***Федеральное агентство по рыболовству***
***Федеральное государственное бюджетное образовательное учреждение высшего образования***
***"Астраханский государственный технический университет"***

**Система менеджмента качества в области образования, воспитания, науки и инноваций сертифицирована ООО «ДКС РУС» по международному стандарту ISO 9001:2015**

Институт рыбного хозяйства биологии
и природопользования

Кафедра
«Иностранные языки и речевая коммуникация»

# *Иностранный язык*

Методические указания
для практического освоения дисциплины
(для обучающихся по всем направлениям аспирантуры)

**Астрахань**

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Целью данных методических указаний является содействие усвоению аспирантами общенаучных терминов английского языка, наиболее частотных единиц и устойчивых выражений подъязыка науки и техники, формированию умения комбинаторики научной лексики при производстве устных и письменных речевых произведений и, в целом, формированию компетенции иноязычного общения в области научной деятельности - **ОПК-2: готовность использовать современные методы и технологии научной коммуникации на государственном и иностранном языках.**

Структура каждого блока методических указаний соответствует дидактическим требованиям расположения теоретических пояснений и практических заданий по степени возрастания их сложности, и подводит обучающихся к выполнению творческой работы на основе усвоенного материала, что обеспечит необходимый уровень сформированности компетенции

Методические указания содержат аутентичные текстовые материалы, ссылки на учебно-методическую литературу и Интернет-ресурсы по темам рабочей программы дисциплины «Иностранный язык».

Методические указания для практических занятий по дисциплине «Иностранный язык в профессиональной сфере» утверждены на заседании кафедры «Иностранные языки» от 01 марта 2024 г., Протокол № 3.

Заведующий кафедрой _____ /Федорова О.В./

Подпись Ф.И.О.

## § 1

### А. Теоретическая часть.

В каждой профессиональной области, включая область научной деятельности, используется особый подъязык национального языка, называемый «язык для специальных целей» (ЯСЦ). Он включает книжную лексику, профессионализмы (профессиональный жаргон), служебные слова, но основным элементом ЯСЦ являются термины или терминологическая лексика. Существует множество определений термина, отражающих разное понимание его лингвистического статуса. В качестве рабочего определения можно предложить следующее:

**Термины** – единицы языка (слова и словосочетания), функционирующие в определенной области деятельности в качестве имен понятий, объектов и субъектов, характеризующих соответствующую область.

В основном в функции термина используются имена существительные, но среди терминологической лексики встречаются также глаголы и имена прилагательные.

Термины служат для передачи специального (экспертного) знания и выступают его материальным носителем. Единичные термины соотносятся с отдельными концептами или понятиями экспертной области, а будучи объединены в отраслевые терминосистемы, они представляют концептосферу соответствующей области – упорядоченную совокупность ее концептов в сознании индивидуального человека и в коллективном сознании профессионального сообщества. Такие терминосистемы оформляются в специализированных словарях.

В качестве характеристик идеального термина в первую очередь называют *точность, однозначность, наличие дефиниции, отсутствие синонимов*, но в реальности часто наблюдается отклонение от идеала.

Термины могут специально создаваться на основе готовых элементов языка (основ, морфем, словоформ), представлять устойчивые сочетания слов или сочетания слов с определенными символами, именами собственными, цифрами. Уже имеющиеся в национальном языке слова могут развивать новое значение (так называемое «терминологическое значение») и использоваться как термины, представляя профессиональное или научное знание об обозначаемом объекте. В этом случае в словаре национального языка делается пометка об области употребления этого значения слова.

О глаголах и именах прилагательных, используемых в своих прямых значениях для передачи экспертного знания, говорят как о *терминологизованных* единицах языка.

Определенную часть терминов в развитых национальных языках представляет *интернациональная лексика*: слова, совпадающие по форме и значению в разных языках (*system, navigator*). Такие единицы распознаются в тексте без обращения к словарю. Для обозначения одного и того же понятия или объекта могут использоваться как интернациональные слова, так и соответствующие эквиваленты национального языка (сравните: *дедукция* или *вывод*). При создании новых терминов в современном английском языке часто используются *интернациональные терминоэлементы* (в основном греко-латинского происхождения: *anti-; non-; -ant; -ent,* и др.). Часто термины заимствуются из других современных языков (заимстовования в русский язык: *computer – компьютер; marketing – маркетинг*; заимствования в английский язык: *sputnik - спутник*).

Термины подъязыка науки классифицируют на основании области использования и в зависимости от содержания обозначаемого понятия или характеристик объекта на следующие группы: общенаучные (*theory, method*), межотраслевые (*demography, memory, thermometer*) и частнонаучные или частноотраслевые (*debit, morpheme, freon*). Изменение содержания общенаучного понятия и ограничение области употребления термина указывается атрибутивным элементом (определением), присоединяемым к соответствующему языковому знаку (*atomic theory, mathematical method, long-term memory; random memory*).

## Б. Практическая часть.

*Задание 1*. Определите, в каком из предложений выделенные слова употребляются в конвенциональном значении, а в каком – в специальном (терминологическом).

1. a) She has been interested in **nature** and wildlife since her childhood. b) Our first lecture was devoted to the **nature** of human communication.

2. a) **Power** within this company is divided between the president and the Board of directors. b) The **power** plant generates enough electricity to meet the needs of the country.

3. a) The role of the **market** in national economy is describes by economists as “invisible hand”. b) The fish **market** in our city opens very early in the morning.

*Задание 2*. Дайте русские соответствия следующим интернационализмам:

Class, type, centre, examination, consultation, laboratory, apparatus, material, specialist, cycle, chaos, economy, culture, universal, practical, national, social, experimental, democratic, energetic, grammatic, pedagogic.

*Задание 3*. Предложите два варианта перевода указанных ниже терминологических единиц. Смотрите образец.

**Model**: *deduction* – дедукция, вывод.

To ignore, to transform, to generate, substance, defect, surprise (to surprise), variation, distribution, induction, cooperation, natural, commercial, public.

*Задание 4*. Подберите русский эквивалент следующим словам, используя данные в скобках подсказки.

*1. decay; 2. derive; 3. determine; 4. essence; 5. goal; 6. prevent; 7. quality; 8. quantity; 9. ultimate; 10. valid.*

1. выводить (дериват, производное); 2. годный, действительный (инвалид, негодный); 3. качество (квалификация); 4. окончательный (ультиматум, последнее условие); 5. суть (эссенция, квинтэссенция); 6. количество (квант, порция); 7. определять (детерминизм, детерминанта); 8. распад (декаданс, упадок); 9. цель (гол); 10. предотвращать (превентивный).

*Задание 5*. a) Переведите на русский язык слова, содержащие интернациональные терминоэлементы:

antecedents, artificial, astrogeology, astronavigation, accurate, bilateral, binocular, bisect, cellular, constant, cordial, cosmodog, demarkation, desalinate, debug, ecology, economy, ecosystem, extraterrestrial, genetic, generation, geology, geography, hemisphere, hydrocarbon, hydrology, hyperactive, hyperlink, illegal, illiterate, intermediary, intermission, intervention, interrelation, immature, irresistable, irrevocable, lunar, majority, minority, microfilm, microorganism, multicoloured, multipurpose, neology, neoimpressionism, optoelectronic; paraacademic, parajournalism, self-criticism, self-governing, semiannual, semicircle, superconductivity, supersonic, telefilm; ultraviolet.

b) рассмотрите словообразовательные связи приведенных ниже английских терминологических единиц, обращая внимание на словообразовательнрые элементы; переведите слова:

to observe – observ**er**; to research – research**er**; to operate - operator
to transform – transform**er**; to conduct – conductor; to freeze – freez**er**
to investigate – investigat**ion**; to solve – solu**tion**; to include – inclu**sion**
to develop – develop**ment**; to move – move**ment**; pay - pay**ment**
to adapt – adapt**able**; to observe – observ**able**; to drink – drinkable

identity – to ident**ify**; quantity – to quant**ify**; quality – to qual**ify**
accident – accidental; chemistry –chemic**al**; statistics – statistic**al**
history – histor**ic**; ecology – ecolog**ic**; philosophy – philosoph**ic**
economy – econom**ist**; biology – biolog**ist**; psychology – psycholog**ist**
safe – safe**ty**; secure – securi**ty**; mature – maturi**ty**; stable - stabili**ty**
annual – annuall**y**; random – random**ly**; periodic - periodica**lly**

c) переведите следующие предложения, обращая внимание на словообразовательную структуру выделенных слов:

1. The book is **mainly** concerned with the problem of **information security**. 2. Theory is an **intellectual** instrument of **scientists**. 3. The **founders** of the Royal Society were **typical natural philosophers**. 3. **Definition** of most **fundamental** concepts is always difficult. 4. **Basically**, they demonstrated a **significant** link between those events. 5. **Finding** a **satisfactory explanation** for this sort of **interaction** is not so easy. 6. Such **conceptual** subjects as mathematics should be included in all **educational** programms. 7. The **criminal** was **identified** from **fingerprints discovered** at the scene of **robbery**. 8. The obtained results were quite **unexpected**. 9. The **behaviour** of **customers** is **mostly predictable**. 10. He announced his **discovery** in a **special communication** to the French Academy of Sciences.

*Задание 6*. Проанализируйте дефиниции следующих терминов и укажите, какие признаки обозначаемого понятия содержатся в них:

**Hypothesis** – any sentence which has as a consequence at least one empirical generalization.

**Principle** – principles are hypotheses accepted as suitable starting points for theoretical work. A principle turns into a law if what before could not be observed becomes observable by virtue of some advance in experimental technique.

**Theory** – a structure in which each step depends on preceding steps. The structure can be stated in terms of concepts in relation. The whole structure rests upon observations and on theoretical assumptions. The advantages of scientific theory are that it can be used for description, the classification and the explanation of observed events. It can also be used for the prediction of future events.

/ From: A. Godman, E.M.F. Payne. Longman Dictionary of Scientific Usage. 1987. Pp.84-85/.

*Задание 7*. А) Прочтите текст, обращая внимание на словообразовательные и семантические особенности использованной автором терминологической лексики. Ответьте на вопросы:

1. Why is definition important in researcher's communicating?
2. What question does the definition answer?
3. Which elements should it include to be considered complete enough?
4. What example of incomplete definition is given in the text?
5. What is the suggested definition formula? How can it be extended?
6. Can you give the definition of any concept from your field of research?

## Definition

When making a hypothesis or other statement scientists must make sure they are understood by other researchers. Misunderstandings occur when there are different concepts of what is being discussed.

A definition answers the question, "What is it?" Sometimes a definition is necessary because a word or concept has more than one meaning. For example, whether carbon a metal or nonmetal depends on how you define carbon. At other times, a definition is required because a term is being used in a special way. For example, physicists use the terms *work* and *energy* in ways that are more specific than their common meanings. A definition should be complete enough to include all the items in the category yet narrow enough to eliminate items that do not belong. The Greek philosopher Plato once defined man as a two-legged creature that has no feathers. His critic Diogenes left the room and brought back a bird without feathers, declaring, "Here is Plato's man!" The problem with Plato's definition was that it did not distinguish a man from other two-legged features without feathers.

Aristotle suggested that a good definition should include the general classification of a term plus the specific characteristics that differentiate the term from other members of its class.

The suggested definition formula: **term = class + characteristics**.

*An astronomer is a scientist who studies the universe.*

Communication between researchers is dependent on precise definition of substances, concepts, processes and ideas.

A definition may consist of as little as a sentence or as much as a book. When a concept is too complex to be defined in one or two sentences, an extended definition is needed. It includes the basic parts of a formal definition (class + characteristics) as well as additional information that may include description, examples, classification, comparison, explanation, or other details. For example, an extended definition of a natural phenomenon (such as an eclipse, earthquake, or hurricane) would probably include cause and effects. An extended definition of a machine would probably include its function and uses. An extended definition of a celestial object (such as a planet or comet) might include its location in respect to the earth and comparison with another heavenly object.

Б) Выскажите на английском языке свое мнение о необходимости дефиниции научных понятий, об ее оптимальном содержании и организации информации. Приведите примеры наиболее удачных дефиниций понятий из какой-либо научной области (воспользуйтесь специализированным англоязычным словарем, учебным пособием или монографией англоязычных авторов, Интернет-источником, например сайтом http://www.diffen.com/difference/Science_vs_Technology).

## § 2

### А. Теоретическая часть.

Составление сообщения о научном исследовании на английском языке требует не только знания специальной терминологии и необходимой лексики, описывающей научную деятельность, но и владения навыком комбинирования языковых единиц, позволяющим оформлять свои рассуждения в виде осмысленных и грамматически корректных высказываний и предложений. Приведенные ниже сведения о наиболее характерных для научного сообщения существительных английского языка позволят избежать типичных ошибок русскоязычных авторов.

1. В соответствии с грамматическими нормами английского языка множественное число имен существительных образуется с помощью форманта **–s/(-es)**: *model – models, scope - scopes, way – ways, photo – photos; hero – heroes* и др. У отдельных существительных происходят изменения в орфографии: *theory – theories, wolf – wolves* и др.

Ряд существительных с формантом **–s/(-es)** не имеют формы единственного числа: *scales, scissors, clothes, stairs* и др.

Отдельные существительные, имеющие окончание **–s**, обозначают единичные понятия и употребляются только в форме единственного числа: *cybernetics, informatics, mathematics, physics, news* и др.

В зависимости от контекста и вкладываемого в употребляемое слово смысла некоторые имена существительные с формантом **–s,** или с иными окончаниями, могут согласовываться с глаголом как в форме единственного, так и в форме множественного числа: *headquarters, crossroads, statistics, politics,government, team,* и др.

Следует запоминать английские существительные, образующие форму множественного числа не по правилам (*man – men, woman – women*, и др.), а так же формы множественного числа заимствованных слов греко-латинского происхождения: *species-species, phenomenon – phenomena, basis-bases, analysis-analyses, matrix-matrices, radius-radii,*и др.). Некоторые из заимствован-

ных слов имеют две формы множественного числа: *focus-foci (focuses), index-indices (indexes), spectrum-spectra (spectrums)* и др.

Всегда в единственном числе употребляются абстрактные невещественные существительные (*research, production, prosperity, whiteness,* и др.) и абстрактные вещественные существительные (*water, gas, meat,* и др.), а так же собирательные имена существительные (*money, advice, truth, information, knowledge, progress,*и др.), имеющие категорию количественности (не путать с категорией числа), выражаемую специальными определителями – квантификаторами: *some , much, a lot of, a little of, a piece of* и др. *(some information; pieces of research).*

Всегда во множественном числе употребляются имена существительные *data, people, police*. Практически всегда с глаголом во множественном числе соотносятся следующие формы существительных: *fish, bacteria, fungi*.

Словосочетания с ядерным компонентом, выраженном именем существительным во множественном числе, теряют суффикс множественности при употреблении в функции определения Сравните: *five pounds – a five-pound note; thousands of people – two thousand people*.

2. Английское существительное имеет два падежа: *общий* и *притяжательный*. Притяжательный падеж в основном допустим лишь для одушевленных существительных (*man, Prof. Wilson, lion*), и только в отдельных случаях – для неодушевленных. К последним относятся географические названия (*London, world, Moon, town, country*), названия транспортных средств (*ship, car, aeroplane*), обозначения различных организаций или структур (*company, agency, government, university*), название меры времени (*hour, week, yesterday*) или расстояния (*mile, inch*).

*Формальным признаком* притяжательного падежа в английском языке выступает окончание или формант ***'s*** (*the student's book*) или только апостроф (') для существительных во множественном числе (*the students'books*).

Притяжательный падеж употребляется в английском языке только в атрибутивной функции и только в препозиции к стержневому слову: *Professor Jones's laboratory*.

Спецификой английского языка является так называемый «групповой притяжательный падеж», оформляющий целую синтаксическую группу: *the Prime Minister of England's speech*.

У неодушевленных существительных значение принадлежности или партитивности передается с помощью предлога *of* (*the roof of the house*), как и субъектности действия (*a run of the equipment*).

3. Категория рода у английского существительного – категория семантическая, а не грамматическая. Род можно определить, лишь соотнеся слово с местоимением 3-го лица ед.ч.: *he, she, it*. Неодушевленные предметы соот-

носятся в английском языке с местоимением *it*, что соответствует среднему роду. Все транспортные средства традиционно соотносят с женским родом. Различия по роду в английском языке выражаются также лексически, путем выбора соответствующего слова: *man – woman, cow – bull*, а также весьма ограниченным набором словообразовательных средств: суффикса *-ess* (*actor-actress, lion-lioness*), и сложных слов типа *woman-teacher, man-servant, boy-friend, girl-friend, he-wolf, she-wolf.*

4. В лингвистическом контексте имена существительные употребляются не изолированно, а в сочетании с детерминативными единцами (артиклями, указательными и притяжательными местоимениями, квантификаторами), прилагательными и существительными же, предлогами и глаголами.

Как правило, сочетания с предлогами и глаголами являются устойчивыми и их следует запоминать, например: ***theory of*** *gravitation;* ***solution to*** *the problem;* ***research into*** *allergic disease; to conduct experiment; to observe phenomena; to describe the event; to analyse data*; и др.

Сочетания отдельных существительных с определенными прилагательными характеризуются частотностью употребления в научном контексте, и их также рекомендуется запоминать (*a representative sample; a recent paper; an early study;* и др.). Количество прилагательных, с которыми может сочетаться одно и то же имя существительное в научном контексте, передавая разные смыслы, как правило, ограничено: ***(common, isolated, natural, universal)*** *phenomenon;* ***(alternative, efficient, practical, convenient, proper, acceptable, modified)*** *method*; и т.п.

При переводе английских сочетаний разных существительных с одним и тем же прилагательным могут использоваться разные русские прилагательные, и наоборот: одно и то же русское прилагательное в сочетании с разными существительными может переводиться разными английскими словами. Сравните: ***current*** *theories –* ***современные*** *теории; the* ***current*** *situation –* ***сложившаяся*** *ситуация;* ***неподобающее*** *поведение –* ***improper*** *behaviour;* ***неподобающая*** *одежда –* ***inappropriate*** *clothes*.

5. В научных текстах часто употребляются слова так называемой «широкой семантики», перевод которых зависит от контекста. К таким словам относятся *case, context, event, issue, point, thing* и др. Иногда перевод этих слов можно опустить: *If this is really the* ***case****, we should put the question to the vote. – Если это действительно* ***так****, следует поставить вопрос на голосование*.

## Б. Практическая часть.

*Задание 1*. Проанализируйте и объясните употребление подчеркнутых существительных в следующих предложениях с точки зрения числа (единственное или множественное) и падежа.

1. The data speak in favour of this theory. 2. As to the thesis it holds for more general cases of this process. 3. The reaction, if any, runs in vacua. 4. As to the scientists' work, it is of great practical importance. 5. After a week's rest the rabbit may be given a second dose of vitamins. 6. There are some methods at one's disposal of reaching this goal. 7. The government, who are hoping to ease export restrictions soon, won't get support. 8. The government, which is elected by a simple majority, takes unpopular decisions. 9. In spite of some objections this engineer's design was accepted. 10. It was implicit owing to comments about using the computer's power. 11. They attempt to continually enlarge the sphere of this program's application. 12. Prof. Beale's theoretical work has always been firmly grounded in practice. 13. You must provide a list of references at the end of your paper. 14. This piece of writing contains no new information. 15. Statistics is useful in language testing. 16. The unemployment statistics are disturbing.

*Задание 2*. Выделите в следующих предложениях предлоги, глаголы и прилагательные, с которыми комбинируется слово **problem**. Переведите предложения.

1. The advent of the atomic age has confronted radio-biology with two fundamental problems. 2. The problems were posed by life itself. 3. In my paper I would like to touch upon a problem which has yet received little attention in the literature. 4. We know that Prof. N is concerned with a similar problem. 5. Until recently only specialists were interested in this problem. 6. In recent years international organizations have concerned themselves with the problem of water desalination. 7. Scientists of many countries were and still are working hard on this problem. 8. This paper embraces a wide range of problems. 9. Let us pass on to the basic problems which are dealt with by biological and medical cybernetics. 10. What problems are involved in the scientific research carried on at your institute? 11. There are mainly the problems of providing for the safety of space flights. 12. A host of entirely new problems arise in connection with the scientific approach to the management of the national economy. 13. This problem will acquire an ever greater importance as the scientific-technological revolution progress. 14. This presents an almost insurmountable problem. 15. I see no problem here. 16. The actual range of the problems is much wider. 17. It is not sudden and not by chance that environmental protection has become a vital problem of our times.

*Задание 3*. Заполните пропуски прилагательными из приведенных ниже. Переведите предложения.

**Previous, appropriate, developing, principal, rough, different, current, quantitative, qualitative, primary, sudden, persuasive, human, popular, fair**.

1. The committee's … concern is to protect … rights. 2. Nanotechnology is a quickly … discipline. 3. Political theory is a … undergraduate subject. 4. Charles Darwin explained the existence of … species in terms of evolution. 5. Both … and … research is necessary to gain a full picture of the … situation. 6. Managers should take decisions which are … to the benefits of shareholders. 7. The … cause of the failure was a … change in the conditions of the experiment. 8. It is important that researchers treated their subjects in a … way. 9. Before you begin to write up your results, make … calculations. 10. … attempts to explain the phenomenon were not … .

*Задание 4*. Рассмотрите сочетание существительных с глаголами и используйте их для высказывания о своем научном исследовании.

In case a phenomena emerge or occur, researchers try to observe, investigate and explain those phenomena. They collect, obtain, gain, get data, information or facts about them. Then they analyze, classify and describe the facts; collate, write up and publish the results. Sometimes results are questioned or invalidated, occasionally the can be even falsified.

*Задание 5*. Поставьте подходящий по смыслу глагол на место сказуемого в следующих предложениях, выбрав из предложенных ниже.

*deals with; to solve; were made; depends on; correlate; is based; concerns, approved; should be included; lacked*

1. It is impossible … this equation without a calculator. 2. The fundamental discoveries in this new science … nearly twenty years ago. 3. All available data … well. 4. This approach … on a rather well established methodology. 5. After a heated debate they … the measures to be taken. 6. This hypothesis … confirmation. 7. The discussion … problems of common interest for most scientists. 8. The text … the methods of biological science, their historical background and development. 9. Much … the personal interest of the student, and on his linguistic and cultural background. 10. Such conceptual subjects as mathematics … in all educational programms.

*Задание 6*. Переведите данные ниже предложения, обращая внимание на слова «широкой семантики».

Рекомендуемый перевод для научного контекста:

**Case** – общий элемент смысла: совокупность конкретных условий или обстоятельств: *случай, положение дел; доводы, доказательства, аргументы* и т.д.

**Context** – *задача, цель; вопрос, тема; область; условие*.

**Issue** – вопрос; тема; проблема; пункт; издание/том (журнала, книги).

1. In any case the results of the experiment will be of great value. 2. If this is really the case, a true scientific break-through of major importance must be anticipated in the nearest future. 3. He presented a strong case against the proposed solution. 4. I believe a case exists for revision of the hypothesis. 5. In the present context, it is only necessary to make the decision. 6. As discussed in the context of epidemiological research, a standardized methodology should be developed. 7. This edition contains bibliographic materials relevant to the present context. 8. The issue of environment protection is on the agenda today. 9. A number of key issues were addressed in this essay. 10. Have you seen the latest issue of *Applied Linquistics*?

*Задание 7*.

A. Read the text and answer the following questions:

1. How is science usually understood?
2. What fields or branches of science can be singled out?
3. How does science develop?
4. Are science and technology identical?
5. What is the purpose of science from your point of view?

## WHAT IS SCIENCE?

There are many definitions of science, but none of them can be accepted as complete. Speaking about science one should remember that the word "*science* " comes from the Latin "*scientia*," meaning "*knowledge*". Webster New Collegiate Dictionary defines science as "*knowledge attained through study or practice*," or "*knowledge covering general truths of the operation of general laws, esp. as obtained and tested through scientific method [and] concerned with the physical world.*"

In general it is thought that science is the concerted human effort to understand the surrounding natural world and human society. Science is usually divided into fundamentals and humanities, into theoretical and empirical (natural and social), or into theoretical or pure science and applied one.

More detailed classification distinguishes between formal, physical, life, and social sciences on the one hand and applied sciences on the other. Each class

includes concrete disciplines. For example, according to Wikipedia “formal sciences are disciplines concerned with formal systems, such as logic, mathematics, statistics, theoretical computer science, information theory, game theory, systems theory, decision theory, and portions of linguistics.” So, we can say that the list of branches of modern science is enormous and growing every year.

It is suggested that modern science began around 1600 due to the efforts of Galileo Galilei (1564-1642), Johannes Kepler (1571-1630), and Francis Bacon (1561-1626). Their era marked the change from scholasticism of the Middle Ages and Renaissance to the science as we know it nowadays.

Scientists make new discoveries or develop new concepts and theories. But through time theories come and go, or at least are modified, as old ideas are questioned and new evidence is discovered. Hence, the body of knowledge produced by science undergoes constant change, which provides progress toward a better understanding of nature and society. According to Karl Popper, "Science is a history of corrected mistakes". It means that science does not presently, and probably never can, give statements of absolute eternal truth - it only provides theories.

To provide development of science, researchers put forward hypotheses - testable propositions explaining the occurrence of a phenomenon or phenomena which help to guide further investigation. Scientists make assumptions and use different methods to obtain data to support their assumptions or propositions. They make conclusions based on reasoning from accepted premises.

Science should not be confused with technology. Thought people doing science often use sophisticated technology, in fact science doesn't require it. Of course, science often leads to technology, and often uses technology, but science isn't technology, and can operate quite independently of it. On the other hand, technology is often defined as the practical application of science. That is why it is quite natural to say that science and technology overlap in so many ways that people treat them as a single field of human activity. They both play an important part in Man’s existence. There is no doubt that man’s technical intelligence rating is very high. But man should ask himself whether he is smart enough to benefit permanently from the advances of science, or so stupid that he will let them destroy his civilization.

What is the purpose of Science? The answer to this question is not an easy one. Some people believe that the purpose of science depends on what subject is being considered by a certain branch of science. Other people consider that the purpose of science is a very simple one: it allows humankind to improve its quality of life, to discover and explain the unknown, or to explain and predict. Still others think that the fundamental aim of science is to describe phenomena and not to “explain things”, while the secondary purpose of science is the formulation of principles and theories, which will lead to new studies and increased knowledge.

Most of contemporary scientists believe that the purpose of science is to produce useful models of reality.

Б) Найдите в Википедии определение вашей области науки на английском языке (http://en.wikipedia.org /). Дополните его сведениями из истории развития этой науки и назовите наиболее значимые теории. Какие технологии связаны с этой областью науки?

## § 3

### А. Теоретическая часть.

Передача научного сообщения невозможна без использования глаголов, которые участвуют в образовании свободных синтаксических конструкций (словосочетаний и предложений). В английском языке в научном контексте часто используются устойчивые сочетания глагола и существительного, как правило, необразного, нефразеологического характера. При использовании в тексте глаголов и глагольных словосочетаний необходимо помнить следующее.

1. Смысловые глаголы, функционирующие в предложении в качестве сказуемого (личные формы глаголов), используются со вспомогательными глаголами (исключая утвердительную форму сказуемых в *Present Indefinite* и *Past Indefinite*), и образуют видовременные формы в соответствии с коммуникативным намерением говорящего. Сведения о видовременных формах английского глагола можно получить из грамматических справочников, но важно знать, что смысловой глагол в любой из форм обозначает само действие и переводится на русский язык. Смысловой глагол в соответствии с типом видовременного сказуемого может употребляться в форме Причастия I (*Present Participle – V-ing: reading*) или Причастия II (*Past Participle – $V_3$*, которое у регулярных глаголов образуется с помощью форманта *–ed: worked* ; формы нерегулярных глаголов приводятся в специальных таблицах: *go-went-gone*).

Вспомогательный глагол (либо первый из нескольких, либо в сочетании со смысловым глаголом) указывает грамматическое время (*Present, Past, Future, Future in the Past*), аспект или вид (*Indefinite/Simple, Continuous/Progressive, Perfect Simple, Perfect Continuous/Progressive*), лицо, число и залог (*Active Voice, Passive Voice*) сказуемого, изменяется в соответствии с указанными категориями и согласуясь с подлежащим, и не переводится. Исключением являются неизменяемые модальные глаголы (*can, may, must,*

*should, would, ought to, need, dare*) и формы сослагательного наклонения (*Subjunctive Mood*).

При анализе предложений следует учитывать наклонение сказуемого: изъявительное (*They obtained all the necessary information.*), повелительное (*Look for the necessary information in the Internet!*), сослагательное (*I would search for the necessary information in the literature if I were you*). Правильное определение и построение видовременной формы сказуемого и наклонения глагола содействует адекватной передаче сообщения адресату и понимания им передаваемой информации.

2. Неличные формы глагола: *Present Participle, Past Participle* и *Infinitive* (без частицы *to*) входят в состав личных форм сказуемого. Все неличные формы глагола, включая *Gerund*, употребляются в предложении самостоятельно, в качестве разных членов предложения, а также в составе особых оборотов (конструкций): зависимых и независимых. Все неличные формы глагола (за исключением *Past Participle,* имеющего одну неизменяемую форму) характеризуются категориями аспекта/вида и залога. Формы *Present Participle* и *Gerund* полностью совпадают во всех категориях, но их функции в предложении различаются. Кроме того, перед *Gerund* часто употребляется предлог: *without* ***making*** *calculations*.

*Infinitive* и *Gerund* сочетают свойства глагола и имени существительного, и могут занимать в предложении позиции, аналогичные занимаемым именем существительным, например позицию прямого дополнения: *I like reading books / to read books*. Если в предложении они функционируют так же, как и имя существительное, то могут переводиться на русский язык существительным же.

3. Английские глаголы делятся на переходные (требующие после себя прямого дополнения: *to take a book*) и непереходные (не требующие прямого дополнения: *to come*). Многозначный глагол в разных своих значениях или употреблениях может быть и переходным и непереходным (*I don't understand; He didn't understand me*). При наличии прямого и косвенного дополнения вначале ставится косвенное, а затем прямое: *give this student the book*. Если косвенное дополнение является предложным, то порядок слов будет противоположный тому, что указан выше: *give the book to him*.

4. Часто глаголы образуют устойчивые сочетания с предлогами, передающими значения, соответствующие значениям падежей в русском языке: *to go* ***to*** (направление движения); *written* ***by*** *N* (исполнитель действия); *equipped* ***with*** *new apparatus* (объект или инструмент действия). Примеры устойчивых сочетаний глаголов с предлогами: *to account for, to associate with, to benefit from, to divide into, to exclude from, to include in, to research into, to speak of, to write of, etc*.

Особенностью английского языка является наличие глаголов с последующей неотделимой частицей (так называемые *фразовые глаголы*). Их следует запоминать, поскольку частица существенно меняет значение глагола: *to look* (смотреть); *to look after smb/smth* (заботиться о ком-либо); *to put up* (смириться с чем-либо); *to write up* (письменно оформить работу); *to make up* (составлять, образовывать); *to put forward* (выдвигать, предлагать). Существуют специальные словари фразовых глаголов. В научном контексте такие глаголы обычно употребляются в устных высказываниях.

5. В научной коммуникации постоянно употребляется некоторое количество глаголов, которые можно назвать ключевыми, и которые рекомендуется запоминать, например: *to assume, to attempt, to calculate, to classify, to conduct, to describe, to develop, to discover, to establish, to examine, to explore, to evaluate, to find, to investigate, to present, to provide, to study, to support, etc.*

6. Для глаголов в научном контексте характерна устойчивость сочетаний с определенными именами существительными или набором существительных: *to provide an explanation; to conduct research /experiment /investigation, to explain the phenomenon /results, etc*.

7. Нередко глагольные словосочетания заменяются в тексте именными. В этом случае следует учитывать наличие или отсутствие предлога у глагола или у однокоренного существительного: *to explain smth – explanation* ***of*** *smth*.

## Б. Практическая часть.

*Задание 1*. Проанализируйте подчеркнутые сказуемые в следующих предложениях и дайте их перевод с учетом грамматического времени, аспекта и залога.

1.Philosophy began with man's sense of wonder and curiosity expressed in the question "What are things really like?" Philosophers approached this question with a fresh and new frame of mind that was in contrast to that of the great poets. 2. We are told by Aristotle that "the Pythagoreans devoted themselves to mathematics". 3. Pythagoras became interested in mathematics for religious reasons. He is, therefore, referred to as the founder both of a religious sect and at the same time a school of mathematics. 3. The research underlines the importance of psychological experiments for understanding the nature of aggression. They will provide solid evidence that aggression is caused both by internal and external factors. 4. The data we have collected will be presented in a chart or table, as it is the most efficient way to illustrate the results of our research. 5. Many scientists are staying in the same research laboratories through their lives and don't agree to move to more prestigious institutions. 6. The failure of the experiment has been linked to the inappropriate methodology.

*Задание 2*. Вставьте необходимый по смыслу глагол из приведенных ниже вместо пропусков в следующих предложениях. Учитывайте сочетаемость глагола с определенными предлогами и именами существительными.

*Depends, demonstrated, is identified, to examine, deals with, were applied, to keep, to emphasize, is based, can be filled*

1. When doing research it is sensible … good records of all your findings. 2. Our next step is … the evidence for the existence of this species. 3. The vacancy … only by a scientist with outstanding record and background. 4. The text … the methods of biological science, their historical background and development. 5. Much … on the personal interest of the student, and on his linguistic and cultural background. 6. This approach … on a rather well established methodology. 7. Their research clearly … the need for a new approach to the study of human behavior. 8. Social research techniques … to examine the effects of the policy on the middle-aged. 9. Monetary economics … with the theories of Milton Friedman. 10. In her speech she tried … on the advantages of this new approach.

*Задание 3*. Обратите внимание на использование модальных глаголов и их эквивалентов в следующих предложениях. Переведите предложения.

1. In his book, Jackson must have departed from his earlier theory. 2. They couldn't account for the mistakes in their calculations. 3. Every visible event in nature can be explained by previous events. 4. In a conceptual analysis one need only examine the parts. 5. Simplification must be used as a method of understanding any science. 6. It may take you twelve hours reading to produce an intellectually honest article of a thousand words. 7. According to the author this theory should hold in all cases. 8. They were able to predict further development of events. 9. Planning for the implementation of research results should begin when the research itself begins. 10. He is allowed to perform the operation. 11. I am to go to the conference. 12. A system analyst must learn to distinguish between real problems and symptoms. 13.This view ought to be accepted. 14. Need we use all these pseudo-operations? 15. All the responsibility should be strictly defined. 16. They need not have carried out the test any more. 17. They may have to take value into account. 18. The following points shall, however, be mentioned. 19. I will direct my critical remarks to the author of the article. 20. I would direct some critical remarks to the author of the article.

*Задание 4*. Замените следующие подчеркнутые глаголы словосочетаниями глагола и существительного. Выберите из предложенных ниже:

*To offer/provide/give an explanation of/for; to carry out an exploration of; to put/place emphasis on; to give/provide a description of*

1. This book emphasizes the importance of reading in language acquisition. 2. Many sociologists explored the relationship between family background and political ambition. 3. The book describes the beginning of space research. 4. This theory explains the fluctuations of the figures for this period.

*Задание 5*. Определите наклонение глагола в следующих предложениях и переведите предложения.

1. The study revealed a regular pattern of criminal behavior for teenagers. 2. Consider the advantages and disadvantages of different linguistic methods. 3. Provide statistical evidence and comments where necessary. 4. This fact proves that we can identify trans-cultural ideals. 5. The work would be done if they prepared for it properly. 6. Does Greig's article supports or challenges Park's theory? 6. I would like to give considerations on this subject. 7. It is desirable that this method (should) be tested in practice. 8. The recent investigation suggests a different interpretation of the situation. 9. Turn to the more difficult cases that I mentioned in my previous lecture. 10. But for the lack of reliable instrument the problem could have been solved long ago. 11. There was apparent discrepancy between the two sets of results. 12. There are many factors that could have contributed to this relatively small imbalance. 13. List the characteristics you examined in detail below. 14. Even problems that would be termed "simple" nowadays could not be handled in a straightforward way.15. We assigned the task randomly to the experimental group and to the control group to see how the subjects would react to different tasks.

*Задание 5*. Найдите в следующих предложениях фразовые глаголы и переведите предложения.

1. The author points out that the increase of population has led to some economic problems. 2. The unemployed in developing countries make up nearly half of adult population. 3. Pavlov decided to work on animal behaviour to analyse stimuli-reaction relationship. He set up a series of experiments investigating the behaviour of dogs. 4. What she has observed seems to go against current theories. 5. On completing your research you have to write it all up. 6. What sort of things must a scientist carry out? 7. It is sensible to go through maths calculations before you draw any conclusion.

*Задание 6*. А) Обратите внимание на подчеркнутые неличные формы глагола и их функции в следующих предложениях. Переведите предложения.

1. Defining problems precisely requires patience. 2. Memory is the process of selective forgetting. 3. To think otherwise would be a mistake. 4. Psychology of creative work is many-sided. 5. The performed work showed good results. 6. The equipment to be used is not ready yet. 7. They succeeded in getting reliable information. 8. He was the first to realize the difficulty of the situation. 9. The theory also basically improves understanding of this situation. 10. To construct a design of this kind seems nearly impossible. 11. Unfortunately the advantage of joining efforts for a complicated job is not always understood. 12. They have come here to observe the experiment. 13. In order to do this work well one must learn a lot. 14. It was a standpoint shared by many philosophers. 15. A number of animals living in the soil feed on plants.

Б) Проанализируйте примеры сложных конструкций с неличными формами глагола в предложениях ниже и дайте их эквивалентный перевод.

Конструкции с Причастиями I и II. 1.The characteristics of the components so far considered can be presented by the following scheme. 2. Several treatments of this problem have been presented, with theories resulting from this investigation falling into one of the two categories. 3. The data obtained are considered as not being adequately represented by equation 1. 4. We know them being invited to all our meetings.

Конструкции с Герундием. 1.The history of radioactivity begins with Henry Bequerel's having reported his discovery of rays of unknown nature. 2. Besides being very involved this procedure is very costly. 3. (With) research involving more and more people, the profession of a scientist has become one of the most prestigious nowadays. 4. There is unmistakable proof *of his (professor, Dean's) having been wrong*.

Конструкции с Инфинитивом. 1. We expect them to be involved in the work. 2. Experience shows this strategy to have produced better results. 3. Prof. Martin seems to have given up this view. 4. The lifetime of the equipment is assumed to be 30 years. 5. For this method to be valuable it must be improved.

*Задание 7*.

A. Read the text and answer the following questions:

1. Why is the scientific method required by researchers?

2. How is the scientific method defined?

3. Which stages or steps does the scientific method include?

4. Which steps should the researcher repeat if the satisfactory explanation is not found?

5. Should the researcher be guided by any factors when making conclusions on the investigated problem or set hypothesis?

## THE SCIENTIFIC METHOD

When a scientist attempts to obtain evidence related to a set hypothesis or collects data about a phenomenon to be explained, or tackle a problem which may come from consideration of some work, he or she applies a particular method of investigation. This rather well-defined procedure of obtaining knowledge has come to be known as the Scientific Method.

Simple description arbitrarily divides research into three stages. Stage one includes the dreams, the ideas, the exploratory work, selecting the problem, setting the objective, testing technical feasibility, and searching the literature. Stage two involves planning the experiment, conducting the experiment, checking the alternates, data taking, and data evaluation. Stage three is the solution of the problem – drawing conclusion and making recommendations.

But more fundamental approach to the essence of the scientific method argues that the steps in the procedure may be listed as follows:

1. The recognition of the problem. It may be stated as a question. (In this case each hypothesis can be regarded as a possible answer to the question or a possible explanation.)

2. Collection of experimental facts or data which are obtained by means of observations or measurements recorded during an investigation and analysed.

3. The results of the analysis are considered and a tentative hypothesis set up. Information from different sources can be brought for comparing.

4. Performance of test experiment or using other methods of data verification.

5. Substantiation, modification, or abandonment of the hypothesis in the light of the results of the previous step.

If the hypothesis is discarded because of the insufficient results of the data analysis, a new one is set up and steps three, four and five are repeated until a satisfactory explanation for all known data obtained in the test experiment is found. Additional hypotheses may also be put forward to provide other possible explanations.

As the amount of substantiating data becomes larger or when a hypothesis is generally accepted by scientists working in the field, it advances to the rank of a theory and eventually can be accepted as true. Accepting hypothesis leads to synthesis of information from different sources, various classifications or generalisations (stated as norms, concepts, principles, laws).

A theory leading to the statement of a principle or law has value not only because it accounts for observations which have been made, but also because it allows scientists to predict what will happen in future observations and experiments.

It should be noted that in general one adopts first the most obvious hypothesis; that is, the one that at the moment seems to offer the simplest explanation. But it may or may not prove to be satisfactory when new evidence is obtained.

In coming to a conclusion about any hypothesis the true scientist should be governed only by the experimental evidence and not by what he wants the results to be, or by reputation of those who advanced the hypothesis, by the views of the majority of researchers on it, or by any emotional reaction to the problem. Then the conclusion can be called objective.

Б) Расскажите о своем научном исследовании, опираясь на приведенное выше описание научного метода. Дополнительные сведения о научном методе и описание конкретных методов можно найти в Интернет-источниках (http://www.gly.uga.edu/railsback/1122science2.html; http://en.wikipedia.org /)

## § 4

### A. Теоретическая часть.

В контексте научного общения, помимо имен существительных терминологического и нетерминологического характера и глаголов, часто используются и иные части речи, характеризующие как сами объекты научного познания, так и инструменты науки, результаты научных изысканий и научную деятельность в целом. Отдельные словосочетания существительных с прилагательными, глаголов с наречиями, ряд метафорических сравнений, идиоматические выражения, приобрели в научном дискурсе характер клише. Наиболее типичные для научной области коммуникации единицы английского языка приводятся ниже.

1. Имена прилагательные, характеризующиеся частотностью употребления, часто комбинируются с определенными существительными или рядом существительных, близких по общему смыслу (*potential problem, possible solution, valuable method, explicit statement/comparison; relevant data/factor, etc*). Прилагательные нередко сочетаются с предлогами (*charactreristic of,*

*suitable for, typical of, relative to, specific to, true to, etc*). Имена прилагательные можно объединять в синонимические ряды (*important = significant*) или запоминать в антонимических парах (*exact* vs *rough*).

2. Наречия могут определенным образом характеризовать действие (*generally, randomly, etc*), или интенсифицировать какой-либо признак объекта (*considerably, especially, very, etc*), указывать на время совершения действия (*nowadays, recently, etc*). Особая группа наречий – наречия частотности (*always, often, usually, rarely, etc*). Как и имена прилагательные, разные наречия могут иметь синонимичное значение (*especially = particularly*), или характеризоваться как антонимичные (*directly* vs *indirectly*).

3. Прилагательные и наречия в формах различных степеней сравнения, наряду с причастием I, часто передают количественный смысл или выступают квантификаторами в сочетании с именами существительными *(large/great amount of; fair, substantial, enormous, total, exceeding, etc*). Иногда такие сочетания становятся устойчивыми (*fewer and fewer; less and less; more and more; no fewer than; etc*).

4. С целью обеспечения логики изложения информации, формальной и смысловой связанности речевого произведения, в научном контексте используются устойчивые фразы с предлогами (*in conjunction with; in addition to; in spite of; etc*) и клишированные выражения (*on the whole; in general; in more detail; as far as; from the point of view; as regards; rather than; etc*) неидиоматического характера.

5. Научное общение и научное творчество не лишено образности и выразительности, поэтому в устных высказываниях и письменных текстах часто используется стилистическая (*the discussion was a real* ***battle***) и когнитивная (*it was an* ***illuminating discussion***, ***the capital is raised*** *by issue of shares*) типы метафоры, что, помимо прочего, позволяет объяснить непонятное через сравнение с хорошо известным, например, сравнение со светом или темнотой, с военными действиями или конфликтами. Аналогично метафоре используются и идиоматические (фразеологические) выражения (*remain in the dark*) поговорки (*the report* ***shines a light on***), и пословицы (*a good beginning makes a good ending*).

## Б. Практическая часть.

*Задание 1*. Проанализируйте подчеркнутые части приведенных ниже предложений с точки зрения использования прилагательных, причастий, наречий и устойчивых выражений. Переведите предложения.

1. The dissertation contains only rough estimates of the population involvment in nature protection. 2. Both quantitative and qualitative research is nec-

essary to gain a full picture of the situation. 3. This response to the questionnaire was specific to young male respondents. 4. Material objects are objects existing in a form that can be seen or felt. 5. To put it simply, the risks of this approach can overweigh its advantages. 6. There are approximately 30 varieties of this plant in South America. 7.The report revealed the glaring discrepancy between people's needs and politicians' decisions. 8.There is a widespread belief that the government policy in the field of education should be changed. 9. The Chairman welcomed the participants of the conference on behalf of the President. 10. They decided to consider the topic in more detail, i.e.(that is) from the point of view of the situation uncertainty.

*Задание 2.* Замените подчеркнутые слова и словосочетания в предложениях синонимичными, выбрав из перечисленных ниже:

**in most respects, appropriate, on the whole, particular, relevant to, rather than, apparent, although I accept that this is true; typical of, largely**.

1. Scientists need to plan technologies which are suitable for the requirements of manufacturers. 2. Is it possible to make science connected to the problems of health care? 3. Combining research methods is characteristic of the situation in many branches of science. 4. The seeming discrepancy between the two sets of results can be due to different methods of calculation. 5. The discussion was mostly successful. 6. Generally, the theory was accepted by the academic community. 7. Special attention has been given to the problem of space flights. 8. Considering most aspects of your work it was a thorough investigation. 9. You should use an eight-point scale in the questionnaire, as opposed to a four-point one. 10. Be that as it may, there is some evidence of misinterpretation of the obtained data.

*Задание 3*. А) установите соответствие между следующими существительными и прилагательными:

**Nouns**: *significance, relevance, interest, frequency, importance, value, use.*

**Adjectives**: *important, significant, valuable, useful, relevant, frequent, interesting.*

Б) Замените в следующих предложениях выделенные существительные именами прилагательными. Измените, где необходимо, грамматическую структуру предложения и замените предлог.

1. Jones's work has great r**elevance** for our further study. 2. The **value** of their research to anyone interested in economic planning is great. 3. At first, politicians could not evaluate **the importance** of this event for the history of Latin

America. 4. The lecturer spoke about **the significance** of Shannon's book for the development of cybernetics. 5. **The use** of software is required for the analysis of large amounts of numerical data. 6. The method she outlines is of great **interest** to biologists. 7. **The frequency** of the expression "on the whole" in academic writing is noted by linguists.

*Задание 4.* Проанализируйте, как изменяется смысл в зависимости от выбора одного из антонимичных слов в следующих предложениях.

1. For this reason / for no reason he decided to repeat the experiment.
2. More and more / fewer and fewer people are staying in the same job throughout their lives.
3. Professor Jones is explicitly / implicitly critical of modern theories of economic growth.
4. They seldom /often complained that they could not persuade the head of the department to start the experiment.
5. Some small errors in the calculations are directly / indirectly linked to the human factor.
6. The human brain is a remarkably complex / simple organic computer.
7. Their observations gave quite an unexpected / quite expected results.

*Задание 5*. Прочтите следующий текст и найдите в нем устойчивые предложные фразы. Переведите текст. Используйте выявленные фразы в своем сообщении о научной работе.

I'd like to speak about our study on behalf of the whole team of researchers. Our interest in the subject came about as a result of discovering some old notes of Ptofessor Jones in his archive. They contained, for the most part, description of anti-social or even aggressive behaviour of his patients, but no conclusion about causes of this aggression was made.

*Задание 6.* Поставьте пропущенные предлоги, проверив правильность выбора с помощью словаря. Переведите предложения. Составьте свои предложения с полученными словосочетаниями.

1. The book was written by Professor Jones … conjunction … his colleagues from the Trinity College. 2. This is a very detailed description of the phenomena … comparison … to the previous one. 3. There are a number of appendices in this volume … addition … the main text. 4. … the exception … the final part, the article provides new information about these events. 5. Her recent paper is … line … modern psychological practice. 6. … spite … the conventionality of the topic, the report contains many fascinating examples. 7. This academic work

may be … some interest …the general reader. 8. … the whole, the conference was a great success.

*Задание 7.*

A. Read the text and analyse its structural and logic division. Find set expressions and metaphors in the text.

## SCIENCE IS NOT STANDING STILL

The development of science, both natural and social, is described by the history of science. It has been estimated that two-thirds of all scientific discoveries have been made in the last half of the XX century, and it is predicted that the forthcoming years of the XXI century are likely to be even more spectacular.

The number of research papers published each year may be taken as a rough indication of activity displayed in any general or specified field of science. The number of papers published annually in learned journals could be a useful barometer indicating the development of scientific thought.

New theories appear to provide explanation to the facts and data gathered in the course of practical work. The value of theory for the development of science cannot be overestimated, as without theories there would be no science. Like a beacon, a theory lights up unexplored regions and helps scientists to make new discoveries.

Modern scientific methods of observation and verification helped man to transcend the limitations of the five senses. Thanks to the developed technological instruments researchers can expand their limited capabilities and study both the smallest fundamental particles or sub-divisions of the atom, as well as the largest ones i.e. stars and planets, which may settle age-old controversies about the nature, age, formation and development of the universe.

While some scientists believe that with these instruments science seems to have reached its limit, and scientific investigations are reduced to mathematical symbols, others argue that though science has advanced far-reaching enough, it cannot approach the limits of the physical universe. Nevertheless, current trends in science witness its turning to the mysteries of the mind and development of Artificial Intelligence. The main questions some scientists are speculating about are the following: What is mind? How does it work? What is consciousness? Does it arise from a physical source, or is it entirely separate from the physical world? Will the development of Artificial Intelligence lead to computers with minds?

As observation, experimentation and analysis enter the sphere of the psyche, science retains its basic attitude and experimental method, and so there is a lot of guesswork and preconception in its operation. It remains to be seen whether science can in fact enter into the domain of the mind, and by what means.

In spite of the fact that scientists' imagination seems to be stirred most by scientific activity that has no nowadays conceivable practical application, previous and current scientific breakthroughs and discoveries have been continually changing the life of people, the economy of the developed countries in particular.

The development of science and technology undoubtedly makes life more comfortable and convenient. New power sources, high-speed trains and other forms of transportation, means of telecommunication, Internet and email are not the only to be mentioned. As rockets and space shuttles are becoming involved in the sphere of tourism, the journey to outer space and other planets is not a dream any more. Modern medicine prolongs people's life and relieves patients of sufferings from many diseases. Thanks to the endeavours scientists have made, cancer and AIDS become treatable and are no longer fatal to people's health.

Science is moving so fast that it is difficult to keep up, let alone understand all its myriad developments. But there would seem no need to fear that we will soon have solved all the problems and made known the entire unknown. In fact, the reverse is much more probable since every new discovery seems to widen the horizon and increase the extent of our contact with unexplored areas.

It is generally accepted that modern science and technology render people many advantages but at the same time science creates many problems, which are not easy to be resolved, among those are air pollution, the deterioration of environment and the scarcity of natural resources.

It is interesting to note that pure science tends to be distinguished from applied science and technology in its strive to reject to share some of the responsibility for the harm resulting from these things. In fact, in the last hundred years or so, pure science has not really been so pure. There are values implicit within pure science which the scientific fraternity is unaware of; and because it isn't aware of these values, scientific research comes unwittingly under their influence.

However, both pure and applied science must find effective solutions to the problems they created. There can be little doubt that man's technical intelligence rating is very high; whether he is also smart enough to benefit permanently from these advances or so stupid that he will let them destroy his civilization will probably be decided shortly.

Б) Speak about the achievements in your field of science and of the problems and threats to humanity connected with the development of this branch of science.

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Рекомендуемые сайты обучающих материалов

http://www.bbc.co.uk -информационные материалы, предоставляемые Британской Теле-радиовещательной Корпорацией (BBC)

http://www.videojug.com/ - информационные и обучающие видеоматериалы на английском языке;

Рекомендуемые сайты информационных баз данных:

http://researchgate.net/ -бесплатная академическая интернет-сеть

http://www.journals.elsevier.com – база данных издательства Elsiver

http://www.springer.com - Базы данных издательства Springer

https://wosjournal.com/ - База данных Web of Science

http://www.scopus.com - Реферативная и наукометрическая база данных SCOPUS

ПРИЛОЖЕНИЯ

Приложение 1.

Выражение согласия, несогласия, аргументированного мнения

**Agreement**

I fully / totally / quite / entirely agree with Prof. N there / on that.
I agree completely with this point of view / with Prof. N.
It must be recognized that this theory is correct.
I / We cannot but agree that these features are characteristic of all substances.
The author is right.
I'd go along with the author there / on that.
I'd tend to agree with him.
I couldn't agree more.
That's exactly my opinion.
That's just how I see it.

**Disagreement**

I don't agree / I disagree with Prof. N.
I am basically in disagreement with this view.
I can't accept this idea.
On the contrary. / Far from it.

**Expressing opinions**

This is particularly useful in practice.
This method is perfectly acceptable.
This concept effectively covers the gap left by the theory.
This constitutes a rather interesting case.
The achievements are noteworthy.
It is doubtful / seems unlikely that this theory will cover all the cases.
This hypothesis is difficult to assess.
It's far from being novel.
This technique is highly complex.
The problem is by no means new.
It is misleading / not correct to think that the theory ignores ecological principles.
This new study failed to verify this mechanism.

Приложение 2

Вопросник для составления сообщения о диссертационной работе

MY RESEARCH

1. Define the subject and main objectives of your research. What is the topic/theme of your thesis/dissertation?
2. Describe briefly the historic background of the problem (or theory/hypothesis/field, etc.) you have chosen.
3. Say, why the problem is of interest to you, and for how long you have been studying it.
4. How many stages does your research include and of how many parts/chapters does your thesis/dissertation consist?
5. Which scientific methods (or techniques, procedures, etc.) do you use in your research? (Observation, experiment, data analysis, etc)
6. What results are you going to obtain (or have you already obtained) while carrying out your research?
7. Where and how do you plan to implement/ to apply these results? Can you estimate the significance of your results?
8. In which way is your research related to your current activity/job?

Приложение 3

Типовая структура научной статьи и рекомендуемые клише

**THE STRUCTURE OF THE ARTICLE**

1. (the) **Introduction** (What was the problem? The chief/general aim…; central/key/ultimate goal…; main/particular purpose…; major/primary task of this paper/study is to investigate/establish P. One of the principal/main objectives of the paper is… . In this article/section I examine the nature/characteristics/features/functions of N. The present paper/investigation goes into/inquires into/ focuses on/ deals with/ is devoted to the question/problem/issues of N; undertakes to survey/identify the structure of P; considers what factors/processes influence Z).

2. **Materials and Methods** (How did you study the problem? In our study we have adopted/applied an innovative approach to P; We develop/offer/provide/ rely on/ try/work out/ use a method of…; P is dealt with/ analyzed within a *functional* framework/ paradigm/ perspective. Our analysis/ investigation *of P* is based on evidence/calculations/ estimates of N; … rests on/ focuses on findings of N; involves observations of L. This method/approach enables predictions of P; …allows decisions on P;… helps to investigate/ display *the main properties of* P.This framework offers a clear/particular way to implement R; … serves for/ aids in organizing/ generalizing/ classifying *the knowledge about* P).

3. **Results** (What did you find? Our study/investigations reveal/show that P…; lend support to the hypothesis of …; …presents evidence to/ indicate/ suggest that…. It has been shown that…/ exhibits properties of P.)

4. **Discussion** (*and concluding remarks*) (What do these findings mean? These results/observations/findings/figures need careful explanation/ require a careful study. The question is…/We are faced with the problem of…/The most logical explanation for P is…/A few words of comment are necessary here. The following is meant as an explanation. Our observations/results support the supposition that…/indicate/suggest that…/reveal close agreement between…/highlight the potential of P. We can explain the effect/process/figures if we assume that…. Our description/ interpretation makes explicit the influence of R on P.We have put forward the view that… . Now it should be clear that … .Our conclusion holds for *any P*. Such knowledge permits predictions about P.)

5. References

Optional:
6. Acknowledgements
7. List of Abbreviations.

## More ideas about the language of the learned article

I. The structure of the Article is as follows. The first section reviews/describes/clarifies/outlines/sketches P. Section 2 portrays/ dwells on/enlarges upon/ shows that Q. Section 3 argues that P. The final section proposes/summarizes/spells out in (more) detail R.

II. In this article I review/debate the problem (and advantages) of P, and argue that Q. I claim/demonstrate/suggest that (insufficient attention has been paid to) Q. In particular, it will be shown that R.

III. In this paper I attempt to clarify the relation of P and Q. To do so, I first present R. I then attempt to show that P. In conclusion, Q is considered.

IV. This paper presents a new/complex/algorythmic/structural approach to the study of P. The empirical results are described in Section 1. In Section 2, I will address/discuss/characterize/comment on/ specify Q. Section 3 turns to P/presents theoretical results. Section 4 concludes with a discussion of implications/consequences of R.

V. This paper presents a new methodological framework within which P can be studied. After analyzing the data, it is concluded that Q. The results of the study are evaluated and assessed in the light of the problems of Q. Additionally, R is examined.

Образцы оформления аннотаций научных статей

´Abstract – a summary of a report, speech or academic paper (**to ab´stract** – to write a short summary of a speech, report, or other piece of writing)/*abstracts* – тезисы/

Annotation – [of (to)**annotate –** to put notes in a piece of writing in order to explain parts of it.] It is the extremely brief account of the main contents like the list of major problems.

Précis – a short summary of a speech or piece of writing (**to précis**).

Résumé – *AmE* – a summary of something.

**Samples**

1. *McCloskey, Donald*. "*An economic uncertainty principle*": Economists claim to know the next month's interest rate, yet they are not rich. Their claim is also a claim that others in the market do not know the future of the interest rates. The economic uncertainty principle **is examined**.

2. *Le Doux, Joseph E*. "*Emotion, memory and the brain*". Researchers have begun to understand the brain's role in producing emotion, and one rewarding area of study lies in the relation between memory and emotion. The neural routes underlying the formation of memories about emotional experiences **have been traced**.

3. *Davies-Jones, Robert*. "*Tornadoes*". Although much has been discovered about the behavior and origins of tornadoes, many misteries still remain about how these violent storms form. Davies-Jones **explores** the many different forms of tornadoes and the devastation that they can create.

4. *Garver, Wayne; Moss, Frank*. "*Detecting signals with noise*": Garver and Moss **describe** two experiments demonstrating the utility of noise in bringing out an electronic signal and the possible extraction of data from background noise. The construction of the experiments and the likely results **are discussed**.

5. *Nowak, Martin A; McMichael, Andrew J*. "*How HIV defeats the immune system*": Nowak and McMichael **propos**e that HIV replicates prodigiously, enough to cause the severe immune impairment that defines full-blown AIDS. The process by which HIV escapes the control of the immune system, signalling the onset of AIDS, **is described**.

6. *Guterl, Fred*. "*Keyhole view of a genius*". Physicist Albert Einstein **is profiled**. A series of books about the man **delves into** his complicated and passionate private life.

7. *Stewart, Jan*. "*The never-ending chess game*": A hypothetical chess game that goes on forever without checkmate and without repeating the same sequence of moves three times in a row **is presented**.

8. *Minsky, Marvin*. "*Will robots inherit the earth?*". **The question of** whether the machines that humans have invented to extend the power of the human mind could outlive them to inherit the earth **is addressed**. Presuming that humankind decides to amplify its intellectual powers and replace failing parts of its mental machinery with computer circuitry, then nanotechnology would make such a prostheses possible.

9. "*Perspectives in interactive video*". The book **brings together** educators from Europe and the USA with wide experience of interactive video for education and training, **describing** their experience and potential for this medium. It **reflects** the current knowledge, both theoretical and practical, relevant to the production of good video material.

10. "*New Information Technology*". **This** unique and effective **picture of** the current state-of-the-art **draws on** a broad range of international experience in computer and modern

language teaching. It effectively **covers the gap** left by scattered papers in journals on individual programmes, and theoretical introductory texts. **Reflecting** the increasing educational uses of computers, and ways in which modern language teaching has utilized such technology, **the book is concerned with** the advanced or mature student learning a new language; - "extremely **comprehensive** and **deals with** a very complex subject in an orderly manner … **useful** to all those engaged in advancing modern technology in the microelectronic, computer and communication fields."

Приложение 5

Образец требований к оформлению
материалов для публикации по результатам конференции

**Full Paper Title in Title Case**

**Name Surname[1], Name Surname[2], Name Surname[2]**
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[2]My Institute/Company
Address, City, Country
Third.Author@uottawa.ca

***Abstract*** **-** In this paper, the formatting requirements for the International ASET Conference Proceedings are described. Some recommendations on writing for a worldwide readership are offered. Please review this document to learn about the formatting of text, table captions, references, and the method to include the indexing information. The conference proceedings will be published in an electronic format. The full paper in MS Word file shall be written in compliance with these instructions. At a later stage, it will be converted into Portable Document Format (PDF). An abstract not exceeding 300 words, in one paragraph, and with no references, should appear on the top of the first page, after the title of the paper and the names of the authors in a section titled "Abstract" (without section number).The word "Abstract" must be Arial, Bold, Italic, and 10 pt. The abstract itself must be Times New Roman and 10 pt. The title of the paper must be Arial, Bold, and 16 pt. Names and affiliations must be Times New Roman. Names must be Bold and 12 pt while affiliations must be 11 pt. The title, names, and affiliations must all be centralized.

***Keywords*****:** 4 - 8 keywords

**1. Introduction**

It is expected that authors will submit carefully written and proofread material. Careful checking for spelling and grammatical errors should be performed. The number of pages of the paper should be from 4 to 8.

Papers should clearly describe the background of the subject, the authors work, including the methods used, results and concluding discussion on the importance of the work. Papers are to be prepared in English and SI units must be used. Technical terms should be explained unless they may be considered to be known to the conference community.

## 2. Paper Format

The uniform appearance will assist the reader to read paper of the proceedings. It is therefore suggested to authors to use the example of this file to construct their papers. This particular example uses an American letter format with 25 mm margins left, right, top and bottom. All text paragraphs should be single spaced, with first line intended by 7 mm. Double spacing should NOT be used anywhere in the manuscript. Position and style of headings and subheadings should follow this example. One empty line (11 pt) should be left between every two consecutive sections. Two empty lines should be left before and after the abstract. All headings and subheadings should be bold and Arial font. Major headings must be 12 pt and subheadings should be 11 pt. No empty lines are required between the heading/subheading and the text.

### 2.1. Header, Footer, Page Numbering

Authors are asked to replace the "XXX" number (with the paper code that was assigned when the paper was accepted) on the header of the first page and on the footer of other pages in order to set a unique page number in the Proceedings.

### 2.2. Fonts

Papers should use 11-point Times New Roman font. The styles available are bold, italic and underlined. It is recommended that any text in the "figures" should not be smaller than 10-point font size.

### 2.3. Tables and Figures

Tables and figures should be placed close to their first citation in the text. All figures and tables should be numbered. Table headings should be centred above the tables. Figure captions should be centred below the figures. Refer to the figure below for a sample.

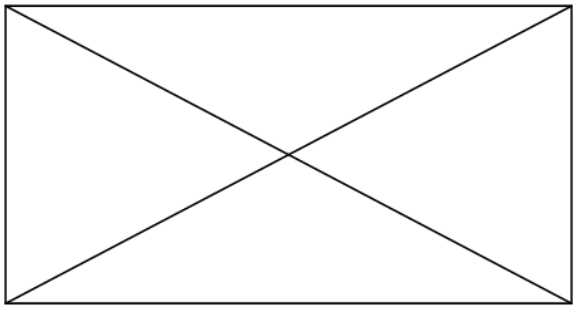

Fig. 1: Caption for figure goes at the bottom.

Figure captions and table headings should be sufficient to explain the figure or table without needing to refer to the text. Figures and tables not cited in the text should not be presented. Refer to the tale below for a sample.

Table 1: Caption for table goes at the top.

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### 2.4. Equations

Each equation should be presented on a separate line from the text with a blank space above and below. Equations should be clear and expressions used should be explained in the text. The equations should be numbered consecutively at the outer right margin, as shown in Eqs. (1) - (2) below. Here is one example.

In this case, the governing system of equations can be written as follows:

$$\frac{\partial \rho}{\partial t} = -\nabla \cdot (\rho \, \mathbf{u}) \tag{1}$$

$$\rho\left(\frac{\partial}{\partial t}+\mathbf{u}\cdot\nabla\right)\mathbf{u}=-\nabla P+\rho\mathbf{g}+\frac{1}{c}\mathbf{J}\times\mathbf{B} \quad (2)$$

$$\rho\left(\frac{\partial}{\partial t}+\mathbf{u}\cdot\nabla\right)e=-P\nabla\cdot\mathbf{u}+\rho\mathbf{u}\cdot\mathbf{g}+\frac{1}{\sigma}\mathbf{J}^2 \quad (3)$$

**3. Submitting the Paper**

The full paper has to be submitted electronically via the website of the conference by the deadline (see website for details).

Paper number (in the format "XXX") is assigned to each abstract after it was accepted and authors are kindly asked to place the paper number to the correct positions in the header and footer before submitting the final version.

**4. Conclusion**

Conclusions should state concisely the most important propositions of the paper as well as the author's views of the practical implications of the results.

**Acknowledgements**

A short acknowledgement section can be written between the conclusion and the references. Sponsorship and financial support acknowledgments should be included here. Acknowledging the contributions of other colleagues who are not included in the authorship of this paper is also added in this section. If no acknowledgement is necessary, this section should not appear in the paper.

**References**

The IEEE citation format is used. Books and book chapters should be referenced as [1] and [2] respectively. Patents are referenced based on [3] and a thesis can be referenced as [4]. Finally, conference presentations/papers and journal papers need to be reference based on [5] and [6] respectively.

With the increasing availability of useful information that can be found on the internet, website references must also be reported based on [7]. Meanwhile, due to the dynamic nature of web pages and the fact that in most cases the information is not peer-reviewed, the use of published resources are very much preferred and advised over online references.

The reference section at the end of the paper should be edited based on the following:

[1] B. Klaus and P. Horn, *Robot Vision*. Cambridge, MA: MIT Press, 1986.

[2] L. Stein, "Random patterns," in *Computers and You*, J. S. Brake, Ed. New York: Wiley, 1994, pp. 55-70.

[3] J. P. Wilkinson, "Nonlinear resonant circuit devices," U.S. Patent 3 624 125, July 16, 1990.

[4] J. O. Williams, "Narrow-band analyzer," Ph.D. dissertation, Dept. Elect. Eng., Harvard Univ., Cambridge, MA.

[5] U. V. Koc and K. R. Liu, "Discrete-cosine/sine-transform based motion estimation," in *Proceedings of the IEEE International Conference on Image Processing*, Austin, TX, 1994, vol. 3, pp. 771-775.

[6] R. E. Kalman, "New results in linear filtering and prediction theory," *J. Basic Eng*., vol. 83, no. 4, pp. 95-108, 1961.

[7] K. Author. (2015, May 10). Facility Greenhouse Gas Reporting (2nd ed.) [Online]. Available: http://www.ec.gc.ca/ges-ghg/default.asp?lang=En&n=040E378D-1

СОДЕРЖАНИЕ