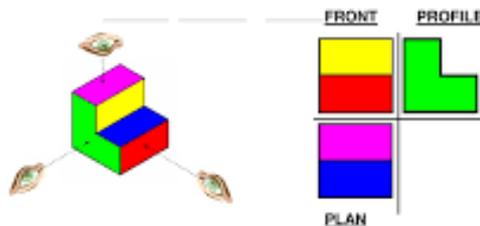


### ❖ VIEWS OF AN OBJECT

Our perception of an object depends on which viewpoint we look at it from. An infinite number of viewpoints are possible, but for technical drawing we use three principal views (at 90°) to give complete details of an object.

### VIEWS OF A FIGURE

The three main views of an object are:  
**PLAN, FRONT** and **PROFILE**.



- **Front view (alzado):** this is what we see when we are in front of the object. The drawing from this view is called a **front** elevation.
- **Side view:** this is what we see when we look at the profile from one side of the object. The view can be from the left (**perfilizquierdo**) or the right (**perfil derecho**). The drawing from this view is called a **side** elevation.
- **Plan view(planta):** this is what we see when we look down from above the object. The drawing from this view is called a **plan**.

Steps to follow:

- Draw the axis

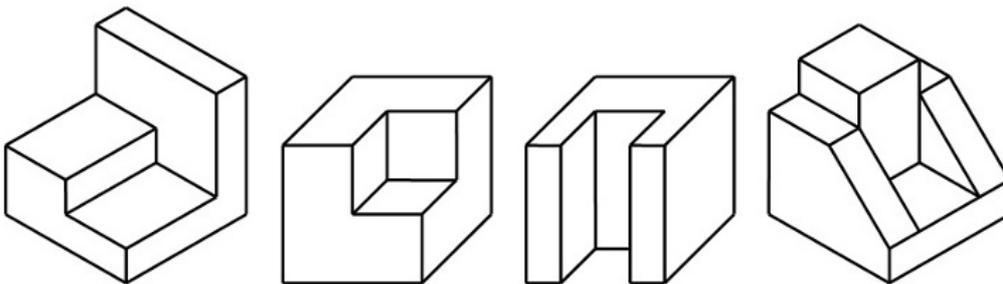
- Draw the front view
- Draw vertical lines and extend the vertical lines of the front view with thin lines to connect to the bottom
- Draw the plan view.
- Extend the horizontal lines of the FRONT view with thin lines to connect to the PROFILE view.
- Extend the horizontal lines of the PLAN view with thin lines to connect to the axis.
- Put the tip of the compass in the centre of the axis and draw the curve.
- Extend to the top.
- Draw the PROFILE view.

Different types of lines are used on a technical drawing to represent different things.

ORDEN DE PREFERENCIA EN LAS LINEAS

- CONTINUA
- OCULTA
- · — · — CENTRAL (EJES)

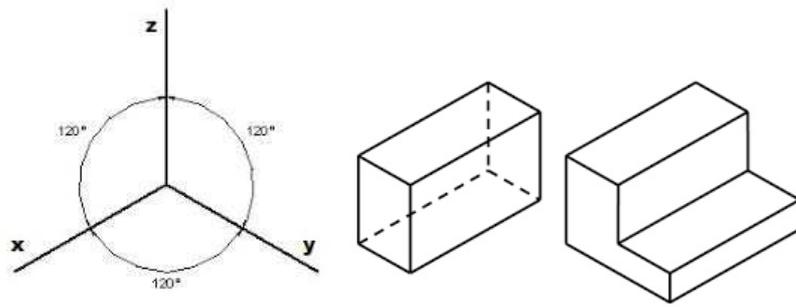
❖ PERSPECTIVE



Perspective shows us the whole object instead of its separate views. In technology two main perspectives :

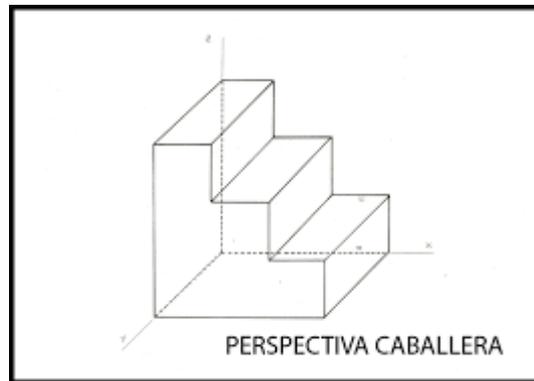
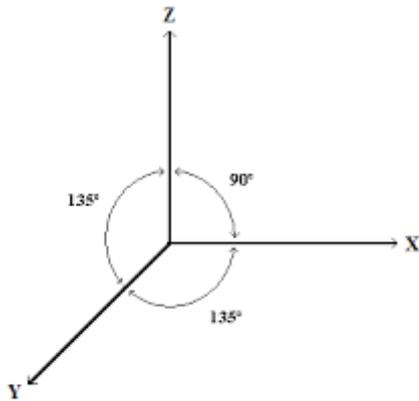
Isometric

We draw the three main axes with a separation of 120° between them



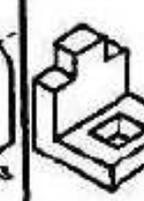
### Cavalier

On a two-dimensional surface like a sheet of paper, we show this perspective by using two axes at right angles to each other, with a third axis at 135° to the others

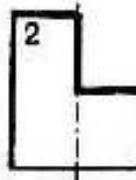
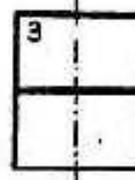
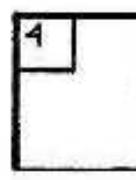
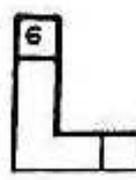
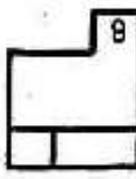
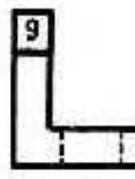
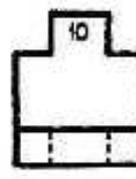
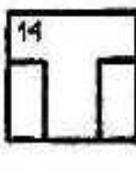
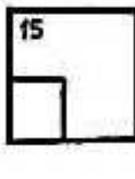
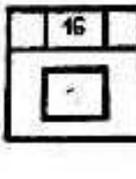
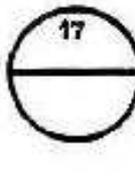
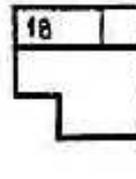


# ACTIVITIES

1. Fill the table with the correspondent view

						
ALZADO						
PLANTA						
LATERAL IZDO						

*Escribe en este cuadro los números de las vistas que le corresponden.*

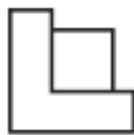
For experts...

Indica en la tabla siguiente los números de las vistas correspondientes a las piezas, teniendo en cuenta que la vista de Alzado se obtiene mirando la pieza en la dirección de la flecha (10 p.)

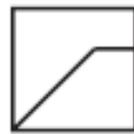
ALZADO						
PLANTA						
PERFIL						



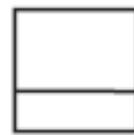
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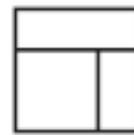
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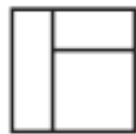
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4



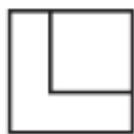
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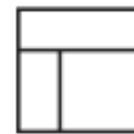
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8



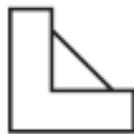
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10



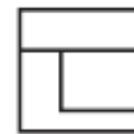
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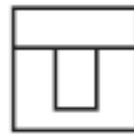
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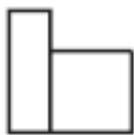
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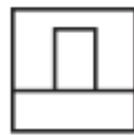
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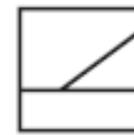
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16

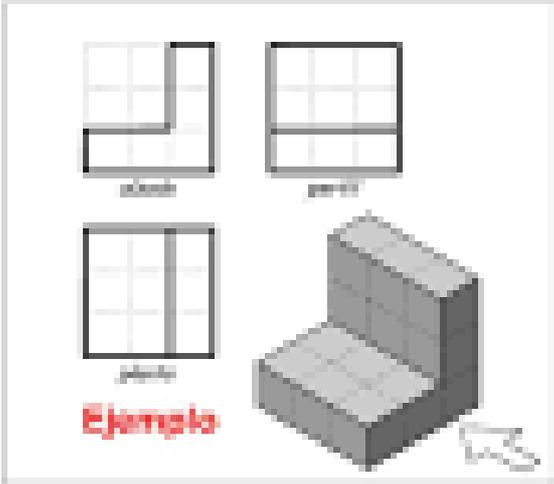
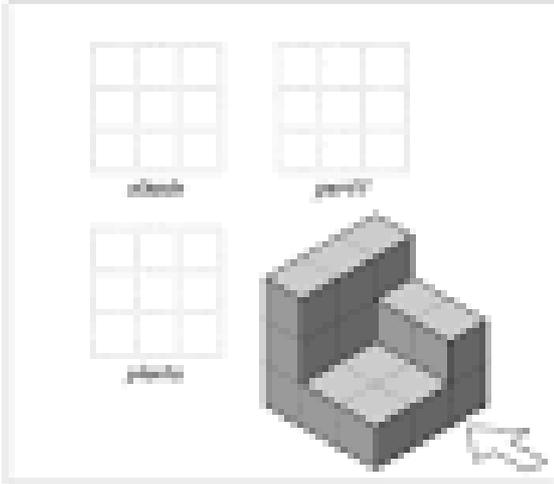
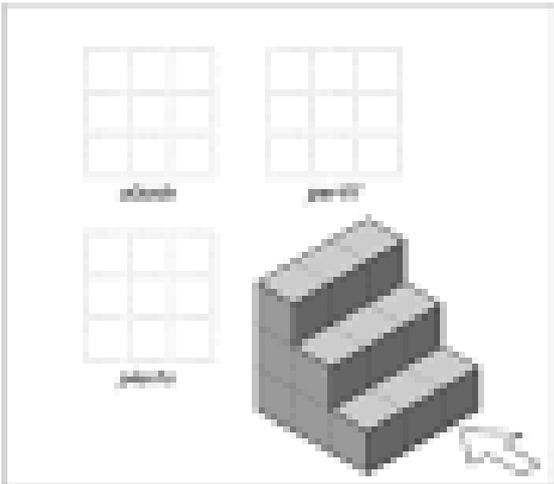
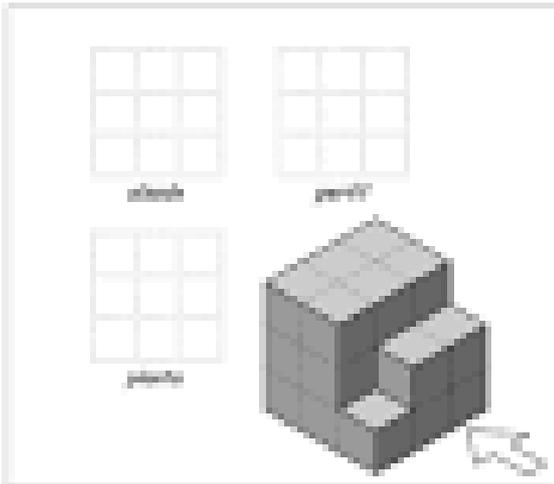
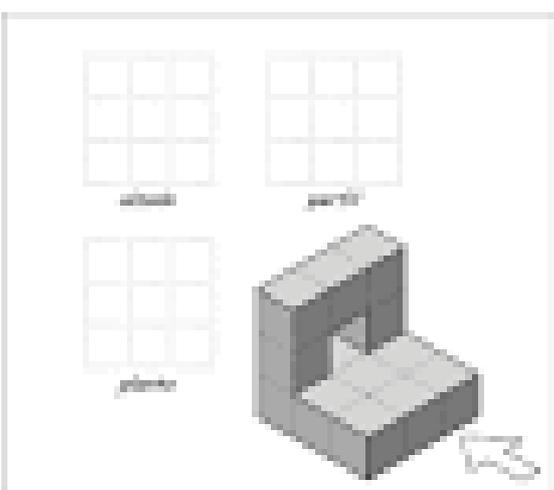
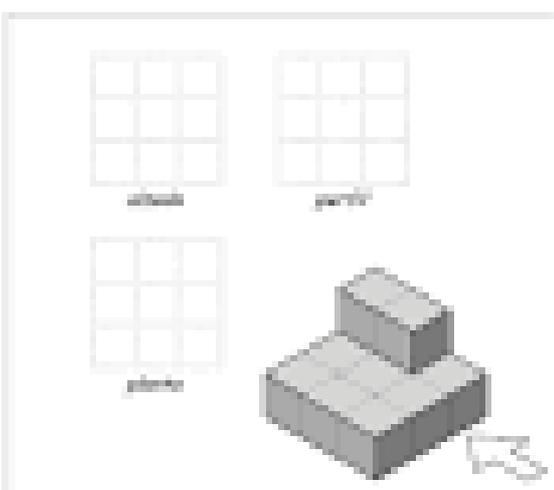


17

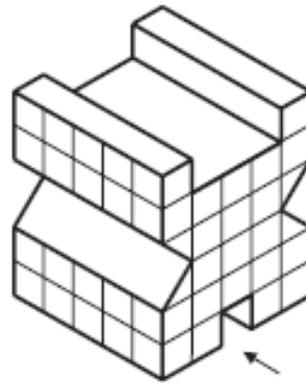
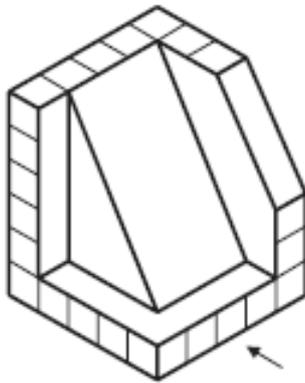
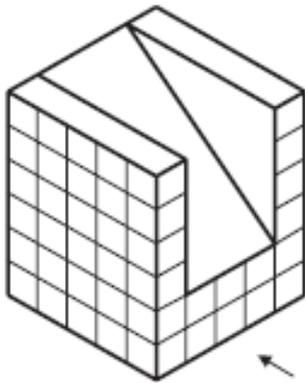
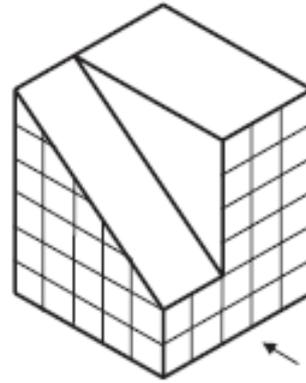
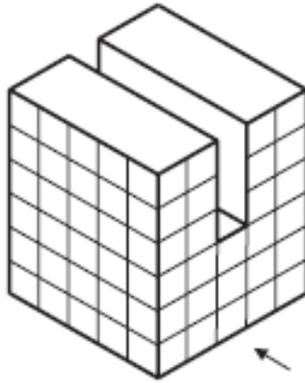
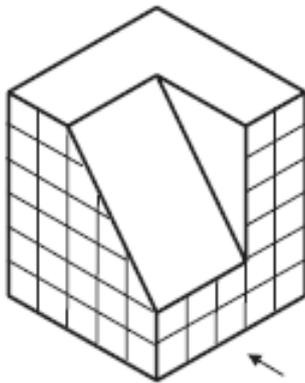
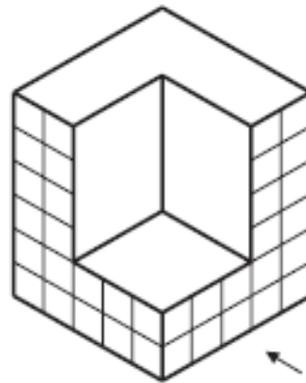
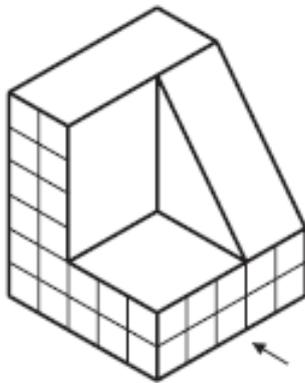
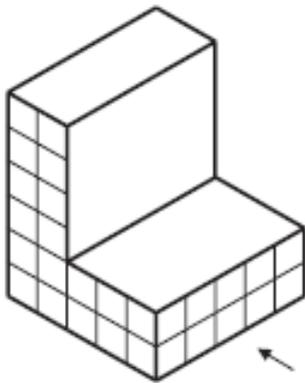


18

## 2. Practicing views

 <p><b>Ejemplo</b></p>	
	
	

3. Views of some of this pieces (in the notebook)



4. Views are also used in architecture...

www.dragoart.com



5. Draw the views in a normalized paper (template drawing)

