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НАУКА И СОВРЕМЕННЫЕ ТЕХНОЛОГИИ

Методические рекомендации по практике устной и письменной речи английского языка

> Витебск ВГУ имени П.М. Машерова 2015

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В данное издание включены аутентичные тематические тексты, а также лексические упражнения и коммуникативные задания по теме «Наука и современные технологии».

Предназначается для студентов V курса филологического факультета (специальность «Романо-германская филология»).

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Предисловие	. 4
Introduction	. 5
I. Social Sciences	. 6
II. Anthropology	. 9
III. The Brain	14
IV. Man and Space	. 24
V. Modern Technologies	. 28
VI. Genetic Engineering	. 45
Supplement for self-access work	. 53
Литература	. 59

Настоящее издание предназначено для студентов V курса филологического факультета (специальность «Романо-германская филология»), а также для изучающих английский язык как второй иностранный.

Методические рекомендации состоят из 6 частей, в которых представлены аутентичные тексты по теме «Наука и современные технологии». Каждая часть содержит лексические упражнения, а также ряд заданий для развития устной речи студентов. В издание включены коммуникативные упражнения и ролевые игры, которые направлены на дальнейшее совершенствование умений как подготовленной, так и спонтанной речи в ситуациях, максимально приближенных к условиям естественной и профессиональной коммуникации.

Учебное издание может быть рекомендовано для самостоятельной работы и полезно лицам, желающим совершенствовать свои знания в английском языке, например, аспирантам, магистрантам и др.

4

INTRODUCTION

What do you think science is?

<u>Reading</u>

a) Science is a way of thinking, a way of understanding the world. The term "scientific method" has fallen into disfavour among educators, perhaps because it conjures up images of a white-coated man hunched over a petri dish. It ought to be restored. The scientific method is the method of thought, of reasoning, which applies not only to explorations of the physical universe, but to all the realms of intellectual inquiry that require hypothesis, inference, and *other tools of brainwork*. As Bertrand Russell explained: "A fact, in science, is not a mere fact, but an instance."

b) Science is the system of knowing about the universe through data collected by observation and controlled experimentation. As data are collected, theories are advanced to explain and account for what has been observed.

fall into disfavour	region/sphere
conjure up	explain
hunch over	cause to appear
reason	deduction/assumption
apply	search/research
exploration	proposition/theory
realm	think carefully and logically
inquiry	bend
hypothesis	put into effect
inference	be disgraced
account for	investigation

Do the following exercises

1. Match these words and their meanings:

2. Answer the questions:

1. What is common about these definitions? What do they differ in?

2. Why has the term "scientific method" fallen out of favour?

3. What are *other tools of brainwork*?

4. Interpret Bertrand Russell's statement: "A fact, in science, is not a mere fact, but an instance."

5. Write down your own definition of what science is, and the ideas,

associations, images and visions conjured up by the word "science".

I. SOCIAL SCIENCES

Pre-reading task

What is a social science? Have you studied any?

<u>Reading</u>

The social sciences are the scientific study of the behaviour of human beings, both in groups and individually. We have no knowledge of human beings who were not in groups. The groups may be small, like the family, or large, like a city or nation. But in order to reach complete development, man must be a member of a society. It is true that some individuals, like monks or hermits, may decide, for religious or other reasons, to leave their society and live alone. But these are unusual individuals, and even they cannot separate themselves completely from the rest of mankind. A society, then, seems to be the natural environment of mankind. Scholars who study mankind in social organisations are called social scientists. Social scientists concern themselves with the behaviour that man must learn so that he can be a functioning member of a group.

Research in the social sciences raises various difficulties not encountered in the natural sciences. A chemist is not a part of the molecule which he is studying; a physicist is not involved with the ion she observes. A social scientist, however, is a member of the human society he studies. It would be impossible for him to separate himself totally from his own learned social behaviour. Human beings must be treated with respect by the scientists who are studying them. They cannot be experimented with or insulted or hurt as objects in the physical world may be. A biologist can deprive a rat of food in order to study the effects of starvation, but no social scientists have had to develop techniques somewhat different from those used for the natural sciences.

THE SOCIAL SCIENCE DISCIPLINES

The various social sciences, or disciplines, are identified by the kinds of human behaviour which they study. In the past, anthropology was the study of pre-historic or primitive, non-literate cultures. Now social anthropologists study both literate and non-literate cultures and both developed and primitive groups. Sociology studies the relations among people in small groups, such as the family. Whereas psychology studies the individual, his intelligence, his ways of learning, his fears and anxieties, social psychology focuses on the behaviour of individuals in groups and may study mobs and riots, for example. Economics studies the way in which people manage their resources, the way they produce and consume, the way they work and spend money. Political science studies the way groups of people govern themselves, their laws, and their methods of law enforcement. Because change is one of the few constants in human life, all of these sciences are very much concerned with changes in the material and social conditions of human life and how these changes affect behaviour. The discovery of uranium ore, for example, would not only cause great changes in the economy of a nation; it might also change the communities in which people live, the pattern of authority in the family, the system of education, etc.

In fact, all of the separate social sciences are closely related to each other and depend upon each other for a complete description of human behaviour. The same methods of research are used in all of them. Many of the concepts and theories used to explain human behaviour in one science are useful and necessary for other sciences. The vocabulary and language used in the different sciences to record the observations of situations is largely the same, although each science also has its own words for special ideas.

NATURAL SCIENCE AND SOCIAL SCIENCE

The natural sciences are primarily concerned with the material world (including living organism in so far they are part of the material world). Their aim is to disclose the structure and behavior of material things in generalized terms (in terms of mathematics as far as possible) which will be true irrespective of variable conditions of time or place. The work of the natural scientist is greatly facilitated by the fact that he is not emotionally engaged with his subject matter: he does not care how it behaves, his subject matter is indifferent to what he does to it, and ignorant of what he has learned about it. Fortunately for the physicist, the atom cannot acquire a knowledge of physics. The physicist can, therefore, proceed on the assumption that any knowledge he may acquire about the behavior of the atom will not modify its behavior and thereby invalidate conclusions based upon its behavior up to date.

The social scientist cannot make this assumption, at least not without important qualifications. For his subject matter is the behavior of men in the world of human relations; and men are not, like the atom, indifferent to what is done to them or ignorant of what is learned about them. On the contrary, the subject matter of the social scientist can find out what he has learned about its behavior in the past, and, as a result of that knowledge, behave differently in the future. This is the fundamental difference between the natural sciences and the social sciences; whereas the behaviour of material things remains the same whatever men learn about them, the behavior of men is always conditioned by what they know about themselves and the world in which they live.

1. Language – Definition

a) Fill in this chart (*characteristics*) to show the parts of the definitions in this text.

concept	class	characteristics	Title of article
anthropology	study of		
social anthropology	study of		
sociology	study of		
psychology	study of		
social psychology	study of		
economics	study of		
political science	study of		

b) Classify the following article titles according to the specific social science disciplines to which they belong and fill in the table above.

Article titles:

Job Enrichment & Job Enlargement Modern Muslim Cultures Respect for Law Cognitive Development of the Child Are Caged Men Like Caged Mice? Stone Age Man Power Structure in Modern Corporations

2. Complete this paragraph, using the words below.

behavior drawing conclusions ethics experiment findings invalidating modify objectivity observing opinions researcher respect subject suffer

The two texts present three problems inherent in social science research. These problems all stem from the fact that both the _____ and the _____ are human.

The first problem, therefore, is the problem of the _____ of the social scientist. He, himself, is a member of the human society he studies. Can he separate himself from his own _____ and _____ in order to be impersonal and scientific in _____ and _____ about his subjects? The second question has to do with what the scientist may or may not do to his subjects in the course of the _____. The laws of ______ demand that human subjects be treated with _____ and not be made to _____. Finally, there is the problem of the influence of the research ______ on the subjects themselves. Because people can know what the social scientists have discovered about their behavior, this very knowledge can ______ their behavior in the future, thus ______ the conclusions of the study.

3. Scan the titles of the articles in the social sciences section to find the one that deals with the first problem of the three problems in social science research.

4. Speak about the difficulties encountered by the social scientist.

<u>©</u> Role play

You want to choose a career of a scientist. Your parents disagree on what science to choose – natural or social.

II. ANTHROPOLOGY

Pre-reading task

What is anthropology? Have you heard of any findings in this branch of social science?

The anthropologist is an explorer in pursuit of answers to the questions: What is it to be human, and what is the nature of humankind? The word **anthropology** derives from the Greek *anthropos*, meaning "man," and *logos*, meaning "study." Therefore, anthropology is the study of people.

MYTHS ABOUT HUMANKIND

There are several essential features about human beings, namely, the human brain, bipedalism (the ability to walk consistently on two legs) and human reproduction, but many things about humans that are believed to be true are actually myths.

THE MYTHS ABOUT HUMAN ANTIQUITY

Many people believe that humans were created last, after the stage had been set for them. According to the Bible, humanity was created on the sixth day and commanded to "subdue" the natural environment and the other living things. People who have had limited contact with evolutionary theory also believe that human beings were the last organisms to evolve.

They assume that humans were the end product of previous mistakes and experiments in nature. These ideas are incorrect. Many kinds of animals and plants evolved after the first *Homo sapiens*. In fact, in the last 5000 years, human domestication of animals has produced many new breeds. In addition, people alive today have an ancestry as long as that of any other contemporary animal species; all animals ultimately derived from the cells that originated billions of years ago. Also, the group of animals to which humans belong, the primates, has been around longer than any other kinds of mammals, such as rodents. Finally, humans are not an end product in that, like all organisms, they are still evolving.

If you were in a sarcastic mood, you might suggest that the chimpanzee on the television screen is your friend's relative. A common misconception is that people evolved from living apes. In reality, the apes are our collateral relatives; they have a common ancestor with us in the distant past. They are not our direct ancestors; one cannot evolve from a contemporary. These two species took separate paths from a common ancestor more than 5 million years ago. As the human line developed, it diverged from that of the apes.

THE MYTH OF TECHNOLOGY

In the last century people have accomplished almost unbelievable technological feats. From the invention of the steamship to the development of the spaceship, humankind's mechanical genius has been displayed. When a phone is picked up, conversation reaches people around the block or thousands of miles away through a thin, plastic-coated wire. Television creates images on a glass screen, and through holography (the projection of three-dimensional images by laser beams) a screen is not even needed. Artificial hearts and humanmade limbs, as well as genetically engineered alterations, are becoming increasingly important in medicine. Technology appears to be able to solve any and every problem that the environment presents. All that is needed is enough time, effort, money, and know-how.

Humans have the ability to think about objects and principles that do not exist. However, not everything that people dream of is possible. For example, unaided humans in their present form could not run a mile in a minute, or anywhere near it. That is believed to be biologically impossible.

Just as some things are biologically impossible, others are technologically infeasible or improbable. It is not likely that we will solve the world's food problem through technology. Even with great advances in methods of food production, more people are starving today than ever before. This is partially because population size is increasing faster than research and technology can be applied and partially because the costs of modern technology are enormous. It is also because cultural traditions often hamper progress.

A major negative aspect of modern technology is that it cannot be "unlearned." For example, many people would like all humanity to forget how to make atomic weapons, but this is not possible. Even if all nuclear arsenals were destroyed, the potential for making new weapons would remain. The reduction or elimination of nuclear weapons would eliminate the threat of an "accidental" nuclear war and could also reduce the chance of a major nuclear catastrophe, but it would not prevent any group of people from acquiring the technology needed to make new nuclear bombs.

Technology, for most people, is not the solution to loneliness or despair, nor will it alleviate hatred or prejudice. It can be a tool but not a cure. In fact, modern technology may ultimately end our existence. If technological "progress" is not accompanied by appropriate social change and ecological responsibility, people may drown in the poisons of their own industrial wastes. THE MYTH OF PLENTY

This leads us to the third myth, the idea that people can continue to increase in number forever. This is not true for two main reasons. First, the

resources that life depends on are limited. For example, green plants, the ultimate source of all animal food, receive only a finite amount of solar energy. This limits the potential amount of green plants, which in turn imposes an absolute limit on the size of the population of any animal species, including humans, for a particular environment.

The second reason that people cannot continue to increase in number indefinitely is simply the lack of space. People cannot occupy every inch of the earth's surface without cutting off their food and water supplies. That wide-open land in the American mid-west must remain wide open. It is from these and similar places that more than 250 million people in the United States obtain the majority of their food. Wheat cannot be grown in a coast-to-coast Manhattan. THE MYTH OF HUMAN SUPERIORITY

It was once thought that the sun revolves around the earth; that the earth is the centre of the universe, and that humans are the highest form of life on earth. This **anthropocentricity**, which is comforting but scientifically useless, embodies the fourth myth. It is true that, compared with other animals, humans are capable of more conscious activities that can modify the environment, yet this is only one of many criteria for superiority. For instance, the termites have been around longer than humans, and evolution has brought solutions to their problems of starvation, internal conflict, and division of labour. Termite societies are highly organized and extremely efficient. These insects, which often are considered so lowly, also greatly outnumber us. Any of these characteristics could be taken as a measure of *their* superiority. Of course, the point is that superiority is relative to the criteria being used. If human beings are superior, it is only because they define themselves as such.

HOW FREE ARE PEOPLE?

Growing out of the idea of superiority is the belief that people control their own destiny, that they possess "free will." Certainly, more variation of behavior exists among human groups and individuals than among other animals, due to the great diversity of learned behavioral patterns among humans. However, there are limitations to behavior. Free will is not so much "free" as it is confined. Every action that we take depends on our biological make up, our culture, and the environment that surrounds us at the moment. On the biological level, for example, some people simply are not equipped to be heavyweight boxing champions or mathematical geniuses. On the cultural level, patterned, learned behavior creates habitual ways of thinking that incline people to analyze experiences according to the particular customs of their culture. In other words, the choices that we make are conditioned or caused by previous events. The environment also limits what people can and cannot do - you could not go skiing in the middle of the Sahara Desert.

The proper understanding of humanity not only involves learning what people are but also requires comprehending what they are not.

Do the following exercises

1. Complete the table with the correct parts of speech and look up in a dictionary the meanings of all the derivatives:

Noun	Verb	Adjective
	behave	
evolution		
condition		
	diverge	
diversity		
		confined
	revolve	

2. Match the words on the left with their meanings on the right:

subdue	parallel	
accomplish	ray	
ancestry	carry out	
collateral	measurement	\leq
diverge	hinder	
feat	overcome	
beam	lessen	
hamper	split	
impose	variety	
alleviate	restricted	
diversity	inflict	
confined	adaptation	
adjustment	line of descent	
dispersed	achievement	
dimension	scattered	

3. Give the opposite of the following words:

Believable, feasible, aided, correct, probable, rational, literate, mortal, legal, significant, comprehensible, finite.

4. Give the plural:

Species, nucleus, genius, index, series, aurochs

5. Fill in the blanks with prepositions:

- a) Technology is not the solution ____ loneliness or despair.
- b) If human beings are superior____ all other creatures, it is only because they define themselves as such.
- c) People are not biologically divergent _____ the rest of the animal kingdom.

d) A finite amount of solar energy imposes an absolute limit _____ the size of the population of any animal species.

- e) However, there are limitations <u>behaviour</u>.
- f) The choices we make are conditioned ____ previous events.

6. Answer the following questions:

- a) Give proofs that humans were not the last organisms to evolve.
- b) What technological feats have been accomplished so far?
- c) What things are biologically impossible for humans?
- d) What things do humans find technologically infeasible and why?
- e) What does the negative aspect of modern technology lie in?
- f) How can humans reduce the negative effect of technology?
- g) Why is it incorrect to regard humans as superior?
- h) What limitations are imposed on our freedom?

de <u>Discussion</u>

Which of the myths about humankind do you share? Give your grounds.

∠ <u>Writing</u>

Render the article commenting upon the issues raised.

ОБЕЗЬЯНА ПРОИЗОШЛА ОТ ЧЕЛОВЕКА

Согласно новой теории российских антропологов нашими предками были гиганты. История человечества насчитывает сотни миллионов лет, и на всем ее протяжении шла не эволюция, а инволюция (то есть деградация) нашего предка.

"По крайней мере, четыре бедствия обрушивались на человечество за всю его историю – одно оледенение и три потопа, – утверждает антрополог Александр Белов. – После каждой катастрофы оставшиеся в живых проходили через так называемое "бутылочное горлышко" – сокращение численности прародителей буквально до нескольких семей".

Среди разнообразия популяций, по мнению ученых, непременно находились такие, которые начинали дичать и вырождаться в тяжелых условиях. Со временем они превращались в дикарей, затем в обезьянолюдей, человекообразных обезьян и, наконец, просто в обезьян. А уж последние на разных этапах своего существования деградировали в другие виды зверей, приспосабливаясь к условиям среды – водной, воздушной, подземной. Рыбы, птицы. Собаки, кроты и даже слоны – все они берут начало от одного с нами предка. Фантастика?

"Мы доподлинно не знаем, как выглядели наши предки. Одно точно: обезьянами они никогда не были – продолжает Белов. – Что касается людей-гигантов, то видимо, после Всемирного потопа около 50 тыс. лет назад их славное племя начало деградировать в больших обезьян. Людьми

осталась лишь, незначительная часть, от которых и произошло человечество".

Деграданты были во все времена. От человеческого сообщества постоянно откалываются те, кто не хочет жить по установленным нормам, предпочитая "дикое", примитивное существование. Они уходят в лес, "на природу", сбиваются в стаи, рожают детей и воспитывают их в их грубеет. соответствии со своими нравами. Со временем тело покрывается волосами, привыкает холоду. Речь исчезает за к ненадобностью. Поселения разумных сородичей они стараются обходить стороной, но случайные встречи порой происходят. Так появляются легенды о снежном человеке (йети), которые есть практически у каждого народа.

Вопросов к дарвинистам накопилась масса. Если предки человека были охотниками и питались мясом, то почему его челюсти так ослабели? Куда девались клыки? Наша пищеварительная система вообще плохо приспособлена к переработке сырого мяса, а костно-мышечная – к тому, чтобы легко и быстро лазить по деревьям. Теория Дарвина не объясняет, почему человек потерял шерсть, но заимел длинные волосы на голове.

Наконец. многочисленные опыты показывают, что обезьяна совершенно не поддается очеловечиванию. Можно выдрессировать ее, научить стоять по стойке смирно и даже произносить какие-то звуки. Но для нее все это будет элементами игры. Наблюдая за обезьянами в зоопарке, мы умиляемся: как они похожи на нас. Зачастую разыгрывают перед нами целый ритуал, спектакль. Могут водить хороводы, причитать и плакать навзрыд, бить себя кулаками в грудь, кивать головой и даже пожимать руку. Чтобы достать свисающий с потолка банан шимпанзе может поставить друг на друга ящики и взобраться наверх. Умница! Но почему она это делает? Ответ прост: в присутствии человека обезьяна "вспоминает" утерянные когда-то навыки. "Вспоминает", что и она давным-давно была существом разумным – с безволосой кожей и выпрямленной спиной.

<u>©</u> Roleplay

Act out discussion between Alexander Belov and supporters of Darwin's evolutionary theory.

III. THE BRAIN

Do the following exercise

Match each characteristic of the human brain with the appropriate explanation.

Characteristics of	Explanations
left and right	
hemispheres of the	
human brain	
1. verbal	putting things together to form wholes
2. non-verbal	using words to name, describe, define
3. spatial	thinking in terms of linked ideas, one thought directly
	following another, often leading to a convergent
	conclusion
4. logical	awareness of things, but minimal connection with
	words
5. linear	drawing conclusions based on logic: one thing
	following another in logical order – for example a
	mathematical theorem or a well-stated argument
6. synthetic	seeing where things are in relation to other things, and
	how parts go together to form a whole

<u>Listening 1</u>

Listen to the talk and answer the questions:

1. What is the crossover effect?

2. The speaker describes the results of two split-brain experiments. What do the results indicate about left and right hemisphere characteristics?

3. The speaker believes we could improve the efficiency with which we use our brain in two ways. What are they?

Listening 2

- You will hear the beginning of an interview with Edward de Bono, a man who has done much to try and develop the skills of thinking and problem solving. He is particularly interested in "lateral" (as opposed to 'logical') thinking and tells a story to illustrate the difference. Listen to the introduction and the first part of de Bono's story about the worms.
- Try to think of as many reasons as you can as to why there are only two holes.

Now listen to de Bono's answer and check your ideas with his solution.

- Can you now explain the difference between logical and lateral thinking?
- Consider these problems:

1 A man goes into a bar and asks for a drink of water. The barmaid gives him the drink and then suddenly screams. What possible explanations are there?

2 Lying on the ground in the centre of a field are a hat, a scarf, a pipe, some pieces of coal, and a carrot. What possible explanations could there be for this? 3 A man lives on the thirteenth floor of a block of flats. Every day he goes out to work, gets into the lift, and goes down to the ground floor. Every day when he comes home he gets into the lift and travels to the eighth floor, gets out, and then walks up the stairs to the thirteenth floor. Why?

Vocabulary work

1. Match the expressions from Column A with the correct expressions from Column B

Α	В
to crack one's brain(s)	вскружить кому-л. голову
to have sth on the brain	забивать себе голову
to make smb's brain reel	иметь причуды; иметь навязчивую
to pick /to suck/ smb's brains	идею использовать чужие мысли, присваивать чужие идеи
to turn smb's brain	поразить /ошеломить/ кого-л.
to addle one's brain	пустить (себе) пулю в лоб
to blow one's brains (out)	сбивать кого-л. с толку
to muddle smb's brain /mind	спятить, свихнуться
to have a maggot in one's brain	только и думать о чём-л., увлекаться
	чем-л., помешаться на чём-л.
to bear /to keep/ in mind	быть в здравом уме
to get sth off/ out of one's mind	быть в нерешительности, колебаться
to poison smb's mind against smb	быть забытым; выскочить из головы
to know one's own mind	быть не прочь что-л. сделать
to slip one's mind	быть непредубеждённым
to have an open mind	выбросить что-л. из головы
to have half a mind to do sth	запасть в душу
to be in /of/ two minds	настроить кого-л. против кого-л.
to be on smb's mind	облегчить чем-л. душу
to take one's mind off sth.	перестать думать о чём-л.
to be in one's right mind	поглощать чьё-л. внимание
to sink deep into the mind	помнить; запоминать; иметь в виду
to disburden one's mind	твёрдо запомнить что-либо
to fix sth in one's mind	твёрдо знать, чего хочешь

2. Complete the row of synonyms which mean *ломать себе голову над чем-либо*

To rack, to ... one's brains **about / with** sth

3. Out of the following list of expressions choose those that mean:

1. откровенно высказываться	2. быть одного мнения с кем-л.

to be clear in one's own mind	to keep an open mind on sth
to be of smb's mind	to let smb know one's mind
to tell smb one's mind	to speak one's mind (out)
to be of the same mind as smb	to take smb's mind off sth
to give smb a piece of one's mind	to be of the same mind
to go out of one's mind	with one mind

4. Complete the following sentences with *brain* or *mind* and translate them.

Bear that in !	I was easy [uneasy] in my
He doesn't know his own	It crossed his that
He has lost his	She has sth on her
Her blanked out.	That's beyond my
His has gone.	This brings to another story.
I called his words to	This is merely the coinage of your
Where's my?	Use your!
I don't understand how hisworks.	I set his at rest.
I have a great to speak to him.	What have you in?

5. Match the following expressions with their Russian equivalents.

two-minded	обладающий преимущественно слуховой памятью
split mind	обладающий преимущественно зрительной памятью;
	воспринимающий мир преимущественно визуально
otherwise-minded	обладающий преимущественно моторной памятью
motor-minded	беззаботный
like-minded	легкомысленный
light-minded	согласный, придерживающийся того же мнения, тех
	же убеждений
free-minded	инакомыслящий
eye-minded	раздвоение личности (при шизофрении)
ear-minded	колеблющийся, сомневающийся; в сомнениях

6. What is the difference between the following pairs or groups of words and expressions?

a. mindless/ brainless

- b. brainwave /brainwashing
- c. to have something on the brain/ to have something on one's mind

d. to have an excellent brain/ to have a good mind to

e. to rack one's brains/ to pick someone's brains

f. to be in two minds about something/ to have a mind of one's own.

7. In the following sentences replace the words in italics with a word or expression from the previous task, making any necessary changes to fit the context.

a. I've just had *a brilliant idea*.

b. She's so clever that everyone in the class asks her for ideas.

c. We really *aren't sure* whether we should buy that house or not. It's big and beautiful but it needs so much doing to it.

d. You must be *mad* to give up such a well-paid job.

e. I've *thought and thought about it* and I still can't remember where I put it.

f. We looped the loop and nosedived towards the ground - it was the most *amazing* experience. And I don't even like flying!

8. Think of English equivalents of the following sentences choosing the missing parts from the list below. Begin all the sentences with *mind*.

(Adrift, dog, eye, health, language, one's P's and Q's, one's own P's and Q's, step, your language, you write)

Следи за своими словами.	Береги своё здоровье.
Держи ухо востро!	Осторожнее!
Его мысли блуждали.	Выражайтесь повежливей!
Осторожно, ступенька.	Не забудь (те) написать.
Берегись собаки.	Не вмешивайтесь в чужие дела.

9. Translate into Russian.

powerful brain	to go out of one's mind
brain drain	to drive /to send/ smb out of his mind
brain death	to bring /to call/ to mind
brain-picking	to keep an open mind on sth
brain power	to smb's mind
brain surgeon	to have a mind to do sth
creation of the brain	to have a good /a great/ mind to do sth
mind game	to change /to alter/ one's mind
presence of mind	to set one's mind on sth
absence of mind	to read smb's mind
cheerful mind	to take smb's mind off sth
peace of mind	at the back of one's mind
mind and body	Not a word, mind!

analytical mind	Mind your own business / affairs!		
mind-reader	He has a grasshopper mind.		
to get sth into one's mind	Mind you don't forget.		
to possess unusual powers of mind	Never mind!		
the great [best] minds of our age	It is branded on my mind.		
to be in one's right mind	I took a load off my mind.		
to be of sound mind, to be sound in	It soaked into his brain.		
mind			

10. Think of the Russian proverbs which have the same meaning. Make up dialogues using some of them.

An idle brain is the devil's workshop.

So many men so many minds.

A sound mind in a sound body.

Out of sight, out of mind.

The face is the index of the mind.

He who would catch fish must not mind getting wet.

Idleness rusts the mind.

<u>Listening</u>

Listen to an interview with Tony Buzan, who has written several books on the brain and how to use it effectively.

Pre-listening task

Work in pairs.

What do you know about the workings of the brain? How does the human brain differ from that of animals? Do you think the following statements are true or false? Write T or F in each box.

1 The brain of a young child is more receptive than that of an adult.2 If the brain is regularly used and stimulated we can continue to learn
the older we get.

3 If you don't challenge your brain for as long as twenty years you will never be able to use it properly again.

4 The only permanent cause of brain deterioration is disease or physical damage.

5 People who are good with their hands are not usually very brainy.

6 The human brain has increased in size over the years.

7 Very soon the human brain will be so large that our bodies will become top-heavy.

8 Scientists believe that if human beings live permanently in the weightlessness of space, the human form will change.

After-listening task

Check your true/false answers, and amend them if necessary.

What do you think?

1. Did anything that Tony Buzan said surprise you?

2. Do you know anything about research that is being done on the functioning of the brain?

□ <u>Scan reading</u>

WHO SAYS WHO IS MAD?

You will read an extract from a book called *Mindwatching*, which describes an experiment conducted by David Rosenhan, a psychologist at Stanford University in California.

Read the extract quickly and decide which of the following was the main purpose of the experiment.

Was the aim to prove that:

- psychiatrists are too quick to admit people to mental homes?
- psychiatrists and doctors are out of touch with their patients?
- it is often very difficult even for psychiatrists to distinguish between the sane and the insane?
- all supposedly sane people have elements of insanity?

Now read the extract in more detail and answer the questions.

1. Rosenhan wondered what would happen if a number of entirely sane people attempted to gain admission to a mental hospital by pretending to have one of the symptoms of insanity. Would these 5 sane individuals be classified as insane? If they were admitted to the mental hospital, would the staff realize that a mistake had been made?

2. The answers to these and other questions were obtained in a study in which eight normal people, five men and three women, attempted to gain admission to twelve different psychiatric hospitals. They consisted of a young psychology graduate, a paediatrician, a psychiatrist, three psychologists, a painter, and a housewife. The twelve psychiatric hospitals were located in five different states on the East and the West Coasts of America. They also varied considerably, ranging from relatively new to old and shabby, and from good staff-patient ratios to severe under-staffing.

3. Each of the eight participants phoned the hospital asking for an appointment. Upon arrival at the admissions office, each of them complained of hearing voices (these voices were often unclear, but appeared to be saying "empty", "hollow", and "thud": they sounded unfamiliar but were of the same sex as the participant).

4. The only important elements of deception were the claims about hearing voices and falsification of the participants' names and occupations: the significant events in each participant's life were described as they actually happened. All of these sane people were judged to be insane, and all of them were admitted to hospital, apparently on the basis of their hallucinations. One of them was diagnosed as suffering from manic-depressive psychosis; the others were diagnosed as schizophrenic.

5. As soon as these pseudo-patients had been admitted to the psychiatric ward, they stopped simulating signs of abnormality, although several experienced a brief period of nervousness and anxiety, because they felt they would immediately be exposed as frauds, which would be highly embarrassing.

6. While they were in the psychiatric ward, the pseudo-patients indicated that they were fine and no longer experienced any symptoms. In general, they behaved in a friendly and co-operative way. The only unusual aspect of their behaviour was that they spent a fair amount of time writing down their observations about the ward, its patients, and the staff. To begin with, these notes were written secretly, but as it gradually became clear that no one took much notice, the note-taking was done quite openly.

7. The hierarchical structure of the various psychiatric hospitals was such that those of greater professional status had the least to do with their patients (and pseudo-patients). The average daily contact of the pseudopatients with psychiatrists, psychologists, and doctors was 6.8 minutes. In view of this general lack of careful observation by those in authority, it is not surprising that the pseudo- patients were not released very quickly. The actual length of hospitalization ranged from 7 to 52 days, with 19 days being the average.

8. The fact that all the pseudo-patients were released within a few weeks of admission may suggest that the psychiatric staff discovered that the pseudopatients had been sane all the time. However, this was not the case. All the pseudo-patients were discharged with a diagnosis of "schizophrenia in remission" indicating that the deception had not been detected.

9. Interestingly, several of the real patients became suspicious about the pseudo-patients. The first three pseudo-patients were placed in wards containing a total of 118 patients, 35 of whom voiced their doubts. They said things like, "You're not crazy. You're a journalist, or a professor. You're checking up on the hospital." However, most of them were reassured by the pseudo-patients' insistence that they had been sick before they came into hospital though they felt fine once they had been admitted. Nevertheless a few of the bona-fide patients continued to voice the opinion that the pseudo-patients were sane.

10. If we accept these findings at face value, they suggest that the distinction between the sane and the insane is so blurred that it is entirely

possible for the sane to be mistaken for the insane, at least by psychiatrists. Rosenhan wondered whether he could show the opposite effect, namely the insane being regarded as sane. He used as his testing ground a research and teaching hospital. The staff there had heard about the study just described, and had informed Rosenhan that they would not have proved so gullible.

11. The first thing that Rosenhan did was to tell the staff of this hospital that one or more pseudo-patients would attempt to gain admission at some time during the following three months. Each member of staff was asked to observe all patients who presented themselves for admission or in the ward and say whether they thought they were pseudo-patients or genuine patients.

12. Judgements were obtained on a total of 193 patients admitted for psychiatric treatment. Forty-one genuine patients were judged with great confidence to be pseudo-patients by at least one member of staff. Nineteen patients were suspected of being frauds by one of the psychiatrists and another member of staff. In fact, none of Rosenhan's pseudo-patients sought admittance during this time. Apparently, then, mental hospital staff do sometimes think that people committed to their care are sane.

13. Rosenhan's main conclusion, which is tremendously important if it is true, was as follows: It is clear that we cannot distinguish the sane from the insane in psychiatric hospitals.' Part of the problem may be that, under normal circumstances, doctors and psychiatrists are more inclined to call a healthy person sick than a sick person healthy. It is obviously dangerous for a doctor to fail to take appropriate action when a sick person asks for treatment. A psychiatrist who refuses to hospitalize someone who has suspicious symptoms and asks to be hospitalized may face legal action if the patient subsequently commits suicide or murder, so it is natural for him to err on the side of caution.

Which paragraph(s) do the following summaries refer to?	
a. how the pseudo-patients behaved while they were in the hospital	
b. how we know that the deception was not detected	
c. the reasons for the original experiment	
d. the supervision of patients in the hospital	
e. the kind of people who were selected for the experiment	
f. the reaction of the real patients to the pseudo-patients	
g. how the pseudo-patients deceived the experts to gain admittance	
h. Rosenhan's conclusion	
i. the results of the second experiment	
j. the reasons for the second experiment	
k. how the second experiment was set up	

Vocabulary work

1. How many synonyms or near synonyms can you think of for the words *stupid*, *intelligent*, *mad*?

2. Which of the words and expressions you have collected are used to describe the medical condition?

3. Which can be used more informally?

4. The following are dictionary definitions of words or phrases in the text. Find these words. The definitions are presented in the same order as the words appear.

a. to be in bad repair or condition
b. dull sound, as of a blow on something soft
c. person or thing that deceives
d. real or genuine
e. what something seems to be from appearances
f. unclear and confused
e. easily deceived or cheated

Work in groups of three.

- Without looking back at the passage, make notes under the summary headings, using them in the right order.
- Still in groups, work together to produce a summary of the extract, using appropriate linking words to join your ideas.

What do you think?

- 1. Are you surprised at the results of these experiments?
- 2. These experiments took place in the USA. Do you think that attitudes to psychiatry are different there from those in your own country? If so, how and why?
- 3. Would you agree to take part in such an experiment if it were held in your country?

∠ <u>Writing</u>

Translate the following sentences using the active vocabulary.

1. Псевдопациентам удалось попасть в клинику и их не разоблачили как обманщиков.

2. Она была так доверчива и принимала все за чистую монету.

3. Если пациент покончит жизнь самоубийством, врача могут преследовать по закону, поэтому естественно, что он ошибается из осторожности.

4. Ложных больных выписали с диагнозом шизофрения в стадии ремиссии, что означало, что обман не был раскрыт.

5. Границы между здравомыслием и безумием расплывчаты. Некоторые люди полагают, что в нормальном мире безумия гораздо больше, чем за стенами психиатрической клиники.

IV. MAN AND SPACE

□ <u>Intensive reading</u>

- Read each complete paragraph.
- Select and write down all the main points/facts.
- Think of a title that shows the subject matter.

Man has always been curious and since prehistoric times he has looked for new lands to conquer. First he explored his cave, then the land, next the sea and eventually the air. Now, finally, Man is exploring space and his dream of leaving the Earth has come true.

This wish to leave the Earth and reach other planets was first mentioned in the second century AD when a Greek, Lucian of Samos, wrote two fantasies about men who went to the Moon; one used a pair of wings made by himself while the other was carried there by a waterspout during a storm. The Moon was the obvious destination in early literature as it is the nearest planet to the Earth and has clearly visible markings which led to imaginative conjecture about life there.

But after Lucian, for the next 1,400 years no other writings about travelling to the Moon have survived. Man seemed content in his belief that the Earth was the most important planet in the centre of the universe and therefore there was no necessity to leave it. This view was reinforced by the Christian Church and in 1543 Copernicus was condemned as heretical when he published his revolutionary theory that the Sun was the centre of the universe and the Earth, Moon and other planets revolved about it. Although this theory was criticised it started men thinking about the stars again.

Not long afterwards the first telescope was invented in Holland and Galileo, the brilliant Italian astronomer, used one to explore the heavens and discover much new information about the planets. When his observations were published in 1610 the Church threatened to excommunicate him so he retracted most of his statements. But Man's imagination had been stirred by this new knowledge and in 1634, Kepler, the German astronomer who had discovered how the planets moved round the Sun, published a story about a journey to the Moon. His hero was transported there by "magic moon people" who could fly through space. Included in the story was a detailed description of the Moon's surface which Kepler had seen through his telescope.

After Kepler's book, there were many more stories about space travel and voyages to the Moon. Mostly they were fantasies but some contained attempts at scientific reasoning. Then in 1640, Bishop Watkins wrote the first serious discussion of space travel, describing physical conditions on the Moon and proposing ways in which Man could possibly live there. Rockets were first suggested as spaceships by Cyrano de Bergerac in two space adventures written in 1649 and 1652. He was also the first writer to send his space travellers to the Sun as well as to the Moon.

But when these books were written over 300 years ago, no one seriously thought that it would be possible to travel in space. It was not until Jules Verne, the French novelist, wrote his famous story "From the Earth to the Moon" in 1865 that any attempt was made to apply known scientific principles to spacecraft. Man had been experimenting with flying ever since 1783 — the advent of the first hot air balloon. But although various gliders and airships were invented, it wasn't until 1903 that the first powered flight was made by the Wright brothers in a wooden biplane. By this time H. G. Wells had already published his famous space stories, "The Time Machine" and "The First Men on the Moon", so once again writers were leading the way. Wells' prophecy, in the latter story, wasn't to come true until 1969 when the two Americans, Armstrong and Aldrin, finally stepped out on to the Moon's surface.

Since then rockets have landed on Venus and Mars and with the launching of the space shuttle, it will not be long before men visit other planets. Then it will be interesting to see if Wells' other prophecy will come true and man will travel faster than light. Will he, in fact, build his own time machine and travel through time as well as space? Many modern science fiction writers have gone far beyond this speculation and have their heroes teleporting from spaceship to planet with the greatest ease, dematerialising and materialising again at will, and making loops with time to unite past and future without effort. How much of this will come true we can only guess. But one thing we can be sure of is that writers will continue to stimulate our imagination with marvellous adventures, spectacular prophecies and astounding ideas, some of which, no doubt, will come true and change fiction to fact.

Self-access work

Do research and find out the latest breakthroughs in space exploration.

Listening 1

ARE WE ALONE?

Pre-listening task

Match the following expressions used in the discussion to their meaning.

• to put the cat among the	Unidentified Flying Objects, Flying Saucers
pigeons	
• quite categorically	• without fear of contradiction
• mumbo-jumbo	object of foolish veneration or fear
• UFOs	• expressions used in science fiction stories
humanoids	• to stir up trouble
• frightening people out of	• terrifying people to the point of madness
their wits	

• pins and needles	• tingling sensation when recovering from numbness
• escapism	• form of entertainment during which worries
	are forgotten
• sci-fijargon	• beings which physically resemble humans

Discuss the answers to the following questions.

1. What do we know about the three speakers taking part in the discussion?

2. What are Professor Betts' views on **extra-terrestrial intelligence**?

3. Why does Dr Barry describe Professor Betts' statement as "a rather **facile** assumption"?

4. In what way have the "highly sophisticated instruments" referred to by Dr Barry proved disappointing?

5. What does Professor Betts mean by the phrase "thinking of life in terms of humanoids"?

6. What has been one of the major factors in the evolution of Man?

7. Why does Professor Betts believe that Man is incapable of understanding the universe?

8. What do people seem most concerned about when they have seen the film "The Lost Galaxy"?

9. Who is Cosmos?

10. How does Stewart Rider feel about science fiction in general?

Listening 2

LECTURE

- Listen to each complete sentence.
- Number and underline all main points.
- Jot down any relevant details under the main points.
- At the end of the lecture, write down a title which clearly states the topic/subject.

After listening

Find the English equivalents of the following as used by the lecturer:

Инопланетяне, наблюдение за НЛО, аура, подвержен, склонен к чемулибо, исчезать, размазанный, нечеткий, вмятина в земле, не имеющий обыкновения лгать, совпадение, шаровая молния, северное сияние, не принимать во внимание, мираж, отбросить как подделку, шутка, обман, мистификация, падение, сползание

Answer the questions:

1. What evidence do believers have to support their belief in the existence of UFOs?

2. What three types of encounter evidence does the lecturer give?

- 3. What are non-believers' arguments?
- 4. What counter arguments do they give against the encounter evidence?
- 5. What is Dr Hynek's opinion of UFOs?

<u>Listening 3</u>

INTERVIEW WITH CARL SAGAN

Comprehension check

Say if the following sentences are true or false?

1. Dr Carl Sagan has been involved in the Cosmos project.

2. There's been much argument recently, especially in California, about man's origin.

3. There is compelling evidence that we are just another animal.

4. Dr Sagan finds the idea of man's connection to primates peculiar.

5. The creationists claim that the world was created by God.

6. According to Dr Sagan all the matter in the universe was confined to an extremely small volume.

7. The creation of the universe is called the Big Bang.

Vocabulary work

Correct the mistakes in the following sentences:

1. There are already well-substantial reports of the signals being received from a planet outside our own galaxy.

2. You have to remember that life forms on Earth had evolved largely as a result of adaptation in the conditions on this planet.

3. At a small village in south-east of England sights of UFOs regularly reported dedicated amateurs whose findings are then reported to world-wide interplanetary associations.

4. Armed by binoculars, cameras and recorded equipment, increasing large number of people spend hours in watching and waiting the appearance of these apparent benevolent visitors from space.

5. Man had always been curious and since prehistoric times he had looked at new lands to conquer.

6. In 1543 Copernicus condemned as heretical when he published his revolutionary theory that Sun was the centre of the universe and Earth, Moon and other planets were revolved about it.

7. Not long afterwards first telescope was invented in Holland and Galileo, brilliant Italian astronomer, used him to explore the heavens and discover many new information about the planets.

8. But when these books had been written over 300 years ago, no one seriously thought that it will be possible to travel in space.

9. Many of reports of UFOs have curious similarity: objects generally described as disc- or cigar-shaped.

10. Certain photographic evidences of UFOs have also been produced, although many of the prints are unclear or blurred.

11. This third kind of encounter is most difficult to believe, although many of witnesses appear to be sensible men and women not giving to lying.

12. Photographs dismiss as fakes or as pictures of aircraft made from unusual angles.

13. The evidence for their existence is rather weak, but from the other hand, there are certain strange phenomena which cannot be explained scientifically at the moment.

Translate the following into English.

1. Люди верят во всякие фетиши, небесные существа, НЛО, не говоря уже об астрологии с присущими ей предрассудками.

2. Уже есть вполне обоснованные сообщения об исследованиях при помощи очень "умных" приборов, доказывающие существование внеземного разума.

3. Думать о внеземной жизни категориями гуманоидов является опасным заблуждением.

4. Писатели-фантасты до смерти напугали людей недоброжелательными пришельцами.

5. Это чистое самовнушение предполагать, что свидетельства о появлении НЛО приведут человека к заключению о том, что его мечта о внеземной цивилизации осуществилась.

6. Галилей отрекся от большинства своих утверждений под угрозой отлучения от церкви.

7. Люди, которые часто видят НЛО, свидетельствуют о вмятинах или оплавлениях земли.

8. Фотосвидетельства НЛО расплывчаты, и похожи на шаровую молнию или на северное сияние.

9. Люди, не склонные ко лжи, отвергают показания об НЛО как миражи и отметают подобные фотографии как фальшивки.

10. Не существует убедительных доказательств или вразумительного объяснения сотворения мира.

V. MODERN TECHNOLOGIES

Vocabulary work

Exercise 1.

Complete definitions 1-15 with words and expressions from the box. You will not need all of the words and expressions from the box.

analyze bioclimatology biology breakthrough cellphone chemistry computers control cryogenics cybernetics development digital discover discovery e-mail experiment genetic engineering genetic fingerprinting genetic modification geneticist information superhighway information technology (IT) innovation Internet invent invention life expectancy microchip modified molecular biology nuclear engineering physics research safeguard scientist technocrat technologist technophile technophobe

1. ______ is a practice or science of changing the genes of a living thing, especially in order to make it more suitable for a particular purpose.

2. A ______ is a rule, law or plan that protects people or something from harm or problems.

3. ______ is the study of living things.

4. A ______ is someone who does not like, trust or want to use technology, especially computers.

5. A ______ is a discovery or achievement that comes after a lot of hard work.

6. ______ is the study or use of computers and electronic systems for storing and using information.

7. If something is ______, it is changed slightly in order to improve it.

8. A ______ is a scientist who studies or works in genetics.

9. ______ is the use of technology to make copies of natural things (for example, artificial body parts).

10. A ______ is a scientist or other technical expert with a high position in industry or government.

11. ______ is the detailed study of something in order to discover new facts.

12. ______ is the science that studies the effects of low temperatures, especially the use of low temperatures for preserving the bodies of dead people.

13. An ______ is a scientific test to find out what happens to someone or something in particular conditions.

14. ______ is the length of time that someone is likely to live.

15. _____ is the invention or use of new ideas, methods, equipment etc.

Exercise 2.

Use your dictionary to check the meanings of the other words and expressions in the box.

Exercise 3.

Complete this essay with appropriate words and expressions from the box in Exercise 1. You may need to change the form of some of the words. "Science and technology have come a long way in the last 60 years and our lives have become better as a result. Do you agree with this statement?'

The second half of the twentieth century saw more changes than in the previous two hundred years. Penicillin has already been (1) _____ and used to treat infections; there have been many remarkable advances in medicine that have helped to increase our average (2) ______ way beyond that of our ancestors. Incredible (3) ______ such as television have changed the way we spend our leisure hours. Perhaps the most important (4) however, has been the microchip. Nobody could have imagined when it was first (5) _____, that within a matter of years this tiny piece of silicon and circuitry would be found in almost every household object from the kettle to DVD recorder. And nobody could have predicted the sudden proliferation of computers that would completely change our lives, allowing us to access information from the other side of the world via the (6) _____ or send messages around the world by (7) ______ at the touch of a button. Meanwhile, (8) _____ into other aspects of information technology is making it easier and cheaper for us to talk to friends and relations around the world. Good news for (9) ______ who love modern technology, bad news for the (10) ______ who would prefer to hide from these modern miracles.

But everything has a price. The development of (11) ______ led to mass automation in factories, which in turn led to millions losing their jobs. The genius of Einstein led to the horrors of the atomic bomb and to the dangerous uncertainties of (12) ______ (we hear of accidents and mishaps at nuclear power stations around the world, where (13) ______ to prevent accidents were inadequate). The relatively new science of (14) ______ has been seen as a major step forward, but putting modified foods onto the market before scientists had properly (15) ______ them was perhaps one of the most irresponsible decisions of the 1990s. Meanwhile, pharmaceutical and cosmetic companies continue to (16) ______ on animals, a move that many consider to be cruel and unnecessary.

Of course we all rely on modern science and technology to improve our lives. However, we need to make sure that we (17) ______ it rather than the other way round.

Exercise 4.

Replace the words and phrases in **bold** in the sentences with a suitable alternative from the box.

advances analysed breakthrough combined cybernetics development discovered experimented genetic engineering innovations invented life expectancy molecular biology nuclear engineering proliferated react research safeguards a technophile a technophobe 1. The company is carrying out **scientific study** to find a cure for AIDS. _____

2. The **planning and production** of the new computer system will take some time.

3. Modern home entertainment systems and other **modern inventions** are changing everyone's lives.

4. Some elements change their chemical composition when mixed with water.

5. The scientists have created a new machine to automate the process.

6. Who was the person who **found** penicillin? _____

7. When the food was **examined closely and scientifically** it was found to contain harmful bacteria.

8. Rain **joined together** with CO₂ gases produces acid rain.

9. Ron is terrified of modern technology.

10. Geoff is very interested in modern technology.

11. Protection against accidents in this laboratory is minimal.

12. The companies **performed scientific tests** with different types of glue before they found one that worked properly.

13. Brian is studying the techniques used to change the genetic composition of a cell so as to change certain characteristics that can be inherited.

14. Sarah is studying the things which form the structure of living matter.

15. Christine is studying how information is communicated in machines and electronic devices in comparison with how it is communicated in the brain and nervous system.

16. Neil is studying **the different ways of extracting and controlling energy from atomic particle.**

17. There has been a sudden success in the search for a cure for cancer.

18. The number of years a person is likely to live has increased a great deal thanks to modern medicine and technology.

19. The number of schools offering computer programming courses has **quickly increased** in the last ten years.

20. In spite of all the **progress** it has made in the last 50 years or so, medical science still knows little about the brain.

Exercise 5.

Now try this essay. Use words and expressions from the box in Exercise 1, and any other words or expressions that you think would be relevant.

What, in your opinion, has been the single most important scientific or technological development of the last fifty years? Use specific reasons and details to support your answer.

Exercise 6.

1. Choose the most suitable word for each space

When faced with some new and possibly bewildering technological change, most people react in one of two (1) _____. They either recoil from anything new, claiming that it is unnecessary, or too (2) _____ or that it somehow makes life less than (3) _____. Or they learn to (4) _____ to the new invention, and eventually (5) _____ how they could possibly have existed without it. (6) _____ computers as an example. For many of us, they still represent a (7) _____ to our freedom, and give us a frightening sense of a future in which all (8) ______ will be taken by machines. This may be because they seem mysterious, and difficult to understand. Ask most people what you can (9) _____ a home computer for, and you usually get (10) _____ answers about how "they give you information". In fact even those of us who are familiar with computers, and use them in our daily work, have very little idea of how they (11) . But it does not take long to learn how to operate a business programme, even if things occasionally go wrong for no apparent reason. Presumably much the same happened when the telephone and the television became (12) _____. What seems to alarm most people is the speed of (13) _____ change, rather than change itself. And the (14) _____ that are made to new technology may well have a point to them, since change is not always an improvement. As we discover during power cuts, there is a lot to be said for the oil lamp, the coal fire, and forms of entertainment, such as books or board games, that don't have to be (15) _____ in to work

1) A) moments	B) kinds	C) ways	D) types	
2) A) complicated B) much		C) obscure	D) tiresome	
3) A) formerly	B) lively	C) personal	D) human	
4) A) adapt	B) react	C) conform	D) use	
5) A) decide	B) wonder	C) suppose	D) admit	
6) A) Discuss	B) Propose	C) Take	D) Thus	
7) A) hazard	· · · · ·		D) threat	
8) A) measures B) decisions		C) chances	D) instructions	
9) A) run B) apply		C) learn	D) use	
10)A) vague	B) such	C) up with	D) hundreds	
11)A) are	B) work	C) manage	D) consist	
12)A) in existence	B) widespread	C) through	D) extensive	
13)A) future	B) machinery	C) physical	D) technological	
14)A) objections	B) appliances	C) criticisms	D) fears	
15)A) wired	B) batteries	C) plugged	D) connected	

2. Answer the questions:

a) The author states people react to technological advances in two ways. What are they?

b) Do you agree that change is not always an improvement?

c) How do you adapt to new inventions?

d) Are you good at using a computer? What can it be used for?

Discussion

They say the invention of the computer can be compared to the discovery of fire or the use of the wheel.

Language Focus

Insert the postpositions on, up, off, down, out, into, on/in in the gaps:

- 1. You need to connect _____ your modem to the telephone line.
- 2. You need to log _____ before you can start using it.
- 3. After you finish, you need to log _____.
- 4. There was a fire and they had to shut _____ the main computer.
- 5. It takes ages for my computer to boot _____ in the morning.
- 6. I turn it _____ and go _____ for a coffee.
- 7. I need to key these data _____ the database.
- 8. All you have to do is to type _____ your name and address.
- 9. You need to back _____your important files.

10. We'll have to wait whilst the computer powers _____. Then we can start.

- 11. I'll print _____ the relevant information.
- 12. Remember to switch this _____ when you are not using it to save power.
- 13. You need to switch it _____ using this button before you can use it.
- 14. They were able to hack _____ Microsoft's system and steal the passwords.
- 15. We cannot access the file. The computer has gone _____.

Use a verb from the top box and a particle from the lower box to complete each sentence. The missing word(s) can be a verb, an adjective or a noun.

switch	hack	type	back	scan	boot	shut	
print	pull	рор	go	log	scroll	add	click

down	out	on	up	in	in	down	
on	down	on	into	up	down	up	in

1. _____ the link below to visit our web site.

2. Select "options" from the _____ menu.

- 3. The printer didn't work because I'd forgotten to ______ it ____!
- 4. I stuck a _____ of the e-mail on the wall.
- 5. Close all programs before you _____ your computer.
- 6. You can _____ your photos and e-mail them to friends.
- 7. _____ vital documents on floppy disk to avoid losing them if your system crashes.
- 8. The computer sometimes takes ages to ______when I turn it on.

9. You'll need a password to ______.10. You can download various ______s that allow your existing software to do even more things.

11. A teenager managed to ______ the bank's main database.

12. I hope the computer doesn't again or I'll never finish this work.

13._____ the page until you find the item you want.

14. your password and press "enter".

15. If you click on the right mouse button a _____ menu will appear.

□ Reading Read the following article and do the following tasks.

The Internet

The Internet has been perhaps the most outstanding innovation in the field of communication in the history of mankind. During our evolutionary journey from Homo erectus to Neanderthal and then to Homo sapiens, we have come a long way. Because of our continuous quest for more amenities and better standard of living, we have been able to invent and discover many new things. The nineties witnessed a major revolution with the invention of the first electronic digital computers. With the advent of the Internet, our earth has virtually reduced in size and has attained the form of a global village. The Internet can be explained as a network of computers, designed to receive and send data in the form of e-mails, blogs, webcasts, etc. To put it simply, it can be likened to a super-massive server, armed with a plethora of information which is used by billions of people simultaneously. All modern technologies are connected by the Internet, thereby leaving no stone unturned. This digital world can be a playground for some and a battlefield for others. The Internet has become an indispensable business tool, which has helped bring the world closer. Receiving news from across the world, accessing knowledge resources, and shopping online are simply a click away.

The Internet has a tremendous potential and a lot to offer in terms of services.

• Faster Communication The Internet has been mankind's greatest means of communication yet. Newer innovations are only making it faster and more reliable. Today, we can initiate real-time communication with someone who is in another part of the world. For more personal and interactive communication, it is possible to avail the facilities of video conferencing, chat and messenger services. With the help of these services, the geographically fragmented countries have come together to form a community that is able to share its thoughts on global issues, that affect each and every one of us. The Internet has given us a common platform and medium through which we are able to explore other cultures and ideologies.

•Abundant Information Resources The Internet is a treasure trove of information which offers knowledge on any given topic under the sun. Search engines make information accessible on various subject matters such as, government law and services, trade fairs and conferences, market information, new innovations and technical support, and even **dispense advice** on love and relationships matters. It has become common practice to seek assistance from the web in order to research and gather resources for homework, office presentations, and supplement one's own research. The web also updates news about the latest breakthroughs in the field of medicine, technology, and other domains of science. Numerous websites, such as America's Doctor, have made it possible to seek online advice from specialist doctors without having to actually fix an appointment.

•Inexhaustible Education The Internet has become an essential propagator of knowledge, both through free as well as paid services. The credibility of this form of education and whether it is safe, secure, and trustworthy, is usually proven through the quality and authenticity of content presented by each website. The World Wide Web has become a remarkable avenue for the academically unprivileged, to amass greater knowledge and know-how on subjects. The entire scope of homeschooling has expanded because of increased accessibility to videos of teachers giving lectures, showing diagrams and explaining concepts, much like a real classroom. Nonprofit organizations too have opened websites that seek volunteers and donations in order to help those in need. There are also sites like Wikipedia, Coursera, Babbel, Archive, and Teachertube, among others, that have dedicated themselves to the art of imparting knowledge to people of all age groups.

•Entertainment for Everyone Entertainment is one of the foremost reasons why people prefer **surfing the Web**. In fact, the Internet has gained much success by marketing for several multifaceted entertainment industries. Finding the latest updates about celebrities and exploring lifestyle websites have become day-to-day activities of many Internet consumers. On the other hand, even celebrities are using the Internet effectively for promoting their cause and for keeping their fans happy. There are innumerable games that can be downloaded, either for a price or for free. Indeed, online gaming has tasted dramatic and phenomenal success because of its ever-increasing demand throughout the world.

•Social Networking and Staying Connected One cannot imagine a social life without Facebook or Twitter. These portals have become our means to stay connected with friends and family, and stay in touch with the latest happenings in the world. Social networking has also evolved as a great medium to connect with like-minded individuals and become a part of interesting groups and communities. Apart from finding long-lost friends, the Internet also makes it easier to search and apply for jobs and business opportunities on forums and communities. There are public chat rooms where users can meet new people. For those who are single, the Internet also provides the option to select a suitable dating partner through secure online profiles that can be filtered as personal preferences.

•Online Services and E-commerce Thanks to numerous monetary services, we can perform all our financial transactions online. We can book tickets for a movie, transfer funds, **pay utility bills and taxes** without having to leave our homes or offices. Travel websites for instance, offer quick booking schemes and plan itineraries as the preferences of their clients. E-commerce is used for all types of business that involve the transfer of money through the Internet. Online transaction of money has become the norm with almost all kinds of business. E-commerce, with its vast reach of variety of products and services, makes it possible to have the client's orders delivered at their doorsteps. Websites such as e-Bay allow customers to bid, buy, sell, and even auction products online.

However, like every other innovation in science and technology, the Internet comes with its own disadvantages.

•*Theft of Personal Information* The use of Internet for banking, social networking, or other services, often makes our personal information **vulnerable to theft.** There are no fail-proof ways to secure names, account numbers, addresses, photos, and credit card numbers from being stolen or misused by thieving websites and individuals. Unscrupulous hackers can access our sensitive information through unsecured connections by planting phishing software. Needless to say, the damage caused by having our identities misused and our accounts broken into, is often irreparable and most of all, embarrassing.

•Spamming Spamming refers to sending unwanted e-mails, which serve no purpose and needlessly obstruct the computer system. Such illegal activities can be very frustrating as it makes it slower to access our email accounts and makes the entire service unreliable for consumers. Spammers usually use bots that bombard the receiver with an endless line of advertisements. This can prove to be increasingly perplexing, as it keeps getting mixed with our more important e-mails. Fortunately, e-mail service providers often have security systems in place **to guard against spamming.** It is possible to report an e-mail as spam, so that all emails from the same email id or IP address are blocked.

•*Malware Threats* One of the most annoying problems with the Internet is the ease with which any malware can infect our computers. Internet users **are often plagued by virus attacks** that harm their computers and important files. Virus programs are **inconspicuous** and may get activated simply by clicking a seemingly harmless link. Computers connected to the Internet **are extremely prone to IP targeted virus attacks** that may end up crashing the system completely. The Internet virus can be of three types. The first type of a virus affects files and goes directly for a particular file or file type. The second type harms system and **executable boot files.** It can be particularly nasty, as it can effectively stop the computer from starting again. Lastly, there's a macro virus, which is the most common, as well as the most harmless of them all. The macro virus simply keeps changing things like symbols on word files. The type of a virus that can replicate and spread itself is known as worms. When a virus is disguised as something else, it's known as a trojan.

•Age-inappropriate Content Pornography and Age-inappropriate Content is perhaps the biggest disadvantage of the Internet, the worst being underage porn, which is largely **rampant** in the deeper parts of the web. It is the lack of control over the distribution and unrestricted access of pornographic material that is detrimental to children. All that parents can do is to lock harmful sites and monitor the sites viewed by their children. Pornography **is not just frowned upon by most societies**; it's also banned by some. The Internet makes uploading shocking content so easy that we end up coming across inappropriate words and images, despite not wanting to.

•Social Isolation, Obesity and Depression The biggest problem with having the Internet is its ability to create rifts between the real and virtual world. The virtual world can often seem so alluring that once hooked, going back to real life seems daunting. There is an addiction for everything that pertains to the web and that includes excessive surfing, online gambling, social networking, and gaming addiction. There are now psychiatric clinics and doctors that specifically cater to resolving the problems created by the Internet. These addictions create both physical as well as mental issues that can lead to health complications if left unattended. It is ironic that, while it is easy to find plenty of online support for agoraphobia, the Internet itself can be a big cause or trigger for it. The link between obesity and the Internet is rather easy to understand. The more one sits in front of the computer, the less one exercises. At the end of the longish list of physical and emotional maladies is depression. Since all problems are so deeply linked with one another and with the Internet, it isn't uncommon for people to be afflicted with multiple issues. Recent studies and research have gone deep enough to actually differentiate between compulsive Internet use and excessive Internet use. Furthermore, thanks to smart-phones, holding a simple face-to-face conversation seems out of the ordinary as compared to chatting online. Thus, even though the Internet has the potential to make our lives simple and convenient, it also holds the power to wreak havoc.

Nonetheless, the greater magnitude of its advantages outweighs its disadvantages. With prudent use, we can manage to harness its unlimited potential and steer clear of its adverse effects.

Paraphrase and comment on the boldfaced words and expressions within the context. Translate them into Russian.

Discussion

Team up in groups and discuss the following statements. Think of pros and cons to back up your viewpoint.

- The virtual world can often seem so alluring that once hooked, going back to real life seems daunting.
- This digital world can be a playground for some and a battlefield for others.
- Unscrupulous hackers can access our sensitive information through unsecured connections by planting phishing software.
- The greater magnitude of the Internet advantages outweighs its disadvantages.

Image: Reading for discussion

HOME ALONE

"As workers we are like bees and our instinct is to hive" says GILES COREN

Working from home was going to be the social revolution of the 1990s. A combination of factors - better and cheaper home computers, modems and faxes, fibre-optic technology was going to make it easier. Everything from air pollution to sexual harassment was going to make it desirable. And business fashion was going to make it inevitable.

It has begun to happen, and the deluded workers who remain in the office are fewer, more miserable, more tired, more stressed, more ill. Downsizing, rightsizing, outsourcing has sent us scattering to the green belt to rear nuclear families, keep dogs, bake bread, and file our wage-earning efforts down telephone lines.

It sounded like a dream lifestyle. Every consideration was catered for. Except one – loneliness.

Human beings like to bustle. They like to fuss and fidget, and grumble and gossip, they are gregarious by nature, and while good friends and family are important, it is the wide cast of passing acquaintances and low-grade office enemies that keep us ticking over. We may be social animals, but as workers we are bees. And our instinct is to hive.

"I think we are beginning to see the end of this fashion for moving out to Cornwall with a modem, or setting up a post office in West Wales," says the occupational psychologist Peter Forsyth, of Career Analysts Ltd, which advises people on just such job changing issues as this. There was a huge rush out of the office in the heyday of downsizing, back in the early Nineties. Big corporations were laying people off and they were taking their redundancy payments and seeing it as an opportunity to set up on their own.

But the price they paid was loneliness. Suddenly they found they were missing people - those informal chats over coffee, or a sandwich in the canteen. We are a gregarious race, and it is part of the human psyche to need interaction with others - both for friendship, and for advantage, which is networking. But surely the home working life must suit some people. "About one fifth of the workforce is suited to working from home," says Mr Forsyth. "We can run a psychometric test that will determine how each person will respond to it. We would be looking for strong independence indicating high autonomy. Low anxiety is very important, as is imaginativeness and detachment. It is a profile that does not fit many people."

"The big boom in working from home was all a bit of an overreaction", he says. "And it is already coming to an end. As people realise that it was not all it was cracked up to be, the wine circles and other groups are filling up with lonely people, and I anticipate fairly soon doing a lot of work with people, trying to setback into the office."

If further evidence were needed that the boom in working from home is creating a craving for human interaction, look at the swelling memberships of such organisations as the Royal Horticultural Society which has risen by 30 per cent and the Ramblers' Association which has seen its ranks increase by 40 per cent. We are just too gregarious to work from home, and our impulse to yak, natter and distract ourselves is seeing us run to whichever groups will have us, to get our fix of social interaction.

In the village of Blewbury, in Oxfordshire, the writer and publisher Stephen Gaymer, who had moved out from Putney, very quickly missed the buzz of office life and set up the Home Alone Club with an advertisement in the *Blewbury Bulletin*. Soon he had architects, gardeners, accountants and animators beating a path to his door, selected on the simple question "do you work with people" to weed out interlopers. Last month they even had their first Christmas party.

Then there is the Freelancers' Convention, a group of freelancers, mainly writers, who gather once a month for lunch to "create a metaphor for office chitchat and ribaldry".

Michael Wright, who has been a freelance writer for the past five years, was a founder member: "Working alone at home all day, you can begin to feel rather isolated. We set up this group to give ourselves a sort of virtual community. The whole point of the freelance life is the freedom, from the bitterness of office politics as much as anything else. But you are working in a vacuum, and your need was of alleviating that pressure." Meeting in pubs and restaurants on the last Friday of each month since March 1996, by November the group was up to 123 regulars, and in December, of course, the office party came.

"Half the stuff we talk about is general day-to-day gossip, who's in, who's out, the rubbish that people in offices take for granted. It is not a necessity in the freelance life, but it is an enhancement - our conversations are a bit useful, too."

While not everyone is able to enjoy the constructed camaraderie created by Messrs Gaymer or Wright, most home-aloners find other ways to hive. The number of people eating out has soared and in big cities it is becoming harder and harder to book tables, as spaces are filled by the lonely self-employed getting their weekly fix of humanity. On the way home they leer greedily through office windows, half-dreaming of a grimy nine-to-five watery tea from a machine and bitchy boss barking into their ear.

The popularity of gyms and health clubs night schools, the revival of Tupperware and Anne Summers parties, sad conversational Web sites on the Internet testify to the desperation with which the newly disofficed are seeking a little quotidien company to keep themselves ticking over.

When, in 1987, Margaret Thatcher announced that there was not such a thing as society, she was wrong. If she said it today, she would be closer to the truth. Each home-aloner who forsakes the office and then grows bored and lonely and sets up an aardvark appreciation council to while away the hours, drives another nail into the fabric of modern life. You cannot replace society with societies.

From "The Times"

sexual harassment		
downsizing, rightsizing, outsourcing		
to rear nuclear families		
a huge rush out of the office		
to set up on one's own.		
to get a fix of social interaction.		
free lancer		
office chit-chat and ribaldry		
the newly disofficed		
drives another nail into the fabric of		
modern life		

Explain or paraphrase the following:

de <u>Discussion</u>

In groups discuss the following:

- We may be social animals, but as workers we are bees. And our instinct is to hive.
- On the way home they leer greedily through office windows, halfdreaming of a grimy nine-to-five watery tea from a machine and bitchy boss barking into their ear.
- You cannot replace society with societies.

<u>Reading</u>

Read the following article and do the following tasks.

THE MOBILE PHONE

Mobile phones, as the name implies, are kinds of phones which possess great mobility. They are also known as Cell phones or Cellular phones. The earlier mobile phones resembled a lot cordless phones **in outward appearance**. Those were meant basically to receive and make calls while it enabled us to save numbers and to send SMS. We have developed a lot from the initial stage. Today we stand at a period where the telecommunication market is filled with smart phones which can do many more things, than a laptop or computer. More or less the mobile phone today performs the function of the television, the telephone, the radio, the laptop, the camera, a guide to help you to find locations and what not. Still, what are the **merits and demerits** of having and using a mobile phone? Isn't it a sad fact that only a few among us are really concerned about our health and safety **when it comes to** mobile phones?

Advantages of Mobile Phones

Living without mobile phones is a very difficult task today since we are so used to them. There are a lot of merits about mobile phones. Many of us can't part with them even for one day. So why did this particular device start to take so much place in our life?

- Wherever we are we feel secured just because we have a mobile phone with us and it helps us to call our beloved ones when needed or in case of emergency. In short it is like a good companion that can rescue and help us.
- With the advent of mobile phones, we are able to keep in touch with our clans and pals. Earlier, we would either have had to call them through a land phone or would have had to visit them in person, but now everything is easy as we are just a click away.
- Another advantage is that mobile phones act as a Walkman, too. When waiting for a bus, alone at home or on a bus, we can listen to our favorite music, radio channels etc. through our cell phones.
- The next main advantage of the mobile phone is the ability to capture every single moment and to treasure it. Of course, mobile phone cameras are not a substitute to the professional SLR cameras but they are of great help at times.
- The facility to access the Internet is another main feature which has attracted many buyers, especially those addicted to it and business people. With the popularity of social networking sites, mobile phones with the Internet are in great demand.
- One more advantage of mobile phones is the ability to send and receive SMS. Quite often we might not be able to take up the call or make a call while in a meeting or in a classroom, then SMS will be of great help.
- The facility of MMS (Multimedia Messaging Service) enables one to send messages with pictures as well. The laptop, too, has a similar facility but mobile phones are much easier to carry than laptops.
- Anything from making a call to booking a ticket is possible through mobile phones. Everywhere, even while filling up an application form, we need to **pen down** our mobile number.

• Having a top brand latest mobile phone is a prestigious thing now. Hence people buy it for status and **show off** purpose as well.

Disadvantages of Mobile Phones

There is not a single thing in this world which does not have demerits. The mobile phone is not an exception. We are living in the age when people prefer to **shoot videos** of an accident via the mobile phone rather than try to help the victims. The main disadvantages of this technological advance are **listed** below.

- The radiation emitted from mobile phones can affect us very badly but we ignore this factor for our convenience. Studies have proven that while we are talking the radiation can affect our brain through cell phones; it can affect the reproductive organs and the production of sperms if the phones are put in pants pockets.
- Using headsets while talking and listening to music hampers our brain. It helps in creating tiny bacteria in our head which in turn will damage the proper function of our body system.
- Never use a mobile phone when it **is plugged in for charging** as it can cause severe damage up to sudden death.
- The mobile phone has increased the number of crimes. Criminals give and take information with the help of this device, which has made their job easier.
- Mobile phone cameras are used by many unethical people to capture vulgar and exotic pictures of others **unknowingly or knowingly**. Later these pictures are used to blackmail the person or are uploaded over the Internet to make money.
- Kids are left out with the latest mobile phones these days, which makes them use the Internet option and thereby they get addicted.
- New viruses are created by unethical people to destroy or to collect information from others as most mobiles nowadays come up with the Internet facility.
- On top of that the increasing use of mobile phones has reduced the number of visits made to our relatives. We prefer to talk over the phone instead of visiting them in person, which affects the bonding between people in the long run.
- The latest smart phones, I-phones etc. use high amount of electricity when charging. Studies have proved that I-phones take as much electricity as a refrigerator. Aren't we wasting our natural resources buying and using phones with a lot of features?
- The high frequency waves produced by mobile phones have caused death of certain species, especially birds. They have become endangered just because of these high frequency waves. The effect of EMF (Electro Magnetic Frequency) radiation on humans is not immediate we gradually **expose** our life and health **to great danger**.

Responses to "Advantages and disadvantages of using mobile phones"

I would also like to add a few more points. As for the researchers, the electromagnetic waves emitted from the mobile actually help in decreasing the chances of suffering from Alzheimer's disease and at the same time, too many electromagnetic waves hamper the activity of the heart as well as the brain. Some doctors even claim that in the near future, mobile phones will be the main cause of brain tumors. So, I would suggest that people should use mobile phones wisely and in a proper way. Here are some of the medically proven suggestions as to how to use mobiles:

1. We should never pick up calls when the battery is too low because at the time the mobiles emit the highest amount of radiation.

2. It is always advisable to answer the calls using the left ear.

3. We shouldn't sleep keeping our phone under the pillow or near the head.

With the advent of mobile phones, we all **got connected 24 x 7** and everybody has become closer within the periphery. Every coin has two sides and we cannot go on mentioning the disadvantage of something without seeing the other side. The world has become small because of Information and Technology and mobile phones have contributed their bit.

In every sphere, there are **mischief mongers** and the mobile phone is not an exception.

When mobiles first came to India we were crazy to grab one and at that time it was a luxury item to purchase. Believe it or not I shelled down rupees twenty four thousand to a Reliance company as advance cheques and got the phone under CDMA connection that time. The company gave three years' bill free service to us but mobile users were very few and the charges of usage were more. Gradually the situation changed and now the mobiles have become the necessity of life and the rates of gadgets and charges are **affordable** to even a common man.

Wasting time with mobile phones is found to be a common thing nowadays so we need to give some attention to our valuable time by avoiding the maximum use of the mobile.

Yes, the mobile phone is a big revolution in our personal life. There used to be time when we could not communicate in time and we had to lose many deals. But having a mobile with us made it easy today. No matter where you are, your work gets done very quickly.

The new features like map in the mobile phone help you so well that you don't require anyone's help to get to your destination. Your mobile will show the Google map, every road and locality name, which made everyone's life so easy. Now even if you are in an unknown city, the map knowledge is always with you.

1. Paraphrase and comment on the boldfaced word combinations within the context. Translate them into Russian.

2. Make up a situation, "a long, long sentence" using the boldfaced words and expressions.

3. Arrange a debate round "The mobile phone. Danger for our identity"

Render and comment upon the issue raised.

Главные проблемы, в которых виноваты гаджеты

Ученые из разных стран составили рейтинг влияния смартфонов на здоровье и психику человека

Болит спина

Огромное количество своего времени владельцы смартфонов проводят, набирая эсэмэски, проверяя новости или сообщения от друзей. По данным британских ученых, такая одержимость привела к резкому росту числа молодых людей с проблемами спины. Почти половина подростков страдают от болей в спине и шее из-за того, что постоянно склонены над своими смартфонами и планшетами. По 7, а то и 10 часов в день проводят они, нагнув голову и уставившись в экран.

Ожирение

Технологическая революция привела к снижению физической активности и, как следствие, росту случаев ожирения, которое является четвертой по значимости причиной смерти во всем мире. Вам уже не нужно выходить из дома, чтобы повидать друга. Достаточно выйти в скайп.

Депрессия

Детские психотерапевты утверждают, что если 20 лет назад им приходилось сталкиваться с одной-двумя попытками самоубийства в год, то теперь – с четырьмя в месяц. Рост количества депрессивных детей и подростков, больных анорексией, детей с суицидальными мыслями напрямую связан с планшетами и смартфонами. Тинейджеры путешествуют в темном мире, который зачастую вовсе не предназначен для них. Родители не имеют никакой возможности контролировать эти виртуальные путешествия.

Тревожность

Казалось бы, новые коммуникационные технологии должны связывать людей, но вместо этого они порождают чувство одиночества и изолированности. Исследования показали, что молодые люди, которые каждый день тратят 10 – 11 часов, глядя на экраны, постоянно ожидают сообщений от своих друзей, и отсутствие вестей вызывает растущее беспокойство, чувство, что их игнорируют.

Бессонница

Более чем 60% молодых людей 18 – 21 года берут с собой смартфоны в постель, однако, два часа чтения книги на смартфоне останавливают выработку мелатонина. Отсюда серьезные проблемы со сном.

Опасность для жизни

Согласно исследованиям, у водителей, которые разговаривают по мобильнику, на 37% снижается активность мозга. Более того, разговор по мобильнику во время вождения автомобиля заставляет водителя совершать те же ошибки, что совершаются под воздействием алкоголя.

Впрочем, это же касается и пешеходов. Набор SMS в 4 раза увеличивает вероятность того, что человек не заметит приближающейся машины или забудет посмотреть по сторонам, переходя улицу.

VI. GENETIC ENGINEERING

Reading

WHAT IS GENETICS?

Genetics is the branch of science concerned with various aspects of heredity and biological variation. Heredity is the word used to describe the way the offspring of living things tend to inherit the nature and characteristics of the parents and ancestors. Simply put, it is the tendency of people, plants and animals to make similar (not identical) people, plants and animals when they reproduce. Biological variation is what makes individuals of the same species different from one another. The biological blueprint that allows organisms to pass on their physical characteristics to their young is their genetic code.

This genetic code is contained within the nucleus of each of an individual's cells. They are made up of coils of deoxyribonucleic acid, commonly referred to as DNA. They are organized in a complex pattern to form chromosomes. Every human cell contains twenty-three pairs of chromosomes for a total of forty-six.

A molecule of DNA is a long, double-helix formation that looks rather like a microscopic staircase. It is the 'steps' of this staircase that make up an organism's genetic code. Three steps (or nucleotides) form a triplet, which ends the production of an amino acid. Amino acids are the building blocks (for) proteins, which in turn are the building blocks of life.

Genes will vary in size, based on the size of the single protein they are designed to produce; however, all genes are arranged in a precise sequence on the chromosomes. The location of a specific gene is called its 'locus.' Depending on a number of factors, certain genes may be dominant or recessive (inactive) when passed on to offspring.

Commonly, human beings have abnormalities in their genes - particularly in their recessive genes. In fact, it has been estimated that people typically carry six to eight abnormal recessive genes. Within the coding of these genes are such characteristics as hair colour, eye colour, height and susceptibility to certain diseases. Tracking abnormalitised mutations in genes to the characteristics they cause is the principle focus of genetic science.

What is Genetic Engineering?

Genetic engineering is the alteration of genetic code by artificial means, and is therefore different from traditional selective breeding.

Genetic engineering examples include taking the gene that programs poison in the tail of a scorpion, and combining it with a cabbage. These genetically modified cabbages kill caterpillars because they have learned to grow scorpion poison (insecticide) in their sap. Genetic engineering also includes insertion of human genes into sheep so that they secrete alpha-1 antitrypsin in their milk – a useful substance in treating some cases of lung disease.

Genetic engineering has created a chicken with four legs and no wings, a goat with spider genes that creates "silk" in its milk. Genetic engineering could create crops that grow in desert heat, or without fertiliser, bananas or other fruit which contain vaccines or other medical products.

Genetic engineering works because there is one language of life: human genes work in bacteria, monkey genes work in mice and earthworms. Tree genes work in bananas and frog genes work in rice. There is no limit in theory to the potential of genetic engineering.

Genetic engineering has given us the power to alter the very basis of life on earth.

Genetic engineering has been said not to differ from ancient breeding methods but this is untrue. For a start, breeding or cross-breeding, or in-breeding (for example to make pedigree dogs) all work by using the same species. In contrast genetic engineering allows us to combine fish, mouse, human and insect genes in the same person or animal.

Genetic engineering therefore has few limits – only our imagination, and our moral or ethical code. Genetic engineering makes the whole digital revolution look nothing. Digital technology changes what we do. Genetic engineering has the power to change who we are.

What is human cloning?

Human cloning is a type of genetic engineering, but is not the same as true genetic manipulation. In human cloning, the aim is to duplicate the genes of an existing person so that an identical set be inside a human egg. The result is intended to be a cloned twin, perhaps of a dead child. Genetic engineering in its fullest form would result in a child having unique genes - as a result of laboratory interference, and therefore the child will not be an identical twin.

<u>Do the following exercises</u>

- Give some examples of genetic engineering.
- Answer the questions:
- 1. What makes genetic engineering work?

2. What is the difference between genetic engineering and ancient breeding methods?

3. What are the limits of genetic engineering?

4. What makes genetic engineering dangerous?

- Describe the process of cloning.
- Render the following article and discuss it with your partner.

Зачем нужны ГМО или генетически модифицированные продукты и организмы? Может быть, они только нанесут вред человечеству, нарушив и наши, человеческие генные коды?

Что говорят сторонники ГМО? Первый аргумент в защиту генномодифицированных организмов – это то, что именно они помогут решить продовольственные проблемы на нашей маленькой планете. Возможно, Вы не очень задумываетесь над проблемой голода, но даже в наши, казалось бы довольно благополучные времена, на Земле есть места, где люди ежедневно умирают от голода. По большей части это относится к африканским странам.

Сторонники ГМО говорят о том, что при помощи данной технологии можно вывести такие растения, которым и засухи африканские будут нипочем и разные болезни растений. Тем самым, можно снизить или даже совсем избавиться от использования химии в сельском хозяйстве. Можно вывести такие генномодифицированные виды сельскохозяйственных животных, которые будут давать много продукции, при этом будут не требовательны к пище и стойки к заболеваниям. Причем на выведение нового вида животного или растения уйдет всего-то года два-три!

Зачем же выращивать генномодифицированные овощи, если можно просто вывести обычные «нормальные» сорта, которые будут давать больше урожая? Такой ответ вполне оправдан. Подобную попытку мировое сообщество уже пыталось сделать в семидесятые годы двадцатого века. На какое-то время эти методы дали результаты. Только вот земля наша не обладает бесконечными ресурсами питательных веществ. Земля истощается. Особенно если ее настолько интенсивно эксплуатировать. А по подсчетам некоторых международных организаций лет через сорок население нашей планеты вырастет настолько, что уже не только Африка, но и более благополучные страны будут иметь проблемы с продуктами питания. Но во многих странах год от года площади, засеянные ГМО растениями, растут. Привело ли это к решению проблемы голода в Африке? Пока, к сожалению, нет. К тому же оказалось, что ГМО-кукуруза, соя и картошка почти на тридцать процентов дороже, чем те, что выращены по старинке.

Есть и еще один минус в производстве генномодифицированных продуктов. Дело в том, что раньше фермер мог оставлять себе часть урожая «на семена». Теперь такое сделать невозможно, потому что генномодифицированные растения не дают ни жизнеспособные семена, ни плоды. То есть это выгодно в первую очередь поставщикам посадочного материала. А еще оказывается, что вопреки ожиданиям ученых, на полях с ГМО гербицидов и пестицидов используют в среднем на сто пятьдесят граммов на гектар больше, чем на обычных полях.

Еще есть один минус, о котором вообще предпочитают молчать. Знаете ли Вы, что на поле культурные ГМО растения дают гибриды с дикорастущими растениями? Страшно представить какие мутанты будут заселять нашу Землю через несколько десятков лет. Еще один минус использования ГМО – при помощи этой технологии международный терроризм может получить новое направление. Представьте себе, сколько новых и никому не известных вирусов можно создать. С такими вирусами справиться будет очень сложно, ведь при их создании можно будет заложить любые качества.

Теперь о плюсах. Если пока не рассматривать всерьез идею борьбы с голодом, то плюсы ГМО как-то сразу не заметишь. Однако при помощи этой технологии можно будет выращивать органы для трансплантации. Тысячи людей умирают ежедневно, так и не дождавшись донорской почки или печени. А вот при помощи генной инженерии можно будет выращивать органы в любых количествах и довольно быстро. Генная инженерия поможет вырастить сырье для биотоплива, которое в ближайшем будущем потеснит бензин с наших заправок.

При помощи ГМО можно будет создавать новые лекарства, выращивать растения для изготовления тканей. Так что у ГМО есть будущее. Главное, чтобы нечистоплотные торговцы или политики не использовали это величайшее открытие во зло человечеству. Если же Вы – приверженец здорового образа жизни и противник ГМО, то выбор за Вами. Сегодня на территории большинства цивилизованных стран на продукты питания ставится маркировка, которая указывает на отсутствие в продукте ГМО.

Reading for discussion

TO CLONE OR NOT TO CLONE: THE ETHICAL QUESTION

Joseph Farnsworth

A couple that had been married for only two years was in a terrible car accident. The wife walked away with a few cuts and bruises. The husband, however, was unconscious when the paramedics arrived. He went into a coma shortly after arriving at the nearby hospital. He came out of the coma but was never to be the same again. It turns out that when he was in the accident he had a severe head trauma, and would be a vegetable the rest of his life. He could not take part in the reproduction of children. The wife is now distraught because they will never have children together. She heard about the possibility of cloning and believes that it is the only way that she will ever have children. Is it so?

After a couple has had their first child, to their disappointment they become infertile and cannot have more children. Cloning would enable such a couple to

have a second child, perhaps a younger twin to the child they already have. This example has a very good argument. Many couples have difficulties having children, and sometimes it is impossible for couples to have children because they are infertile. Cloning would allow these couples to have children. Also, occasionally a woman is born without a uterus or has other complications and cannot produce eggs, then with the help of a surrogate mother she can have a child of her own using her own DNA or her husband's.

The example at the beginning gives arguments for promoting cloning. It is hard to tell someone that they cannot use cloning to have children when no other possible ways to produce offspring are available. This is one reason why it is difficult to decide if cloning is ethical or not. The following are some of the reasons why cloning should be allowed.

As just discussed, cloning can be used to help benefit those who are sterile and cannot have children through the normal, natural way. It is the desire of most couples to have children and when it is impossible to bear children of your own, some are willing to do anything to have a child. Cloning will allow them to have a child or many children that have the genetic pattern of one of the parents.

Through cloning, research can progress. It is hard to say what we can learn from cloning if cloning is not allowed. We possibly can learn more about cell differentiation. We can learn enough to produce human organs without having to produce human beings. We may develop technology to allow easier genetic testing and fixing problems such as spinal cord injuries, cancer, Tay-Sachs disease, and many more.

Cloning organs for organ transplants is one of the major practical reasons that cloning should be allowed. There is always a high demand for organs. Some argue for the cloning of humans to create spare body parts. Others talk of just wanting to clone an organ to replace a defective organ.

Rejuvenation is also a key argument for advocates of cloning. Human cloning may one day reverse heart attacks. Some scientists believe that injecting cloned healthy heart cells into damaged heart tissue will lead to healing of the heart. By combining the technology for cloning and the technology for growing human stem cells, conditions like Alzheimer's disease, Parkinson's disease, and degenerative joint disease may be curable. The possibilities are endless and may be left undiscovered if human cloning is banned.

Thou Shall Not Clone

One of the main goals of the government is to protect human life. Some people want the government to regulate cloning and not allow it. Michigan's government believes this and became the first government to place a ban on cloning. The governor signed laws that prohibit engaging or attempting to engage in human cloning. A Michigan state senator, Mr. Bennett said, "This legislation boils down to one thing: prohibiting the creation of human life for scientific research. Human cloning is wrong; it will be five years from now; and wrong 100 years from now!" Producing clones for research or using their parts is unethical. It would be against the code of ethics of a doctor to harm a clone (i.e., use it for an organ transplant). The clone would be a human being and deserve all the rights and privileges that a non-cloned human has. A clone should not be a second-class citizen. It is speculated that they would be considered as such.

Cloning would lead to the loss of individuality because one's genetic predispositions and conditions would be known. If raised by a clone parent or as a sibling to the cloned, one may have great expectations to live up to. However, the human clones could differ greatly in personality and even grow up with different conditions than the cloned. Even monozygotic twins differ. This could be a great stress to the clone and possibly even the loss of ability to choose for itself.

The long term genetic effects of cloning may cause more problems than can be imagined. In an evolutionary standpoint cloning is not good. Evolution relies on a continual mixing and matching of genes to keep the gene pool alive. With cloning, the natural process of selection of genes would be bypassed and evolution would be impaired.

Technology as we presently know will not effectively support the cloning of humans. The success rate was quite low when cloning Dolly. Only one of the 277 tries succeeded. The same problems of the difficulty of having the fertilized egg implant parallels with that in vitro fertilization.

The fear that clones will be treated as second-class citizens is also present. If a clone is created to act as a bone marrow or kidney donor, the question arises if it would be treated as the first child? Would the parents even love this child the same? If not, this would lead to negative self-esteem and/or other physiological problems.

There is also a fear that some would want to clone people to create large armies of the same soldier or even produce large numbers of workers. This would also lead to the creation of a second and lower class for clones.

From the religious point of view God has commanded that the sacred powers of procreation are to be employed only between man and woman, lawfully wedded as husband and wife. Cloning involves only one parent, therefore it does not follow God's plan in which a man's sperm and a woman's egg are united to create life.

Cloning tissues and organs falls under a different category than cloning human beings. It would be advantageous to science and medicine to clone tissues and organs. However, this research involves foetal tissue which is a completely different ethical discussion.

Answer the questions:

1. How can cloning foster scientific research?

2. What are practical reasons for cloning?

- 3. What are ethical reasons against cloning?
- 4. What might the long term genetic effects of cloning be?

Do the following exercises

1. Translate into English:

генетика	впасть в кому
наследственность	выйти из комы
вид	подпадать под закон
проект	отпрыск
хромосома	омоложение
подверженность некоторым	стереть с лица земли все
болезням	человечество
передавать физические свойства к-л	ухудшить, повредить
травма	навредить, испортить
стать предметом широкого	использовать технологию в
обсуждения	неправедных целях
рассмотреть все за и против	непредвзятое мнение
оказаться правдой	попадать в другую категорию
суррогатная мать	возможный, осуществимый
искусственное осеменение	оживший кошмар
утробный плод	брат или сестра
отделаться легкими ушибами	ткань

de <u>Discussion</u>

- Technology seems to take away many of the morals that we have worked so hard to install in society.
- Pros and cons of cloning.
- Scientists should be free to conduct any experiments they like regardless time, utility, ethics.

ROUND-UP

Revise the material covered and do the translation using the topical vocabulary:

1. Ничто теперь не может помешать использованию этого нового технического достижения.

2. Существует предположение, что культура препятствует развитию прогресса.

3. Человечество прошло длинный путь от Семи Чудес до запуска космического корабля в космос. Телевидение, видео и компьютер – все это было изобретено, чтобы сделать нашу жизнь интересной и разнообразной.

4. Ученого, недавно открывшего новую планету и предложившего включить ее в состав планет солнечной системы, ждет всемирная известность и Нобелевская премия, если он даст ей соответствующее название.

5. Астрономия – это наука, которая изучает солнце, планеты, отдельные звезды и созвездия, кометы, метеориты и другие небесные тела.

6. Преодоление скорости света – вот одна из тех задач, которая на данный момент абсолютно неосуществима.

7. Обезьяны не могут быть нашими предками, они наши побочные родственники.

8. Гипотеза, предположение, поиск, вывод – все это необходимо для научных открытий.

9. Многие конгрессмены настаивают на принятии закона о запрещении клонирования, как для воспроизводства человека, так и в терапевтических целях.

10. Генная инженерия представляет собой изменение генетического кода искусственным путем и, следовательно, отличается от традиционной селекции.

11. Некоторые ученые считают, что введение клонированных здоровых клеток сердца в поврежденные ткани сердца приведет к его исцелению.

12. Стремление добыть знания является чистой наукой. Прикладная наука – это поиск практического использования научных знаний.

13. Разумно используя Интернет, мы можем управлять его неограниченным потенциалом и держаться подальше от его негативных последствий.

14. Благодаря многочисленным денежным услугам, мы можем выполнить ряд финансовых операций в Интернете – забронировать билеты на фильм, перевести средства, оплатить коммунальные услуги и налоги, не выходя из дома или офиса.

15. Разве это не печально, что лишь немногие из нас действительно обеспокоены своим здоровьем и безопасностью, когда речь заходит о мобильных телефонах?

16. Самая большая проблема Интернета – его способность создавать пропасть между реальным и виртуальным миром.

17. Компьютеры, подключенные к Интернету, уязвимы для целенаправленных вирусных атак.

SUPPLEMENT FOR SELF-ACCESS WORK

Reading

HISTORY OF SCIENCE

SCIENCE (Latin *scientia*, from *scire*, "to know"), the term used in its broadest meaning to denote systematized knowledge in any field, but applied usually to the organization of objectively verifiable sense experience. The pursuit of knowledge in this context is known as pure science, to distinguish it from applied science, which is the search for practical uses of scientific knowledge, and from technology, through which applications are realized.

ORIGINS OF SCIENCE

Efforts to systematize knowledge can be traced to prehistoric times, through the designs that Paleolithic people painted on the walls of caves, through numerical records that were carved in bone or stone, and through artifacts surviving from Neolithic civilizations. The oldest written records of protoscientific investigations come from Mesopotamian cultures; lists of astronomical observations, chemical substances, and disease symptoms, as well as a variety of mathematical tables, were inscribed in cuneiform characters on clay tablets. Other tablets dating from about 2000 BC show that the Babylonians had knowledge of the Pythagorean theorem, solved quadratic equations and developed a sexagesimal system of measurement (based on the number 60) from which modern time and angle units stem.

From almost the same period, papyri documents have been discovered in the Nile Valley, containing information on the treatment of wounds and diseases, on the distribution of bread and beer, and on finding the volume of a portion of a pyramid. Some of the present-day units of length can be traced to Egyptian prototypes, and the calendar in common use today is the indirect result of pre-Hellenic astronomical observations.

RISE OF SCIENTIFIC THEORY

Scientific knowledge in Egypt and Mesopotamia was chiefly of practical nature, with little rational organization. Among the first Greek scholars to seek the fundamental causes of natural phenomena was the philosopher Thales, in the 6th century BC, who introduced the concept that the earth was a flat disk floating on the universal element, water. The mathematician and philosopher Pythagoras, who followed him, established a movement in which mathematics became a discipline fundamental to all scientific investigation. The Pythagorean scholars postulated a spherical earth moving in a circular orbit about a central fire. At Athens, in the 4th century BC, Ionian natural philosophy and Pythagorean mathematical science combined to produce the syntheses of the philosophies of Plato and Aristotle. At the Academy of Plato, deductive reasoning and mathematical representation were emphasized; at the Lyceum of Aristotle, inductive reasoning and qualitative description were stressed. The interplay between these two approaches to science has led to most subsequent advances.

During the so-called Hellenistic Age following the death of Alexander the Great, the mathematician, astronomer, and geographer Eratosthenes made a remarkably accurate measurement of the earth. Also, the astronomer Aristarchus of Somos espoused a heliocentric (sun-centered) planetary system, although this concept did not gain acceptance in ancient times. The mathematician and inventor Archimedes laid the foundation of mechanics and hydrostatics; the philosopher and scientist Theopharastus became the founder of botany; the astronomer Hipparchus developed trigonometry; and the anatomists and physicians Herophilus and Erasistratus based anatomy and physiology on dissection.

Following the destruction of Carthage and Corinth by the Romans in 146 BC, scientific inquiry lost its impetus until a brief revival took place in the 2nd century AD under the Roman emperor and philosopher Marcus Aurelius. At this time the geocentric (earth-centered) Ptolemaic system, advanced by the astronomer Ptolemy, and the medical works of the physician and philosopher Galen became standard scientific treatises for the ensuing age. A century later the new experimental science of alchemy arose, springing from the practice of metallurgy. By 300, however, alchemy had acquired an overlay of secrecy and symbolism that vitiated the advantages experimentation might have brought to science.

MEDIEVAL AND RENAISSANCE SCIENCE

During the Middle Ages, six leading culture groups were in existence: the Latin West, the Greek East, the Chinese, the East Indian, the Arabic, and the Mayan. The Latin group contributed little to science before the 13th century, the Greek never rose above paraphrases of ancient learning, and the Mayan had no influence on the growth of science. In China, science enjoyed periods of progress, but no sustained drive existed. Chinese mathematics reached its zenith in the 13th century with the development of ways of solving algebraic equations by means of matrices, and with the use of the arithmetic triangle. More important, however, was the impact on Europe of several practical Chinese innovations. These include the processes for manufacturing paper and gunpowder, and the use of printing and the mariner's compass. In India, the chief contributions to science were the formulation of the so-called Hindu-Arabic numerals, which are in use today, and in the conversion of trigonometry to a quasi-modern form. These advances were transmitted first to the Arabs, who combined the best elements from Babylonian, Greek, Chinese, and Hindu sources. By the 9th century Baghdad, on the Tigris River, had become a center for the translation of scientific works, and in the 12th century this learning was transmitted to Europe through Spain, Sicily, and Byzantium.

Recovery of ancient scientific works at European universities led, in the 13th century, to controversy on scientific methods. The so-called realists espoused the Platonic approach, whereas the nominalists preferred the views of Aristotle. At the universities of Oxford and Paris, such discussions led to

advances in optics and kinematics that paved the way for Galileo and the German astronomer Johannes Kepler.

The Black Death and the Hundred Years' War disrupted scientific progress for more than a century, but by the 16th century a revival was well under way. In 1543 the Polish astronomer Nicolaus Copernicus published *De Revolutionibus Orbium Coelestium* (On the Revolutions of the Heavenly Bodies), which revolutionized astronomy. Also published in 1543, *De Corpis Humani Fabrica* (On the Structure of the Human Body) by the Belgian anatomist Andreas Vesalius corrected and modernized the anatomical teachings of Galen and led to the discovery of the circulation of the blood. Two years later the *Ars Magna* (Great Art) of the Italian mathematician, physician, and astrologer Gerolamo Cardano initiated the modern period in algebra with the solution of cubic and quartic equations.

MODERN SCIENCE

Essentially modern scientific methods and results appeared in the 17th century because of Galileo's successful combination of the functions of scholar and artisan. To the ancient methods of induction and deduction, Galileo added systematic verification through planned experiments, using newly discovered scientific instruments such as the telescope, the microscope, and the thermometer. Later in the century, experimentation was widened through the use of the barometer by the Italian mathematician and physicist Evangelista Torricelli; the pendulum clock by the Dutch mathematician, physicist, and astronomer Christiaan Huygens; and the exhaust pump by the English physicist and chemist Robert Boyle, and the German physicist Otto von Guericke.

The culmination of these efforts was the universal law of gravitation, published in 1687 by the English mathematician and physicist Isaac Newton in *Philosophiae Naturalis Principia Mathematica*. At the same time, the invention of the calculus by Newton and the German philosopher and mathematician Gottfried Wilhelm Leibniz laid the foundation of today's sophisticated level of science and mathematics.

The scientific discoveries of Newton and the philosophical system of the French mathematician and philosopher Rene Descartes provided the background for the materialistic science of the 18th century, in which life processes were explained on a physicochemical basis. Confidence in the scientific attitude carried over to the social sciences and inspired the so-called Age of Enlightenment, which culminated in the French Revolution of 1789. The French chemist Antoine Laurent Lavoisie published *Traite elementaire de chimie* (Treatise on Chemical Elements) in 1789 with which the revolution in quantitative chemistry opened.

Scientific developments during the 18th century paved the way for the following 'century of correlation' so called for its broad generalizations in science. These included the atomic theory of matter postulated by the British chemist and physicist John Dalton; the electromagnetic theories of Michael

Faraday and James Clerk Maxwell, also of Great Britain; and the law of the conservation of energy, enunciated by the British physicist James Prescott Joule and others

The most comprehensive of the biological theories was that of evolution, put forward by Charles Darwin in his *On the Origin of Species by Means of Natural Selection* (1859), which stirred as much controversy in society at large as the work of Copernicus. By the beginning of the 20th century, however, the fact, but not the mechanism, of evolution was generally accepted, with disagreement centering on the genetic processes through which it occurs.

But as biology became more firmly based, physics was shaken by the unexpected consequences of quantum theory and relativity. In 1927 the German physicist Werner Heisenberg formulated the so-called uncertainty principle, which held that limits existed on the extent to which, on the subatomic scale, coordinates of an individual event can be determined. In other words, the principle stated the impossibility of predicting, with precision, that a particle such as an electron would be in a certain place at a certain time, moving at a certain velocity. Quantum mechanics instead dealt with statistical inferences relating to large numbers of individual events.

FIELDS OF SCIENCE

Knowledge of nature originally was largely an undifferentiated observation and interrelation of experiences. The Pythagorean scholars distinguished only four sciences: arithmetic, geometry, music, and astronomy. By the time of Aristotle, however, other fields could also be recognized: mechanics, optics, physics, meteorology, zoology, and botany. Chemistry remained outside the mainstream of science until the time of Robert Boyle in the 17th century, and geology achieved the status of a science only in the 18th century. By that time the study of heat, magnetism, and electricity had become part of physics. During the 19th century scientists finally recognized that pure mathematics differs from the other sciences in that it is logics of relations and does not depend for its structure on the laws of nature. Its applicability in the elaboration of scientific theories, however, has resulted in its continued classification among the sciences.

The pure natural sciences are generally divided into two classes: the physical sciences and the biological, or life, sciences. The principal branches among the former are physics, astronomy, chemistry, and geology; the chief biological sciences are botany and zoology. The physical sciences can be subdivided to identify such fields as mechanics, cosmology, physical chemistry, and meteorology; physiology, embryology, anatomy, genetics, and ecology are subdivisions of the biological sciences.

All classifications of the pure sciences, however, are arbitrary. In the formulations of general scientific laws, interlocking relationships among the sciences are recognized. These interrelationships are considered responsible for much of the progress today in several specialized fields of research, such as

molecular biology and genetics. Several interdisciplinary sciences, such as biochemistry, biophysics, biomathematics, and bioengineering, have arisen, in which life processes are explained physico-chemically. Biochemists, for example, synthesized deoxyribonucleic acid (DNA); and the cooperation of biologists with physicists led to the invention of the electron microscope, through which viruses and gene mutations can be studied. The application of these interdisciplinary methods is also expected to produce significant advances in the fields of social sciences and behavioral sciences.

The applied sciences include such fields as aeronautics, electronics, engineering, and metallurgy, which are applied physical sciences, and agronomy and medicine, which are applied biological sciences. In this case also, overlapping branches must be recognized. The cooperation, for example, between iatrophysics (a branch of medical research based on principles of physics) and bioengineering resulted in the development of the heart-lung machine used in open-heart surgery and in the design of artificial organs such as heart chambers and valves, kidneys, blood vessels, and inner-ear bones. Advances such as these are generally the result of research by teams of specialists representing different sciences, both pure and applied. This interrelationship between theory and practice is as important to the growth of science today as it was at the time of Galileo.

Paleolithic	Ionian	Hindu	papyri
Mesopotamia	Plato	Baghdad	lyceum
Egyptian	Aristotle	Tigris	treatise
Hellenic	Archimedes	Byzantium	deoxyribonucleic acid
Nile	Carthage	Galileo	electron
Pythagoras	Ptolemy	Johannes	metallurgy
Athens	Galen		

<u>Do the following exercises</u> Practice the pronunciation of the following

2. Find synonyms for the following

to verify	mariner
to trace	`controversy
to espouse	to enunciate
to dissect	circa
ensuing	extant
overlay	to foster
to vitiate	

3. Find English equivalents of the following

ремесленник решать квадратные уравнения система измерений, основанная на 60 единицы измерения углов ввести понятие принять получить признание заложить основу потерять стимул последующий приобрел завесу секретности умалять достиг своего расцвета подобный вызвать дискуссии проторить дорогу к закон всемирного тяготения закон сохранения энергии сохранившийся поныне способствовать научной деятельности оставаться в стороне от произвольный

4. Speak about the development of scientific thought.

∠ <u>Writing</u>

- Write 5 sentences containing as many of your active words as possible. Compare with your fellow students.
- Translate the following sentences using the active vocabulary.
- 1. "Наука" это термин, используемый для обозначения систематизированных знаний в какой-либо области.
- 2. Стремление добыть знания является чистой наукой.
- 3. Прикладная наука это поиск практического использования научных знаний.
- 4. Греческие ученые пытались найти основные причины природных явлений.
- 5. Философ Талий ввел понятие о том, что земля это плоский диск.
- 6. Математик, астроном и географ Эратосфен произвел абсолютно точное измерение земли.
- 7. Астроном Аристарх выдвинул идею о гелиоцентрической планетарной системе.
- 8. Математик и изобретатель Архимед заложил основу механики и гидростатики.
- 9. Новая экспериментальная наука алхимия приобрела покров секретности и символизма, что замедлило развитие химии. Химия оставалась на задворках науки до 17 века.
- 10.Закон всемирного тяготения был открыт английским математиком и физиком Исааком Ньютоном.
- 11. Теория эволюции Чарльза Дарвина вызвала многочисленные дискуссии в обществе.

<u>©</u> Roleplay

Imagine you are a teacher. Think of the way you would explain to your pupils one of the following laws:

- the universal law of gravitation
- the atomic theory of matter
- the electromagnetic theories
- the law of the conservation of energy
- the theory of evolution
- quantum theory
- the theory of relativity
- the uncertainty principle

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