## HOMEWORK NOTES

## TOPIC 1: British Standards: including third angle projection, dimensioning, line types and use of simple scale

## Drawing Symbols

This symbol is the third angle projection symbol. It is found on all orthographic drawings, drawn using British Standards.


## Orthographic Drawing

An orthographic drawing drawn using British Standards is laid out like this. The Plan is always aligned above the Elevation. The End Elevations are always aligned to the right or left of the elevation as shown.


## Dimensions



Notice how dimensions are always in millimetres so there is no need to add 'mm' after writing the number. Numbers are always written above the dimension line.

Notice that radius dimensions are preceded by capital $\mathbf{R}$ and diameter dimensions by the diameter symbol

## Line Types

You will also notice that there are several different lines used in this drawing. The complete list of linetypes used in British Standard drawing are shown below.


## Continuous thin.

Used for construction lines, leader lines, dimension lines, hatch lines on sectional views (see below)

## Continuous thick <br> Used for outlines

## Dashed thin

Used for Hidden detail

## Chain thin

a) Used for centerlines and lines of symmetry.
b) When thick ends are added this line is also used as a cutting plane in a sectional view

## Double dashed chain thin

Used for foldlines on development drawings

## Sectional Views

When an object in an orthographic view is cut it creates a section or sectional view. It is used to give clear detail about the assembly or internal components in a product.

Look at the example of a shopping trolley wheel and bracket below. Notice the position of the cutting plane (line $\mathbf{X}-\mathbf{X}$ ) and how the sectional end elevation is different from a normal end elevation, because it shows angled hatch lines on most surfaces that have been cut.


Sectional End Elevation X-X


Elevation

Look carefully at the drawing on the previous page and notice the following things

- the sectional end elevation shows clearly how the three parts are assembled by showing internal detail. This is often the reason why sectional views are used.
- it is easy to see which part is which because of the clear thick continuous lines around each part and the hatch lines that run at the same 45 degree angle across the whole of the part.
- different parts that are touching have hatch lines running in opposite directions in this instance the wheel and the bracket.
- the pin that holds the wheel and bracket together is not hatched. This is also true of axels, nuts and bolts and webs (if you don't know what a web is... ask your teacher!)


## Dimensioning different shapes

There are some shapes that are dimensioned differently they are squares, hexagons, and octagons. Square ( $\square$ ), Across the Flats (A/F), Across the Corners (A/C). Hexagons and Octagons can be dimensioned across the flats or across the corners depending on their position the page.


## Drawing to Scale

Sometimes the drawing of an object is a different size from the object itself. Take the example of a house. The drawing must be smaller that than the house itself so that the architects, structural engineers etc... can work with the drawing. So the size of the house will be reduced by a certain scale.


The scale often used for the elevation view of a house is $1: 50$. The drawing is 50 times smaller that the real house.

The graphic opposite shows the elevation view of the wheel from a toy car.

The wheel H has been drawn at a scale of $1: 1$ ( the actual size of the wheel).

The enlarged wheel $\mathbf{J}$ has been drawn to a scale of $2: 1$ in order to show the details (A) on the wheel more clearly.

There are actually three 3 things that determine the scale of a drawing

Toy Car Wheel


Wheel (H)
Scale 1:1


Enlarged Wheel J Scale 2:1

1. the size of the object
2. the size of the paper
3. the level of detail required in the drawing

## HOMEWORK 1 QUESTIONS

## Question 1 (mark out of 8)



Look at the different views in Drawing $\mathbf{X}$ at the top. How would the views change if they became sectional views?

Write in the number that correctly shows the sectional plan view A-A
and the sectional front elevation view $B-B$


7


11


12


13


10


14

Measure and add the correct dimensions to these drawings using British Standards. Use the leader lines provided for you


## Question 3 (mark out of 6)

There are $\mathbf{3}$ mistakes in the British Standard drawing below, unrelated to the values in millimetres.
a) Write down what these mistakes are.

1. $\qquad$
2. $\qquad$
3. $\qquad$
b) Make changes to the drawing so it shows now the correct dimensioning techniques.

