

Unit 2 CAD.Types of computers

I. Introductory exercises

Answer the following questions

1. What are computers used for?
2. What is their role in CAD?
3. What are the main parts of computers?
4. What types of computers do you know?

Learn the words

access (v)	['ækses]	иметь доступ (к чему-либо)
application (n)	[,æplɪ'keɪʃ(ə)n]	применение, приложение
calculation (n)	[,kælkju'leɪʃ(ə)n]	вычисление
capacity (n)	[kə'pæsəti]	мощность, производительность
collaborate (v)	[kə'læb(ə)reɪt]	работать совместно, сотрудничать
distinguish (v)	[dɪ'stɪŋgwɪʃ]	различать, находить отличия
extinct (adj)	[ɪk'stɪŋkt]	устаревший, вышедший из употребления
handle (v)	['hændl]	управлять, контролировать
mainframe (n)	['meɪnfreɪm]	универсальная вычислительная машина
outlet (n)	['aʊtlet]	выходное отверстие

performance (n)	[pə'fɔ:mən(t)s]	производительность; коэффициент полезного действия
retrieval (n)	[ri'tri:v(ə)l]	восстановление, поиск, извлечение
span(v)	[spæn]	охватывать, распространяться
stand-alone (adj)	[,stænd ə'ləun]	автономный
subsequent (adj)	['sʌbsɪkwənt]	последующий, следующий
supplant (v)	[sə'plɑ:nt]	вытеснять, занимать чье- либо место
tumble (v)	['tʌmbl]	падать
utilize (v)	['ju:tɪlaɪz]	использовать
variable (n)	['vɛəriəbl]	переменная (величина)
visualization (n)	[,vɪzju(ə)laɪ'zeɪʃ(ə)n]	визуализация, создание графического представления для большого объема данных или для данных со сложной структурой

Ex.1 Nouns

Match the nouns on the right to the nouns on the left

1.calculation	a/выходное отверстие
2.variable	b/хранение
3.capacity	c/извлечение (данных)
4.outlet	d/применение, приложение
5.retrieval	e/требование
6.mainframe	f/вычисление
7.requirement	g/переменная (величина)
8.input	h/универсальная вычислительная машина
9.application	i/мощность, производительность
10.storage	j/ввод информации

Ex.2 Adjectives

Match the adjectives on the right to the adjectives on the left

1. extinct	a/дорогой
2.numerous	b/сложный
3.expensive	c/устаревший
4.entire	d/создающий эффект присутствия (с одновременным воздействием на слух, зрение, осязание)
5.recent	e/многочисленный
6.irrespective	f/дополнительный
7.stand-alone	g/полный, целый
8.immersive	h/независимый (от чего-либо)
9.additional	i/недавний
10.complex	j/автономный

Ex.3 Verbs

Match the verbs on the right to the verbs on the left

1.utilize	a/вытеснять, занимать чье-либо место
2.handle	b/преобразовывать, превращать
3.keep pace with	c/различать, находить отличия
4.convert	d/использовать
5.access	e/распознавать (данные)
6.recognize	f/охватывать, распространяться
7.accommodate	g/управлять, контролировать
8.supplant	h/вмещать
9.distinguish	i/не отставать от
10.span	j/иметь доступ к чему-либо

Ex.4 Match the synonyms

1.calculation (n)	a/transform
2.entire (adj)	b/following
3.collaborate (v)	c/difficult
4.complex (adj)	d/use
5.distinguish (v)	e/computation
6.subsequent (adj)	f/control
7.utilize (v)	g/whole
8.handle (v)	h/differentiate
9.supplant (v)	i/cooperate
10.convert (v)	j/replace

Learn the word combinations

1.mathematical computations	математические вычисления
2.discrete signal	дискретный сигнал
3.data storage capabilities	возможности хранения данных
4.data processing	обработка данных
5.binary digit system	двоичная система счисления
6.input/output devices	устройства ввода/вывода информации
7.software development	разработка ПО
8.high resolution display	экран высокого разрешения
9.value-add tools	дополнительные программные средства
10.high-end microcomputers	микрокомпьютеры высокого технического уровня

Ex.5 Match the word combinations

1.mathematical computations	a/ обработка данных
2.discrete signal	b/ двоичная система счисления
3.data storage capabilities	с/возможности хранения данных
4.data processing	d/ разработка ПО
5.binary digit system	e/ математические вычисления
6.input/output devices	f/ экран высокого разрешения
7.software development	g/ дополнительные программные средства
8.high resolution display	h/ микрокомпьютеры высокого технического уровня
9.value-add tools	i/ устройства ввода/вывода информации
10.high-end microcomputers	j/ дискретный сигнал

II.Reading

Ex.7 Read text A and answer the following questions

1. What principle is the classification of computers based on?
2. What types of computers are described in text A?
3. Which type works on the principle of binary digit system?
4. What is a hybrid computer?
5. How many people can use a mainframe computer at the same time?
6. What is the difference between minicomputers and mainframes?
7. What are microcomputers designed for?
8. What are the most well-known manufacturers of microcomputers?
9. What is a workstation?
10. What are supercomputers used for?

Text A Types of computers

Read the text

Computers can be classified based on the principles of operation or on the configuration. By configuration, we mean the size, speed of doing computation and storage capacity of a computer.

There are three different types of computers according to the principles of operation:

- **Analog Computers**
- **Digital Computers**
- **Hybrid Computers**



The analog computer is almost an extinct type of computer these days. It differs from a digital computer in respect that it can perform numerous mathematical operations simultaneously. It is also unique in terms of operation as it utilizes continuous variables for the purpose of mathematical computation. It uses mechanical, hydraulic, or electrical energy.

The digital computer operates on digital data such as numbers. It uses binary number system in which there are only two digits 0 and 1. Each one is called a bit. Digital computers recognize data by counting discrete signal of 0 or 1.

Based on the purpose, Digital computers can be further classified as,

- **General Purpose Computers**
- **Special Purpose Computers**

Special purpose computers are ones that are built for a specific application. *General purpose computers* are used for any type of applications. They can store different programs and do the jobs as per the instructions specified on those programs. Most of the computers today are general purpose computers.

The hybrid computer combines the desirable features of analog and digital computers. It is mostly used for automatic operations of complicated physical processes and machines. Digital computers which work on the principle of binary digit system of “0” and “1” can give very precise results. But the problem is that they are too slow and incapable of large scale mathematical operation. In the hybrid types of computers digital counterparts convert the analog signals to perform Robotics and Process control.

There are four different types of computers in terms of their performance and capacity.

1. Mainframe Computers

A mainframe computer is a large, powerful computer that handles the processing for many users simultaneously (up to several hundred users). The name mainframe originated after minicomputers appeared in the 1960's to distinguish the larger systems from the smaller minicomputers.



Users connect to the mainframe using terminals and submit their tasks for processing by the mainframe. A *terminal* is a device that has a screen and keyboard for input and output, but it does not do its own processing. The processing power of the mainframe is time-shared between all of the users.

Mainframes typically cost several hundred thousand dollars. They are used in situations where a company wants the processing power and information storage in a centralized location. Mainframes are also now being used as high-capacity server computers for networks with many client workstations or for serving files over the Internet.

2. Microcomputers

Desktop computers, laptops, personal digital assistant (PDA), tablets and smartphones are all types of microcomputers. The microcomputers are widely used and the fastest growing computers. These computers are the cheapest among the other types of computers. They are specially designed for general usage like entertainment, education and work purposes. Well-known manufacturers of microcomputers are Dell, Apple, Samsung, Sony and Toshiba.

Workstations are powerful, high-end microcomputers. They contain one or more microprocessor CPUs. They may be used by a single-user for applications requiring more power than a typical PC (rendering complex graphics, or performing intensive scientific calculations).

Alternately, workstation-class microcomputers may be used as server computers that supply files to client computers over a network or the Internet. This class of powerful microcomputers can also be used to handle the processing for many users simultaneously who are connected via terminals; in this respect, high-end workstations have essentially supplanted the role of minicomputers.



3. Minicomputers

Minicomputers are used by small businesses and firms. Minicomputers are also called as “Midrange Computers”. These are small machines which don’t have such processing and data storage capabilities as supercomputers or mainframes. These computers are not designed for a single user. Individual departments of a large company or organizations use minicomputers for specific purposes. For example, a production department can use Minicomputers for monitoring certain production process.

4. Supercomputers

Supercomputers are mainframe optimized for speed and famous series of supercomputers founded and named after Seymour Cray. Supercomputers are used for intensive tasks such as detonations, aerodynamic flows, NASA uses supercomputers for launching space shuttles, controlling them and for space exploration purpose.



computers that have been processing power. The most were designed by the company Seymour Cray. extremely calculation-simulating nuclear bomb and global weather patterns.

Supercomputers are very expensive and very large in size. They can be accommodated in large air-conditioned rooms; some supercomputers can span an entire building.

Ex.6 Complete the following sentences

1. Computers can be classified based on	a/desktop computers, laptops, PDAs, tablets etc.
2.The analog computer	b/are very expensive and large in size, they can span an entire building.
3.Analog computers	c/their principle of operation or on their configuration.
4.Hybrid computers	d/calculation-intensive tasks.
5.Mainframe computers are	e/combine the desirable features of analog and digital computers.
6.Minicomputers	f/are the cheapest among the other types of computers.
7.Microcomputers	g/is almost an extinct type of computer these days.

8. Microcomputers include	h/ large, powerful computers that handle the processing for many users simultaneously.
9. Supercomputers are used for	i/ are also called as Midrange computers.
10. Supercomputers	j/ utilize continuous variables for the purpose of mathematical computation.

Ex.8 Match the questions to the answers

A

1. What principle is the classification of computers based on?
2. What types of computers are described in text A?
3. Which type works on the principle of binary digit system?
4. What is a hybrid computer?
5. How many people can use a mainframe computer at the same time?
6. What is the difference between minicomputers and mainframes?
7. What are microcomputers designed for?
8. What are the most well-known manufacturers of microcomputers?
9. What is a workstation?
10. What are supercomputers used for?

B

a/ The digital computer does.

b/ They are used for extremely calculation-intensive tasks.

c/ They are Dell, Apple, Samsung, Sony and Toshiba.

d/ It is a powerful, high-end microcomputer.

e/ It is based on the principles of operation and configuration.

f/ Minicomputers are smaller and less powerful than mainframes.

g/ Analog computers, digital computers, hybrid computers, mainframes, microcomputers, minicomputers, supercomputers are described.

h/ They are designed for general usage like entertainment, education and work purposes.

i/ It is a computer which combines the features of analog and digital computers.

j/ Several hundred people can do it.

Text B

The parts of computers

Read the text

Computers are made up of many parts. These different parts perform one or more functions including input, output, processing, or storage.

OUTPUT DEVICES

Output devices send information from your computer to you. This information is usually in the form of sound and sight, but some devices can send information as touch. Some common output devices are monitors, printers, and speakers.



INPUT DEVICES

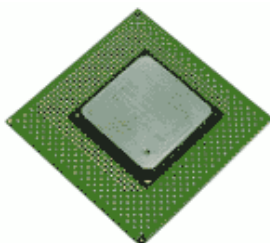
Input devices are the parts that let you enter and manipulate information on a computer. These devices range from the standard keyboard and mouse, to scanners, microphones, joysticks, and light pens.



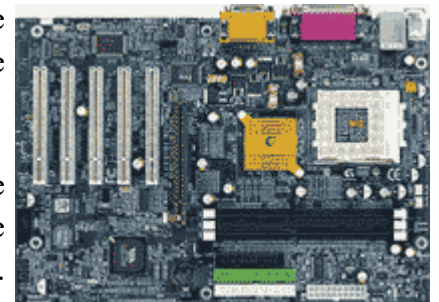
ON THE INSIDE

The inside of a computer has many parts that all work together. These parts are generally found within computer case.

The **motherboard** is the backbone of the computer. All the individual pieces are connected to the motherboard in some way. The motherboard includes the processor chip, pci slots, and memory.



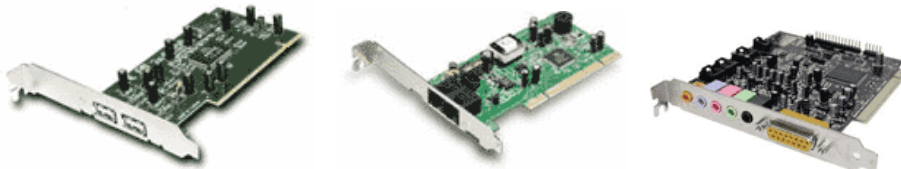
Processor - This is the chip that does the "thinking" of the computer. These are the "Pentium" and "AMD" chips you hear about. Processor speed is measured in MegaHertz(Mhz) and GigaHertz(Ghz). 1 Ghz = 1000 Mhz



Memory - This is where information is temporarily stored for the processor to use and manipulate before being stored on the HARD DRIVE. Also known as RAM (Random access memory). Information is stored in memory only when the computer is turned on. Ram is measured in Megabytes(Mb), which is storage capacity.



PCI Slots - These are outlets in the motherboard that allow you to install extra components like sound cards, modems, video cards, and other devices. The images below show different PCI card components.



Hard Drive - This is the part of your computer where information is stored for later retrieval. All the information you access on your computer, all your documents, pictures, email messages, and programs are here. Unlike memory, the hard drive stores information even after the power is turned off. The image to the right shows the inside of a hard drive.



CD ROM or DVD ROM Drives - This plays your music and data, or if you have a DVD drive, it will also play DVD movies. CDs hold up to 700Mb of information.

Ex.9 Match the items on the left to the items on the right

1.input devices	a/ It does the 'thinking' of a computer.
2.output devices	b/ These devices range from standard keyboard and mouse to scanners, microphones and light pens.
3.motherboard	c/They send information from your computer to you.
4.processor	d/This plays your music and data.
5.RAM	e/This plays your DVD movies.

6.PCI slots	f/Unlike memory, it stores information even after the power is turned off.
7.DVD ROM drive	g/They let you enter and manipulate information on a computer.
8.Hard drive	h/It includes chip, pci slots and memory.
9.CD ROM drive	i/These are outlets in the motherboard.
10.input devices	j/This is where information is temporarily stored for the processor to use and manipulate before being stored on the hard drive.

Text C **Supercomputers in CAD**

Read the text

Supercomputers are now increasingly being used to create, store, access, process and share complex CAD designs, something they achieve both efficiently and effectively. But are supercomputers what's really required in the current climate? What about the cost, what about the cooling, the heating, the energy requirements - the space needed? The answer is most definitely yes; and history tells us that this should really come as no great surprise.



Although from the year 2000 onwards CAD software developments appear to have slowed, they have not stopped altogether. And, perhaps more importantly, in recent years the applications of CAD have broadened considerably. In the construction industry, it is commonplace to see CAD as the basis for not only pure building design, but more data intensive water supply, wastewater & sewer systems and even interior design. In addition, CAD is in use to support external building or site works such as roads and highways and railroads and tunnels. Access to a specific CAD project is also now a requirement for a broader range of people - town planners, architects, visualisation specialists, builders, engineers, etc. - not all necessarily based in the same department, company or even country.

Supercomputers - more than stand-alone PCs - are now needed to keep pace with features and functions added to subsequent versions of CAD software enabling users to process, store, access and share ever more complex designs irrespective of job function or location. Arguably, though, it is in the visualisation that supercomputers can bring the most benefits.

Powered by supercomputers, visualisation is the first step to lifting CAD designs off the stand-alone PC into an environment where they can be viewed effectively by the designer and, in addition, shared with colleagues. Visualisation can take the CAD model and display it on much larger, higher resolution displays, and at the same time allow research and design teams to collaborate together.

University of Salford has recently created a world class £1.3 million 'Think Lab', centred on delivering a visualisation facility where multidisciplinary teams can meet and work together to solve problems. At the heart of the Think Lab is a large 4.8 metre by 2.0 metre immersive and interactive display, driven by an IBM supercomputer, as well as individual displays and touch-screen electronic whiteboards. The system allows researchers to work with CAD models and simulations as if they really existed in three-dimensional space.

Supercomputers have a long history of powering CAD in construction; they have clear benefits for CAD and enable additional value-add tools such as visualisation. Importantly, as the price of supercomputers tumble, there is no reason for construction designers not to look to supercomputers to deliver more complex, innovative and information designs.

Ex.10 Answer the following questions

1. What is CAD used for at present?
2. What is the role of supercomputers in CAD?
3. Where can supercomputers bring the most benefits?
4. What is visualization?
5. What has University of Salford created?
6. What is this system used for?
7. What are the advantages of it?

Ex.11 Decide what sentences are true

1. Supercomputers are now increasingly being used to create, store, access, process and share complex CAD designs.
2. Although from the year 2000 onwards CAD software developments appear to have slowed, they have not stopped altogether.
3. In recent years the applications of CAD have reduced considerably.
4. CAD is in use to support external building or site works such as roads and highways and railroads and tunnels.
5. Powered by supercomputers, visualisation is the last step to lifting CAD designs off the stand-alone PC into an environment where they can be viewed effectively by the designer.
6. Visualisation prevents research teams from cooperating together.
7. University of Stanford has recently created a world class £1.3 million 'Think Lab'.
8. At the heart of the Think Lab is a large 4.8 metre by 2.0 metre immersive and interactive display.

9. The Think Lab allows researchers to work with CAD models and simulations as if they really existed in three-dimensional space.

10. Supercomputers have a short history of powering CAD in construction but they have clear benefits for CAD.

Ex.12 Fill in the gaps

keep pace with, model, additional, stand-alone, higher resolution displays, store, collaborate, complex, visualization, subsequent

1. Supercomputers are now increasingly being used to create,(1), access, process and share(2) CAD designs.
2. Supercomputers - more than(3) PCs - are now needed to(4) features and functions added to(5) versions of CAD software.
3. Visualisation can take the CAD (6) and display it on much larger,(7), and at the same time allow research and design teams to(8) together.
4. Supercomputers have a long history of powering CAD in construction; they have clear benefits for CAD and enable(9) value-add tools such as(10).

III. Language practice

Ex.13 Translate from Russian into English

1. Компьютеры состоят из устройств ввода и вывода, материнской платы, жесткого диска и процессора.
2. Аналоговые компьютеры отличаются от цифровых вычислительных машин тем, что могут выполнять много математических вычислений одновременно.
3. Специализированные компьютеры могут сохранять различные программы и выполнять задания согласно установленным инструкциям.
4. Рабочие станции – это мощные микрокомпьютеры высокого технического уровня, которые могут использоваться для выполнения сложных вычислений.
5. Миникомпьютеры не обладают такими же возможностями по обработке и хранению данных как суперкомпьютеры.
6. Суперкомпьютеры – самые мощные вычислительные машины с точки зрения производительности и обработки данных.

7. Суперкомпьютеры все больше используются для создания, хранения, обработки данных и совместной работы над сложными САПР проектами.
8. Суперкомпьютеры необходимы для того, чтобы справиться с новыми приложениями САПР.
9. Использование визуализации позволяет отобразить проектируемую модель на экранах высокого разрешения и дает возможность командам исследователей и разработчиков сотрудничать при работе над проектом.
10. В последнее время возможности применения САПР значительно расширились.

Ex.14 Make a short report based on these sentences

1. Computers can be classified based on.....
2. The analog computer is almost an extinct type of computer.....
3. The digital computer operates on.....
4. Based on the purpose, digital computers can be further classified as.....
5. The hybrid computer combines the desirable features of
6. A mainframe computer is a large, powerful computer that
7. Microcomputers are specially designed for general usage like.....
8. Minicomputers are small machines which don't have such processing and data storage capabilities as
9. Supercomputers are mainframe computers that have been optimized for....
10. Supercomputers are used for extremely calculation-intensive tasks such as.....

Text D Vocabulary and definitions

1.a physicist	an expert in the scientific study of matter and energy
2.tools	things that help you to do a particular activity
3.the green light	here, approval. This is a reference to traffic lights
4.spare time	time when you are not working
5.to herald	to show a sign that something positive is about to happen
6.content	elements or components of media

7.egalitarian	belief that people have the same importance and should have the same rights and opportunities
8.digital divide	used to refer to the gap between people who have access to the internet and those who don't
9.diehards	people who do not want to change
10.to shy away	to avoid something you are afraid of

Ex.15 Listen to text D and answer the questions

1. What did Berners-Lee invent?
2. When did he invent it?
3. Why did his experiment herald a new era?
4. What do people think about his invention?
5. What do they use it for?
6. Why do some people avoid using the technology?

Ex.16 Decide what sentences are true

- 1.On Christmas Day 1980, British physicist Tim Berners-Lee finished developing the tools to create the World Wide Web.
- 2.He was working at the Swiss organisation for Nuclear Research in Geneva.
3. His boss gave him the green light to work on the project and Berners-Lee produced the world's first webpage alone.
4. The experiment heralded a new era because it demonstrated how computers could talk to each other through a new language.
5. Tim Berners-Lee created a new language called Web Markup Language.
6. Fortunes were made in the World Wide Web and Tim Berners-Lee became a billionaire.
- 7.Tim Berners-Lee wanted to keep the egalitarian spirit of the web intact.
- 8.People buy and sell products and services, make friends through the internet.
- 9.All people think that it is essential to have an internet connection.

10. Some people shy away from technology because of all the privacy issues.

Script 1 text D

Happy Birthday, WWW!

It's been 20 years since British scientist Tim Berners-Lee created the first webpage. The World Wide Web has since spawned about one trillion webpages. It revolutionised the way we communicate and some people can't imagine life without it. Can you?

Valdirene Ruston reports:

On Christmas Day 1990, in a laboratory in Switzerland, British **physicist** Tim Berners-Lee finished developing the **tools** to create the World Wide Web. He was working at the European Organisation for Nuclear Research, Cern, in Geneva.

His boss gave him **the green light** to work on the project during his **spare time** and together with the help of his Belgian colleague Robert Cailliau, Tim Berners-Lee produced the world's first webpage.

The experiment **heralded** a new era because it demonstrated how computers could talk to each other through a new language they created called Hyper-Text Markup Language, or HTML. Currently there might be anything up to a trillion webpages with all sorts of **content**. People buy and sell products and services, make friends through these pages, learn and teach. We found many enthusiasts of the web in the streets of London.

Man 1: "It means having information in your home with easy access which in the past would have only been available in thousands of libraries. So it's information at your fingertips."

Woman: "Access to a lot of people really. We've got a lot of family overseas so we use Skype quite a bit."

Man 2: "Information, news, social groups."

Man 3: "I'm just using it usually for emails and social networking with my friends and well, reading newspapers and information. Basically everything!"

Fortunes were made in the World Wide Web. Many say that Tim Berners-Lee could have been a billionaire through his invention but he said that all he wants is to keep the **egalitarian** spirit of the web intact and the medium free to use. Many users share the same ideals.

Man 1: "I think that today it is essential to have an internet connection and that's going to be a real problem in terms of you know, **digital divide** when some people in the world can't access the internet or when the speed (connection speed) is not enough."

And there are other concerns.

Woman: "I'm not very keen on that because of all the privacy issues and everything, I'm very aware of it. So I try to keep private things private as much as I can."

And there are the **diehards**, who **shy away** from technology.

Man 2: "I leave it all to my wife, I hate computers."

Text E Vocabulary and definitions

1.to bill as	to highlight as
2.to pit... against	matched with or set up to compete against
3.human contenders	human opponents or opposition
4.to digest	to understand and organise
5.at its disposal	available to use
6.how good a match	how effective a comparison or answer
7.to buzz	to make a noise to indicate it has an answer to a question
8.nuances in language	slight differences in what certain words or phrases mean
9.an IT genius	something (or someone) highly skilled with gadgets and technology
10.a breakthrough	a new discovery or something that is groundbreaking

Ex.17 Listen to text E and answer the questions

1. What is the report about?
2. What is Watson?
3. What is it able to do?
4. What company developed it?
5. What does the company say about Watson?

Script 2 Text E

Supercomputer beats TV quiz champions

Two champion contestants on a popular American quiz show have been easily beaten by a computer. The IBM machine, named Watson, won in three special editions of Jeopardy. One of the men it defeated holds the Jeopardy record of 74 straight wins. Tom Burridge reports.

Jeopardy is one of America's oldest and most popular quiz shows. But this time, inside the brightly-lit studio, a contest **billed as** 'man versus machine' - the programme's producers **pitted** two of their most successful contestants ever **against** a computer. Known as Watson, the computer is a giant piece of hardware, equivalent in size to several fridges. And over three programmes, Watson beat his **human contenders** with ease.

In a split-second, Watson is able **to digest** the question and try and match it against huge amounts of information it has **at its disposal**. It very quickly assesses **how good a match** it thinks it has and **buzzes** either very quickly, or not so quickly, reflecting how confident it is that it has the right answer.

Watson is also able to notice **nuances in language**, between say 'bat' the animal and 'bat' used in sports. On a prime-time US TV show with millions of viewers it was great publicity for IBM. But the company says Watson the computer is **an IT genius** and **a breakthrough** in computing.

IV. Making a presentation

This morning I'd like to talk about

The report is concerned with ...

The purpose of my report is to(explain...)

My presentation consists of ... (three parts)

First, I'd like to...

Then I'll focus on..

After that we'll deal with... (the technical aspects)

Now let's move on to... (the next part...)

I'd like to attract your attention to...

I'd like to draw your attention to...

I'd like to emphasize the fact that...

I think, you are entirely right...

I would object just a little...

I have doubts about...

It is worth mentioning the fact that...

Let us have a closer look at...

I can tell you without any exaggeration...

I won't go into details...

This diagram shows...

Actually, I don't know...

If you look at this graph you can see...

In conclusion let me ...

In closing (conclusion), I'd like to mention very briefly..

Are there any questions?

Could you be more specific about...?

In addition, I would like to mention...

That brings me to the end of my presentation (report)...

Since I am running out of time...

I'd like to express my gratitude to...

Linking devices

Types	Examples
<i>Additive linkers</i> (giving additional information)	Furthermore к тому же, кроме того Moreover более того In addition кроме того Besides кроме того Along with наряду с
<i>Adversative linkers</i> (introducing information which contrasts with what has been stated previously)	Yet однако However однако, тем не менее Nevertheless тем не менее On the other hand с одной стороны
<i>Comparative linkers:</i> a) Expressing	a) In comparison по сравнению By analogy аналогично Similarly так же, подобным образом

similarity; b) Expressing difference	b) While Whereas As opposed to In contrast (to) On the contrary	в то время как тогда как в отличие в противоположность напротив
<i>Concessive linkers</i> (to concede a point contradicting the main argument of a sentence)	Although Though Despite ... In spite of ...	хотя хотя, несмотря на несмотря на не смотря на
<i>Causal linkers</i> : introducing the result of previous information	Consequently As a result Therefore Hence Thus For this reason	следовательно в результате поэтому следовательно таким образом по этой причине
<i>Concluding linkers</i> : a) At the end of a series of facts or comments; b) at the end of the text	a) In brief b) In summary To sum up In conclusion To conclude	короче говоря подводя итог подводя итог в заключение в заключение

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