Creative Software

1 Computer graphics

A Discuss these questions

1 How would you define computer graphics?
2 Which types of professional might use the computer graphics in their job?
3 How do they use them?

B Read the text and answer the following questions.

Computer graphics

The term computer graphics includes almost everything on computers that is not text or sound. Computer graphics can be a series of images which most often called video or a single image. Computer graphics can be created as either raster or vector images. Raster graphics are bitmaps – a grid of individual pixels that collectively compose an image.

However, because raster graphics are pixel based, they suffer from image degradation. Just like photographic images that get blurry and imprecise when blown up, a raster image gets jagged and rough. When you look closer enough, you can begin to see the individual pixels comprising the image. Hence, your raster-based logo, magnified to 1000% becomes bitmapped before you know it, although raster graphics can be scaled down, smaller versions often appear less crisp than the original.
Unlike pixel-based raster images, vector graphics are based on mathematical formulas that define geometric primitives. They are best used to represent more structured images. Inherently, vector graphics are more malleable than raster images- thus, they are much more versatile, flexible and easy to use. The most obvious advantage of vector graphics over raster graphics is that vector images are perfectly scalable. There is no upper or lower limit for sizing images.

Most modern computer graphics packages let you draw an image using a mixture of raster or vector graphics, as you wish, because sometimes one approach works better than another—and sometimes you need to mix both types of graphics in a single image. With a graphics package such as the GIMP (GNU Image Manipulation Program), you can draw curves on screen by tracing out and then filling in "paths" before converting them into pixels ("rasterizing" them) to incorporate them into something like a bitmap image.

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.

Real life isn't like a computer game or a virtual reality simulation. The very best **CGI (computer-generated imagery)** animations are easy to tell apart from ones made on film or video with real actors. When we look at objects in the world around us, they don't appear to be drawn from either pixels or vectors. In the blink of an eye, our brains gather much more information from the real-world than artists can include in even the most realistic computer-graphic images. To make a computerized image look anything like as realistic as a photograph (let alone a real-world scene), we need to include far more than simply millions of colored-in pixels. Really sophisticated computer graphics programs use a whole series of techniques to make hand-drawn (and often completely imaginary) two-dimensional images look at least as realistic as photographs.
The simplest way of achieving this is to rely on the same tricks that artists have always used—such things as **perspective** (how objects recede into the distance toward a "vanishing point" on the horizon) and **hidden-surface elimination** (where nearby things partly obscure ones that are further away).

Graphic artists and designers use drawing programs to create freehand drawings and illustrations for books or for the Web. Businesses use graphics design to convey a message more effectively and grab the required attention of the targe audiences. Most consumers tend to be more attracted in products and services that have high-quality graphics. This will help businesses improve and achieve a higher level of sales' success.

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. 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 **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 advertising, publishing and film to produce visual effects. 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.

1 What are the differences between raster graphics and vector graphics?

2 Why is it easy to recognize CGI animations from real ones?

3 What makes graphic design an important communication tool?

4 Which word in the text means **having an uneven edge**?

5 Which is the best synonym for **enlarged'** in the text?

6 What is the antonym of **soft** in the text?

2 *Language work: the - ing form*

A **Underline all the –ing forms in the text 'Computer graphics', and then say what part of speech they are.**

B **Look at the help box and decide if the –ing forms in these sentences are gerunds, present participles or adjectives .Write g, pp, or adj.**

1 PCs generate graphics by performing mathematical calculations on data. ……..

2 Colour picker lets you pick a colour from an area of an image, instead of choosing the colour from the colour palette. ……

3 Zoom is like a magnifying glass which changes your view of drawing. ……..

4 She is designing a logo for the company. ……

5 If you need to make a presentation, I suggest using Power Point. ……

6 The Internet is a network linking other networks ……...

C **Rewrite the following passage using the –ing form. Some changes are necessary.**

Researchers use automatic translation software (e.g. Google Translate, Babelfish, and Systran) which can considerably ease their work when they need to translate documents. Such software saves them money, for example the fee they might have otherwise had to pay to a professional translator. It also increases the amount of time they have to spend in the laboratory rather than at the PC.

……..…

……....

……..

……..

. ……..…

D **Read the passage below, then underline the gerunds and decide whether they function as the subject, the subject complement, the object of a verb, or the object of a preposition.**

You cannot create a picture simply by specifying primitives. Instead, you must specify the primitives and their attributes, then transform them by specifying where and how you want them placed on the screen so they create your picture. Transformation means moving or otherwise manipulating the object by translating, rotating and scaling the object. Translation is moving an object along an axis to somewhere else in the viewing area. Rotation is turning the object around an axis. Scaling is making the object larger or smaller

Help box

The -ing form

We use the –**ing** form in these ways:

- ***Rendering*** includes ***lighting*** and ***shading***.
- We are ***designing*** a new car on computer.
- They use special applets to create ***amazing*** fractals.
- In 1, ***rendering*** is a gerund (see below), acting as the subject. ***Lighting*** and ***shading*** are also gerunds, acting as the objects.
  A gerund refers to an activity or process.
- In 2, ***designing*** is a present participle .This is used in continuous tenses (in the above example, the present continuous) and reduced relative clauses.
  …a representation **showing** the outlines of all edges. (=which shows the outlines…)
- In 3, ***amazing*** is an adjective.

We use gerunds in the following ways:

- As the subject of a verb
  Compositing is combining parts of different images…
- As the complement of the subject
  Compositing is ***combining*** parts of different images…
- As the object of a verb
  Rendering includes ***lighting*** and….
- After a preposition
  Designers start a project by ***making*** a

3 Listening

Listen to the following recording and

Augmented reality" to complete the

3 Listening

Listen to the following recording about "Understanding Virtual reality and Augmented reality" and complete the following passage.

These days, we spend a lot of time looking at screens. Computers, smartphones and televisions are a big part of our lives. They are how we get **1**……., use social media, watch movies and more. Virtual reality and Augmented reality are two technologies changing the way we use screens, creating new, **2**……. experiences.
Virtual reality also known as VR uses a headset with a **3**……..that displays a virtual environment for you to explore. These headsets use a technology called **4**……. which allows you to look **5**…… by simply moving your head.
Augmented reality or AR is a bit different. Instead of **6**…….. a virtual world it takes digital images and **7**……..in the real world around you. This is done through the use of either a **8**…… or smartphone. So with VR you could **9**…….dinosaurs but with AR you see those dinosaurs **10**……. .around you.
Both of these technologies are growing **11**……..and being implemented in a variety of different ways. Surgeons are using VR to practice **12**…… before operating. Businesses are using them to give consumers **13**…… of products and locations. There are even apps that can use your smartphone's camera **14**…….. a foreign language in real time.
As they continue to grow, VR and AR **15**……. greatly change almost every industry, you will want **16**……..to see how they might soon affect your job and potentially your everyday life.

4 Reading: *This is how Augmented Reality will reshape our future*

A
If you are still unclear about what AR is, then all you have to do is go back and remember the time Pokémon Go took over the internet by storm. The game revolves around players catching digital monsters. Similarly, apps such as Snapchat, Facebook and Instagram offer users with filters which overlay animated images onto users' faces.
You will now be wondering how this technology can reshape or transform our future. Augmented Reality could bring about a lot of changes and development in various industries. Let's find out what they are.

B

We all dream of living in the perfectly designed house that boasts of our style and statement. With the augmented reality, that dream might just come true. AR uses interactive computer-generated images, which allows the buyers to envision the finished property while it is still under construction. The benefit of this technology in the real estate industry is that it can transform all 2D models such as blueprints and photos into 3D models for buyers to easily interact with.

Builders and real estate agents will find it convenient to display the properties with such an immersive experience. And not just that, interested buyers can also modify the colour, furniture, room sizes and more based on what they would want the completed design to look like. Envisioning your completed property with AR even before it is built is an advantageous marketing tool for selling a property.

C

Online shopping is slowly taking over the traditional way of shopping. However, it is uncertainty that stops buyers from buying things online. AR making its way in the shopping industry could most definitely move potential buyers towards online shopping. With the growth of augmented reality at the store, customers can view products in a highly realistic manner in their preferred environment. It will also become easier for marketers to share product catalogues with up-to-date information. Additionally, shopping experiences can be enhanced with AR glasses being available at every retail store or supermarket. These glasses will display all the pricing, design, and product specs to the buyers while shopping. Augmented Reality could definitely change the way people shop.

D

The travel industry is another sector that augmented reality could revolutionize. Although virtual reality has a bigger role to play in the travel industry, augmented reality could still be seen as huge change. AR-based applications on smartphones will help tourists and travellers check and find local tourist attractions nearby and translate boards and signs instantly into their native language. Moreover, exploring and visiting local attractions, theme parks and zoos with augmented reality will help travelers have the most extraordinary trip. The technology will display 3D models of landmarks and take travelers back in time showing them the evolution brought with time. AR for the travel industry is not just about the fun factor, but also adds an educational element for the travelers.

E

While people are getting used to being transported into the world of 3D that does not really exist with Virtual Reality headsets, AR is already being used in the pharma and healthcare industry, to save lots of lives. However, that is not all. Augmented reality can be of major assistance to healthcare organizations in helping them perfect their existing processes. AR will provide surgeons with an in-depth knowledge of the risks involved with minimally invasive surgeries and help them perform effectively.

Surgeries earlier required different types of monitors which would display the patient's vital statistics through an endoscopic camera. Leaving all these hassles behind, doctors can wear AR smart glasses which will display all the pertinent information while they are performing the surgery and helping them stay focused on the task at hand.

F

Augmented reality in the educational sector could be a huge game-changer towards how children learn. The technology will provide students with immersive content that will help them understand the concepts. With the help of engaging 3D models, students can grasp complex information in an easier manner providing them with a wider understanding of topics.

In our dynamic day and age, augmented reality let museums and historical sites incorporate AR features to their exhibits to stay at par with technology. This is a great way for people to explore and gain additional informative knowledge. AR is all about exploration, which eventually leads students towards learning and understanding. This is a win-win for both technology and the educational industry.

G

There is no doubt that Augmented Reality will reshape more than just these five industries. As devices adapt to the new technology, the growth of Augmented Reality is exponentially huge. With so many positive advantages, AR could fundamentally change what it is to be human.

A Mark the following statements as True, False or Not Given.

1 Using AR, buyers can conceive what a home design will look before it is completed. …….

2 What looks good in blueprints is not usually well translated into practice. …….

3 When purchasing online, the inability to see a product at first-hand can leave consumers with doubts. ……..

4 Both VR and AR allows buyers to potentially find more information simply by pointing their smartphone at a product. ……..

5 AR technology is fully dedicated to entertainment. …….

6 VR headsets enable surgeons to focus on the operational field instead of looking at monitors. …

7 Students will learn easily with 3-D models representations, especially for the difficult topics…….

B Find in the text words or phrases having similar meanings to the following

1 became suddenly very popular ……

2 involving deep absorption in something. ……

3 situations causing difficulty or trouble. ……..

4 a thing that significantly affects the outcome of something. ……

.

5 Language work: The infinitive

A **Underline the verbs in the infinitive form in the text 'This is how Augmented Reality Will reshape our future'.**

2 The bare infinitive (without to) is used in the following ways:

- After modal verbs: **can, could, may, might, will, would, must, should**

  E.g. Augmented Reality **could bring** about a lot of changes…
  E.g. These glasses **will display** all the pricing…

- After the object the verbs **let** and **make** and verbs of perception such as **watch, see, hear, feel**

  E.g. Let's **find** out what they are.
  E.g. Programs make computers **perform** specific tasks.
  E.g The teacher made her **take** the exam again.

Note: In the passive form, the verb **to make** is followed by the to-infinitive.

  E.g. Computers are made **to perform** specific tasks.
  E.g. She was made **to take** the exam again.

- After the question word **Why** in suggestions.

B Complete the following passage with verbs in the correct form (gerund or infinitive).

I bought a new MacBook Pro last month. The Intel Core 2 Duo is a real bonus, allowing the computer **(1)** ……tasks faster than earlier MacBook models; the 160GB hard drive is large enough **(2)** ……all of my music, photo and videos, and I didn't even need (3) …….. an external hard disk. Another great feature is the built-in iSight camera, I can **(4)**……it for webchats, **(5)**……video podcasts and enables you **(6)**……photos. Software updates are easy too: If you are online – for **(7)**……..the web or **(8)**……emails – and an update becomes available, a box appears **(9)**……..if you want **(10)**……..the update. You just click OK, and it's done. I don't even have to **(11)**…….about security either.

Every time I transmit data from my computer on the Internet, Apple's Safari web browser protects my personal information, such as bank details and credit card numbers by **(12**)……..a firewall.

6 THE METAVERSE

Complete the following passage about "The Metaverse" with the missing words. The first letter of the word is given.

The term metaverse is a combination of two words, "meta'' and "verse". Meta means beyond or transending, while verse refers to the universe. The metaverse comprises several 3-D worlds, where digital versions of people can (1) **i**..... and move from one place to another. Dubbed by many as the "future of the internet", the metaverse could allow people to work on projects, (2) **c**..... in sports, watch concerts together on shared platforms or provide (3) **e**..... beyond online gaming.
The metaverse spans both real-world and digitally-created (4) **c**..... and experiences. It aims to provide people a (5) **g**..... to experience real-world activities in a virtual environment.
The following features give a clearer picture of what a metaverse looks like:
Events and experiences in the metaverse do not (6) **p**....., end or reset, just like in the real world. The metaverse and the digital objects inside are experienced in real-time. Any content, experience, or information is (7) **a**..... at any given time and remains available even when a user (8) **l.**.....of their account. Everything inside the metaverse will continue to exist and (9) **f**..... .
Digital information and assets are shared across multiple virtual platforms. The same can also be (10) **t**..... into the physical world. For example, a user can purchase an (11) **i**.....of clothing for their avatar and use it on different virtual platforms.
Users can change their avatars or digital identities at any time to (12) **s**..... their personality or current mood. Content may be designed and created by independent developers and large organisations.

Users can purchase digital goods and services to (13) **e**..... their metaverse experience. They can also shop for physical items that can be (14) **s**..... anywhere they want in the real world.
The metaverse is still in its early stages of development, but some (15) **e**..... apps and games already explore the concept of this fully (16) **i**..... virtual universe.