



# Graphics

Many children are very confident with computer graphics, easily combining a painting program and a mouse to create some astounding displays. There are others, however, who do not have this facility, and many teachers themselves find it difficult to achieve anything they would want anyone else to see!

The ideas in this section are intended not only to extend users' coordination skills but also to suggest how computer graphics can make a greater contribution to cross-curricular work in areas such as Mathematics and Language. In most cases children will work in groups of two or three, and it is quite feasible to impose time restrictions to encourage 'on task focus' and to help with managing the system. However, the children will need an opportunity to experience and play a little with the equipment and software.

The suggested tasks can easily be adapted to suit varying individual abilities and the graphics tools you are using. Remember, graphics does not always mean painting.

Graphics screens often have a bright white background. This can cause discomfort and eye strain, so it is sensible to adjust the brightness and contrast controls on the monitor to tone down the glare.

## Suitable software

PC/RM	Acorn
Paint Brush	Kidpix
Paint Pot	Dazzle
Polanski	Revelations
PaintSPA	Easel
Colour Magic	



## 18 Getting started

**Age**  
5+

**Organisation**  
Pairs or small groups

**Time**  
10–20 minutes per group

### Purposes

- To introduce the children to computer graphics.

- To practise common **IT** skills such as saving, loading and printing.

- To support learning in another curriculum area.

### Activity

1 Create a suitable outline drawing and save it. Houses, clowns, vehicles, space pictures, mosaics and maps are just a few of the many different possibilities available to you in connection with a suitable classroom topic. If you are already confident with your own skills of drawing on a computer it will not take long to set up some suitable starter screens; if you have not yet acquired that capability this is an ideal way to improve your skills.

Demonstrate how to use the graphics features – such as filling and flooding – that the children will need for this activity.

Challenge them to load your outline and finish it off by filling each separate area with an appropriate colour.

They can then save their picture before printing it out and using it as appropriate in their ongoing work.

### Extensions

Look out for opportunities to focus and extend the challenges you design into these simple starting points. For example, a house can be coloured as 'day', then overfilled as 'night', or in 'summer' and 'winter' modes; a clown can be coloured according to a brief written description or to reflect the moods of 'happy' and then 'sad'; the number of colours used to fill the mosaic can be selected by throwing dice – how does the number affect the ease of creating a repeating pattern or even a symmetrical pattern?

### Note

► When drawing your outline, the slightest gap will allow colour to escape into another area. Test your starting picture before presenting it to the children, and repair any leaks by blocking gaps with a dot or line. Of course, you could leave gaps deliberately so that colour will flow into complicated areas such as the sky behind the branches of a tree. Another reason for leaving a gap could be to give the children the task of finding the cause of the problem and repairing it themselves.



## 19 Colour Teddy

**Age**  
4-6

**Organisation**  
Class or large groups

**Time**  
15 minutes

### Purposes

To involve young children in some interesting language work.

To introduce them to some of the possibilities of computer graphics.

### Activity

Draw and save an outline picture of a teddy.

Arrange the children around the computer so that they can all see what you are doing. Reload your outline drawing.

Prompt the children to discuss and decide on the colour of the teddy's fur, eyes, nose, etc.

4 Each time a decision is made, use the mouse yourself to colour in the appropriate area.

5 You can use a photocopied print-out of your original outline as part of a follow-up activity away from the machine.

### Extensions

Depending on the children's ability level – and your own! – you can introduce decisions about matching, size, position, number, etc. A set of flowers of different sizes, or a scene with a row of houses, are examples of suitable alternative starting points.

### Note

► When filling or flooding a shape with colour, remember that pure colours can usually be overfilled with another pure colour as often as you like, but as soon as you use a mixed or hatched colour you will no longer be able to recolour the shape easily. Remember to save your fancy colours until you're certain you won't want to change them!



## 20 Manipulate shapes

**Age**  
7+

**Organisation**  
Whole class, then small groups

**Time**  
20-30 minutes per group

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### Purposes

To familiarise the children with the graphics shape selection menu.

To further understanding of rotation, reflection and symmetry.

To develop the ability to visualise the possible outcomes of design decisions.

### Activity

Show the children how to select and manipulate the graphics program's shape selection menu.

Challenge them to create a design based on using these shapes: a clown's face using only solid filled-in circles, or a robot entirely constructed by manipulating rectangles, are simple examples which lead to planning,

creating and evaluation opportunities. They could use pcm 20 to keep a record of the decisions they make.

Afterwards it is useful to print out and share the different solutions that will have arisen from the challenge and to discuss the decisions that each group made.

### Note

► A surprising variety of shapes can be created after a little practice and rather more thought. For example, a full moon can be represented by a simple yellow disc on a black sky, but to create a crescent moon the full moon will have to be overlaid with another slightly offset solid black one. Planning ahead and completing actions in the right order are vital in these cases.



## 21 Complete the sequence

Age  
6+

Organisation

Whole class, then small groups

Time

20–30 minutes per group

### Purposes

- To extend the children's familiarity with graphics tools.

- To practise their physical IT manipulation skills within a mainly mathematics-based environment.

### Activity

Prepare on the computer the beginnings of some shape sequences, which can range from simply a row of red squares to more complex sequences in which two or three elements are changed each time. Save your sequences individually.

1 Introduce the children to the graphics tools you want them to use, such as Rectangle, Fill and Line. Older children may be encouraged to use tools such as Copy and Paste.

2 Ask the children to load a sequence appropriate to their ability level, and challenge them to complete it.

### Extensions

- One item in each sequence can be altered before printing to produce a

paper-based 'Find the odd one out' game for others to play. This will also illustrate the advantage of using IT to make changes to a picture in a way that is invisible to the viewer.

Draw any symmetrical scene or design on your graphics screen, such as a Christmas tree, church, leaf, clown, etc. Next, draw a vertical line down the centre of the screen and use the rub-out tool to completely erase all the drawing to one side of the line. Save your half-picture. This is now the starting point for a mirror-symmetry challenge. Quite a simple outline can offer plenty of problem-solving, planning, language, maths and IT opportunities. If a group produces a perfect mirror image in less than two minutes they have probably discovered the Copy, Paste and Flip commands. You can encourage them to talk about their use of IT and then compare it with doing the same thing by hand on a photocopy of your original half-picture.



## 22 Recreate a design

Age  
6+

Organisation

Pairs

Time

20–30 minutes per pair

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### Purposes

- To give children a shared aim which can focus their language, decision-making and problem-solving skills.

- To deploy visualisation, prediction, estimation and trial and discovery learning.

### Activity

Prepare a set of designs of varying complexity – a building, a face, a fish, etc. Print out and photocopy your designs, or you can use pcm 22.

Challenge pairs of children to recreate one of your designs on the screen, using a limited set of the options the program offers – for example the rectangle, circle, erase and fill tools.

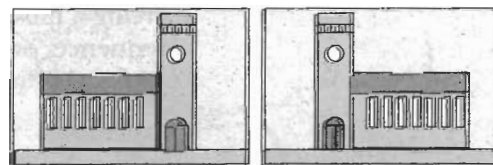
Ask them to print out their version of the design.

Then ask them to produce a written account – by hand, or using the word-processor – of how they created their version.

Display both your own design and the children's, together with their description of how they produced their work.

### Extensions

- Children who find this easy can be asked to recreate your design in three different sizes, facing in two different directions, etc.



- Younger children can be encouraged to count and record the shapes that were used in the design.

- All children can try producing their own variations on the designs you give them. The challenge is in discovering how the shapes can be manipulated, rather than simply drawing a picture on a computer.



## 23 Design to order

Age  
8+

Organisation  
Pairs or fours

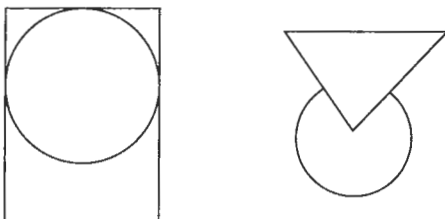
Time  
10–20 minutes per pair

### Purposes

- To develop language skills.
- To support the IT skills of visualisation, selection, manipulation, evaluation and editing.

### Activity

1 Give one pair of children, team (A), a simple design such as one of those shown below, ensuring that the other team members (B) cannot see it.



Team B uses the graphics program to recreate the design by following team A's spoken instructions; team A can watch and adjust their instructions as appropriate. The type of language most

likely to arise may be directional, descriptive, mathematical, etc., depending on the focus of the design you select.

### Extensions

Sit team A so they cannot see the screen, or have team B ask questions of A which they can only answer with a Yes or No.

Extend the challenge by introducing a time limit or increasing the complexity of the design.

### Note

► Some printers, in particular the older dot-matrix ones, do not give a true representation of the shapes you see on the screen: a square will become an oblong and a circle will be stretched into an oval. This causes little problem in general, but for mathematical work such as drawing and printing nets it can be very misleading. There is usually no easy solution other than to try a different printer.



## 24 Work with grids

Age  
5+

Organisation  
Individuals or groups

Time  
5–30 minutes

### Purpose

To use IT graphics in a variety of pattern investigations.

### Activity

- 1 Use the straight-line drawing facility or the outline-shape feature of your graphics program to create two or three grids of different fineness.
- 2 Save these onto disk.
- 3 Ask the children to load a grid and create a mosaic pattern or repeat sequence, or try to make a spiral, simply by flood-filling the squares.

### Extensions

Use the grids as a background for building bar charts, word-squares or maps with coordinate references. These all require the use of further features of a

graphics program such as the Text option for labels, titles, etc. The children will also be using a simple template, a very important feature of computer use in business and industry.

### Notes

- As with any outline pictures, try to avoid filling shapes with the same colour as the lines.
- It is often useful to remove the grid lines themselves before printing. Simply select the background colour, usually white, and then select the Flood-Fill option. Next place the mouse pointer exactly on a grid line and click. The grid will be filled with the background colour and should disappear. You can get it back again by using the Edit and/or Undo facility, but this must be done immediately.



## 25 Tracing

Age  
9+

Organisation  
Pairs

Time  
30 minutes per pair

### Purpose

To experience a way of creating an accurate outline of a map or other irregular shape.

To use an accurate graphical background to develop a high-quality IT product.

### Activity

The object in this example is to produce copies of an outline map of the area around the school. Give the children involved in the activity a piece of OHP acetate and ask them to trace the shape of the drawing area of your graphics program using a suitable marker or china-graph pencil.

Tell them to cut off the excess area (or do this yourself).

3 Give them a map of the area and ask them to trace onto the acetate the relevant features – the school, main roads, park, etc. – using a fairly light colour.

4 Get them to cover the graphics drawing area by attaching the corners of their tracing to the screen with masking tape, BluTak or similar.

5 Ask them to use the mouse to go over the outlines of the tracing, producing a copy on the screen. Make sure they use a

dark colour so they can easily see what they are drawing on the screen.

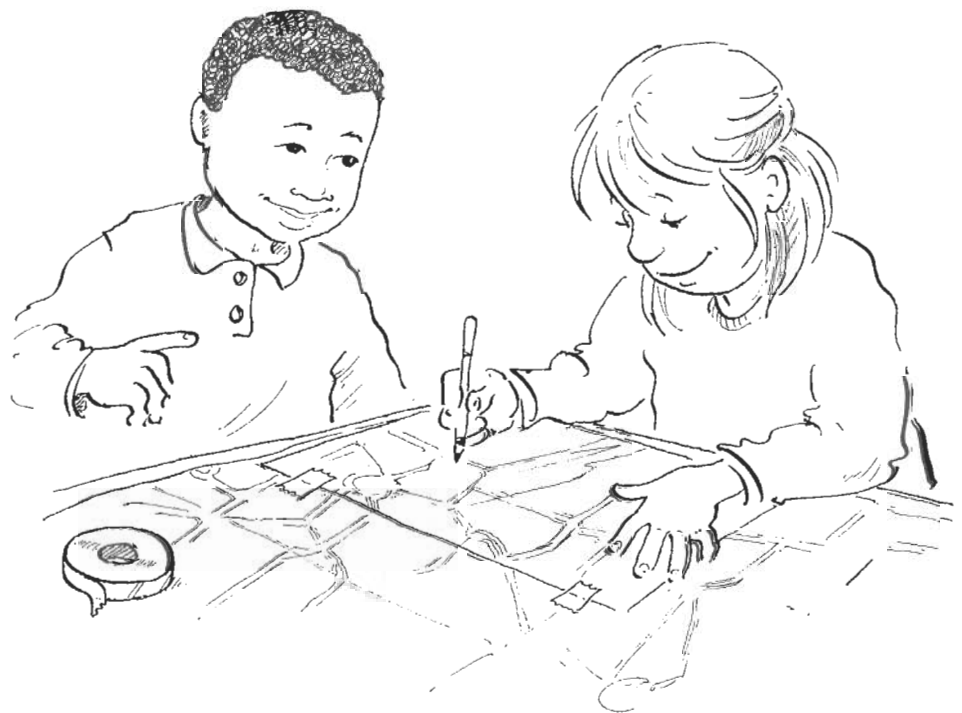
6 They can then save their tracing before printing it out and using it as a starter background on which they can mark amenities, bus routes, safety features or whatever they are studying. Most graphics programs allow the addition of text so that scales, direction indicators and keys can all be added before printing to enhance the effectiveness of the map.

### Extensions

Making use of clipart, scanning or multimedia are all alternative solutions to the problem of producing complicated backgrounds such as maps, people, animals, etc. Of course they all require familiarity with a wider range of equipment and software.

### Note

► All graphics programs have an Undo facility somewhere, but you will often find that it removes more than you bargained for! To avoid this, reselect the line drawing tool whenever you have completed a section satisfactorily. Then when you use the Undo command you will only lose the most recent section which contains the mistake. Henry VIII's wonky hat may disappear, but you'll still have his face and beard!



# Can you make a picture?

Copy these and cut them out. **A** is used to challenge children to manipulate and transform the shape options on a graphics program. **B** can be used to record the shapes used in activity **A** or any other picture created from shapes.



## A Can you make a picture?

Use 2 squares

Use 3 triangles

Use 4 oblongs

Use 2 circles

**Tick the boxes when you use the shapes.**

What picture did you make? \_\_\_\_\_

My name is \_\_\_\_\_



## B I made my own picture from shapes

I used \_\_\_\_\_ squares

I used \_\_\_\_\_ triangles

I used \_\_\_\_\_ oblongs

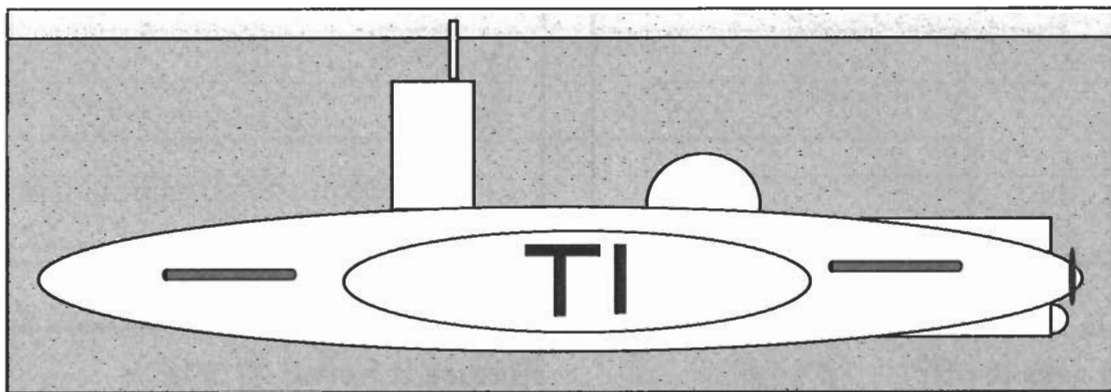
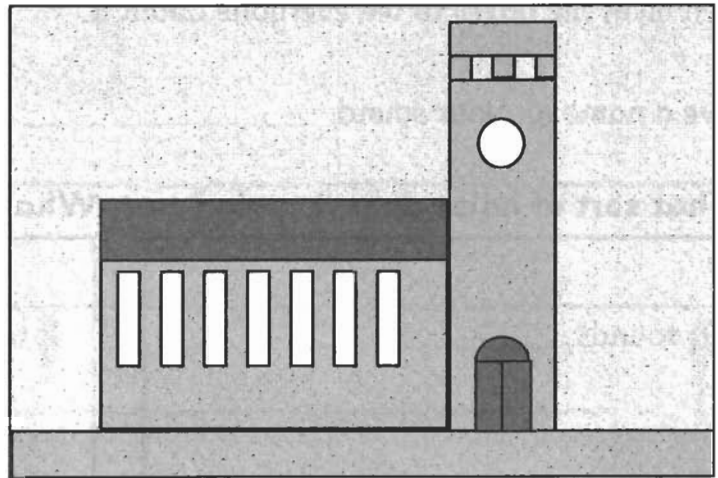
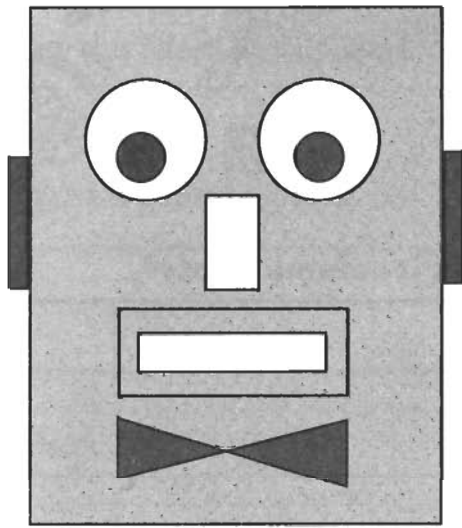
I used \_\_\_\_\_ circles

I made a picture of a \_\_\_\_\_

I used a program called \_\_\_\_\_

My name is \_\_\_\_\_

# Recreate a design



These picture puzzles have all been made by using **circles** and **squares** on the computer.

Some of the shapes were **squashed** or **stretched**.

With a partner, choose one picture and see if you can work out how it was made.

When you think you have a plan, try making it on the computer. When you finish you could add some extras before you print it out.

