

2D Vector Drawing for Schools

Quick Start Manual

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Quick Start Manual

The Quick Start Manual provides a basic overview of aspexDraw and contains information to enable the new user to draw simple 3D shapes on the screen and to display their Nets and Projections.

Expanded and updated versions of the aspexDraw manual will from time to time be made available in pdf format for download from:

www.aspexsoftware.com *(UK Site)*

www.knowledgetree.ca *(US Site)*

Vector Drawing.

A vector is a quantity which describes the position of a point in space relative to another point. In a two dimensional drawing package like aspexDraw a vector can be thought of as a 'translation distance' in the X and Y directions to take you from a starting point to an ending point. These points are established using a set of Vector Drawing tools.

In 3D systems the vector is described in the X,Y and Z directions.

In a Vector drawing package the points described by vectors are joined using lines and curves. Often these form a closed shape like a triangle, circle, a square or an irregular shape which is then filled with a colour.

When **vector shapes** are changed in shape or size, the values for each point in the shape also change, and the lines which join them together form a larger or smaller shape, or one which has been in some way distorted.

The newly changed vector shape is filled with the same colour it had before. As a shape is enlarged for example, it is filled with more 'pixels' of colour, and it retains its original sharpness and quality.

When a **bitmap** is enlarged, its pixels each get bigger and the image starts to lose quality.

Objects

Drawings made in aspexDraw are constructed using lines, curves, rectangles and ellipses. Text can also be added to the drawing and all the various parts of the drawing are called **objects**.

Objects in aspexDraw can be enlarged or shrunk without loss of picture quality and this is why the software is described as a Vector Drawing Package.

A bitmap image imported into the drawing will be treated as a single object. However, a bitmap image is different from a vector image, being made up of a fixed number of dots or pixels. When a bitmap image is enlarged, the individual dots or pixels, get bigger becoming pixilated and reducing the quality of the picture.

How to draw with aspexDraw

In aspexDraw drawings are created with the mouse, acting like pen and paper except that instead of a pen the mouse controls the drawing tools to draw shapes on the screen. These shapes can be coloured and edited.

Shapes drawn using the mouse can be combined with text typed in from the keyboard. A drawing can be merged with previously-made drawings and images from other sources. Dimensions can also be added to create CAD style drawings.

A unique collection of ClipArt is included with aspexDraw which comprises of items and furniture found in the home, enabling you to instantly design '3D' rooms including a Bathroom, Bedroom, Kitchen and Lounge.

Drawing Toolbar



Select Click on an object to select it. When an object is selected it will be bounded by a coloured box with 'grab handles' ; use these 'grab handles' to **resize** and **rotate** the object.

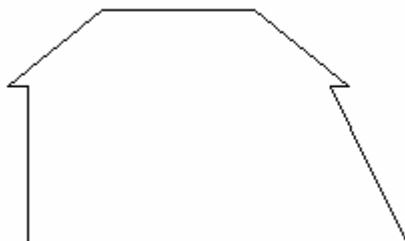
NB. aspexDraw makes a guess as to whether the you wish to select the object or move it. If the object is being selected, the bounding box with grab handles will always appear. If the object is simply being moved then the bounding box will not be displayed. aspexDraw is quite good at making the correct decision but won't always get it right.



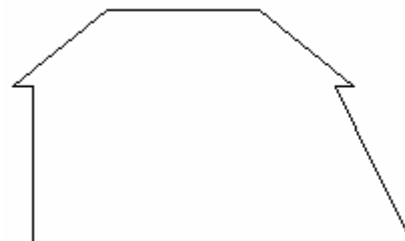
Line Use this tool to draw a straight line or a series of connected straight lines. When the open line tool is selected, successive clicks with the left mouse button will draw points on the screen, joined together by straight lines.

A line drawing can be completed in three different ways:

1. To make an Open-Line: Double-click the left button. .
2. To make a Closed-Line: Click the right mouse button to close the line and fill the enclosed area with the selected colour.
3. To make a Closed-Line: Click near to the first point of the line.



An open line made using seven clicks of the left mouse button and a **double**-click to place the last point and finish.



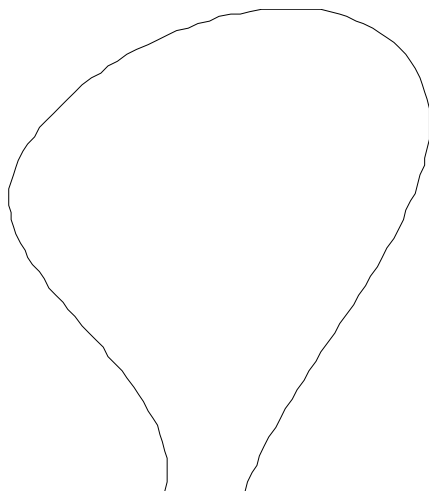
A closed line made using eight clicks of the left mouse button then finished with a **right** click. (*filled with colour white*)



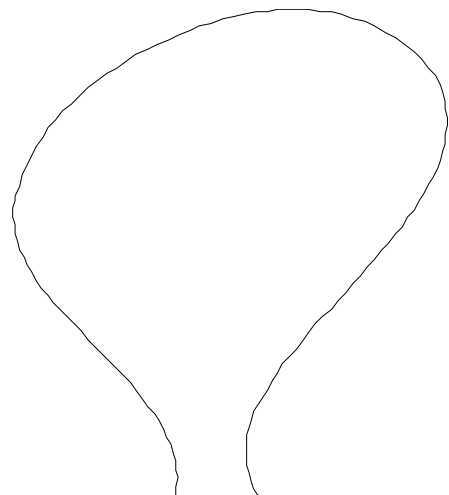
Curve tool

Use this tool to create curved shapes, a wavy line for example. When the open curve tool is selected, successive clicks with the left mouse button will draw points on the screen joined together by a smooth curve. The curved line can be completed in three different ways:

1. To make an open-curve: Double-click the left button.
2. To make a closed-curve: Click the right mouse button to create a curved line enclosing a colour filled area.
3. To make a closed-curve: Click near to the 'first point' of the curve and a colour filled curve shape will be drawn.



An open-curve made with three clicks of the left button and a **double** click to finish the last point.



An open-curve made with four clicks of the left button and a **right** click to close the curve.

Single Lines and Curves

A quick way to draw single lines and curves is to select the appropriate tool, press the left mouse button at the start position of the line, drag the mouse then release the button to finish the line.



Rectangle

Use this tool to draw a rectangular shape using one of the following methods:

1. Click with the left mouse button to fix the first corner of the rectangle into position, move the mouse diagonally and click to finish when the rectangle is the right size.
2. Press the left button, drag the mouse diagonally then release the button to complete the rectangle.



Ellipse tool

Use this tool to draw an ellipse shape using one of the following methods:

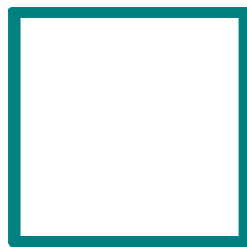
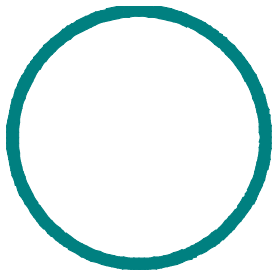
1. Click with the left mouse button to fix the top edge of the ellipse in position, move the mouse downwards and click to finish the shape when it is the right size.
2. Press the left mouse button, drag the mouse to the desired position, then release the button.

Drawing Circles and Squares

To draw a perfect circle: Press the ctrl-key at any time while drawing an ellipse, and the ellipse will change to a circle. Keep the ctrl-key pressed until you have finished drawing it.

To draw a perfect square: Press the ctrl-key at any time while drawing a rectangle, and the rectangle will change to a square. Keep the ctrl-key pressed until you have finished drawing it.

Another way to draw perfect circles and squares is to draw an ellipse or rectangle while the **grid** is switched on.



Press the ctrl -key when drawing ellipses and rectangles to draw perfect squares and circles.



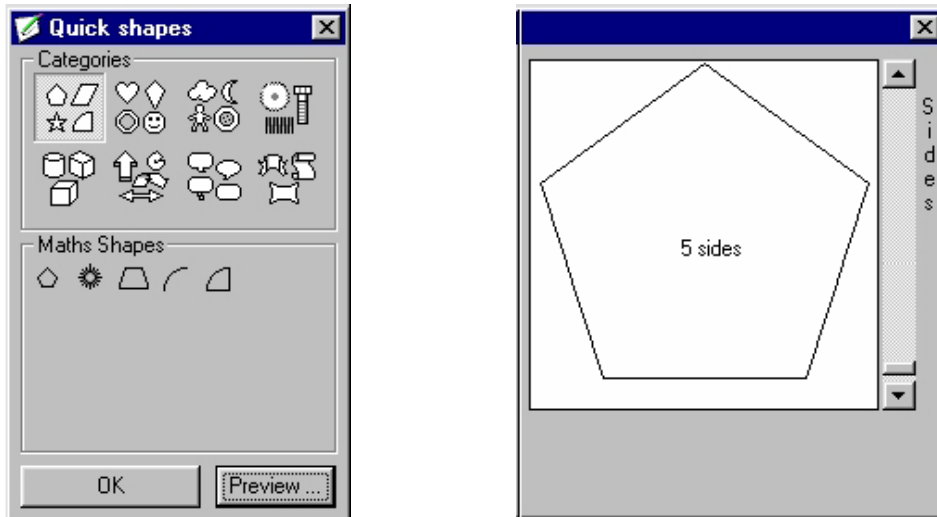
Freehand tool

The freehand tool enables you to draw irregular lines as if you were drawing them with a pencil. The freehand tool operates by drawing many small segments as the drawing tool is moved.

nick

QuickShapes

Click the QuickShapes button on the left hand toolbar to display the QuickShapes box. There are several categories of shapes and each one contains a small library of pre-made shapes to choose from.



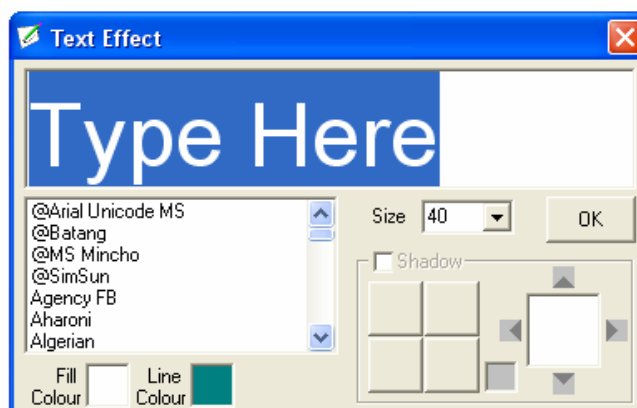
Each QuickShape can also be manipulated in some way. You can adjust the number sides in the 'polygon' shape, rotate the arrow to a different position and so on. The adjustments are controlled by scroll-bars in the QuickShapes preview window.

Text

To add text to your drawing, click the text button, click on the screen and start typing. Font and text point size can be changed, along with text colour and other attributes such as boldness and italic. Text can also be moved and rotated. To do this, double-click over a block of text to display a bounding box around it, then move the block of text like any other object.

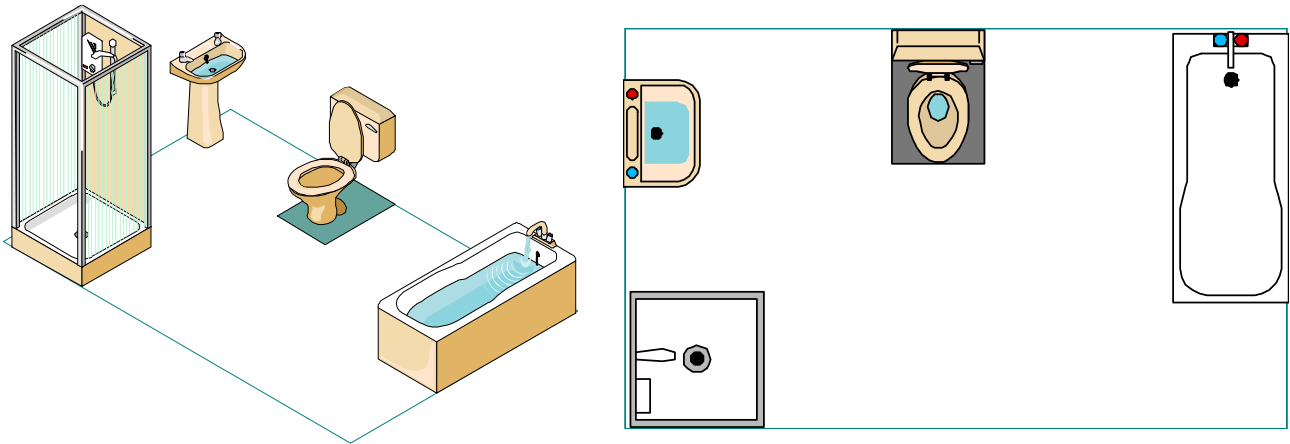
Text Effects

Click on the text effect toolbar button to display the text effects window. Type your text into the window and press OK. aspexDraw will create a drawing on the screen resembling the characters typed. These characters can be edited and manipulated just like any other vector object, a square for example.



ClipArt

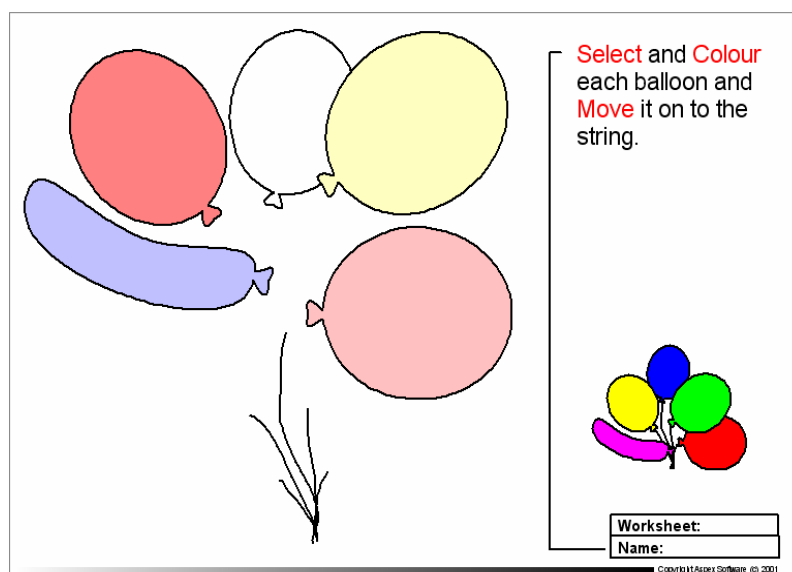
The ClipArt toolbar button opens a window containing vector clipart which can be put into your drawing. There are clipart drawings of furniture useful for making classroom and home designs. Most items of clipart are saved as both 3D and a 2D plan views.



Worksheets

the worksheets toolbar button gives you access to a set of simple worksheets. The worksheets are suited to younger pupils, in particular for teaching the ICT QCA graphical modelling units.

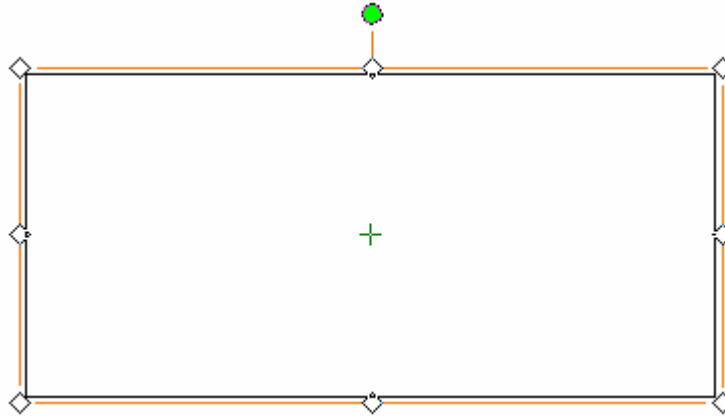
Teachers can also create their own worksheets and make them accessible from the toolbar. The worksheet template can be **locked into place** by selecting all the objects and pressing Ctrl-Shift-L to lock them into place. The same key-presses **unlock** the template.



To reduce the chance of a saved worksheet being changed accidentally, you should make your worksheets into read-only files, and do not allow the saved files to default to the worksheets folder.

Selecting shapes

Select a shape by clicking the mouse over it. When a shape is selected, a 'box' with grab-handles appears around it, called a bounding box.



Resizing and rotating shapes

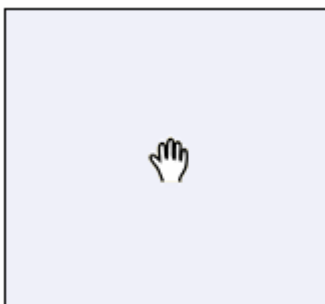
To RESIZE the shape, click the left button in a grab-handle and drag the mouse. If you press the ctrl-key at the same time then the aspect ratio of the shape will be maintained. Use the green grab-handle to rotate the shape.

Moving shapes

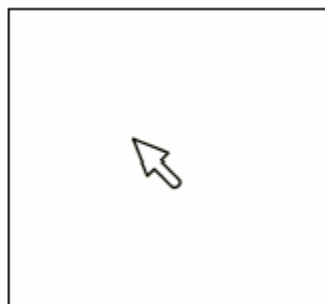
If your intention is to 'move' a shape rather than to select it, aspexDraw will allow you to move the shape without displaying the bounding box. Press the left button over a shape and drag the mouse to move the shape without a bounding box.

To select a shape

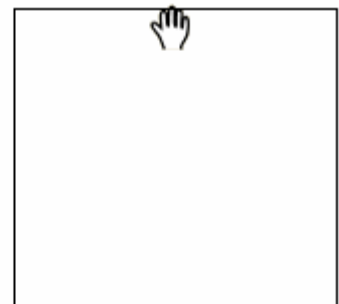
To select a shape, hover the mouse pointer over a physical part of the shape, eg a colour fill or a line. When this condition is met the mouse pointer changes to a hand; a click will then select the shape and display the bounding box.



The mouse pointer changes to a hand when it hovers over a filled shape.



When the mouse hovers over an empty shape it doesn't change*.



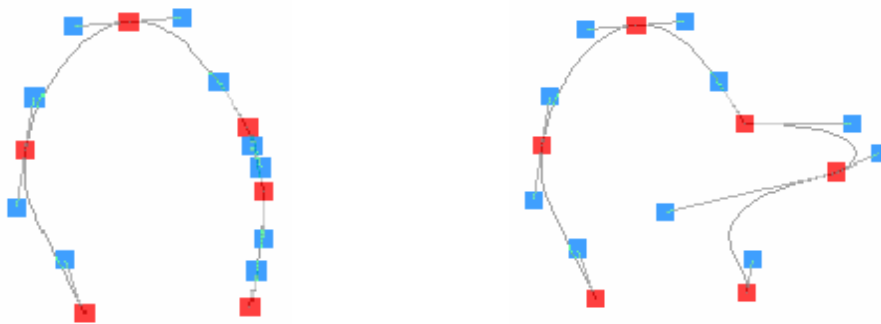
The mouse pointer changes to a hand when it hovers over a line.

* It will change to a hand if it touches another line or colour beneath the unfilled shape.

Editing shapes

When you select a shape and click the Edit Tool the shape will switch to edit mode and the points and lines it is constructed from are displayed. Use the mouse to move the points and change the shape.

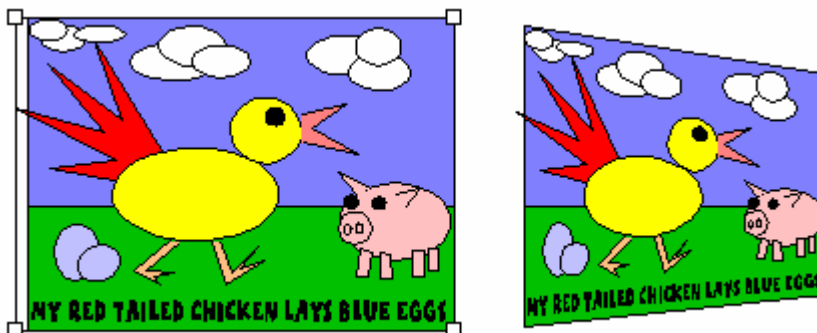
Below, a curve has been selected and edit mode is switched on. The red squares mark **end** points of each segment of the curve, coinciding with the mouse clicks used to create the shape in the first place. The red squares can be moved with the mouse to change the shape.



The blue squares are **control points** and can be moved to change the direction and size of the curve.

Bend box

The Bend Box is used to distort a shape, for example to create a perspective view, as in the chicken drawing below. The drawing on the left was first selected and the BendBox button then clicked, displaying the **bend handles** which were moved to produce the 'distorted' drawing shown on the right.




Layer

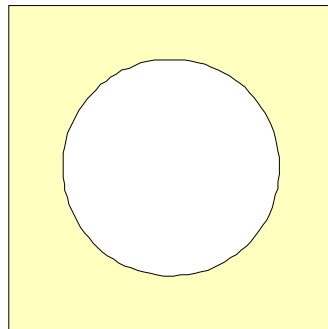
Select a shape then click a layer button to send the shape to the back or bring it to the front. A shape can still be selected even if it is in the back layer; as long as the user can see it, the mouse can select it.

Group / Ungroup

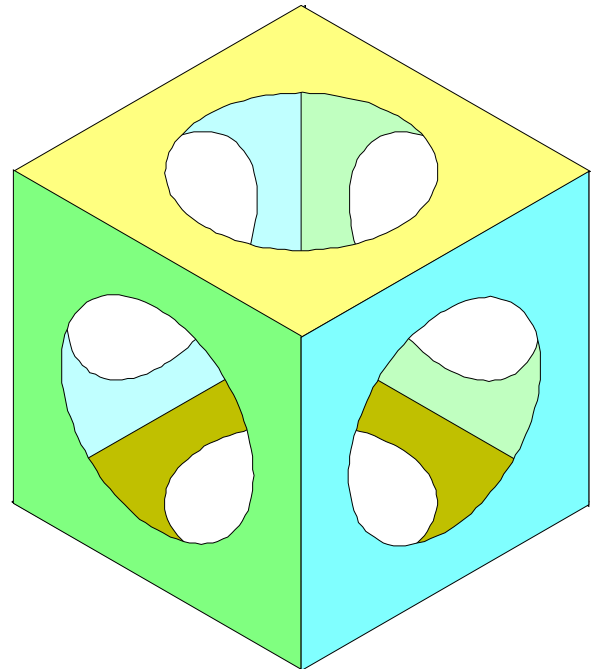
Several objects can be selected and then grouped so they act like a single object. For example when draw a chair, all the components of the drawing could be grouped together to make the chair just one object. The chair can then be moved around easily and saved as an item of clipart to use later.

 Holes are easy to make in AspexDraw. To make a hole in a shape, superimpose another shape representing the hole over it. Select both shapes then click on the Holes button.

The cuboid with holes on each face was constructed from a square and a circle, grouped together and selected. The holes tool was clicked to 'merge' the shapes together, thus creating a hole.

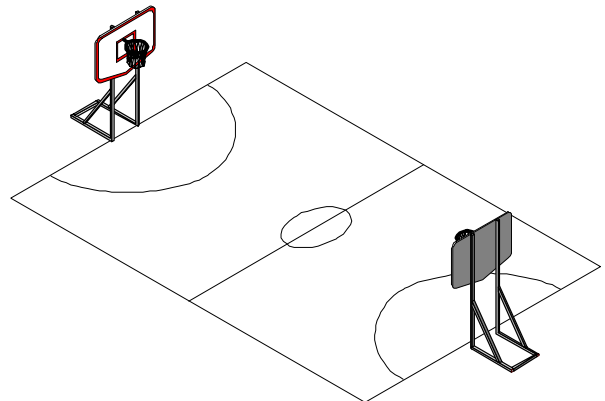
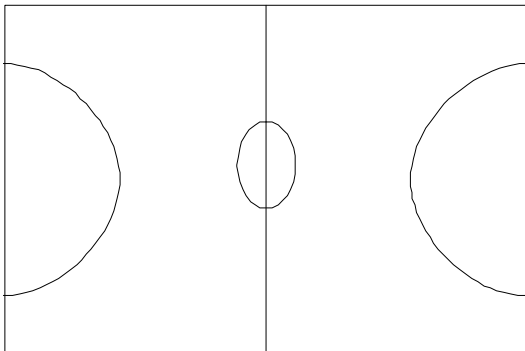


The resulting shape was copied six times. Each face was converted to isometric view using the 'convert to isometric' function in the effects menu. The faces were positioned with the mouse and the layer tool was applied to faces as necessary to position them correctly in depth.



Transforming shapes

Selected shapes can be transformed by flipping them horizontally or vertically and converting them to an isometric view. The isometric conversion is useful when making '3D' drawings, for example; it is simple to draw the plan-view, for example a netball court, and then convert it to isometric.



The netball baskets were dragged onto the drawing from the clipart folder.

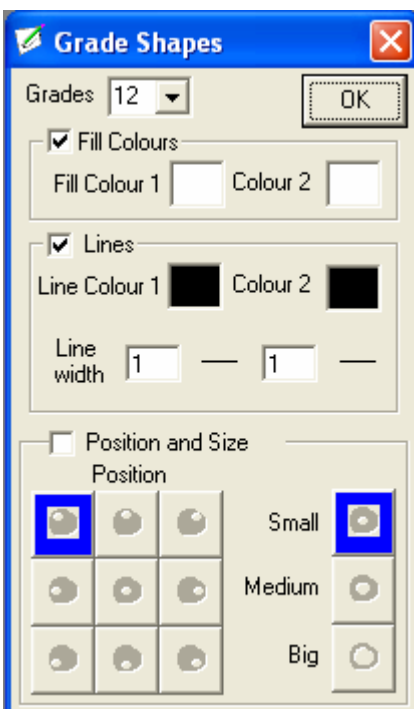


Select All / Deselect All

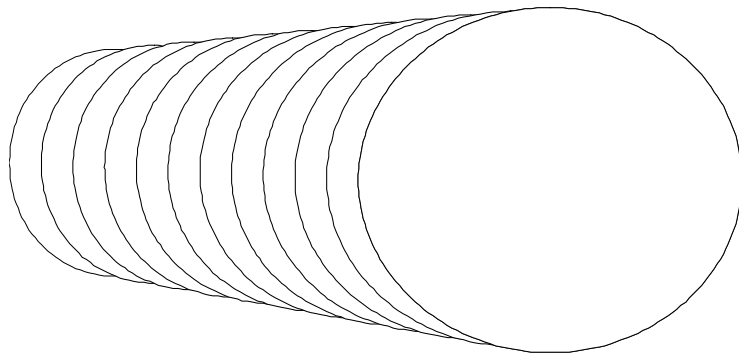
These tools provide a quick way to selecting all the objects prior to grouping them together or to clear multiple selections with one click.

Grade shapes.

Grading can be used to create effects. You can grade a single shape or two shapes. If a single shape is graded, successively smaller copies of itself are created and stacked on top of the original shape. Grading two shapes means automatically creating copies of the first shape and placing these copies at intervals between the original shape and its copy.

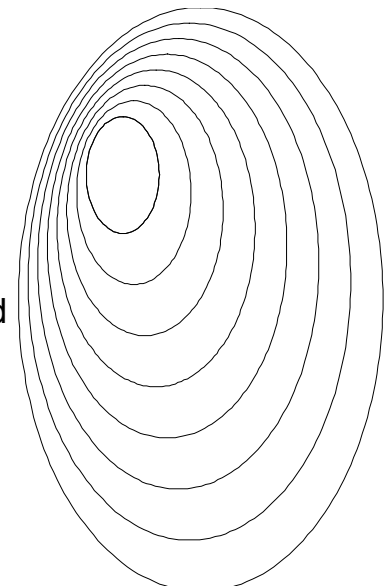


When a **pair** of objects (a shape and its copy) are graded, aspexDraw creates and stacks the copies between them. Below, two circles were 'graded', the copies being stacked between the two originals. In this case eight copies (or grades) were made, AspexDraw can create hundreds of copies if needed.



There is a different effect when a **single** object is graded. (See right). The original shape is automatically copied and successively smaller copies are stacked on each other with the smallest copy on top. The position of the smallest copy can be decided prior to grading.

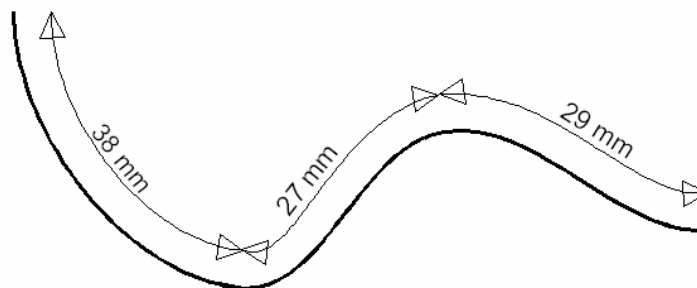
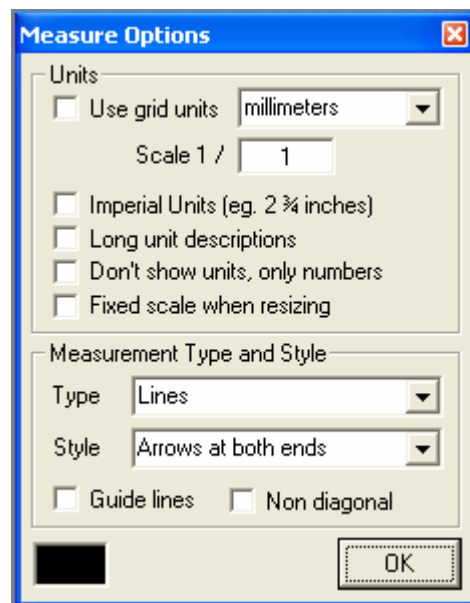
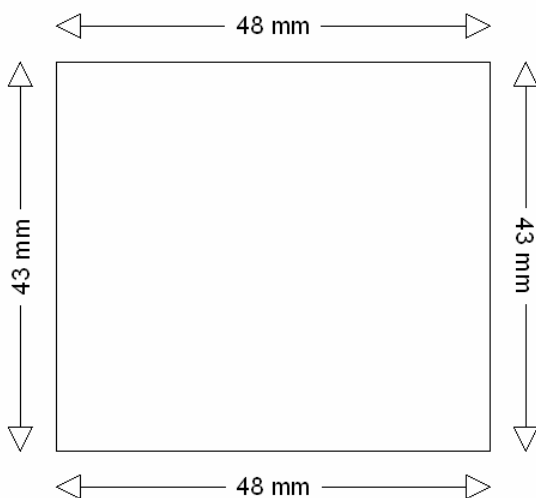
Single shapes can also be colour-graded with two colours. To create a 'shiny' grape, if the oval shape on the right was graded with purple and white, and with 'line colour' switched off, the result would look like a grape with the light shining on it.



Dimensions

When the dimensions button is active, dimensions will be shown next to an object during its creation. If an object does not have dimensions attached then selecting it and clicking the dimensions button will add them.

A drop-down menu on the dimensions button allows for different dimensions to be added; width and height, distance, width only, radius. The perimeter, or distance format is useful when adding dimensions to a curve.



Dimensions for newly created objects will appear with the units already set in the drop down menu. However, you can select an object, change the units of its dimensions, and then continue creating objects with the previously set units.

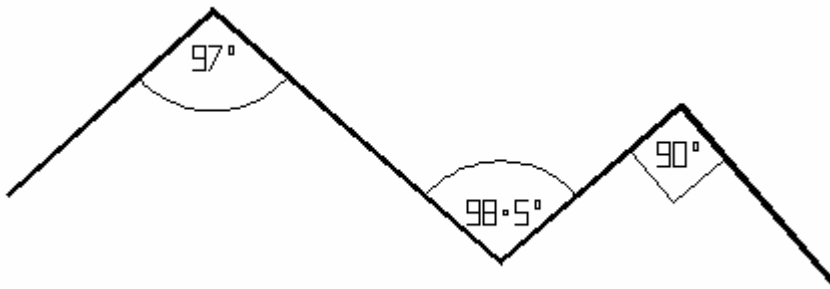
Adding dimensions manually.

The manual dimension tool is used to draw dimensions as objects which can be placed anywhere on the drawing. They can be selected, rotated, moved and treated like any other object.



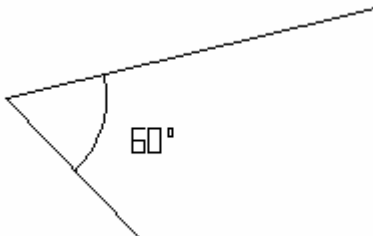
Angles

When the angles button is active, angles will be added to an object as it is created. If an object does not have angles attached then selecting it and clicking the angles button will add them.



Adding angles manually

The manual angles tool is used to draw angles as objects which can be placed anywhere on the drawing. They can be selected, rotated, moved and treated like any other object.



Notes for Network Administrators

Network administrators may find it useful to copy the contents of the CD on to the server, then access the installer from each workstation.

A textfile in the application folder, admsetup.txt can be edited to change the pathname where aspexDraw will look for particular files or folders. The default paths are relative to the application folder. Absolute paths can be supplied, ie: LicensePath=\\server\Draw Resources\lic so that all the network stations refer to a single licence file making simple the task of licence upgrading for the the administrator.

aspexDraw Startup Settings

Normal Settings: SetupPath:default

This tells aspexDraw to read and write settings to a file called aspexdrawsetup.dat in the Windows\Temp Directory on the local machine.

aspexDraw and Draw^{MST}

If the file `aspexdrawsetup.dat` does not exist, aspexDraw will use a default settings file called `setup.dat` in the app directory. aspexDraw will try to save its user settings on exit.

Networks

The `aspexdrawsetup.dat` file can be placed in a different location, a server for example so that all users read from the same settings list.

To change the location type the new pathname after `SetupPath:` for example:
`SetupPath:P:\Server\AspexDrawSetup.dat`

IMPORTANT. An initial dummy `aspexdrawsetup.dat` must be placed into the new location. Create an empty `.dat` file and save it at the new location with the name `aspexdrawsetup.dat`

Read Only Settings File

aspexDraw saves to the settings file each time it is quit. Therefore by forcing the `aspexdrawsetup.dat` to read-only then all the pupils will read the same settings without any individual pupils writing and thus changing the settings for everyone else.

The licence file contains the user name and license number which is read by aspexDraw on start-up. It is recommended that for network users, just one license file is used and placed on the server. This will make the task of upgrading the numbers of permitted users a simpler one later on. The default path is a relative one pointing to the license file inside the application folder.

`ClipArt:default` (*Clipart folder in the application folder*)
`GroupEffects:ON`
`LicensePath:default` (*Lic.lic in the Application folder*)
`SaveType:ADW`
`SetupPath:default` (*aspexdrawsetup.dat in the Windows\Temp folder*)
`UserFiles:C:\My Documents\`
`Worksheets:default` (*Clipart folder in the application folder*)

Expanded and updated versions of the aspexDraw manual will from time to time be made available in pdf format for download from the Aspex Software website:

www.aspexsoftware.com