

МІНІСТЕРСТВО ОСВІТИ І НАУКИ УКРАЇНИ
НАЦІОНАЛЬНИЙ УНІВЕРСИТЕТ «ЧЕРНІГІВСЬКА ПОЛІТЕХНІКА»

Іноземна мова

COMPUTER SCIENCE 2

**Методичні вказівки до практичних занять та самостійної роботи
для здобувачів вищої освіти денної форми навчання
спеціальностей 123 Комп'ютерна інженерія та
121 Інженерія програмного забезпечення**

Обговорено і рекомендовано
на засіданні кафедри іноземних мов
професійного спрямування

Протокол № 2 від 28.02.2023

Чернігів 2023

Іноземна мова. COMPUTER SCIENCE 2. Методичні вказівки до практичних занять та самостійної роботи для здобувачів вищої освіти денної форми навчання спеціальностей 123 Комп'ютерна інженерія та 121 Інженерія програмного забезпечення. Укладачі: Дивнич Г.А., Сікалюк А.І., Кормільцина С.Ю. Чернігів: НУ «Чернігівська політехніка», 2023. 38 с.

Укладач: Дивнич Ганна Андріївна,
доцент кафедри іноземної філології
Сікалюк Анжела Іванівна,
доцент кафедри іноземної філології
Кормільцина Світлана Юріївна,
старший викладач кафедри іноземної філології

Відповідальний за випуск: Литвин С.В.,
завідувач кафедри іноземної філології,
кандидат педагогічних наук, доцент

Рецензент: Литвин С.В.,
завідувач кафедри іноземної філології,
кандидат педагогічних наук, доцент

ЗМІСТ

Вступ.....	4
I. Internet and email.....	5
II. Web.....	17
III. Graphics and design.....	23
IV. Web design.....	28
V. Communication systems.....	32
Рекомендована література.....	38

Вступ

Методичні вказівки призначені для студентів вищих навчальних закладів денної форми навчання спеціальностей 123 Комп'ютерна інженерія та 121 Інженерія програмного забезпечення.

Мета даних методичних вказівок – забезпечити формування у студентів навичок усного та писемного мовлення у професійному дискурсі.

Методичні вказівки складаються з п'яти розділів. Кожен розділ містить тематичний текст для опрацювання та посилання на онлайн-ресурси з певним завданням, завдання для самостійного вивчення а також фінальні комунікативні завдання.

Матеріал, розміщений у методичних вказівках, сприятиме формуванню англomовної компетентності студентів та створює основу для їх успішної комунікації у англomовному професійному середовищі та виконання робочих завдань у сфері комп'ютерної та програмної інженерії.

I. Internet and email



The Internet is becoming the town square for the global village of tomorrow.

(Bill Gates)

Questions for group discussion:

How do you understand the Quote?

What is the Internet for you?

Ex. 1. Read the extract from the Britannika article “Internet” – translate the words in bold and answer the following questions:

1. What are the features of time-sharing systems?
2. What is ARPANET?
3. What is packet switching?
4. What are the origins of the Internet?
5. What was the first browser?

Sometimes referred to as a “network of networks,” the Internet emerged in the United States in the 1970s but did not become visible to the general public until the early 1990s. By 2020, approximately 4.5 billion people, or more than half of the world’s population, were estimated to have access to the Internet.

The Internet provides a capability so powerful and general that it can be used for almost any purpose that depends on information, and it is accessible by every individual who connects to one of its constituent networks. It supports human communication via social media, electronic mail (e-mail), “chat rooms,” newsgroups, and audio and video transmission and allows people to work collaboratively at many different locations. It supports access to digital information by many applications, including the World Wide Web. The Internet has proved to be a spawning ground for a large and growing number of “e-businesses” (including **subsidiaries** of traditional “brick-and-mortar” companies) that carry out most of their sales and services over the Internet.

The first computer networks were dedicated **special-purpose systems** such as SABRE (an airline reservation system) and AUTODIN I (a defense command-and-control system), both designed and implemented in the late 1950s and early 1960s. By the early 1960s computer manufacturers had begun to use semiconductor technology in

commercial products, and both conventional **batch-processing** and time-sharing systems were in place in many large, technologically advanced companies. Time-sharing systems allowed a computer's resources to be shared in rapid succession with multiple users, cycling through the queue of users so quickly that the computer appeared dedicated to each user's tasks despite the existence of many others accessing the system "**simultaneously.**" This led to the notion of sharing computer resources (called host computers or simply hosts) over an entire network.

Host-to-host interactions were envisioned, along with access to specialized resources (such as supercomputers and mass storage systems) and interactive access by remote users to the computational powers of time-sharing systems located elsewhere. These ideas were first realized in ARPANET, which established the first host-to-host network connection on October 29, 1969. It connected time-sharing computers at government-supported research sites, principally universities in the United States, and it soon became a critical piece of infrastructure for the computer science research community in the United States. Tools and **applications** — such as the simple mail transfer protocol (SMTP, commonly referred to as e-mail), for sending short messages, and the file transfer protocol (FTP), for longer **transmissions** — quickly emerged. In order to achieve cost-effective interactive communications between computers, which typically communicate in short bursts of data, ARPANET employed the new technology of **packet switching**. Packet switching takes large messages (or chunks of computer data) and breaks them into smaller, manageable pieces (known as packets) that can travel independently over any available circuit to the target destination, where the pieces are reassembled. Thus, unlike traditional voice communications, packet switching does not require a single dedicated circuit between each pair of users.

Commercial packet networks were introduced in the 1970s, but these were designed principally to provide efficient access to **remote computers** by dedicated terminals. Briefly, they replaced long-distance modem connections by less-expensive "virtual" circuits over packet networks.

DARPA (Defense Advanced Research Projects Agency; formerly ARPA) supported initiatives for ground-based and satellite-based packet networks. The ground-based packet radio system provided mobile access to computing resources, while the packet satellite network connected the United States with several European countries and enabled connections with widely dispersed and remote regions. A strong motivation existed to connect the packet radio network to ARPANET in order to allow mobile users with simple terminals to access the time-sharing systems for which they had authorization. Similarly, the packet satellite network was used by DARPA to link the United States with **satellite terminals** serving the United Kingdom, Norway, Germany, and Italy.

The Internet resulted from the effort to connect various research networks in the United States and Europe. First, DARPA established a program to investigate the interconnection of "heterogeneous networks." This program, called Internetworking, was based on the newly introduced concept of open architecture networking, in which networks with defined standard interfaces would be interconnected by "**gateways.**" A

working demonstration of the concept was planned. In order for the concept to work, a new protocol had to be designed and developed; indeed, a system architecture was also required.

In 1974 Vinton Cerf, then at Stanford University in California, and this author, then at DARPA, collaborated on a paper that first described such a protocol and system architecture — namely, the transmission control protocol (TCP), which enabled different types of machines on networks all over the world to route and **assemble** data packets. TCP, which originally included the Internet protocol (IP), a global addressing mechanism that allowed routers to get data packets to their ultimate destination, formed the TCP/IP standard, which was adopted by the U.S. Department of Defense in 1980. By the early 1980s the “open architecture” of the TCP/IP approach was adopted and endorsed by many other researchers and eventually by technologists and businessmen around the world.

From the Internet’s origin in the early 1970s, control of it steadily devolved from government stewardship to private-sector participation and finally to **private custody** with government oversight and forbearance. Today a loosely structured group of several thousand interested individuals known as the Internet Engineering Task Force participates in a grassroots development process for Internet standards. Internet standards are maintained by the nonprofit Internet Society, an international body with headquarters in Reston, Virginia. The Internet Corporation for Assigned Names and Numbers (ICANN), another nonprofit, private organization, oversees various aspects of policy regarding Internet domain names and numbers.

In 1993 the University of Illinois made widely available Mosaic, a new type of computer program, known as a browser, that ran on most types of computers and, through its “point-and-click” interface, simplified access, retrieval, and display of files through the Internet. Mosaic incorporated a set of **access protocols** and **display standards** originally developed at the European Organization for Nuclear Research (CERN) by Tim Berners-Lee for a new Internet application called the World Wide Web (WWW). In 1994 Netscape Communications Corporation (originally called Mosaic Communications Corporation) was formed to further develop the Mosaic browser and server software for commercial use. Shortly thereafter, the software giant Microsoft Corporation became interested in supporting Internet applications on personal computers (PCs) and developed its Internet Explorer Web browser (based initially on Mosaic) and other programs. These new commercial capabilities accelerated the growth of the Internet, which as early as 1988 had already been growing at the rate of 100 percent per year.

**Revision: explain grammar of the underlined phrases.*

Ex. 2. Match the words to make up phrases from the article:

to connect to	services
to provide	files
to carry out	a network
to employ	growth
to retrieve	access
to accelerate	a technology

Ex. 3. Explain the compound adjectives:

e.g. special-purpose – having a special purpose

- command-and-control system
- host-to-host interactions
- time-sharing computers
- cost-effective communications
- long-distance modem connections
- ground-based packet radio system
- “point-and-click” interface

Ex. 4. Make compound adjectives out of the phrases:

e.g. software that is free to access – free-access software

- Internet with high speed
- a programme owned by a private person
- partnership that lasts for a long term
- a programme that is well developed
- a game that wastes your time
- an error that is too common for all users
- a programme that is based on interaction with users
- a document that has 3 pages

Ex. 5. Write down a short summary of the article in ex. 1 (5-6 sentences).

Ex. 6. Look at the list of benefit of the Internet. Which ones are the most important for you? Give your reasons.



Taken from: <https://www.tutorialsmate.com/2022/01/advantages-of-internet.html>

Useful phrases:

'In my opinion...'

'Personally, I feel that...'

'I would say that...'

'Speaking personally....'

'Speaking from my perspective...'

'I guess that...'

'I bet that...'

'I assume that...'

'I gather that...'

'My impression is that...'

'I am sure that...'

'I'm certain that....'

'I have a feeling that...'

'I would say that...'

Ex. 7. Read the abstract from the text “Internet Safety for Kids: How to Protect Your Child from the Top 7 Dangers They Face Online”. Share its main ideas. What other threats are possible for an Internet user?

The internet can be a dangerous neighborhood for everyone, but children and teens are especially vulnerable. From cyber predators to social media posts that can come back to haunt them later in life, online hazards can have severe, costly, even tragic, consequences. Children may unwittingly expose their families to internet threats, for example, by accidentally downloading malware that could give cyber criminals access to their parents' bank account or other sensitive information. Protecting children on the internet is a matter of awareness—knowing what dangers lurk and how to safeguard against them. Although cyber security software can help protect against some threats, the most important safety measure is open communication with your children.

Cyberbullying

The vast majority, 90%, of teens agree that cyber bullying is a problem, and 63% believe this is a serious problem. What's more, a 2018 survey of children's online behavior found that approximately 60% of children who use social media have witnessed some form of bullying, and that, for various reasons, most children ignored the behavior altogether. And according to enough.org, as of February 2018, nearly half (47%) of all young people had been the victims of cyber bullying. Social media and online games are today's virtual playground, and that is where much cyber bullying takes place, and it's operating 24/7. Children can be ridiculed in social media exchanges. Or, in online gaming, their player personas can be subjected to incessant attack, turning the game from an imaginative adventure into a humiliating ordeal that escalates into cyber bullying across multiple platforms and in real-life.

Cyber Predators

These days sexual and other predators often stalk children on the internet, taking advantage of their innocence, lack of adult supervision and abusing their trust. This can culminate in children being lured into dangerous personal encounters IRL. These predators lurk on social media and gaming platforms that appeal to children—the same virtual venues where anonymity facilitates cyber bullying. There, they can exploit not only children's innocence, but also their gift of imagination. "Let's play pretend" is a common and healthy part of online gaming and interaction, but predators can use it as a hook to pull children in.

Posting Private Information

Children do not yet understand social boundaries. They may post personally identifiable information (PII) online, for example in their social media profiles, that should not be out in public. This might be anything from images of awkward personal moments to their home addresses or family vacation plans.

Phishing

Phishing is what cyber security professionals call the use of emails that try to trick people into clicking on malicious links or attachments. These can be especially difficult for kids to detect because often, the email will appear to be from someone legitimate, like a friend or family member, saying simply, "Hey — thought you might like this!" This can also be done with using messaging apps or text messages — then it's called "smishing".

Falling for Scams

Children are probably not going to fall for Nigerian princes offering them a million dollars, but they might fall for scams that offer things they value, such as free access to online games or special features. Young people are easy marks for scams because they have not yet learned to be wary. As with phishing, cyber criminals can use sites popular with children to identify potential victims, and then promise prizes in return for what they want—like parents' credit card information.

Accidentally Downloading Malware

Malware is computer software that is installed without the knowledge or permission of the victim and performs harmful actions on the computer. This includes stealing personal information from your computer or hijacking it for use in a "botnet," which causes sluggish performance. Cyber criminals often trick people into downloading malware. Phishing is one such trick, but there are others — such as convincing victims to download malware masquerading as games — can be especially beguiling to children.

Posts that Come Back to Haunt a Child Later in Life

The internet does not have a "Delete" key. It is the opposite of Las Vegas. Things that happen online, stay online. Forever. Anything your child puts online is nearly impossible to remove later. The dangers of social media are especially daunting. It is hard for teenagers in particular to consider how a party picture or Snapchat message could cause problems ten years down the road when they interview for a new job, or how a prospective mate might respond to personal content that they post to their social media profiles or other websites.

The internet can pose serious dangers to children. It can also open doors of wonder for them that previous generations could not even have dreamed of. Help ensure that your children's online safety so they experience the joys and opportunities of the online world, and avoid its hazards.

Text source: <https://usa.kaspersky.com/resource-center/threats/top-seven-dangers-children-face-online>

Ex. 8. Work in groups. Use information from the text in ex. 7 and your own ideas. Develop an instruction for safe usage of the Internet.



Ex.9. Look at the email. Analyse its structure.

New Message — ↗ ✕

To _____ Cc Bcc

Great to meet you at the Sales Tech event! — **Subject Line**

Hi Shipra, — **Salutation** — **Introduction**

This is Jenny Keohane from Yesware, we met at the Sales Tech event last Friday (8/12). It was great chatting with you.

I'm reaching out to see if you'd still be interested in jumping on a call with me sometime this week to discuss the collaboration project more in-depth. We can talk overall goals for the initiative and plan next steps.

Let me know if you're still interested and I'll send over a calendar invite.

Looking forward to working together, — **Closing** — **Body**
Jenny

--

JENNY KEOHANE | Content Marketing Manager — **Email Signature**
e: jkeohane@yesware.com
 Yesware

What makes a good email? How to save it from getting to Spam section?

Ex.10. Write an email to your English teacher on any Internet-related issue that disturbs you.

Modal verbs

Ex.11. Read the article from ex.1 – find examples of modal verbs usage – explain their functions.

Ex.12. Write down the modal verbs according to their functions. Make-up sentences.

can, may, must, shall, will, might, could, should, would, ought to, have to, need to

function	modal verb	example
probability		
ability		
permission		
requests		
offers and invitations		
advice		
necessity		
obligation		

Set phrases

- Can't help: I can't help laughing = Не можу не сміятись.
- Can't but: I can't but agree. = Мені нічого не залишається, як погодитись.
- Can't possibly: I can't possibly do what you ask. = Я просто не можу зробити те, що ви просите.
- Couldn't care less/ be better/worse: I couldn't care less what you think. = Мені байдуже, що ти думаєш. How's life? – Awful. It couldn't be worse. = Гірше нікуди.
- may/could well for strong possibility: The profits may well reach \$1 mln this year. = Цілком ймовірно прибутки можуть
- may/ might as well = it makes no difference: I'm going to town anyway; I may as well give you a lift. –... можу й тебе підвезти

Ex.13. Make up sentences, expressing the general possibility.

Learning English	can (present)	sometimes often occasionally	be exciting.
Playing computer games			be boring.
Winter sports	be painful.		
Going to the dentist	could		be hard work.
Travelling	(past)		be dangerous

Ex.14. Use the modals can, could to answer the questions:

1. What can you do on the Internet?
2. What could you do when you were a kid?

Ex.15. Give recommendations on the Internet usage. Use proper modal verbs.

Ex.16. Look at the pictures. Speculate what must/may/might have happened.



A.



B.



C.



D.

Ex.17. Think about the future of Ukraine. What should/could have been done in the past to improve our present? What could/might/should be done now to improve our lives in the future?

Self-study task

Ex.18. Read the text “How to set up a Wi-Fi network” and fill in the missing words from the list:

enter, broadcast, search, settings, modem, ensure, successful, secure

To create your own Wi-Fi network, you'll need a wireless router. This is the device that will _____ the Wi-Fi signal from your Internet modem throughout your house. Your Internet service provider (ISP) may offer you a wireless router for a small monthly fee. If you've never set up a Wi-Fi network before, this may be the easiest option.

Once you've acquired a wireless router, you'll need to connect it to your existing Internet modem.

Connect an Ethernet cable from your _____ to the wireless router (there is usually a short Ethernet cable included with your wireless router for this purpose).

Plug in the power cable for the wireless router.

Wait at least 30 to 60 seconds, and make sure the lights on your router are working correctly.

Using your web browser, _____ the router's default IP address into the address bar, then press Enter. Your router's instructions should include this information, but some of the most common addresses include 192.168.0.1, 192.168.1.1, and 192.168.2.1.

The router's sign-in page will appear. Again, the exact sign-in details should be included with your router's instructions, but most routers use a standard user name and password combination, such as admin and password.

Your router's _____ page will appear. Locate and select the Network Name setting, then enter a unique network name.

Locate and select the Network Password setting, and choose an Encryption option. There are several types of encryption you can use, but we recommend WPA2, which is generally considered to be the most _____ .

Enter your desired password. Make sure to use a strong password to help _____ no one else can access your network.

Locate and select the Save button to save your settings.

Locate your computer's network settings, and _____ for nearby Wi-Fi networks.

Select your network, and enter your password.

If the connection is _____, open your web browser and try navigating to a webpage like www.google.com. If the page loads, it means your Wi-Fi connection is working correctly.

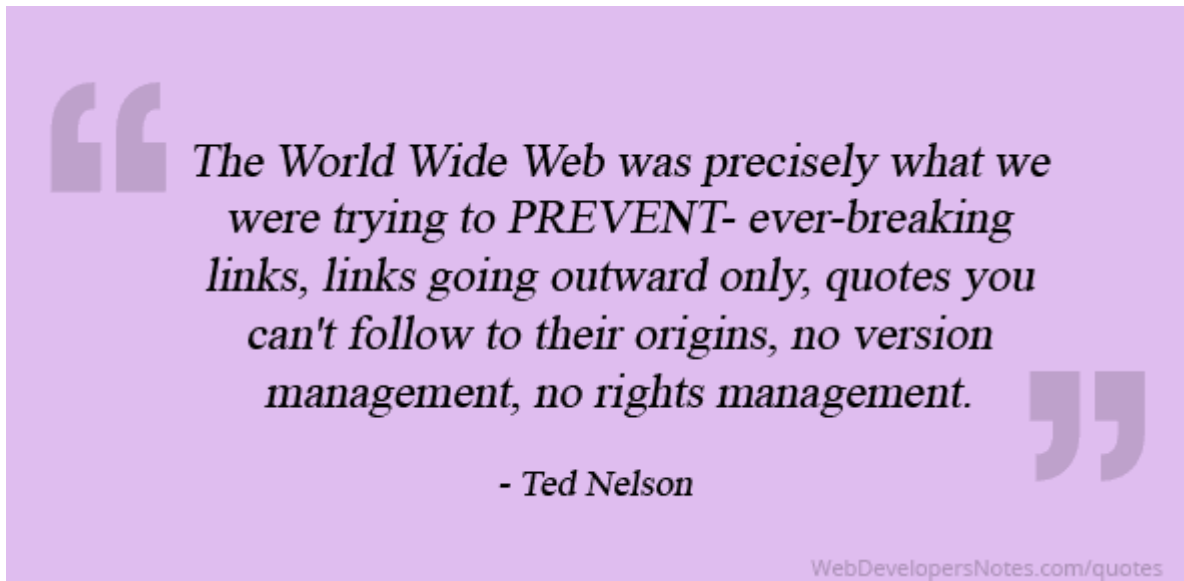
Text source: <https://edu.gcfglobal.org/en/internetbasics/how-to-set-up-a-wifi-network/1/>

Ex.19. Watch the video “The Declaration of Independence of Cyberspace / John Perry Barlow” at Youtube.com. Answer the questions:

1. Why was the Declaration written?
2. What are the features of the Cyberspace?
3. How should the problems be solved in the Cyberspace?

Ex.20. Write down your opinion on the matter of dependence/independence of Cyberspace.

II. Web



Questions for group discussion:

Express your opinion on the quote above.

What is the World Wide Web?

Ex.1. Read the text “The World Wide Web” from Britannica and suggest your subheadings A-F:

A. _____

World Wide Web (WWW), byname the Web, the leading information retrieval service of the Internet (the worldwide computer network). The Web gives users access to a vast array of documents that are connected to each other by means of **hypertext** or hypermedia links—i.e., **hyperlinks**, electronic connections that link related pieces of information in order to allow a user easy access to them. Hypertext allows the user to select a word or phrase from text and thereby access other documents that contain additional information pertaining to that word or phrase. Hypermedia documents feature links to images, sounds, animations, and movies. The Web operates within the Internet’s basic **client-server format**; servers are computer programs that store and transmit documents to other computers on the network when asked to, while clients are programs that request documents from a server as the user asks for them. Browser software allows users to view the retrieved documents. A hypertext document with its corresponding text and hyperlinks is written in HyperText Markup Language (HTML) and is assigned an online address called a Uniform Resource Locator (URL).

B. _____

The development of the World Wide Web was begun in 1989 by Tim Berners-Lee and his colleagues at CERN, an international scientific organization based in Geneva, Switzerland. They created a protocol, HyperText Transfer Protocol (HTTP),

which standardized communication between servers and clients. Their text-based Web browser was made available for **general release** in January 1992.

C. _____

The World Wide Web gained rapid acceptance with the creation of a Web browser called Mosaic, which was developed in the United States by Marc Andreessen and others at the National Center for Supercomputing Applications at the University of Illinois and was released in September 1993. Mosaic allowed people using the Web to use the same sort of “point-and-click” graphical manipulations that had been available in personal computers for some years. In April 1994 Andreessen cofounded Netscape Communications Corporation, whose Netscape Navigator became the dominant Web browser soon after its release in December 1994. BookLink Technologies’ InternetWorks, the first browser with **tabs**, in which a user could visit another Web site without opening an entirely new window, debuted that same year. By the mid-1990s the World Wide Web had millions of active users.

D. _____

The software giant Microsoft Corporation became interested in supporting Internet applications on personal computers and developed its own Web browser (based initially on Mosaic), Internet Explorer (IE), in 1995 as an add-on to the Windows 95 operating system. IE was integrated into the Windows operating system in 1996 (that is, it came “bundled” ready-to-use within the operating system of personal computers), which had the effect of reducing competition from other Internet browser manufacturers, such as Netscape. IE soon became the most popular Web browser.

Apple’s Safari was released in 2003 as the default browser on Macintosh personal computers and later on iPhones (2007) and iPads (2010). Safari 2.0 (2005) was the first browser with a **privacy mode**, Private Browsing, in which the application would not save Web sites in its history, downloaded files in its cache, or personal information entered on Web pages.

E. _____

The first serious challenger to IE’s dominance was Mozilla’s Firefox, released in 2004 and designed to address issues with speed and security that had plagued IE. In 2008 Google launched Chrome, the first browser with isolated tabs, which meant that when one tab crashed, other tabs and the whole browser would still function. By 2013 Chrome had become the dominant browser, surpassing IE and Firefox in popularity. Microsoft discontinued IE and replaced it with Edge in 2015.

F. _____

In the early 21st century, smartphones became more computer-like, and more **advanced services**, such as Internet access, became possible. Web usage on

smartphones steadily increased, and in 2016 it **accounted** for more than half of Web browsing.

Ex.2. Read the text again and answer the questions:

1. What are the functions of the Web?
2. What is hypermedia?
3. Why did Mosaic increased the popularity of the Web?
4. What are the main differences between IE, Firefox and Chrome?
5. What is your favourite web browser? Why?

Ex.3. Match the words to make up phrases:

1.	to host	a)	servers
2.	to shut down	b)	a link
3.	to attack	c)	a web application
4.	to infiltrate	d)	access
5.	to gain	e)	an account
6.	to use	f)	a website
7.	to access	g)	a network
8.	to click	h)	a database

Ex.4. Read the article and find examples of using the phrases from the ex. ..

Types of Web Threats

Denial of Service (DoS) and Distributed Denial of Service (DDoS)

Denial of Service (DoS) attacks have grown more and more sophisticated as the world wide web becomes more diverse. The primary objective of a DoS attack is to overwhelm the capacity of the web server where your website is being hosted.

Essentially, hackers will continually flood your web traffic to ultimately shut down your network simply due to overloading. This occurs when multiple systems are compromised by malware and work together to attack a network.

DDoS, on the other hand, focused on also attacking servers but in a much larger scale. In this case, web hackers take control of a wide array of computers to form what we refer to as “botnets”. These botnets are then used as zombie mercenaries to bombard and attack a certain web server of the hacker’s choosing. If you’re a popular blogger or a business owner, you can definitely see the big issue here at play.

A simple DoS or DDoS attack can essentially shut down your website and deny access to your products and services to your customers. This is devastating for businesses and subscribers who need constant updates from you.

SQL Injections

SQL Injections differ from DDoS in terms of target. While DDoS seeks to disturb the normal flow of a website, SQL Injections are malicious programs, which were designed to infiltrate a database with the purpose of obtaining sensitive information.

SQL Injections looks for faulty code or poor designed forms that might give the hacker a way to access your database's scripting. Once the hacker gains access, a hacker can "inject" their own code into the database, allowing them to manipulate and steal the sensitive stored data.

Cross-Site Scripting (XSS)

XSS is one of the most insidious attacks on the web. XSS is a malicious code injected to the client-side of a website. One could get infected by simply visiting a website or using a web application. Just like SQL Injections, hackers look into a website for any kind of input vulnerability so they can inject their own code.

Some attacks examples are:

XSS downloads your user's cookie information allowing the hacker to impersonate you and access your online accounts with ease.

An infected website might show inappropriate content.

XSS lets the hacker record your keyboard's events so your IDs, passwords, and even bank account information could be collected by the hacker.

Phishing

Phishing would be considered the minimum threat of all web attacks but it doesn't make it less dangerous. Usually phishing comes in the form of emails sent by seemingly credible entities such as banks, relatives, shops, etc.

In reality, they are fake emails crafted by a hacker. The emails will bait the users to click a link or fill a form. The hacker will receive the information and gain access to your personal accounts, leaving you exposed for identity theft, online scams or much worse.

Text source: <https://www.cloudbric.com/types-of-web-threats/>

Use of English

The phrases you worked with in ex. .. are called *collocations*.

A *collocation* is two or more words that often go together. These combinations just sound "right" to native English speakers, who use them all the time. On the other hand, other combinations may be unnatural and just sound "wrong". Look at these examples:

natural English...	unnatural English...
the fast train	the quick train
fast food	quick food
a quick shower	a fast shower
a quick meal	a fast meal

Taken from: <https://www.englishclub.com/vocabulary/collocations.htm>

Ex.5. Fill in the table of words often used with the “web”

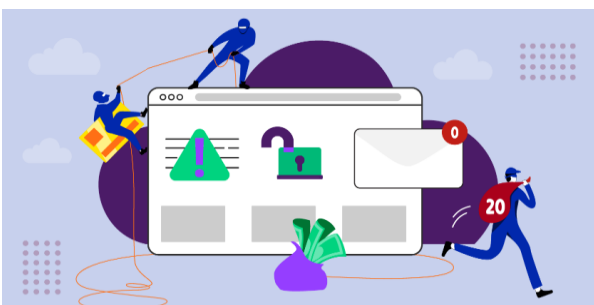
access, development, address, scour, version, search, space, directory, streaming, log, page, site, design, access, browse, service, accessibility, ~~traffie~~, use, host, ~~tool~~, hosting, surf, publishing, search, browser, cam, server, content, resources,

verbs	nouns (space)	nouns (information)	nouns (use)	nouns (activities)	nouns (service)
<i>use,</i> ...	<i>page, ...</i>	<i>resources, ...</i>	<i>traffic, ...</i>	<i>publishing,</i> ...	<i>tool, ...</i>

Choose any 5 collocations and make up your own sentences.

Ex.6. Read the text “Types of Web Threats” again, find more examples of collocations.

Ex.7. Surf the Net to find out more information about the Web threats. Prepare group presentations. Prepare a list of 5 key phrases from your presentation to share with your groupmates.



Self-study

Read “How To Write an Article in 7 Easy Steps” at [Indeed.com](https://www.indeed.com) and write your article on a topic, related to the Web security.

III. Graphics and design

“The details are not the details.
They make the design.”

———— Charles Eames ————

Questions for group discussion:

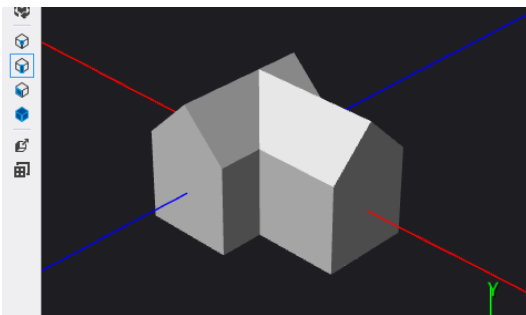
1. How do you understand the quote by Charles Eames?
2. What experience do you have with graphics and design? What web applications / websites have you used?

Ex.1. Match the terms with the pictures. Explain their meaning:

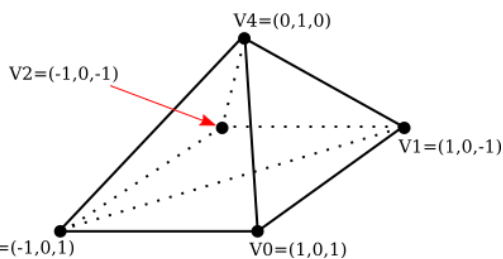
- 1) three-dimensional model
- 2) two-dimensional image
- 3) rendering
- 4) vertices
- 5) simulation of reflections



a.



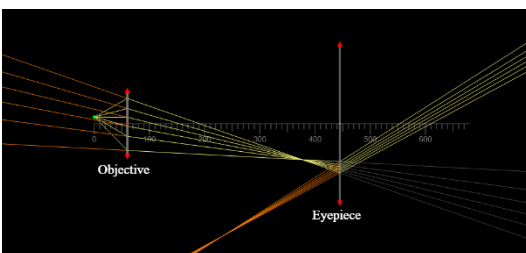
b.



c.



d.



e.

Ex.2. Read the article “What is Computer Graphics?” and fill in the missing words:

screen, realism, lighting, simulating, engines, techniques, algorithms

The field of computer graphics is a broad and diverse field that exists cross section between computer science and design. It is interested in the entire process of creating computer generated imagery, from creating digital three-dimensional models, to the process of texturing, rendering, and _____ those models, to the digital display of those renderings on a_____.

This process starts with simple object rendering _____ to transform mathematical representations of three-dimensional objects into a two-dimensional screen image, calculating projection transformations of vertices as well as occlusion and depth of objects.

Detail and _____ is added to these images through simulation of materials, textures, and lighting. The most accurate and realistic techniques involve understanding the way light interacts with objects in the physical world, and _____ those interactions as closely as possible on a computer. Phenomena such as reflections, transparencies, or diffuse lighting can be modeled using a variety of different_____, some designed to be physically accurate, others to be computationally efficient, depending on different needs. Virtual reality imagery must be generated in a matter of milliseconds, while a detailed architectural rendering may take hours of computation time.

With developments both in the hardware of GPUs and the software of rendering_____, Computer Graphics developments continue to push the bounds of both accuracy and speed of computer generated imagery.

Text source: <https://www.graphics.cornell.edu/about/what-computer-graphics>

Ex.3. Read the text again. Find examples of gerund. Comment on its usage.

Ex.4. Match computer graphics terms with their explanation:

1.	Texturing (shading)	a.	converts a model into an image either by simulating light transport to get physically-based photo-realistic images, or by applying some kind of style as in non photo-realistic rendering.
2.	Animation	b.	the process of describing surface appearance. This description can be as simple as the specification of a color in some colorspace or as elaborate as a shader program which describes numerous appearance attributes across the surface.

3.	Rendering	c.	nets of interconnected triangles.
4.	Scene setup	d.	the temporal description of an object, that is, how it moves and deforms over time. There are numerous ways to describe these motion, many of which are used in conjunction with each other. Popular methods include keyframing, inverse kinematics, and motion capture.
5.	Modeling	e.	involves arranging virtual objects, lights, cameras, and other entities on a scene which will later be used to produce a still image or an animation.
6.	Meshes	f.	describes the shape of an object.

Ex.5. Read the text “What exactly is 3D animation?” – put the stages into correct order.

_____ Texturing

After a 3D object has a primitive mesh design, it needs some clothes to cover it. This is texturing. You can texture an item by mapping out colors on the object or layering 2B images or designs in repeating patterns. Some creators also choose to use real photographs.

_____ 3D modeling

Modeling is the task of building the story environment. This includes any props, characters, and scenery. A creator will take specific objects from the storyboard and mold them into a 3D "mesh." This is a simple shape that can be refined with more details later in the animation process. Some art departments set hundreds of little hinges on each character called Avars. These move specific parts of a character's body for a more realistic feel.

_____ Animation

Now you know how your character will move, it's time to get it moving. There are a few different techniques to use. Keyframe animation is similar to old-style cartoons. An animator moves and manipulates the objects on a frame-by-frame basis. Animators can also use splines to draw a path for a character rig to follow. Another technique is using built-in engines in your software. So, when a scene requires a specific movement, your object will follow suit.

_____ Rigging

Now that your character has a form, you need to put his skeleton to work. This is rigging and is the last stage before a character animation begins. Every rig is unique to every single character and object. The process sets up a skeleton you can control so you see how it will move during animation.

_____ Rendering

Rendering is one of the final steps in creating great animation. This is when the animation gets "made" with its final details. An animator creates a good, final render with attention to lighting, camera placement, and special effects.

_____ Lighting

Lighting isn't just for photography. It's an important tool for bringing animation to life, too. Lights in a 3D world don't exist until an animator applies them. So, when done incorrectly, it can wash out a scene and make it flat. And when done well, it makes the scene even more convincing.

_____ Camera Settings

Think about it. The 3D world has no physical limitations. You can take a journey to the surface of the sun. Or, explore a world inside a person's intestines. Using a good camera perspective makes these journeys not only possible but also more realistic. To get a better understanding, you can look through the lens of a real camera. How does it show the scene in front of you? Can you adjust the focus? What happens when you adjust your position? Now, take these concepts into consideration during the animation. You can adjust that focus and your position. You can adjust your perspective, too. Bonus, you can even have the perspective of multiple cameras in your animation.

_____ Editing and final output

We have reached the end! It's time to combine the renders, music, special effects, and any edits to create a final project. Once you ensure your project has the right flow and feeling, it's time to save it in a compatible format.

_____ Music and sound effects

Have you ever watched a scene without any music? It feels flat and emotionless. Adding music and sound effects round out your animation with extra depth. Music helps to set the mood and tone in a setting. Anything from a happy celebration to a somber breakup. Foley is another term for sound effects. A foley artist will create sounds specific to animation using a variety of props.

_____ Compositing and special VFX

After rendering your animation, it's time to round out your animation with special effects. Need to add an explosion? Does an alien need to morph into another object? Does a science experiment evaporate in a scene? These are all fairly obvious examples, but there are other concepts to consider during this step. You can add a green screen to add extra special effects. Or create more buildings in the animation environment. You can even extend the background to become a more complete world.

Ex.6. Read the text again, find English equivalents for: *розкадровка, петлі, повторювані візерунки, скелет, покадрова основа, робити плоским, фізичні обмеження, розміщення камери, фон, створювати настрій, сумісний формат.*

Ex.7. Choose any graphics design product – describe it from the technical point of view.

Ex.8. Work in groups. Find information on the software used for computer graphics. Fill in the table:

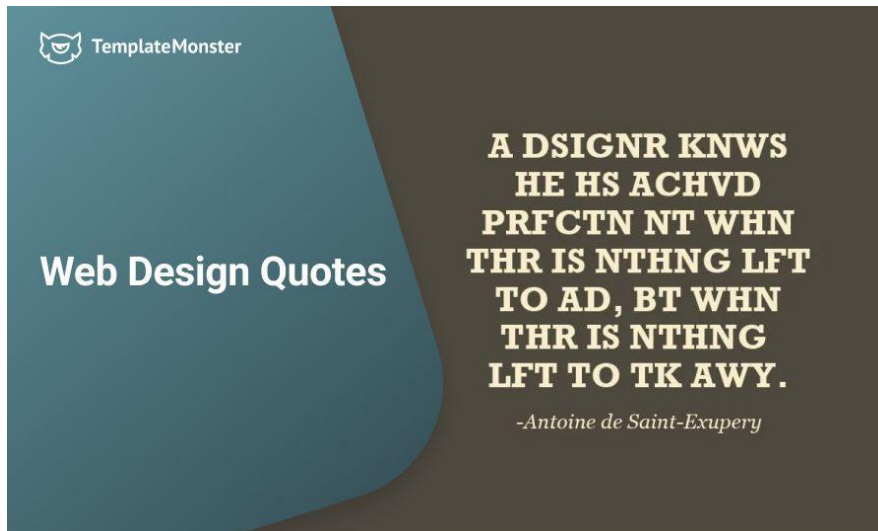
Software	Advantages	Disadvantages	Notes

Which of the above mentioned do you like more? Why (compare with the rest)?

Self-study

Read the article “What Is Graphic Design?” at Brainstation.io (<https://brainstation.io/career-guides/what-is-graphic-design>). Write down its summary (150 – 200 words).

IV. Web design



Questions for group discussion:

- 1. Read aloud the quote above. How do you understand it?*
- 2. What websites do you think have a good design? Why?*
- 3. Are you interested in web design professionally?*

Ex.1. Read the abstract from the Interaction Design Foundation article “Web design” and answer the questions:

- 1. Where is web design used?*
- 2. What are the elements of the web design?*
- 3. What should be taken into consideration in the web design?*

Web design refers to the design of websites that are displayed on the internet. It usually refers to the user experience aspects of website development rather than software development. Web design used to be focused on designing websites for desktop browsers; however, since the mid-2010s, design for mobile and tablet browsers has become ever-increasingly important.

A web designer works on the appearance, layout, and, in some cases, content of a website. Appearance, for instance, relates to the colors, font, and images used. Layout refers to how information is structured and categorized. A good web design is easy to use, aesthetically pleasing, and suits the user group and brand of the website. Many webpages are designed with a focus on simplicity, so that no extraneous information and functionality that might distract or confuse users appears. As the keystone of a web designer’s output is a site that wins and fosters the trust of the target audience,

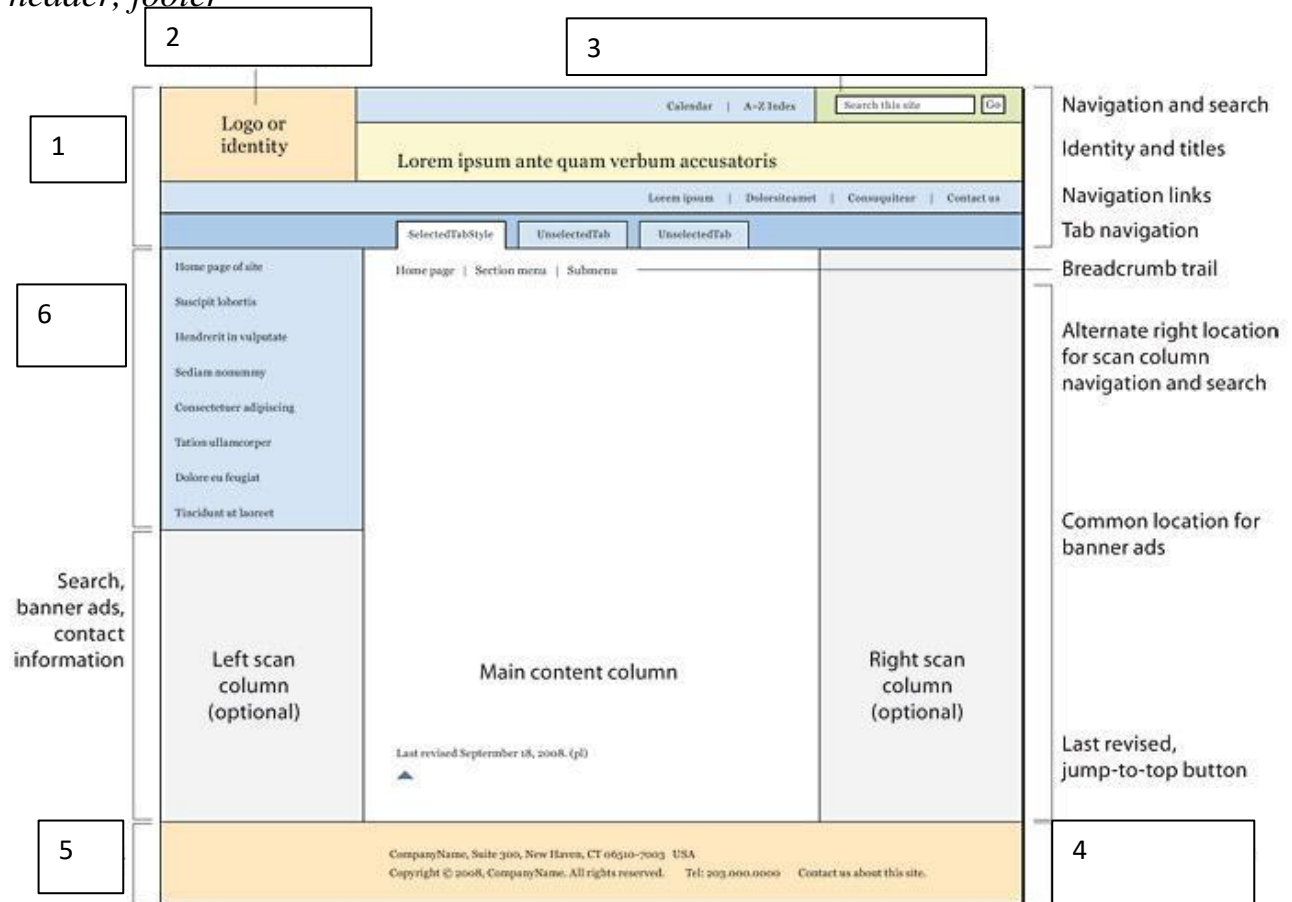
removing as many potential points of user frustration as possible is a critical consideration.

Two of the most common methods for designing websites that work well both on desktop and mobile are responsive and adaptive design. In responsive design, content moves dynamically depending on screen size; in adaptive design, the website content is fixed in layout sizes that match common screen sizes. Preserving a layout that is as consistent as possible between devices is crucial to maintaining user trust and engagement. As responsive design can present difficulties in this regard, designers must be careful in relinquishing control of how their work will appear. If they are responsible for the content as well, while they may need to broaden their skillset, they will enjoy having the advantage of full control of the finished product.

Ex.2. Suggest 10 key words/phrases from the text above.

Ex.3. Fill in the web page structure:

search box, local navigation, contact information & copyrights, link to home page, header, footer



Read and translate all the page elements. Which of them would you include for your web page design?

Ex.4. Imagine you are in a project team on creating a new university/department website. Make your suggestions on the website structure and home page layout, as well as its design elements.

Ex.5. Read the note from the prospects.ac.uk on Web design and development. Discuss in groups what skills are necessary for different job positions from the list.

**Revise the usage of modal verbs must/have to/need/should/ought to*

Studying web design and development provides you with the technical and design-related skills needed for a career in the web, software development and computer science industries

Jobs directly related to your degree include:

- Applications developer
- Game developer
- Multimedia programmer
- Multimedia specialist
- SEO specialist
- UX designer
- UX researcher
- Web content manager
- Web designer
- Web developer

Which of the positions could you take for your future career?

Self-study

Ex.6. Read the extract from the article “What is a Blog and How is it Different from a Website?” (Beginner’s Guide for WordPress). Fill in the missing sentences (one is extra):

- A) Blogs can be part of a larger website.
- B) Blogs are typically run by an individual or a small group of people to present information in a conversational style.
- C) Blogs also come with a RSS feed feature.
- D) Blogs are used to express personal ideas.
- E) They also have an informational blog.
- F) Blogs are a type of website.

A blog is a type of website where the content is presented in reverse chronological order (newer content appear first). Blog content is often referred to as entries or “blog posts”.

1.____However, now there are tons of corporate blogs that produce a lot of informational and thought-leadership style content. Typical blog posts also have a comments section where users can respond to the article.

2.____The only real difference between a blog and other types of website is that blogs are updated on a regular basis with new content, which is displayed in reverse chronological order (new blog posts first). Typical websites are static in nature where content is organized in pages, and they are not updated frequently. Whereas a blog is dynamic, and it is usually updated more frequently. Some bloggers publish multiple new articles a day.

3.____Often businesses have a blog section where they regularly create content to inform and educate their customers.

Many small businesses around the world have traditional websites made up of just pages and no blog. Such small websites are often made to create an informational web presence for a business, organization, or individual. On the other hand, more and more businesses are realizing the potential of a blog in their overall marketing strategy. Business owners are adding a separate blog section to their traditional websites and using it to get more traffic from search engines. That’s because blogs are proven to improve search engine optimization (SEO).

4.____ It allows users to stay updated with your latest posts. When a new post is published, the RSS feed is updated automatically. Smart marketers often connect the RSS feed with an email newsletter or web push notification to send their users a notification alert about recent posts, product announcements, and more.

5. ____Here they teach users how to improve conversions and get more leads. This helps them cover their industry keywords to get free traffic from search engines and make more sales.

Whether you are a business, a non-profit organization, or a professional, adding your own blog to your website can help you attract your target audience, grow your email list, and sell products.

Ex.7. Read the examples of personal blogs at TechCrunch: <https://techcrunch.com/>. What are their common features? Which blog did you like most?

Ex.8. If you had a blog – what could it be about? Write down a post.

V. Communication systems



Questions for group discussion:

What is a communication system?

What types of communication systems do you know?

Why are communication systems important?

Ex.1. Put the elements of a communication system into the right order:

input message, output transducer, transmitter, receiver, channel, output message, input transducer



Ex.2. Match the term with its definition

signal	a medium by which a signal travels
communication channel	the strength of the signal
transducer	information that has been converted into a digital format
receiver	a device used to convert one form of energy into another form

attenuation	a device that receives the signals sent/ transmitted by the senders and decodes them into a form that is understandable by humans
anplitude	the range of frequency over which a signal has been transmitted
amplification	the reduction in the strength of analog or digital signal as it is transmitted over a communication medium
bandwidth	the process to strengthen the amplitude of the signals using an electronic circuit
repeater	any electrical signal which interferes with an information signal
noise	a device that extends the range of communication systems by amplifying the signals

Ex.3. Read extract from the article “Wireless Communication System and Its Application in Big Data Remote Monitoring and Decision-Making” by Huanyu Kou. Answer the following questions:

1. Why is wireless communication technology necessary?
2. What are the main parts of a wireless communication system?
3. What are their functions?
4. How is the real-time operating status of wireless devices obtained?

Computer technology plays an increasingly important role in human production and life, and it promotes the application of unmanned technology. For instance, the appearance of automatic driving of ships can not only liberate the labor force but also improve the level of navigation safety; the unmanned technology of cars makes the car design does not need to consider the impact of the car on the human body, so it can adapt to more complex working conditions and then better play the car performance; the use of unmanned aerial vehicles (UAVs) in modern warfare has greatly increased combat capabilities, and its unmanned nature can reduce casualties. However, the above technologies all rely on stable and fast wireless signal transmission. Based on the wireless signal transmission, a large amount of real-time data generated by the unmanned terminal can be transmitted to the base station, thereby realizing the communication between the unmanned terminal and the base station. Therefore, to promote the development of unmanned technology, it is necessary to develop wireless communication technology.

The wireless communication system mainly includes three parts: signal transmitting device, transmission medium, and signal receiving device. The function of the signal transmitting device is to collect signals that can reflect the status of the unmanned terminal and then process the collected signals for transmission; the role of the transmission medium is to provide a medium for signal transmission; the function of the signal receiving device is to receive wireless signals and perform inverse signal processing. For wireless devices such as UAVs, to achieve remote real-time control, it is necessary to obtain signals representing the status of the wireless device in real-time at the base station, thereby judging the operating status of the wireless device and then deciding the next operation strategy. Therefore, a wireless communication system between the base station and the wireless device is required. With the wireless signal communication system, the base station can receive a large number of wireless signals from the wireless device in real-time. These signals can be temperature signals, pressure signals, speed signals, etc., and they can reflect the real-time operating status of wireless devices.

[Text source: <https://www.hindawi.com/journals/mpe/2022/8161917/>]

**Revision: find examples of Passive voice. Explain its usage.*

Ex.4. Fill in the table with information about other types of communication systems:

Type	Principle of work	Components/equipment	Spheres of usage
Line communication systems			
Radio Communication systems			
Analog communication systems			
Digital communication			

systems			
Baseband communication system			
Carrier communication system			

Ex.5. Describe the work of 1) a mobilephone 2) a computer as a communication system.

Self-study

Ex.6. Read the article “Starlink” and write down 5 key words/ phrases:

Starlink is a satellite constellation system that aims to deliver global internet coverage. This system is ideally suited for rural and geographically isolated areas where internet connectivity is unreliable or nonexistent.

A SpaceX initiative to create a global broadband network, Starlink uses a constellation of low Earth orbit (LEO) satellites to provide high-speed internet services. SpaceX, more formally known as Space Exploration Technologies Corp., is a privately held rocket and spacecraft company that Elon Musk founded in 2002.

How does Starlink work?

Starlink operates on a satellite internet service technology that has existed for decades. Instead of using cable technology, such as fiber optics to transmit internet data, a satellite system uses radio signals through the vacuum of space. Ground stations broadcast signals to satellites in orbits, which in turn relay the data back to the Starlink users on Earth. Each satellite in the Starlink constellation weighs 573 pounds and has a flat body. One SpaceX Falcon 9 rocket can fit up to 60 satellites.

The goal of Starlink is to create a low latency network in space that facilitates edge computing on Earth. The challenge of creating a global network in outer space isn't a small one, especially because low latency is an important demand. SpaceX has

proposed a constellation of almost 42,000 tablet-size satellites circling the globe in low orbit to meet this demand. The CubeSats -- miniature satellites commonly used in LEO -- create tight network coverage, and their low Earth orbit produces low latency.

However, Starlink isn't the only contender in the space race and has a few competitors, including OneWeb, HughesNet, Viasat and Amazon. HughesNet has been providing signal coverage from 22,000 miles above the Earth since 1996, but Starlink follows a slightly different approach and presents the following improvements:

- Instead of using a couple of large satellites, Starlink uses thousands of small satellites.
- Starlink uses LEO satellites that circle the planet at only 300 miles above surface level. This shortened geostationary orbit improves internet speeds and reduces latency levels.
- The newest Starlink satellites have laser communication elements to transmit signals between satellites, reducing dependency on multiple ground stations.
- SpaceX aims to launch as many as 40,000 satellites in the near future, ensuring global and remote satellite coverage with reduced service outages.
- Starlink has the advantage of being part of SpaceX, which in addition to launching Starlink satellites, also conducts regular partner launches. Other satellite internet providers may not be able to schedule regular satellite launches due to the high-cost factors involved.

How to connect to Starlink?

Once users subscribe to Starlink, they receive a Starlink kit that includes a satellite dish, a dish mount and a Wi-Fi router base unit. Starlink also comes with a power cable for the base unit and a 75-foot cable for connecting the dish to the router.

To use the service, Starlink customers must first set up the satellite dish to start receiving the signal and pass the bandwidth to the router. The company offers various mounting options for the dish, including for yards, rooftops and home exteriors. There's also a Starlink app for Android and Apple iOS that uses augmented reality to guide users in selecting the best location and position for their receivers.

[Text source: <https://www.techtarget.com/whatis/definition/Starlink>]

Ex.7. Write down a short summary of the article “Starlink” (around 300 words).

Ex.8. What is your attitude to this technology? How do you see its future? Express your opinion in the form of a short blog post.

Рекомендована література

1. Англійська мова. Фахові тексти та завдання для опрацювання професійної лексики студентами II курсу денної форми навчання напряму підготовки 6.050102 – "Комп'ютерна інженерія" / Укладач: Светенок Л.К. Чернігів: ЧДТУ, 2012. 77 с.
2. Англійська мова. Методичні вказівки до самостійної роботи для студентів 2 року денної форми навчання напрямів підготовки 6.050102 – "Комп'ютерна інженерія" та 6.050103 – "Програмна інженерія" / Укладач: Светенок Л.К. Чернігів: ЧДТУ, 2013. 86 с.
3. Foley M., Hall D. MyGrammarLab. Intermediate. Pearson Education Limited, 2012. 373 p.
4. Michael McCarthy and Felicity O'Dell. English Collocations in Use. Cambridge University Press, 2005. 156 p.
5. Nataliia Haidai. INFINITIVE, GERUND & PARTICIPLE: Methodical recommendations for 2nd year students of the Faculty of Philology, specialty 014.02 "Secondary education. Language and literature (English)". 2nd ed. Chernihiv: National University "Chernihiv Collegium" named after T.H. Shevchenko, 2018. - 128 p.
6. Resources for teachers. University of Oxford. URL: <http://www.ox.ac.uk>
7. Wilson C. SpeakOut 2nd edition. Intermediate. Pearson Education Limited, 2015. 176 p.