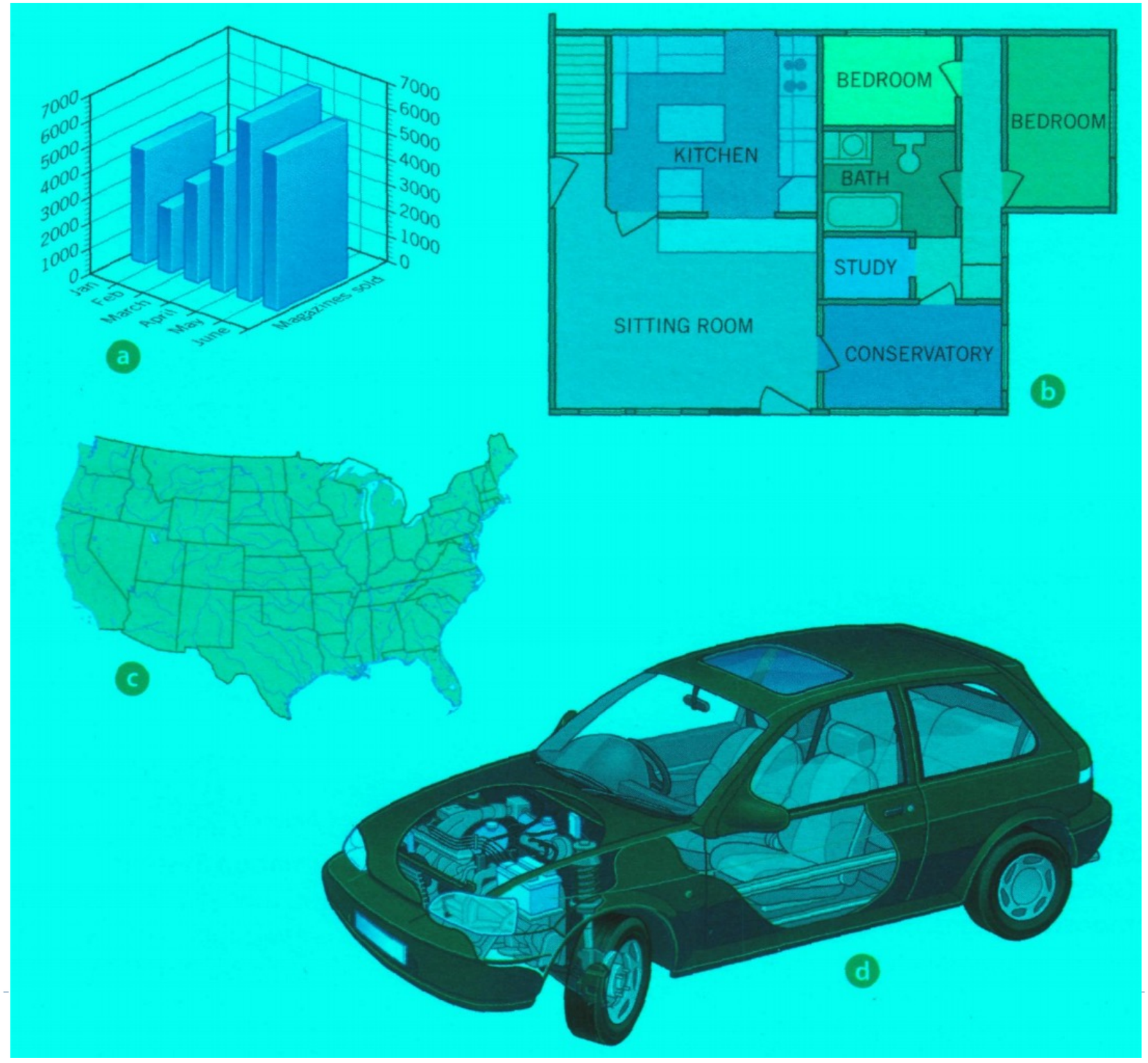
UNIT 9

Graphics and design

New words

- Three-dimensional (3D)
- Scale (v)
- Handle (v)
- compose of
- composite
- Simulate
- Palette
- Primitive
- Attribute
- Filter
- Wireframe
- Texturing
- Render
- Fractal
- Animation
- Raster graphics
- Vector graphics
- Pixel
- Density
- Resolution
- jagged edge
- geometric
- illustrate (v)/ illustration (n)
- GIS Geographic Information Systems
- CAD Computer Aided Design

Which of these computer graphics are three-dimensional (3-D)?
Which types of professional might use the computer graphics (a-d)?



Computer graphics

Computer graphics are pictures and drawings produced by computer. There are two main categories:

Raster graphics, or **bitmaps**, are stored as a collection of pixels. The sharpness of an image depends on the density of pixels, or **resolution**. For example, text or pictures that are scaled up - that is, made bigger - may show **jagged** edges. Paint and photo-editing programs like Adobe Photoshop focus on the manipulation of bitmaps. Popular raster formats are **JPEG, GIF** and **TIFF**.

Vector graphics represent images through the use of geometric objects, such as lines, curves and polygons, based on mathematical equations. They can be changed or scaled without losing quality. Vector data can be handled by drawing programs like Adobe Illustrator, Corel Draw or Macromedia Freehand. **EPS** is the most popular file format for exchanging vector drawings.

Almost all computer users use some form of graphics. Home users and professional artists use image-editing programs to manipulate images. For example, you can add **filters** (special effects) to your favourite photos, or you can **composite** images. Compositing is combining parts of different images to create a single image.

Graphic artists and designers use drawing programs to create freehand drawings and illustrations for books or for the Web. Businesspeople use presentation graphics to make information more interesting visually - graphs and diagrams can be more effective ways of communicating with clients than lists of figures. Electrical engineers use graphics to design circuits in order to present data in a more understandable form. Mechanical engineers use **CAD** (**C**omputer **A**ided **D**esign) software to develop, model and test car designs before the actual parts are made. This can save a lot of time and money.

Computer graphics

CAD is also used in the aerospace, architecture and industrial sectors to design everything from aeroplanes and buildings to consumer products. Designers start a project by making a **wireframe**, a representation showing the outlines of all edges in a transparent drawing. They then specify and fill the surfaces to give the appearance of a 3-D solid object with volume. This is known as **solid modeling**. Next, they add paint, colour and filters to achieve the desired 'look and feel': this is called **texturing** the object. Finally, they **render** the object to make it look real. Rendering includes lighting and shading as well as effects that simulate shadows and reflections.

Computer art, or **digital art**, is used in adverts and TV programmes. Artists and scientists use special graphic applets to create amazing **fractals**. Fractals are geometrical patterns that are repeated at small scales to generate irregular shapes, some of which describe objects from nature. Government agencies use **GIS** (**Geographic Information Systems**) to understand geographic data and then plan the use of land or predict natural disasters. Cartographers use GIS to make detailed maps. Animators use **computer animation** software to create animated cartoons or add effects in movies and video games.

B Read the text and answer these questions.

1. What are the differences between *raster* graphics and v*ector* graphics?
2. Which graphics file formats are mentioned?
3. What is *compositing*?
4. What does CAD stand for?
5. What are the benefits of using graphics in the car industry?
6. What type of graphics software is used to make maps or 3-D models of the Earth?
7. Who uses computer animation? How?

D Match the words (1-6) with the definitions(a-f).

1 resolution	**a** special effects that can be applied to pictures
2 jagged	**b** a technique that generates realistic reflections, shadows and highlights
3 filters	**c** geometrical figures with special properties
4 wireframe	**d** irregular or uneven
5 rendering	**e** the number of pixels in an image
6 fractals	**f** the drawing of a model by using features like edges or contour lines

Dạng **-ing**

- Ba cách sử dụng dạng **-ing** :
  1. ***Rendering*** *includes* ***lighting*** *and* ***shading***
  2. *We are* ***designing*** *a new car on computer.*
  3. *They use special applets to create* ***amazing*** *fractals.*
- Câu 1: Danh động từ (gerund) – chỉ hành động hoặc quá trình

  Rendering : chủ ngữ ***lighting, shading***: tân ngữ
- Câu 2: Phân từ hiện tại – dùng trong thì tiếp diễn hoặc để rút gọn mệnh đề quan hệ

  designing: thì hiện tại tiếp diễn
- Câu 3: Tính từ

Dạng **-ing**

- Danh động từ (gerund) được dùng làm:
- Chủ thể của hành động

Compositing *is combining parts of different images to create a single image.*

- Bổ nghĩa cho danh từ

Compositing is ***combining*** *parts of different images*

- Đối tượng của hành động

I ***enjoy editing*** *pictures.*

- Sau giới từ

Designers start a project ***by making*** *a wireframe.*

- Bổ nghĩa cho động từ

This course ***involves painting*** *and* ***drawing*** *in various media.*

- Một số động từ phải đi cùng động từ dạng –ing, không phải động từ nguyên thể (VD: avoid, fancy, finish, give up, hate, imagine, involve, keep, look forward to, mind, suggest, enjoy)

A Decide if the ***-ing*** forms in these sentences are gerunds, present participles or adjectives. Write ***g, pp*** or ***a.***

1. PCs generate graphics by performing mathematical calculations on data. ….g……
2. Businesspeople use graphics to make information more interesting visually. ……a….
3. Graphs and diagrams can be more effective waysof communicating withclients than lists of figures. ……g……
4. She is designing a logo for the company. ……pp……
5. If you need to make a presentation, I suggest using PowerPoint. ….g……
6. The Internet is a network linking other networks. ……pp……

B Correct the mistakes in these sentences. There are seven mistakes in total.

1. Computer animation is the process of create objects which move across the screen.
2. *Texturing* involves add paint, colour and filters to drawings and designs.
3. You can open the colour palette by click on the corresponding icon.
4. CAD programs are very fast at to perform drawing functions.
5. A lot of time and money is saved by test a car design before to make the product.
6. To render refers to the techniques used to make realistic images.

3B Listen and complete this extract from the web version of the tutorial.

Graphics programs usually have a *toolbox* - a collection of drawing and (1)painting... tools that enable you to type, (2) select....., draw, paint, edit, move, and view images on the computer.

The basic shapes which are used to (3) make..... graphical objects are called *primitives.* These are usually geometric, such as lines between two points, arcs, circles, polygons, ellipses and even text. Furthermore, you can specify the *attributes* of each primitive, such as its colour, line type, fill area, interior style and so on.

The various tools in a toolbox usually appear together as pop-up icons in a menu or palette. To use one, you activate it by (4) clicking..... on it. For example, if you want to (5) draw..... a rectangle, you activate the rectangle tool, and the pop-up options give you the possibility of (6) drawing..... rectangles with square or rounded corners.

You can transform an object by translating, (7) rotating... or scaling it. *Translation* means moving an object to a different location. *Rotation* is (8)turning..... the object around an axis. For example, you may need to rotate an object 90 or 180 degrees to fit the drawing. (9) Scaling.... is making the object larger or smaller.

C Match the tools from the Photoshop toolbox (1–10) with the functions (a–j).

1  Marquee select tools

2  Move tool

3  Crop tool

4  Paintbrush, pencil

5  Eraser

6  Paint bucket

7  Type tool

8  Colour picker (Eyedropper)

9  Zoom

10  Colour tools and palette

a cut down the dimensions of a picture

b select a particular part of an image (you can choose different shapes for selection)

c fill in an area with a colour

d control the foreground and background colour

e select a specific colour in a photo

f magnify areas of an image when you are doing close, detailed work

g delete the part of the picture you drag it over

h insert text into your document

i draw and paint in different shapes and patterns

j move a selection or entire layer by dragging it with your mouse