

МИНИСТЕРСТВО НАУКИ И ВЫСШЕГО ОБРАЗОВАНИЯ
РОССИЙСКОЙ ФЕДЕРАЦИИ
ФЕДЕРАЛЬНОЕ ГОСУДАРСТВЕННОЕ АВТОНОМНОЕ ОБРАЗОВАТЕЛЬНОЕ
УЧРЕЖДЕНИЕ ВЫСШЕГО ОБРАЗОВАНИЯ
«СЕВЕРО-КАВКАЗСКИЙ ФЕДЕРАЛЬНЫЙ УНИВЕРСИТЕТ»

Методические указания

к практическим занятиям по дисциплине
«Иностранный язык в сфере профессиональной коммуникации»
для магистрантов направления подготовки

13.04.02 «Электроэнергетика и электротехника»

Направленность (профиль) «Мониторинг и управление режимами электрических сетей на
базе интеллектуальных информационно- измерительных систем и технологий»

Предлагаемые вашему вниманию методические указания составлены в соответствии с Государственным образовательным стандартом высшего профессионального образования, рабочим учебным планом и программой дисциплины «Английский язык» для студентов всех специальностей.

Методические указания включают в себя теоретический материал, цель которого ознакомить студентов с содержанием понятий «аннотация» и «реферат», с современными требованиями к их составлению, задания для развития навыков создания вторичных документов, вопросы для самопроверки, список рекомендуемой литературы (основной и дополнительной) и приложение с текстами для аннотирования и реферирования.

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Ставрополь 2026

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Трудно представить современную жизнь без информации, которая превратилась в третий ресурс развития общества, наряду с материей и энергией. Все сферы жизни охвачены процессом информатизации, т. е. насыщением их различными видами информации. Все чаще приходится слышать, что современное общество – это общество информационное, в котором любой индивидум может получить релевантную информацию независимо от того, где, в каком банке данных, она находится. Все это вызвало необходимость подготовки специалистов, способных непрерывно совершенствовать свою квалификацию, используя отечественные и мировые достижения в различных областях науки. Овладение умениями и навыками аннотирования и реферирования иноязычной литературы по своей специальности – один из аспектов реализации этих задач.

Данные методические указания призваны научить студента работать с книжными и журнальными научными текстами, ознакомить с основами компрессии текста, формами и методами подготовки вторичных документов (аннотации и реферата). Предлагается ряд заданий, направленных на практическое овладение этими жанрами научной речи. Результатом работы с текстом является умение составлять аннотацию и реферативный обзор.

Методические указания предназначены для студентов второго курса, имеющих определенные навыки чтения и перевода английских текстов. Приводятся образцы реферата и аннотации к конкретному тексту, составленные как на русском, так и на английском языках. В конце каждого практического занятия предлагаются вопросы для самопроверки.

Практическое занятие 1

РЕФЕРАТ И АННОТАЦИЯ. ОБЩИЕ ПОЛОЖЕНИЯ

Теоретическая часть

Важнейшим источником научной информации и средством передачи ее в пространстве и времени служит научный документ. По форме книги, журналы, статьи и т. д. относят к письменным научным документам. Они могут быть первичными и вторичными.

К первичным документам относятся монографии, сборники, материалы научных конгрессов, конференций, симпозиумов, учебники, руководства, журналы, статьи, газеты и другие издания.

Реферат и аннотация относятся к вторичным документальным источникам научной информации. Это те документы, в которых сообщаются сведения о первичных документах, преобразование информации заключается в процессе изучения каждого первичного документа или определенной совокупности их (например, сборника статей) и подготовке информации, отражающей наиболее существенные элементы этих документов (текстов).

На основе использования вторичных документов комплектуются информативные издания: реферативные журналы, справочная литература, научные переводы и др. Рефераты и аннотации составляют основное содержание реферативных журналов.

Реферат (от лат. *refero* – сообщаю) – краткое точное изложение содержания документа, включающее основные фактические сведения и выводы, без дополнительной интерпретации или критических замечаний автора реферата.

Аннотация (от лат. *annotatio* – замечание) – краткая характеристика документа с точки зрения его назначения, содержания, вида, формы и других особенностей.

Задания***Задание 1. Прочитайте и переведите текст.*****THE ORIGIN OF THE MOON**

By Kim Taylor

For thousands of years people have seen the Moon above them and probably wondered what its nature and origin were. So far these questions remain unanswered although many of the Moon's mysteries have been unravelled. Of all the hypotheses of the Moon's origin there seem to be three most likely.

According to the “fission” or “escape” theory, the Moon is a “daughter” of the earth. This theory suggests that a single large planet formed where the earth is now; and as it cooled, it began to spin so rapidly that it flattened into a disk-shape, then into a sausage-shape, and finally split into two parts. The larger part became the earth, and the smaller part was flung out into orbit to become the moon.

The “capture” theory views the moon as a “girl-friend” of the earth. The moon formed separately in another part of the solar system, possibly in the asteroid belt, or perhaps outside the solar system entirely. Some time after it was formed, it passed close enough to the earth to be captured by the earth's gravity and held in orbit around it. This theory doesn't explain how the moon formed; it just explains how it got to where it is now.

The “double planet” theory suggests that the earth and the moon condensed into separate bodies as the solar system was forming. The moon is thus a “sister” of the earth; both bodies formed close together, and they remained close together ever since.

None of the three theories was particularly convincing, the explanations being uncertain and unlikely.

By 1957, when the Space Age was inaugurated with the launching of the Russian satellite Sputnik 1, theories about the moon had reached the limit imposed by earthbound observations. Any further advances in lunar study would require something new in the history of science: a massive, all-out

effort to study the moon at close range, to put instruments on its surface, and to bring its rocks back to earth for analysis, that is direct exploration of the moon's surface and depths.

In 1959 such investigations were begun with the moon flight of the Russian automatic probe Luna 2. One of the most important results of the flight was that it proved the absence of a magnetic field on the moon. Consequently it at once became clear that a cosmonaut could not use a compass on the moon's surface.

Since that time dozens of space probes have reached the moon and near moon space, relaying a mass of important information about our natural satellite. Rock specimens have been studied, delivered by Russian Luna automatic probes and the American Apollo expedition.

(From: "Scientific Discoveries", N.Y.,
No. 11, October, 2008)

Задание 2. Определите, какой из следующих вторичных документов является аннотацией к данному тексту, а какой рефератом:

1. Kim Taylor. "The origin of the Moon". "Scientific Discoveries", N.Y., No. 11, October, 2004.

The article touches upon the theories of the Moon's origin.

According to the "fission" theory a single large planet spun so rapidly that ultimately split into two parts, the larger – to become the Earth and the smaller one – the Moon.

The "capture" theory suggests that the Moon being formed outside the solar system was captured by the Earth's gravity and got in the orbit around it.

The "double planet" theory views the Earth and the Moon as two separate bodies initially formed close together.

It is stressed in the article that all the theories were not particularly convincing as before 1957 explanations about the Moon were limited by earthbound observations.

It is pointed out that in 1959 a direct exploration of the Moon's surface

was begun with the first moon flight of the Russian automatic probe Luna 2. Since that time a lot of important information and even rock specimens have been delivered by dozens of probes.

2. Kim Taylor. "The origin of the Moon". "Scientific Discoveries", N.Y., No. 11, October, 2004.

The article deals with the theories of the Moon's origin. It is pointed out that none of them is particularly convincing.

It is stressed that from 1959 with the first moon expedition it became possible to study rock specimens brought by probes and get a mass of important information about our natural satellite.

Задание 3. Определите, к какому типу научных документов относятся следующие тексты:

1. Происхождение Луны. Kim Taylor. "The origin of the Moon". "Scientific Discoveries", N.Y., No. 11, October, 2004 (англ.).

На протяжении тысяч лет люди, наблюдая за луной, задумывались о природе ее происхождения. До сих пор на многие вопросы так и не нашли ответы, однако существует множество гипотез.

В качестве примера приводятся три наиболее распространенные теории.

Согласно одной из них, первоначально на месте Земли образовалась одна большая планета. По мере остывания она двигалась так быстро, что разделилась на две части. Большая часть стала Землей, а меньшая – ее спутником.

Согласно теории «захвата», Луна, образовавшись в другой части солнечной системы, попала в гравитационное поле Земли и осталась на ее орбите.

Теория «двойной планеты» утверждает, что Земля и Луна первоначально образовались как две близко расположенные планеты.

Подчеркивается, что ни одна из этих теорий не является убедительной, т. к. все они ограничивались наблюдениями с Земли.

Указывается на тот факт, что в 1959 г. с полетом первой российской научно-исследовательской станции Луна 2 началась эпоха новых открытий. С тех пор десятки космических ракет летали на Луну, передавая массу важной информации о нашем естественном спутнике.

2. Происхождение Луны. Kim Taylor. “The origin of the Moon”. “Scientific Discoveries”, N.Y., No. 11, October, 2004 (англ.).

Рассматриваются несколько теорий происхождения Луны, которые, однако, не дают полного объяснения ее природы, а лишь предполагают, как Луна попала на земную орбиту.

Приводятся некоторые результаты прямого исследования поверхности Луны и ее глубин, полученные российской автоматической научно-исследовательской станцией и американской экспедицией.

Задание 4. Переведите заголовок статьи и определите ее характер (научный, методический, исторический).

Задание 5. Разделите текст на несколько логических частей и придумайте к ним заголовки.

Задание 6. Составьте план статьи.

Задание 7. Выпишите термины, относящиеся к астрономии и космонавтике.

Задание 8. Максимально сократите текст.

Задание 9. Подготовьте письменный перевод текста в 5 – 7 предложениях.

Вопросы к практическому занятию

1. Какие первичные и вторичные научные документы вы знаете?
2. Какие сведения сообщаются во вторичных научных документах?
3. Что такое реферат?
4. Что такое аннотация?
5. Для каких целей составляются реферат и аннотация?

Литература: [1, 6].

Практическое занятие 2

НАЗНАЧЕНИЕ И СТРУКТУРА РЕФЕРАТА

Теоретическая часть

Целевое назначение реферата разнообразно. Реферат выполняет следующие функции:

- 1) отвечает на вопрос, какая основная информация заключена в реферированном документе;
- 2) дает описание первичного документа;
- 3) оповещает о выходе в свет и о наличии соответствующих первичных документов;
- 4) является источником для получения справочных данных.

Реферат является также одним из самостоятельных средств научной информации и может быть выполнен в форме устного доклада.

При всем своем разнообразии рефераты обладают некоторыми общими чертами. В реферате не используются доказательства, рассуждения и исторические экскурсы. Материал подается в форме консультации или описания фактов. Информация излагается точно, кратко, без искажений и субъективных оценок. Краткость достигается во многом за счет использования преимущественно терминологической лексики, а также применения нетекстовых средств лаконизации языка (таблиц, формул, иллюстраций).

Согласно ГОСТу 7.9-95 реферат включает следующие аспекты содержания исходного документа:

- предмет, тему, цель работы;
- метод или методологию проведения работы;
- результаты работы;
- область применения результатов;
- выводы;
- дополнительную информацию.

Предмет, тема, цель работы указываются в том случае, если они не ясны из заглавия документа.

Метод или методологию проведения работы следует описывать в том случае, если они отличаются новизной или представляют интерес с точки зрения данной работы.

Результаты работы описывают предельно точно и информативно. Приводятся основные теоретические и экспериментальные результаты, фактические данные, обнаруженные взаимосвязи и закономерности.

Выводы могут сопровождаться рекомендациями, оценками, предложениями, гипотезами, описанными в исходном документе.

Дополнительная информация включает данные, не существенные для основной цели исследования, но имеющие значение вне его основной темы. Кроме того, можно указывать название организации, в которой выполнена работа, сведения об авторе исходного документа, ссылки на ранее опубликованные документы и т. п.

Задания

Задание 1. Прочитайте и переведите текст.

RUBBER

By Maria Mart

There is hardly a sector of industry today which could do without rubber. Rubber-based items are needed by the motor, iron and steel and chemical industries, all engineering, construction, agriculture and our every day life. On the other hand, the rubber industry, and especially tyre making, remains one of the most labour-consuming and costliest branches of world industry.

Ask anyone what rubber is and he will at best say that rubber is a flexible, elastic material on a caoutchouc foundation. However there is difference between this definition and modern rubber.

Scientists define rubber as a large group of compositional materials capable of easily changing their form under the action of even small efforts and restoring it after the load is taken off.

The extreme diversity of the conditions in which rubber particles and parts are used requires the development of a great many different compositions.

For this purpose rubber of nearly 150 grades and more than 350 ingredients is being used in our country. Our rubber articles remain effective both in the Antarctic cold and at high temperatures. They are used in spacecraft to ensure reliable docking in orbit, exit into open space and the cosmonauts' safe return to the station.

Modern rubber works in atomic power plants and nuclear powered icebreakers. Special rubbers have been developed for work near a reactor and in intensive radiation currents.

In other words, modern rubber works reliably and long enough in most extreme conditions, helping to solve problems large and small.

Rubber is in use everywhere and yet the motor industry has been and remains its main consumer.

More than 60 years ago factories for producing synthetic rubber from alcohol by the method of Academician Lebedev – the first in the world – were commissioned. Whereas our first lorries had only 15 rubber parts, the modern Kamaz has 800!

Synthetic rubber plays an ever greater role in the tyre-making industry, especially in the production of great carrying capacity tyres, made exclusively from synthetic rubbers without the slightest share of natural rubber. This is of tremendous significance, since rubber-bearing plants do not grow in our climatic conditions. Imported natural rubber can be used now only where it is really irreplaceable.

Today, with the production of tyres growing rapidly, we are facing a problem: what should be done with car rubber that has served its term?

Part of the old tyres is regenerated: a new tyre tread is made from new rubber. But this is only part. The problem of the old tire has become a major ecological and also a social problem.

The problem is tackled in different ways. We know the attempts to use

rubber as fuel. This is hardly advisable: after all in the production of this material much more effort and energy have been put than returned in calories after burning rubber in furnaces.

Specialists of the Tyre Industry Research Institute have developed a method for regenerating rubber from deteriorated tyres. According to the method an old tyre is first crushed and then undergoes special chemical treatment. Then we get fine rubber powder in which 90 per cent of the particles are less than 10 mm in size. This powder is called Dispor. Dispor can be introduced into rubber compositions of various kinds receiving material which is not inferior to the initial material. The share of Dispor in the new material may be as high as 30 per cent.

(From: "Russian Science", October, 2008)

Задание 2. Выделите основные положения статьи.

Задание 3. Отметьте абзацы, которые могут быть опущены без ущерба для содержания.

Задание 4. Определите, содержит ли текст интересную с вашей точки зрения информацию.

Задание 5. Укажите абзац, в котором дается главный вывод автора.

Задание 6. Ответьте на следующие вопросы:

1. Where is rubber used?
2. What properties does rubber possess?
3. What problems does rubber industry have?
4. Can rubber be reused and recycled?

Задание 7. Выпишите основные термины.

Задание 8. Выпишите выходные данные статьи.

Задание 9. Напишите план текста.

Вопросы к практическому занятию

1. Каково целевое назначение реферата?
2. Что входит в содержание реферата?
3. Как излагается информация в реферате?
4. Какая дополнительная информация может указываться в реферате?

Литература: [1, 6].

Практическое занятие 3

ОФОРМЛЕНИЕ И ТЕКСТ РЕФЕРАТА

Теоретическая часть

Текст реферата не должен содержать интерпретацию содержания документа, критические замечания и точку зрения автора реферата, а также информацию, которой нет в исходном документе [6].

Текст реферата должен отличаться лаконичностью, четкостью, убедительностью формулировок, отсутствием второстепенной информации.

Текст реферата начинают фразой, в которой сформулирована главная тема документа. Сведения, содержащиеся в заглавии и библиографическом описании, не должны повторяться в тексте реферата. Следует избегать лишних вводных фраз.

В тексте реферата следует употреблять синтаксические конструкции, свойственные языку научных и технических документов, избегать сложных грамматических конструкций.

В тексте реферата следует применять стандартизованную терминологию. В рефератах по общественным наукам допускается использование терминологии исходного документа.

Следует избегать употребления малораспространенных терминов или разъяснять их при первом упоминании в тексте.

Сокращения и условные обозначения, кроме общеупотребительных, в научных и технических текстах, применяют в исключительных случаях или дают их определения при первом употреблении.

Текст реферата рекомендуется строить по следующему плану:

- 1) цель и методика исследования (изучения) или разработки;
- 2) конкретные данные о предмете исследования (изучения) или разработки, его изучаемых свойствах;
- 3) временные и пространственные характеристики исследования;
- 4) результаты и выводы.

Таблицы, формулы, чертежи, рисунки, схемы, диаграммы включаются только в случае необходимости, если они раскрывают основное содержание документа и позволяют сократить объем реферата.

Единицы измерения переводятся в «Международную систему единиц (СИ)». При необходимости в тексте реферата разрешается приводить (в круглых скобках рядом с измерениями в единицах «СИ») значения величин в системе единиц, использованной в первичном документе.

Имена собственные (фамилии, наименования организаций, изделий и др.) приводят на языке первоисточника. Допускается транскрипция (транслитерация) собственных имен или перевод их на язык реферата с добавлением в скобках при первом упоминании собственного имени в оригинальном написании.

Географические названия рекомендуется приводить в соответствии с последним изданием «Атласа мира». В случае отсутствия в указателе русской транскрипции названий, упомянутых в реферате, они приводятся на языке оригинала.

Ссылки в тексте реферата на другие работы даются в следующих случаях:

- 1) когда в первичном документе обсуждается содержание другого документа;
- 2) когда первичный документ является продолжением ранее

опубликованного документа.

Примерный объем реферата находится в пределах 1/8, или 10 – 15 % объема реферируемой статьи. При необходимости объем может быть больше указанного.

Заглавие реферата не должно повторяться в тексте. Заглавие реферата может быть представлено в двух вариантах:

1) заглавием реферата служит точный перевод на русский язык заголовка первичного документа, опубликованного на английском языке;

2) заглавием реферата является смысловой перевод заголовка первичного документа, если этот заголовок неточно или недостаточно полно отражает основное содержание документа. В этом случае заглавие реферата выносится в квадратные скобки. Такое заглавие реферата рекомендуется составлять после того, как полностью уяснена сущность первичного документа и составлен реферат.

Задания

Задание 1. Прочитайте и переведите текст.

PLANET GETS NEW NAME: EAARTH

By: Susan Kraemer

It seems like science fiction. It seems impossible that we would destroy our planet and our future, but, we did. We have no idea how bad the effects of our brief exploitation of fossil fuel will be, over the next centuries and millennia.

Since it is going to be a completely different planet, it needs a new name. The UK Guardian reveals why Bill McKibben suggests we begin to call it “Eaarth”.

“There’s a slightly science fiction look to it; that’s appropriate in the sense it’s a little like a science fiction story: we wake up one day and the planet we have been used to for 10,000 years has 5 % more moisture in the atmosphere, the sea is turning more acid. The only trouble is it’s not fiction.”

The 10,000 years helps us understand this. When I was a kid, we worried about the terrible problem of radioactive nuclear waste that would still be here in

10,000 years. Gradually, our perception of time horizons have closed in on us since then. Now we dare only look 50 or 100 years into the future, and no further. We have stopped talking about 10,000 years ahead. Cities like New York City have to plan for the beginning, of course. Scientists have to guess how bad the effects might be by 2100, our immediate future.

But sea levels won't magically stop rising in 2100. Icecaps and glaciers won't magically stop melting in 2100. The dust from drying continents won't stop blowing away in 2100. Species won't stop going extinct in 2100.

We've come 10,000 years as a group of civilizations. But to imagine as far ahead as we have been civilized is no longer an option. We no longer look as far forward as we can look back.

Now it seems almost quaint to care about radiation for those people 10,000 years into the future, as we know that much worse will befall them far, far sooner than that, thanks to our brief fling with fossil fuel. We bequeath Eearth to them. Who knows what it will be, or how long humans can even survive on it?

After the Permian extinction 250 million years ago, this pig-sized creature almost had the planet to itself for 30 million years. The Permian extinction took about 5 million years to eradicate 95 % of life on earth, leaving behind just a few species like the Lystrosaurus to dominate the planet.

Who knows what species will survive what we did to Eearth? My guess? A jellyfish. They are already expanding in our new acidic ocean.

(From: "Scientific American", April, 2010)

Задание 2. Выпишите выходные данные статьи.

Задание 3. Задание 4. Выделите наиболее информативные отрывки текста.

Задание 4. Напишите план текста.

Задание 5. Составьте реферат статьи на английском языке.

Задание 6. Переведите заголовок статьи и определите ее характер (научный, методический, исторический).

Задание 7. Выпишите термины, относящиеся к астрономии.

Задание 8. Укажите абзац, в котором дается главный вывод автора.

Задание 9. Составьте реферат статьи на русском языке.

Вопросы к практическому занятию.

1. Что содержит текст реферата?
2. Каковы особенности употребления терминов и имен собственных в реферате?
3. Как составляется план реферата?
4. Можно ли использовать доказательства, рассуждения и исторические экскурсы при составлении реферата?
5. Что такое библиографическое описание и как вы оформили выходные данные статьи при составлении реферата в задании 9?

Литература: [1, 6].

Практическое занятие 4

СОСТАВ И НАЗНАЧЕНИЕ АННОТАЦИИ

Теоретическая часть

В соответствии с ГОСТ 7.9-95 аннотация включает характеристику основной темы, проблемы объекта, цели работы и ее результаты. В аннотации указывают, что нового несет в себе данный документ в сравнении с другими, родственными по тематике и целевому назначению.

Аннотация может включать сведения об авторе первичного документа и достоинствах произведения, взятые из других документов.

Аннотация также содержит сообщение об изменениях заглавия документа или авторского коллектива и год выпуска предыдущего издания (при переиздании), год, с которого начат выпуск многотомного издания, указание о принадлежности автора к стране (на документы, переведенные с иностранных языков).

Аннотации по содержанию и целевому назначению могут быть справочные, раскрывающие тематику документов и сообщающие какие-

либо сведения о нем, но не дающие его критической оценки, и рекомендательные, содержащие оценку документа с точки зрения его пригодности для определенной категории читателей. По охвату содержания аннотированного документа и читательского назначения различают аннотации общие, характеризующие документ в целом и рассчитанные на широкий круг читателей, и специализированные, раскрывающие документ лишь в определенных аспектах, интересующих узкого специалиста. Аннотации могут быть совсем краткими, состоящими из нескольких слов или небольших фраз, и развернутыми, но и в этом случае, в отличие от реферата, дают в сжатой форме лишь самые основные положения и выводы документов.

Аннотация выполняет следующие функции:

- 1) дает возможность установить основное содержание документа, определить его релевантность и решить, следует ли обращаться к полному тексту документа;
- 2) предоставляет информацию о документе и устраняет необходимость чтения полного текста документа в случае, если документ представляет для читателя второстепенный интерес;
- 3) используется в информационных, в том числе автоматизированных системах для поиска документов и информации.

Задания

Задание 1. Прочитайте текст.

VOLCANIC ERUPTIONS

By Kate Wong

Clues to the group's disappearance are found in layers of volcanic ash in a cave in the northern Caucasus Mountains that preserve a long record of Neandertal occupation preceding those layers and none afterward.

A cave in the northern Caucasus Mountains may hold a key to the long-standing mystery of why the Neandertals, our closest relatives, went extinct. For nearly 300,000 years the heavy-browed, barrel-chested Neandertals presided over

Eurasia, weathering glacial conditions more severe than any our own kind has ever faced. Then, starting around 40,000 years ago, their numbers began to decline. Shortly after 28,000 years ago, they were gone. Paleoanthropologists have been debating whether competition with incoming modern humans or the onset of rapidly oscillating climate was to blame for their demise. But new findings suggest that catastrophic volcanic eruptions may have doomed the Neandertals and paved the way for modern humans to take their place.

Researchers led by Liubov Golovanova of the ANO Laboratory of Prehistory in Saint Petersburg studied the deposits in Mezmaiskaya cave, located in southwestern Russia. First discovered by archaeologists in 1987, the cave once sheltered Neandertals and, later, modern humans. Analyzing the various stratigraphic layers, the scientists found layers of volcanic ash that, based on the geochemical composition of the ashes, they attribute to eruptions that occurred in the Caucasus region around 40,000 years ago. Because the cave preserves a long record of Neandertal occupation preceding the ash layers but no traces of them afterward, the team surmises that the eruptions devastated the locals.

Moreover, looking more broadly at sites across Eurasia, the investigators noted that the eruptions coincided with the disappearance of the Neandertals across most of their range, save for a few groups that took refuge in the south. In a paper published in *Current Anthropology*, they propose that the eruptions precipitated a so-called volcanic winter that may have resulted in mass deaths of Neandertals and their prey. The misfortune of the Neandertals, however, was a boon for modern humans, who lived in southern locales unaffected by the volcanic activity. Once the Neandertals were gone, so the theory goes, moderns could move north unchallenged.

The team's interpretation of the data from the cave has elicited criticism from some researchers, such as Francesco G. Fedele of the University of Naples in Italy, who complained in commentaries published alongside the paper that the age of the ashes is not firm enough to draw such conclusions. But others, including Paul B. Pettitt of the University of Sheffield in England, called the new

extinction and replacement scenario plausible. The riddle of the Neandertals' downfall is far from solved, but the volcanic eruption theory may turn up the heat on the competition.

(From: "Scientific American", December, 2010)

Задание 2. Выпишите выходные данные статьи.

Задание 3. Переведите заголовок на русский язык.

Задание 4. Определите характер статьи (теоретический, практический, научный, методический).

Задание 5. Найдите русские эквиваленты словосочетаниям: Mezmaiskaya cave, stratigraphic layers, volcanic ash.

Задание 6. Подготовьте письменный перевод текста в 5 – 7 предложениях.

Задание 7. Составьте реферат статьи на русском языке.

Задание 8. Найдите ответы на следующие вопросы:

1. What key does a Mezmaiskaya cave hold?
2. What do new findings suggest?
3. What can the eruption theory explain?
4. What has these data elicited?

Задание 9. Выпишите предложения, необходимые для включения в аннотацию.

Вопросы к практическому занятию

1. Что такое аннотация?
2. Каково целевое назначение аннотации?
3. Каковы основные способы достижения лаконичности при составлении реферата?
4. Можно ли давать субъективную оценку содержанию первичного текста при составлении реферата?

Литература: [1, 6].

Практическое занятие 5

ПРАВИЛА СОСТАВЛЕНИЯ АННОТАЦИИ

Теоретическая часть

При составлении указываются лишь существенные признаки содержания документа, то есть те, которые позволяют выявить его научное и практическое значение и новизну, отличить его от других близких к нему по тематике и целевому назначению.

В аннотации не следует пересказывать содержание документов (выводы, рекомендации, фактический материал). Следует свести к минимуму использование сложных оборотов, употребление личных и указательных местоимений.

Объем аннотации не должен превышать 600 печатных знаков.

Состав аннотации:

- 1) библиографическое описание;
- 2) данные об авторе (ученая степень, звание и др.). Подробные данные об авторе не являются обязательным элементом аннотации;
- 3) конкретная форма аннотируемого документа (если она не указана в библиографическом описании): монография, учебник, учебное пособие и т. д.;
- 4) предмет изложения и его основные характеристики: тема, основные понятия и т. д.;
- 5) отличительные черты документа по сравнению с родственными по тематике и целевому назначению: то новое в содержании, что несет в себе документ, а также особенности подачи материала (например, система изложения вопроса, постановка проблемы, новая концепция или гипотеза и др.);
- 6) конкретный читательский адрес: кому адресуется статья (книга), дополнительный круг читателей, кроме основного.

Информация о содержании и характере документа является задачей не только аннотации, но и реферата. Требования к составлению аннотации и

реферата связаны с различным назначением этих документов. Аннотация служит только для осведомления о существовании документа определенного содержания и характера, в реферате же излагается содержание документа с характеристикой методов исследования, с фактическими данными и итогами работы. В аннотировании основное заключается в умении лаконично обобщить содержания документа, реферирование предполагает владение мастерством сокращения текста первичного документа.

Задания

Задание 1. Прочитайте и переведите текст.

HOW TO PRESERVE THE BREADTH OF LIFE ON THE PLANET

By David Biello

A barometer measures atmospheric pressure. Now a coalition of biologists is calling for a similar scientific tool to measure extinction pressure on Earth's biodiversity – a so-called “barometer of life”.

After all, scientists have conclusively identified only a fraction of the species that exist on Earth; the roughly 1.9 million species catalogued to date may represent only 20 percent of the total biodiversity on the planet. “Species disappear before we know they existed,” wrote biologists Simon Stuart, chair of the Species Survival Commission at the International Union for Conservation of Nature (IUCN), Edward O. Wilson of Harvard University, and others in the April 9 issue of *Science*, calling for an international effort to fund the creation of such a bio-barometer. Adds Stuart: “The point of conservation is to turn that negative trend into a positive trend”.

The biologists propose to do that by spending \$60 million to pull together all the known information to assess roughly 160,000 individual species from four groups: chordates (mammals and other vertebrates); invertebrates (insects and worms); plants; and fungi. The species would be assessed to identify which are suffering as a result of various extinction pressures: agricultural expansion and / or intensification; habitat changes; and climate change, among others. Such an assessment would give a better picture of the overall threat to biodiversity than

do current efforts, according to the biologists. “There’s an awful lot of information out there that we’re not using because it’s sitting in obscure places like museum jars,” Stuart says.

Of course, 160,000 is only roughly 8 percent of known species – and the survey will not attempt to expand the rolls of living things, like the *Encyclopedia of Life* (an effort to catalogue all the species on the planet). “We’re not going to be able to monitor the conservation status of nematodes anytime soon,” Stuart admits. But “if the barometer shows a very major decline – as the IUCN Red List of Threatened Species suggests already – in mammals due to overhunting in Asia then that informs us what needs to be done”.

As the aforementioned *Encyclopedia* and Red List suggest, the barometer would be only one of many such efforts, particularly given that this is the International Year of Biodiversity, according to the United Nations. But many of those efforts, including the IUCN’s, cover even fewer species and betray a distinct bias toward charismatic megafauna like polar bears or bald eagles.

Other conservation groups take a different approach: The Nature Conservancy will release its Atlas of Global Conservation on April 22, which attempts to capture in maps the pressures faced by global habitats as well as the relative density of various species, such as amphibians. “By taking a habitat view, you’re able to encompass all those species,” says Conservancy senior scientist Jennifer Molnar. “It’s a new view of the planet”.

The new maps, which rely on collating everything from satellite data to field expeditions to fish species counts in specific locales, reveal that most areas of the world have already warmed as a result of climate change; almost all coastal ecosystems are now impacted by excess flows of nitrogen and other fertilizers, along with a decrease in sediment; and many regions of the world (if not all, because the rest lack sufficient data) now enjoy at least five invasive mammal species and three invading freshwater plants or animal species. “It’s the first time to see how bad the problems are at a global scale,” Molnar says. “We’re not just

damaging the environment, we're hurting ourselves.... The maps show that these resources are threatened beyond what we may realize”.

The maps might show that current conservation efforts have failed, given that global species-saving efforts have grown as have the extent of protected habitats, although IUCN's Stuart rejects that claim. “Things would be going very much worse were it not for conservation measures,” he says. “What we don't know at this stage is how much conservation has achieved.” Given that Earth may be losing as many as 140,000 species a year – most of those nematodes and other uncharismatic microfauna – the question of how well conservation has worked to preserve biodiversity may soon be moot.

(From: “Scientific American”, April, 2010)

Задание 2. Определите характер статьи (научный, методический, исторический).

Задание 3. Определите, кому адресована данная статья.

Задание 4. Прочитайте текст еще раз и отметьте предложения, которые могут быть опущены без ущерба для содержания текста.

Задание 5. Составьте план статьи в виде вопросов.

Задание 6. Максимально сократите текст и подготовьте сообщение о его содержании.

Задание 7. Составьте реферат статьи на русском языке.

Задание 8. Напишите реферат статьи на английском языке.

Задание 9. Определите, где могут быть использованы следующие речевые модели:

1. The subject of the text is...
2. The purpose of the article is...
3. At the beginning the author touches upon...
4. Then the author goes on to say that...
5. The article ends with...

Вопросы к практическому занятию

1. Можно ли пересказывать содержание документа (выводы, рекомендации, фактический материал) при составлении аннотации?
2. Какие аспекты содержания исходного документа вы включили в реферат?
3. Какие аспекты содержания включаются в аннотацию?
4. Чем отличается аннотация от реферата?

Литература:[1, 6].

Практическое занятие 6

АННОТИРОВАННАЯ БИБЛИОГРАФИЯ НА ИНОСТРАННОМ ЯЗЫКЕ

Теоретическая часть

Аннотация и реферат относятся к типам библиографического описания.

Библиографическое описание – совокупность сведений о произведении печати, дающих возможность получить представление о его содержании, читательском назначении, объеме, справочном аппарате и т. д. Основные элементы библиографического описания: заглавие, сведения об авторстве, выходные данные (место издания, наименование издательства), год издания. Другие элементы (факультативные): количество страниц, наличие иллюстраций и некоторые другие данные.

Библиографическое описание статей на иностранном языке состоит из: заглавия на русском языке; фамилии и инициалов автора; заглавия и сведений о журнале или книге на языке первичного документа; в скобках на русском языке указывается язык, на котором опубликован документ. Аннотированная библиография помогает читателям ориентироваться в имеющейся литературе и оказывает существенную помощь в ее выборе.

Задания***Задание 1. Прочитайте и переведите текст.*****COMBATING AGAINST OIL POLLUTION**

By Kseniya Sokolova

Russian scientists have developed a method of combating oil pollution, which involves sprinkling a powder composed of a specially selected bacterial preparation and a set of mineral salts. This removes oil slicks on water and returns fertility to oil-polluted soils. It takes 1.5 to 2 grammes per 1,000 square meters of surface. It can be sprayed by land transport and aircraft.

The bacterial strain in the preparation is a strong oxidant which turns irreversibly hydrocarbons, no matter what their chemical structure might be like, into ecologically neutral substances.

The new preparation has a number of advantages over the existing biological methods of combating oil pollution. The strain used in it has not been produced by genetic engineering, but is from nature. It is amazingly omnivorous and transforms over 20 components of oil, including asphalt resin substances. The content of cancerogenic substances is reduced by ten times in the decay residue of oil.

The new preparation can work practically in any weather because its activity doesn't change in a temperature range of from 50°C below zero to +70°C. And it can be used both in fresh and sea water.

How effective is the preparation?

The tests showed the following: 12.5 kg of oil were spilled per square meter of an experimental plot of land. After that the powder was sprinkled on it only once. Two months later green grass was growing on the plot.

On water, the time it takes to return to normal depends on the thickness of the oil slick. If it is up to 2 mm thick then the last traces of oil disappear on the sixth day after the slick was sprinkled once with powder.

Several modifications of the preparation have been developed. Some of them are most effective against crude oil, others against diesel fuel, lubricants, etc.

(From: "RUSSIA", February, 2005)

Задание 2. Выпишите выходные данные статьи.

Задание 3. Прочитайте текст и укажите, какие предложения можно опустить без ущерба для содержания.

Задание 4. Выделите ключевые положения статьи.

Задание 5. Максимально сократите текст.

Задание 6. Составьте аннотацию статьи на английском языке, используя следующие речевые модели:

1. This article is concerned with...
2. It is shown that...
3. It should be noted that...
4. The importance of... is stressed.
5. There is no doubt that...

Задание 7. Переведите на русский язык название статьи и ее выходные данные.

Задание 8. Подготовьте перевод статьи в 5 – 7 предложениях.

Задание 9. Составьте аннотацию на русском языке.

Вопросы к практическому занятию

1. Каков примерный объем аннотации по отношению к первичному тексту?
2. Какими приемами вы пользовались при компрессии текста в задании 5?
3. Какой у вас получилась аннотация по содержанию и целевому назначению (общая или специализированная, справочная или рекомендательная)?

4. Для чего составляется аннотированная библиография на иностранном языке?

Литература: [1, 6].

Список рекомендуемой литературы

Основная литература:

1. Английский язык для инженеров / Т. Ю. Полякова, Е. В. Синявская, О. И. Тынкова, Э. С. Улановская. – М. : Высшая школа, 2006.

Дополнительная литература:

2. Англо-русский политехнический словарь / сост. Ю. Синдеев. В 2 тт. Ростов н / Д : Феникс, 2002.

3. Новый англо-русский словарь / под ред. В. К. Мюллера. – М. : Русский язык, 2000.

4. Oxford Dictionary of Abbreviations / Editors: John Daintith, Valerie Illingworth, Elizabeth Martin, Anne Stibbs, Judy Pearsall, Sara Tulloch. – Oxford University Press, 1996.

5. Wheeler, M. The Oxford Russian Dictionary / M. Wheeler, B. Unbegaun, P. Falla. – Oxford University Press, 1997.

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Приложение

Тексты для аннотирования и реферирования

Текст 1. Squeezing More Oil Out of the Ground

By Leonardo Maugeri

On 20 dry, flat square miles of California's Central Valley, more than 8,000 horseheads – as old-fashioned oilmen call them – slowly rise and fall as they suck oil from underground. Glittering pipelines crossing the whole area reveal that the place is not merely a relic of the past. But even to an expert's eyes, Kern River Oil Field betrays no hint of the miracle that has enabled it to survive decades of dire predictions.

Kern River Oil Field was discovered in 1899, and initially it was thought that only 10 percent of its heavy, viscous crude could be recovered. In 1942, after more than four decades of modest production, the field was estimated to still hold 54 million barrels of recoverable oil. As pointed out in 1995 by Morris Adelman, professor emeritus at the Massachusetts Institute of Technology and one of the few remaining energy gurus, "in the next forty-four years, it produced not 54 million barrels but 736 million barrels, and it had another 970 million barrels remaining." But even this estimate was wrong. In November 2007 U.S. oil giant Chevron announced that cumulative production had reached two billion barrels. Today, Kern River still puts out more than 80,000 barrels per day, and Chevron reckons that the remaining reserves are about 480 million barrels.

Chevron began to achieve its miracle in the 1960s by injecting steam into the ground, a novel technology at the time. Later, a new breed of exploration and drilling tools – along with steady steam injection – turned the field into a sort of oil cornucopia. Yet, Kern River is not an isolated case. Most of the world's oilfields have revived over time. New exploration methods have revealed more of the Earth's secrets. And leaps in extraction technology have led to tapping oil in once-inaccessible areas and in places where drilling was once uneconomic. In a way, technology is the real cornucopia.

(From: "Scientific American", April, 2009)

Текст 2. Planets May Affect the Chemistry of Their Stars

By John Matson

Planets are, by and large, at the mercy of their stars. Not only do stars provide a ready energy source of radiated light and heat, but the mass and gravitational pull of stars flat-out dwarfs the summed masses and pulls of any orbiting companions. In our solar system, which has more planets – regardless of where one stands on the Pluto debate – than any other planetary system we know of so far, the sun still makes up more than 99.8 percent of its system’s mass.

But a new survey of stellar chemistry in solar-type stars reveals at least one way that pip-squeak planets can strike back, affecting the evolution of their parent stars. A paper in the November 12 issue of *Nature* shows that lithium is greatly depleted in stars known to host planetary systems compared with otherwise similar stars that appear to be barren of planets.

A correlation between stellar lithium abundances and the presence of planetary systems had been suspected for years – our lithium-weak sun, for one, certainly fits the bill. But the catalogue of stars with such extrasolar planets, or exoplanets, was too small to evaluate the relationship with statistical confidence. In the past dozen years, however, numerous exoplanetary discoveries have been announced, including a suite of 30 new planets unveiled in October by the European Southern Observatory’s HARPS planet-finding collaboration that boosted the full set of known exoplanets to more than 400.

Study co-author Nuno Santos, an astrophysicist at the Center for Astrophysics at the University of Porto in Portugal, and his colleagues took chemical-abundance data, derived from precision light spectra, on 133 stars of roughly sunlike temperature from the HARPS survey, 30 of which are known to harbor planets. (They also added more than two dozen other stars to the population to boost the sample size.) The vast majority of stars with planets were excessively depleted in lithium, whereas most “single” stars were only partly depleted. And in a subset of the 84 stars closest to the sun’s temperature, the correlation was even stronger.

The researchers suspect that the presence of orbiting planets may increase convective mixing in the host star, plunging the lithium into its hotter regions where nuclear reactions consume the light element as fuel. “We know that lithium depletion in a star is dependent on the history of the star, how it rotates through its history,” Santos says. “The presence or formation of planets could change this rotational history of the star.”

But might lithium-depleted stars simply be more amenable to planet formation? Not likely, Santos says. “I don’t think that’s the reason, because actually lithium is not supposed to play any role in planet formation,” he says. “There are only very small quantities of lithium, so it’s not acceptable that lithium is, by itself, influencing planet formation. The idea is that things come the other way around. By some process, the planet-formation process is influencing the depletion of lithium in the atmosphere of the stars.” Whatever the reason, a simple lithium measurement – in concert with characteristics such as stellar mass and other chemical abundances – might aid future exoplanet hunters in pegging the stars that are most likely to bear planetary fruit.

(From: “Scientific American”, November, 2009)

Текст 3. Boundaries for a Healthy Planet

By Jonathan Foley

Although climate change gets ample attention, species loss and nitrogen pollution exceed safe limits by greater degrees. Other environmental processes are also headed toward dangerous levels.

Promptly switching to low-carbon energy sources, curtailing land clearing and revolutionizing agricultural practices are crucial to making human life on Earth more sustainable.

For nearly 10,000 years – since the dawn of civilization and the Holocene era – our world seemed unimaginably large. Vast frontiers of land and ocean offered infinite resources. Humans could pollute freely, and they could avoid any local repercussions simply by moving elsewhere. People built entire empires and

economic systems on their ability to exploit what seemed to be inexhaustible riches, never realizing that the privilege would come to an end.

But thanks to advances in public health, the industrial revolution and later the green revolution, population has surged from about one billion in 1800 to nearly seven billion today. In the past 50 years alone, our numbers have more than doubled. Fueled by affluence, our use of resources has also reached staggering levels; in 50 years the global consumption of food and freshwater has more than tripled, and fossil-fuel use has risen fourfold. We now co-opt between one third and one half of all the photosynthesis on the planet.

(From: “Scientific American”, March, 2010)

Текст 4. Cat Lap: Engineers Unravel the Mystery of How Felines

Drink

By John Matson

One morning a few years back Roman Stocker was watching his cat, Cutta Cutta, drink, and began to wonder about the mechanism by which cats lap fluid into their mouths.

For Stocker, an associate professor in the Department of Civil and Environmental Engineering at the Massachusetts Institute of Technology, the thought was not an idle one. After investigating the mechanism via high-speed videography, experimental simulation and research on other feline species with visits to zoos and *YouTube*, Stocker and his colleagues have now produced a scientific description of cats' lapping mechanism.

“There is an increase in interest in taking inspiration from nature to look for solutions to physical problems,” Stocker says. Watching Cutta Cutta lap, he says, made him realize “there was probably an interesting biomechanical problem there.” A cat’s curious method of lapping, which involves bending the tip of its tongue downward toward its chin to pull liquid into its mouth, had been explained in general terms but had not, apparently, been investigated in scientific detail.

“It was certainly surprising” that the mechanism had not been more fully explored, says M.I.T. engineer and study co-author Pedro Reis. The new work builds on that of another M.I.T. engineer, Harold Edgerton, who pioneered stroboscopic (strobe light) photography in the 1930s. In a short film about Edgerton’s work, *Quicker ‘N a Wink*, which won the Academy Award for best one-reel short of 1940, high-speed videography shows a cat bending its tongue downward and pulling liquid up and into its mouth. Edgerton “saw something interesting about cats’ lapping, but no one did any work since him,” Reis says.

Having provided the inspiration, Cutta Cutta made a logical subject for detailed observation. “The first thing we did was take high-speed movies of my own cat,” Stocker says. Movies of Cutta Cutta and other house cats at an animal shelter showed that cats do not dip their tongue into the liquid to scoop up water, as dogs do in lapping. Rather, a cat touches its tongue, with tip bent downward, against the surface of the liquid before drawing its tongue rapidly back into its mouth. Liquid at the surface rises with the retreating tongue, which pulls it up into a column of fluid. The cat then traps that liquid in its mouth, swallowing only after several laps have accumulated a significant volume of fluid in its mouth.

To uncover the physical principles at work, the researchers used a robotic system with a round glass disk, mimicking the tip of the feline tongue, that could be placed on a liquid surface and rapidly pulled upward. “You can’t tell a cat, “Please lap at a different frequency,” Reis says. “So we developed a mechanical, robotic version of the cat’s tongue.” He notes that it was a challenge just to mimic the tongue’s quickness, which can rise at speeds nearing one meter per second. “To do that experimentally is not so easy,” Reis says.

The feline films and the simulation revealed that fluid inertia is the prime mover in forming the column of liquid that rises with the tongue into the mouth. When the tongue leaves the liquid, adhesion pulls fluid with it from the surface, and inertia causes more liquid to follow. Gravity acts against the upward motion of the column, eventually pinching it off at a certain height. To trap the most liquid in its mouth, the researchers found, a cat should close its mouth around the

column just before gravity pinches it off – a strategy that house cats, at least, seem to have internalized.

Numerically, each cat has an optimal drinking frequency – say, four laps per second – and the researchers' analysis showed that larger feline species, which tend to have larger tongues and drink from greater heights above the surface of the liquid, should lap more slowly to maximize their intake. Specifically, the group predicted that the lapping frequency should scale with the cat's mass raised to the power of $-1/6$.

To check that theory, the group filmed a lion, a tiger, a jaguar and an ocelot at the Stone Zoo in Stoneham, Mass., and the Franklin Park Zoo in Boston. Then they hit *YouTube*, where countless individuals have filmed bobcats drinking in backyards or larger cats glimpsed on safari slaking their thirst. “We realized that was a source of information that we could use in a very simple way,” Stocker says. With six additional data points gleaned from those videos, the actual lapping of various felines agreed well with the predicted scaling.

Turning to *YouTube* for data, although not exactly common for major-journal studies, was a natural leap for the researchers to make. “You pose a question, and you have to answer it,” Reis says. “Whatever tools you can grab to come to an answer, you go for it.”

Pure curiosity, such as that inspired in Stocker by watching his cat lap, can drive some very fundamental research, Reis adds. “Now we’re worrying about black holes and particle colliders and nanotechnology, but there is a lot of science all around,” he says. “When you stop for a second, you realize you don’t understand everything around you.” And in this case, Reis is careful to point out, curiosity did not kill the cat – no animals were harmed in the making of this study.

(From: “Scientific American”, November, 2010)

Текст 5. Jump-Starting the Orbital Economy

By David H. Freedman

The shuttle is out. When NASA retires the space shuttle in the middle of next year, the U.S. will no longer be able to launch astronauts or supplies to the International Space Station.

Private companies are in. The Obama administration has canceled Constellation, the planned successor to the shuttle, and instead plans to rely on private companies to ferry astronauts.

Hopes are high. In theory, early government support of daring entrepreneurs could jump-start a vibrant economy centered on space travel, with competition pushing prices ever lower.

Risks are, too. Yet no one knows if start-up companies will be able to deliver safe, affordable, reliable spacecraft. If they fail, human exploration of space could be set back by decades.

Two years ago deceased *Star Trek* actor James “Scotty” Doohan was granted one last adventure, courtesy of Space Exploration Technologies Corporation. SpaceX, a privately funded company based in Hawthorne, Calif., had been formed in 2002 with the mission of going where no start-up had gone before: Earth orbit. In August 2008 SpaceX loaded Doohan’s cremated remains onto the third test flight of its Falcon 1, a liquid oxygen- and kerosene-fueled rocket bound for orbit. Yet about two minutes into the flight Doohan’s final voyage ended prematurely when the rocket’s first stage crashed into the second stage during separation. It was SpaceX’s third failure in three attempts.

Well, what did you expect? Sneered old NASA hands, aerospace executives and the many others who hew to the conventional wisdom that safely ushering payloads and especially people hundreds of kilometers above Earth is a job for no less than armies of engineers, technicians and managers backed by billions in funding and decades-long development cycles. Space, after all, is hard. A small, private operation might be able to send a little stunt ship wobbling up tens of kilometers, as entrepreneur-engineer Burt Rutan did in 2004 to win the X-Prize.

But that was a parlor trick compared with the kinds of operations NASA has been running over the years with the space shuttle and International Space Station. When you're going orbital, 100 kilometers is merely the length of the driveway, at the end of which you'd better be accelerating hard toward the seven kilometers a second needed to keep a payload falling around Earth 300 kilometers up.

(From: "Scientific American", December, 2010)

Текст 6. Drug-Resistant Genes Spread among Bacteria

By Katherine Harmon

In the fight to stay alive, many bacteria, such as MRSA, have developed resistance to commonly used antibiotics. But other bacteria are using a more insidious type of resistance: that imbued by transferable genes, which can spread among commonly circulating strains.

One of these genetic elements, NDM-1 (New Delhi metallo-beta-lactamase 1), is an enzyme-based defense that renders a bacterium immune to beta-lactam-based antibiotics, which include penicillin, as well as carbapenems (often used as a last resort antibiotic against *Escherichia coli* infections), cepheems (such as cephalosporins and cephamycins) and monobactams, making treatment extremely difficult. The trait was first identified in 2008, and instances of NDM-1-positive infections are now not uncommon in India, Pakistan and Bangladesh. Cases also have been documented in Brazil, Canada, Japan, the U.K. and the U.S.

A new essay published in the December 16 issue of *The New England Journal of Medicine* revisits the issue, highlighting the potential that NDM-1 and other antibiotic-busting genes have to disable much of our current pharmaceutical arsenal.

"The spread of these organisms has prompted widespread concern because some of them are resistant to all antimicrobial agents except the polymyxins," Robert Moellering, of Harvard Medical School and Beth Israel Deaconess Medical Center, wrote in the perspective piece.

Initial cases of NDM-1 seemed to be only found among patients who had received medical care in India, where antibiotic use is less regulated. But more

recent findings have suggested some NDM-1–positive patients in the U.K. might have picked up a resistant strain without traveling abroad.

These genes do not need an exotic infection to wreak havoc in a patient. They can be picked up by “all sorts of bugs we’re all walking around with in our guts,” says Brandi Limbago, of the Division of Healthcare Quality Promotion at the U.S. Centers for Disease Control and Prevention. But once the resistant genetic material enters the bacterium, “it produces an enzyme that attacks the antibiotic and makes it nonfunctional – they basically chew it up,” she explains. These infections are not always deadly, but “in the right host,” such as one with a weakened immune system or inserted medical equipment (including catheters), “those patients become infected with these organisms,” Limbago says. “And if you don’t have the right tools to treat them, that’s when you run into trouble.”

Newer antibiotics, such as cephalosporins and carbapenems as well as beta-lactamase inhibitors, seemed like an effective strategy against these bacterial tactics. But these have “simply been met with the evolution of new beta-lactamases, often through mutations, that inactivate these antibiotics,” Moellering wrote. Currently, there are some 890 such known enzymes, “far more than the antibiotics developed to combat them.”

Indeed, Limbago warns, “all carbapenem-resistant *Enterobacteriaceae* are bad – it’s not just NDM-1 that should have us worried.” And although NDM-1 might be grabbing more headlines globally, Limbago explains that here in the U.S., another enzyme, *Klebsiella pneumoniae* carbapenemase, has been a much bigger concern. And, as Moellering noted in his essay, another class, known as CTX beta-lactamases, “at the very least will compromise our ability to use beta-lactam antibiotics to treat community-acquired urinary tract infections.”

(From: “Scientific American”, December, 2010)

МИНИСТЕРСТВО НАУКИ И ВЫСШЕГО ОБРАЗОВАНИЯ
РОССИЙСКОЙ ФЕДЕРАЦИИ
ФЕДЕРАЛЬНОЕ ГОСУДАРСТВЕННОЕ АВТОНОМНОЕ ОБРАЗОВАТЕЛЬНОЕ
УЧРЕЖДЕНИЕ ВЫСШЕГО ОБРАЗОВАНИЯ
«СЕВЕРО-КАВКАЗСКИЙ ФЕДЕРАЛЬНЫЙ УНИВЕРСИТЕТ»

Методические указания

Для самостоятельной работы по
дисциплине

«Иностранный язык в сфере профессиональной коммуникации» (английский)

для магистрантов направления подготовки

13.04.02 «Электроэнергетика и электротехника»

Направленность (профиль) «Мониторинг и управление режимами электрических сетей на
базе интеллектуальных информационно- измерительных систем и технологий»

Ставрополь 2026

Практическое занятие 1

Задание 1:

- составьте список ключевых слов и словосочетаний, соответствующих вашей научной специальности или направлению подготовки;
- переведите эти словосочетания на английский язык с помощью словаря Multitran.

www.multitran.ru

- верифицируйте свой перевод с помощью Google, найдя с его помощью, сайты, статьи содержащие эти словосочетания.

Задание 2:

- используя ключевые слова найдите литературу (статьи, монографии, книги, патенты и т.д.) соответствующие вашему научному направлению

! www.sciencedirect.com (статьи не должны быть старше 5 лет)

!! <https://scholar.google.com>

www.wikipedia.org на данном сайте используйте активные ссылки в конце статьи. !

Задание 3:

- составьте список литературы.
- выберите для перевода 2 статьи любого объема.

Практическое занятие 2:

Задание 1.

Переведите 1 статью и составьте словарь незнакомых слов к ней разделив слова на общую лексику и термины.

Задание 2.

Изучите план реферирования статьи и напишите резюме статьи.

Резюме и реферирование текста-оригинала. *Резюме* (Summary) как документ и *реферирование* как процесс представляют собой краткое изложение сути текста-оригинала, а также представление информации о его выходных данных и личном мнении о прочитанном. При составлении резюме (как и при

написании аннотаций и научных статей) широко используются речевые штампы.

I. Introduction

1. The article/text/passage is head-lined...
2. The author of the article/text/passage is... The article is written by...
3. It is published in...

II. Main part

1. The article/text/passage deals with... The article is about... The main idea of the article is...
2. The purpose of the article is to give a reader some information on...
3. At the beginning the author describes,
touches upon.....,
explains,
introduces,
mentions,
characterizes,
analyses,
comments on...,
enumerates,
points out, underlines,

III. Conclusion

In conclusion the author...

IV. Your own opinion

I found the article informative /interesting/dull/ useful and easy/difficult to understand

При написании резюме используйте слова-связки:

Then/ after that, further on, next/ the author passes on to..., goes on to say that

Практическое занятие 3

Задание 1

Переведите статью 2 и составьте словарь незнакомых слов к ней разделив слова на общую лексику и термины.

Задание 2

Напишите резюме статьи по плану.

Задание 3.

Найдите 2 -3 статьи по теме своих научных интересов.

(Например: ваша специальность «Продукты питания животного происхождения», вас интересует более узкое направление «Современные технологии упаковки и хранения мясных продуктов»)

Практическое занятие 4

Задание 1.

Переведите заголовок, аннотацию и введение статей.

Задание 2.

Просмотрите статьи и выберите из них отрывки, содержание которых представляет для вас наибольший интерес с точки зрения вашей магистерской диссертации.

Переведите эти отрывки сопровождая их ссылками на источник.

Задание 3.

Составьте словари к статьям

Задание 4

Выполните реферирование статей

Практическое занятие 5

Задание 1.

Переведите заголовок, аннотацию и введение статей.

Задание 2.

Просмотрите статьи и выберите из них отрывки, содержание которых представляет для вас наибольший интерес с точки зрения вашей магистерской диссертации.

Переведите эти отрывки сопровождая их ссылками на источник.

Задание 3.

Составьте словари к статьям

Задание 4

Выполните реферирование статей

Практическое занятие 6

Задание 1.

Переведите заголовок, аннотацию и введение статей.

Задание 2.

Просмотрите статьи и выберите из них отрывки, содержание которых представляет для вас наибольший интерес с точки зрения вашей магистерской диссертации.

Переведите эти отрывки сопровождая их ссылками на источник.

Задание 3.

Составьте словари к статьям

Задание 4

Выполните реферирование статей

Практическое занятие 7

Задание 1.

Переведите заголовок, аннотацию и введение статей.

Задание 2.

Просмотрите статьи и выберите из них отрывки, содержание которых представляет для вас наибольший интерес с точки зрения вашей магистерской диссертации.

Переведите эти отрывки сопровождая их ссылками на источник.

Задание 3.

Составьте словари к статьям

Выполните реферирование статей

Задание 1

Внесите в таблицу информацию о проработанных статьях

[illegible]

Задание 1

Внесите в таблицу информацию об источниках, представляющих интерес для вашей работы

[illegible]

МИНИСТЕРСТВО НАУКИ И ВЫСШЕГО ОБРАЗОВАНИЯ РОССИЙСКОЙ ФЕДЕРАЦИИ
Федеральное государственное автономное образовательное учреждение
высшего образования
«СЕВЕРО-КАВКАЗСКИЙ ФЕДЕРАЛЬНЫЙ УНИВЕРСИТЕТ»

МЕТОДИЧЕСКИЕ УКАЗАНИЯ

к практическим занятиям по дисциплине
«Иностранный язык в сфере профессиональной коммуникации» (английский)
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Ставрополь 2026

Учебное пособие составлено в соответствии с Федеральным государственным образовательным стандартом высшего профессионального образования, рабочим учебным планом и программой и включает специализированные тексты, вопросы к текстам, лексико-грамматические упражнения и краткий словарь, содержащий терминологические единицы.

Целью пособия является совершенствование навыков чтения специальных текстов, грамматических умений и навыков, а также накопление словарного запаса в профессиональной сфере.

Данное пособие предназначено для студентов технических специальностей очной и заочной форм обучения, изучающих дисциплины «Иностранный язык (английский язык)», «Технический иностранный язык (английский язык)», «Иностранный язык в сфере профессиональной коммуникации (английский язык)». Данное пособие может быть использовано как во время аудиторных занятий, так и для самостоятельной работы студентов.

СОДЕРЖАНИЕ

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Практическое занятие 2. Письмо-заявка
Практическое занятие 3. Curriculum vitae (CV)
Практическое занятие 4. Описание проекта
Практическое занятие 5. Собеседование
Практическое занятие 6. Научная коммуникация
Практическое занятие 7. Обзор литературы
Практическое занятие 8. Сбор данных
Практическое занятие 9. Эксперимент
Практическое занятие 10. Описание эксперимента
Практическое занятие 11. Материалы и методы
Практическое занятие 12. Данные
Практическое занятие 13. Графики и таблицы
Практическое занятие 14. Визуализация
Практическое занятие 15. Презентация
Практическое занятие 16. Конференция

ВВЕДЕНИЕ

Цель и задачи освоения дисциплины

Цели дисциплины: формирование набора общекультурных и профессиональных компетенций будущего бакалавра по направлению подготовки 13.04.02 Электроэнергетика и электротехника

В результате освоения дисциплины студенты должны:

Знать:

-лексический минимум иностранного языка профессионального характера; фонетические, грамматические и лексические структуры устной и письменной речи; словообразовательную структуру общенаучного и терминологического слоя текста по специальности, лексику делового общения, лексическое наполнение деловой корреспонденции

- основные языковые средства и социокультурные особенности изучаемого языка

Уметь:

-общаться с зарубежными коллегами на одном из иностранных языков, осуществлять перевод профессиональных текстов; работать с профессиональной литературой на иностранном языке в печатном и электронном виде, вести деловую и личную переписку, составлять заявления, заявки; делать рабочие записи при чтении и аудировании текста; готовить устные сообщения на заданную тему; вести телефонные переговоры; аргументировать свою точку зрения.

-использовать языковые средства для достижения коммуникативных целей в конкретной ситуации общения на изучаемом иностранном языке.

Владеть:

-навыками разговорной речи на одном из иностранных языков и профессионально-ориентированного перевода текстов различных видов основной профессиональной деятельности.

-технологиями приобретения, использования и обновления гуманитарных, социальных и экономических знаний, способами ориентации в профессиональных источниках информации (журналы, сайты, образовательные порталы).

- системой языковых средств и навыками письменного общения на изучаемом иностранном языке

Перечень осваиваемых компетенций:

Индекс	Формулировка:
УК-4	Способен применять современные коммуникативные технологии, в том числе на иностранном(ых) языке(ах), для академического и профессионального взаимодействия

Наименование практических занятий

№	Наименование разделов и тем дисциплины, их краткое содержание	Объем часов	Форма проведения
2 семестр			
1	Практическое занятие 1. Виды текстов	2	
2	Практическое занятие 2 Письмо-заявка	2	собеседование
3	Практическое занятие 3. Curriculum vitae (CV)	2	
4	Практическое занятие 4. Описание проекта	2	
5	Практическое занятие 5. Собеседование	2	
6	Практическое занятие 6. Научная коммуникация	2	собеседование
7	Практическое занятие 7. Обзор литературы	2	
8	Практическое занятие 8 Сбор данных	2	
9	Практическое занятие 9 Эксперимент	2	
10	Практическое занятие 10 Описание эксперимента	2	
11	Практическое занятие 11. Материалы и методы	2	собеседование
12	Практическое занятие 12. Данные	2	
13	Практическое занятие 13. Графики и таблицы	2	
14	Практическое занятие 14. Визуализация	2	
15	Практическое занятие 15. Презентация	2	
16	Практическое занятие 16. Конференция	2	

Практическое занятие № 1.

Виды текстов Academic Writing

The purpose of academic writing

Writers should be clear why they are writing. The most common reasons for writing include:

- to report on a piece of research the writer has conducted
- to answer a question the writer has been given or chosen
- to discuss a subject of common interest and give the writer's view
- to synthesise research done by others on a topic/

Exercise 1. Common types of academic writing. Below are the most common types of written work produced by students. Match the terms on the left to the definitions on the right.

Notes	A piece of research, either individual or group work, with the topic chosen by the student(s).
Report	
Project	The longest piece of writing normally done by a student (20,000+ words) often for a higher degree, on a topic chosen by the student.
Essay	
Dissertation/ Thesis	A written record of the main points of a text or lecture, for a student's personal use.
Paper	
	A general term for any academic essay, report, presentation or article.
	A description of something a student has done e.g. conducting a survey.
	The most common type of written work, with the title given by the teacher, normally 1000–5000 words.

Exercise 2. The features of academic writing.

There is considerable variation in the format of academic writing required by different schools and departments. Your teachers may give you guidelines, or you should ask them what they want. But some general features apply to most formats. Read the text below and identify the features underlined, using the words in the box.

sentence, heading, sub-title, paragraph, title, phrase

- (a) A fishy story
- (b) Misleading health claims regarding omega-3 fatty acids
- (c) Introduction
- (d) There has been considerable discussion recently about the benefits of omega-3 fatty acids in the diet. (e) It is claimed that these reduce the risk of cardiovascular disease and may even combat obesity. Consequently food producers have added omega-3s to products ranging from margarine to soft drinks in an attempt to make their products appear healthier and hence increase sales.
- (f) However, consumers may be unaware that there are two types of omega-3s. The best (long-chain fatty acids) are derived from fish, but others (short-chain fatty acids) come from cheaper sources such as soya. This latter group have not been shown to produce the health benefits linked to the long-chain variety. According to Tamura et al. (2009) positive results may only be obtained either by eating oily fish three times a week, or by taking daily supplements containing 500mg of eicosapentaenoic acid (EPA) or docosahexaenoic acid (DHA).

Практическое занятие №2

Письмо- заявка Letter of Application

Exercise 1 Read the extract from a website and then, in pairs, answer the questions below.

About

The Sheridan Australian Research Fellowship (SARF) aims to develop science in Australia by attracting outstanding scientists in their field to continue their research in an Australian university or research institution.

SARF fellowships are awarded to individual scientists with future potential for leadership in their field. Successful applicants receive a 5 -year grant covering salary, travel and relocation costs.

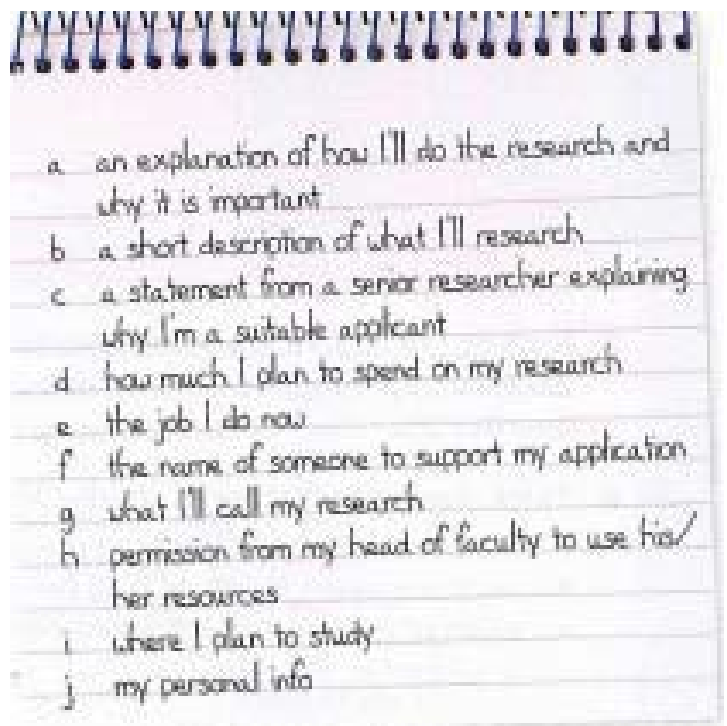
1. Can an organisation apply for this scholarship?
2. Would you be interested in applying for SARF?
3. Why / why not?
4. What information might you need to include on your application form?
5. What are the advantages of attracting scientists 'with future potential for leadership in their field' to a country?

Exercise2. Eriko has decided to apply to SARF and has downloaded an application form. Look at the list of sections on the form (1-10) and match each one to Eriko's notes on the information she needs to provide (1-10)



The image shows a screenshot of the Sheridan Australian Research Fellowship Application Form. At the top, there is a blue header with the text "Sheridan Australian Research Fellowship" and a small logo. Below the header, the title "APPLICATION FORM" is centered. A list of ten sections is provided, numbered 1 through 10. The sections are: 1. APPLICANT, 2. CURRENT APPOINTMENT AND ADDRESS, 3. LOCATION OF PROPOSED STUDY, 4. SPONSOR'S RECOMMENDATION, 5. DEPARTMENTAL SUPPORT, 6. PROJECT TITLE, 7. PROJECT SUMMARY, 8. DETAILS OF PROPOSED RESEARCH, 9. BUDGET, and 10. NOMINATED REFEREE WITH PERSONAL KNOWLEDGE OF APPLICANT.

Sheridan Australian Research Fellowship	
APPLICATION FORM	
1	APPLICANT
2	CURRENT APPOINTMENT AND ADDRESS
3	LOCATION OF PROPOSED STUDY
4	SPONSOR'S RECOMMENDATION
5	DEPARTMENTAL SUPPORT
6	PROJECT TITLE
7	PROJECT SUMMARY
8	DETAILS OF PROPOSED RESEARCH
9	BUDGET
10	NOMINATED REFEREE WITH PERSONAL KNOWLEDGE OF APPLICANT



Exercise 3. In pairs, discuss the following questions.

1. Have you ever applied for a job in science? If not, what kind of job would you like to apply for in the future?
2. Which of the following documents are job applicants usually asked for in your country?
 - application form
 - biodata
 - cover letter (covering letter)
 - resume or CV (curriculum vitae)
3. Have you ever written one of these documents in English?
4. Do you think that the information you include and the way you organize a resume or CV in English will be the same as a resume or CV in your own language?

Exercise 4. Section 1 of the SARF application form asks applicants to include a copy of their CV. In pairs, look at the list of possible headings for a CV (1-12) and then answer the following questions.

1. Would you use all the headings (1-12) on your CV? Why / why not?
2. How would you organise the information in your CV? Put the list of headings (a-l) in the best order.

3. What kind of information would you include under each heading? Make suggestions for each heading.

1. computer skills 2. dissertations 3. education 4. grants and awards 5. personal information 6. presentations	7. Publications 8. research experience 9. study abroad 10. teaching experience 11. technical skills 12. travel
---	---

Exercise 5. Eriko is getting advice from Susana about writing her CV. Read the dialogue and use the list above to complete the headings Eriko will use.

Eriko: So if I use the research experience heading, do I include presentations, publications, grants, awards, skills and everything all in there? I mean, won't the section be too long?

Susana: You're absolutely right... it would be too long. I think this is one of the big differences between a CV in English and the resumes most of us learned to write. In a CV you can use a lot of different headings for the various sections. So you can have a research experience heading where you list your research positions, but then separate headings for the other details, the publications and so on.

Eriko: OK, so let me just check I've got this right. I should start with a personal information heading, and then next is education. Could I just ask one thing about that?

Susana: Sure.

Eriko: In the education section, how far back should I start? I mean, which school should be first? Not elementary school, I assume.

Susana: Ah, well, another thing here. In CVs, they always write the most recent thing first. So in education, your PhD comes first, just after the title.

Eriko: So ... what... in publications, the paper I published last is written first, right?
Susana: Right.

Eriko: Hmm, OK ...

Susana: ... and as to which education to mention, I'd start with high school at the earliest, nothing before that.

Eriko: OK, so start with Osaka University.

Susana: Exactly.

Eriko: And after the education section, research experience and then technical skills, followed by publications ...

Susana: No, no, no - put your teaching experience next, after technical skills, because you'll hopefully be doing some teaching.

Eriko: OK, so research experience, technical skills, teaching experience, publications, OK fine, and then grants and awards and finally presentations. Is that the lot?

Susana: Yeah, that should be good. So you'll be OK now?

- Personal Information
- (1) _____
- Research Experience
- Technical Skills
- (2) _____
- Publications
- (3) _____ and (4) _____
- Presentations

Практическое занятие №3 **Curriculum Vitae (CV)**

Exercise 1. When adding details to your CV, it is a good idea to use bullet points rather than full sentences. Look at the following revisions to the part of Carlos's CV and then answer the questions below.

~~“One of my research focuses was to examine the relationship between vegetation and the hydroperiod by producing detailed graphical profiles.”~~

- *Produced detailed graphical profiles to examine the relationship between vegetation and the hydroperiod.*

~~“The research for my PhD focused on the analysis of the intra- and inter-annual variability of perilagoonal vegetation.”~~

- *Analysed the intra- and inter-annual variability of perilagoonal vegetation.*

- 1 What kind of word comes first in each bullet point? How is this word formed?
- 2 Why does he move to examine the relationship between vegetation and the hydroperiod to the end of the first sentence?

Exercise 2. Rewrite the following sentences as bullet points.

1. My main research focus was to generate specific carbohydrate oligomers by using pure cloned enzymes.
2. During my project, I focused on the creation of a new CD4 positive HeLa cell clone.
3. As part of the Cell Wall Genomics team, I have developed sensitive methods to determine the fine structure of pectins in maize.
4. I have been involved in investigating the way the myocardium adapts following exercise, particularly the adaptation that takes place at the sub-cellular level.

Exercise 3. Your CV should always include any publications you have worked on in their correct citation form. Answer the following questions.

1. What is the correct order of information in a citation? Number the words below in order from 1 to 6.
 - page numbers
 - journal volume and/or issue number
 - title of article
 - year
 - journal name
 - author's name
2. If the paper has not yet been published, what do you write instead of the volume and page?
3. If the paper has been submitted (given) to a journal but not yet accepted, what do you write instead of the journal name, volume and page?

Exercise 4. Write out the information for three different publications Carlos has worked on (1-3) in the correct citation form.

1. I Hernandez Sanchez, R. and Alvarez, C.M. (2011) 'Salinity and intra-annual variability of perilagoonal vegetation' *Submitted manuscript*.
2. Hernandez Sanchez, R., Gomez Herrera, S.A. and Alvarez, C.M. (2011) 'Declining peri-dunal variability in Dohana' *Environmental Management Review* In press.
3. Hernandez Sanchez, R. and Alvarez C.M. (2010) 'Hydroperiod effects on peri-dunal vegetation' *Spanish Hydrology Journal* I Vol 2. pp 167-184

Exercise 5. Make a list of your publications and add it to your CV.

Практическое занятие № 4

Project

Exercise 1. Read Eriko's completed project summary below. Then say what you think the commercial applications of Eriko's research might be.

Exercise 2. Match each highlighted section in the summary (A-F) to the correct function (1-6).

PROJECT SUMMARY

Provide a brief summary of aims, significance and expected outcomes of the research plan.

A 3-D odour-compass for odour-detecting robots

Odour-sensing robots offer many benefits over the current use of animals in similar roles, including safety, efficiency and durability. **[A] However, the robots which have been developed to date are limited** by the fact that they can only accurately detect and navigate towards odour plumes if they are within direct 'sight' of the chemical source. Clearly, in real world situations, obstacles may well impede the robot's detection ability, and at present, odour-sensing robots are therefore only of limited use. **[B] The proposed research will concentrate on developing** a robot which is able to gather readings in three dimensions and therefore overcome the limitations of current models in odour-detection. **[C] This technology will make robots a more effective substitute for animals.**

[D] This research aims to develop existing robotic technology to create a three-dimensional (3-D) odour compass to be used as a navigation tool in searching for an odour source. **[E] This will then be tested experimentally** in simulated environments where wind direction is not stable or where obstacles interfere with odour distribution. A second stage in the research will be to develop the robot's environmental sensors, thus allowing it to safely negotiate the terrain to reach the source of the odour. **[F] This should produce a robot which is able to** both detect and move to the source of an odour, even on difficult terrain.

- 1 - State the aims of your research
- 2 - Define what the problem is
- 3 - Explain why your topic is worth researching
- 4 - Say what the expected outcomes of the research are

- 5 - Outline the procedures you will follow
- 6 - Outline how you will limit your investigation

Exercise 3. Look at the sections A-F again. Underline the words that you could use in your own project summary.

Exercise 4. Complete the project summary by another researcher below using the correct word or phrase from the box.

aims to	however	the initial phase	the proposed research	the study	will indicate
---------	---------	-------------------	-----------------------	-----------	---------------

Consumer interest in wines produced in organic vineyards has increased significantly in the last few years. (1)_____, to date it is unclear whether these production methods actually improve soil or grape quality. (2)_____ will be the first phase of a long-term study on a New Zealand vineyard. These results (3)_____ whether methods of viticulture improve grape quality.

The research (4)_____ investigate the effects of organic agriculture on soil and grape quality. (5)_____ will consist of two treatments, organic and conventional (the control), each replicated four times in a randomised, complete block design. All organic practices will follow the standards set out by the Food Standards Australia New Zealand (FSANZ).

(6)_____ will assess soil quality using physical, chemical and biological indicators over six years. The next phase will then assess the physiology of the vines.

Exercise 5. Write a short project summary of about 150 words for the research you discussed in the exercise above. Use the phrases from Exercises 3 and 4.

Exercise 6. Write a short project summary for your own research.

Практическое занятие 5 An Interview

Exercise 1. Read the extract of an email to Eriko from Dr Caroline Hansford of SARF and then answer the following questions.

1. How will Eriko be interviewed?
2. What does she have to do before the interview?

3. Why might this interview be particularly difficult?

....and we plan to hold interviews in the final week of July. Your interview has been scheduled for Thursday 28 July at 0900GMT. As you are currently based in the UK, we will be interviewing you by conference call. Please write back to us to confirm your availability for this date and time. We will be asking all interviewees to deliver a short presentation of their research proposal at interview. In your case, we would like to ask you to upload a video of yourself giving such a presentation no later than Wednesday 20 July.

Exercise 2. A) Eriko has decided to write her presentation and then to memorise it.

Hello. My name is Eriko Oshima and I'm currently a PhD candidate at Imperial College London. My research focuses on developing odour-sensing robots. This is useful because humans have a poor sense of smell, and so we have to rely on other methods to detect particular odours. For example, we use trained sniffer dogs to locate people trapped in buildings, chemical leaks or illegal drugs. However, there are a number of problems with using dogs.

First, they cannot communicate exactly what they have detected. But a robot could. Secondly, it is difficult to tell if an animal's sense of smell is in some way impaired. But a malfunctioning robot would be easily spotted.

Third, animals require extensive training with ...

B) Now write your presentation according to the plan below.

- 1 Hello. My name is ... and I'm currently ...
- 2 My research focuses on ...
- 3 This is useful because ...
- 4 For example, ...
- 5 However, there are a number of problems with ...
6. First.....
7. Second....
8. Third.....

Exercise 3. A) Phone and video conferencing are both common for interviews and meetings nowadays.

Complete the advice for interviews by conference call using the following words and phrases below:

application form, comfortable position, facing, late, phone number, questions, see, shuffle, thank, tone of voice

CONFERENCE CALL INTERVIEWS

Before your interview • Find out exactly who you will be talking to • Check whether they will be able to (1) _____ you or just hear you • Check the date, time, the (2) _____ to dial in on, and the right code to access the conference call • Read your CV and (3) _____ again • Practise answering questions you might be asked • Prepare (4) _____ to ask the interviewer	During your interview • Don't be (5) _____ ! • Use your (6) _____ to sound confident and enthusiastic • Do not (7) _____ papers (this will make a noise) • Sit in a (8) _____ - do not move about too much • Speak very clearly, (9) _____ the microphone When the interview is over (10) _____ the interviewer(s) and end positively
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Exercise 4. Imagine you are being interviewed for a job or a fellowship. Make a list of questions which you might be asked.

Практическое занятие №6 Scientific Communication

Exercise 1. Which of these ways do you usually use to communicate?

an academic journal
a popular science magazine
a conference
a popular science book
an online forum or science blog
a newspaper

Exercise 2. Why is it important for scientists to keep in touch with?

- a. other people in their field (e.g. biology)?
- b. people in their specialism (e.g. molecular biology)?
- c. people in other fields of science?

Exercise 3. Read the following statements and say which form(s) of communication from Exercise 1 the speakers should use to find the information they want.

1. I'm trying to learn more about the Hadron collider because it's big news, but it's not even close to my area so I'm finding the papers on it heavy-going.
2. At my university, I don't meet enough people in my field - I really need to network and build some connections with people working around the world.
3. I'm having a problem with one of my protocols. I've tried a few different things, but with no luck - I could do with some suggestions from other people of what to try next.

Exercise 4. Read the following five extracts and then say which form (or forms) of communication from Exercise 1 each one comes from. Which form(s) of communication are not included in these extracts?

A more people were pain-free when using the handheld device than those who had used an identical dummy device. Although the study by Lipton et al. (2010) has reliable results, there are some points to consider when putting these findings into context. Importantly, the results will need to be verified in larger trials that directly compare ...

B. Tea and coffee drinkers have a lower risk of developing type 2 diabetes, a large body of evidence shows. And the protection may not be down to caffeine since decaf coffee has the greatest effect, say researchers in Archives of Internal Medicine. They looked at ...

C. ... can be rapidly generated by lentivirus-mediated transgenesis. RNAi also holds great promise as a novel therapeutic approach. This report provides an insight into the current gene silencing techniques in mammalian systems.

D. Hi! Has anyone had any experiences with nanoparticles sticking to glassware. If so, does anyone know if there's a suitable silylation protocol to pre-treat the glassware to do something about this annoying non-specific adsorption? Thanks!

E. Animal and in vitro studies suggest that aspirin may inhibit breast cancer metastasis. We studied whether aspirin use among women with breast cancer decreased their risk of death from breast cancer. This was a prospective observational study based on ...

Exercise 5. The language we use changes according to why we are writing (the purpose) and who we are writing for (the reader). It is important to notice the different styles of language used in English.

Complete the second column of the table below, carefully reading the appropriate extract (A-E).

Feature	Examples	Extract
1. Asks the reader questions Has anyone had ... ?	Has anyone had ... ? _____	D D
2. Uses multi-word verbs (a verb with an adverb or a preposition)	_____ do something about	B D
3. Uses exclamation marks and emoticons	Hi! _____	D D
4. Uses non-specific references to the work of other researches	_____ _____	B
5. Uses specific references to the work of other researchers	_____	A
6. Uses impersonal phrases to avoid saying 'You' or 'We	there are some points to consider	A E
7. Uses passive verbs to avoid saying who carries out a process	can be rapidly generated	A C
8. Uses Latin language expressions	et. al	A E

Exercise 6. Which of the features in the table (1 -8) are appropriate for formal scientific research papers? Which are appropriate for personal

communication (such as email)?

Exercise 7. Read three recent posts from an online forum (A-C) below. Imagine you belong to the forum where these questions are asked. Which questions could you answer? Which answers could you guess?

A. Subject: Filovirus Host Range?

(1) Does anybody know what the host range is for filoviruses (i.e. Ebola and Marburg)? (2) I know that they can infect most (all?) types of mammals and several species of birds, but I can't find the actual host range anywhere. (3) Any help here would be appreciated.

B. Subject: materials which x-rays can't pass through?

(1) I've been looking for a while now, but I can't find anything telling me what the radiopaque materials are. (2) In other words, which materials can't x-rays pass through? (3) Thanks in advance.

C. Subject: Quality of scientific writing considered in peer review?

(1) I was wondering how important the quality of the writing of a submitted paper is in the peer review process. (2) I don't mean the quality of the data, but the actual writing. (3) In other words, will a nicely written paper with the same data be more likely to be accepted?

Exercise 8. Read the posts again. For each post, say which sentence or sentences (1 - 3) in each one the writer uses to:

- a. ask the question
- b. say what the problem is
- c. thank the reader

How are the questions in the Subject field of each post different from normal questions?

Exercise 9. Think of a question related to your own research. Then write a three-sentence post for an online forum in an appropriate style using the phrases in the box to help you.

- Does anybody know what... is ...?
- I know that..., but I can't find / don't know ...
- I was wondering how / what / why ...

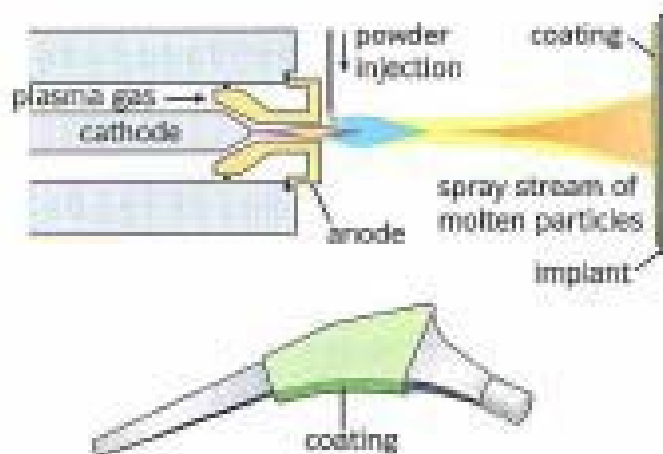
- I don't mean, but...
- In other words, ...
- Any help here would be appreciated.
- Thanks in advance.

Практическое занятие 7

Literature Review

Exercise 1.

A) Pia is a materials scientist. She would like to find a more efficient way of coating metallic bone implants with hydroxyapatite (HA), bioactive calcium phosphate (CaP). Look at the diagram. It shows a plasma-spray process for coating metallic bone implants with calcium phosphate. Use a dictionary to check the meaning of the words in the diagram.



B) Pia has noticed a problem with the process, but she thinks that a biomimetic solution might be possible. In pairs, look at the diagram carefully following questions.

1. What do you think the problem might be?
2. Can you think of a biomimetic way to coat the implants with CaP? (Clue think about how crystals grow naturally)

Exercise 2.

A) Pia has decided to read up on the topic to help her plan her research to find a more efficient coating method. In pairs, discuss the following questions.

1. Why is it a good idea to review the literature before planning your experiment?
2. How can you find research papers which will be relevant to your area?
3. What might Pia's next step be after she has read some of the literature?

B) Look at the extracts from the literature which Pia has found. Which extract(s) describe:

1. why CaP is used on metallic bone implants
2. the advantages of CaP-coated implants
3. the disadvantages of using plasma-spraying to CaP-coat metal

A

All coatings were found to undergo significant plasma-spraying-induced changes. Specifically, hydroxyapatite (HA) partly decomposed to α -TCP and tetra calcium phosphate. (Radin, S.R. and Ducheyne, P., 1992)

B

Uncemented HA-coated implants had better survival rates than the uncoated, cemented ones. (Havelin, L.I., Engesteter, L.B., Espehaug, B., Furnes, O., Lie, S.A. and Vollset, S.E., 2000)

C

Plasma-sprayed coatings have an irregular surface, and always contain some holes throughout their thickness. (Pilliar, R.M., 2005)

D

Surface engineering of biomaterials is aimed at modifying the biological responses while still maintaining the mechanical properties of the implant. Therefore, there has been research to develop CaP-based surface coatings on various metals for implant applications. (Paital, S.R. and Dahotre, N.B., 2009)

E

Since 1985, it has been reported that HA coatings on metallic implants can successfully enhance clinical success, and a less than 2% failure rate was reported during a mean follow-up study of 10 years. (Yang, Y., Kim, K-H. and Ong, J.L., 2005)

Exercise 3. Match the definitions (1 -8) to the underlined words and phrases in Exercise 2B.

1. a further investigation into sth which happened before
2. a way in which sth can be used for a particular purpose
3. having parts of different forms, shapes or sizes
4. to cause sth to happen
5. to change
6. to continue to be sth or have sth
7. to decay or to break down into smaller parts
8. to improve the quality, amount or strength of sth

Exercise 4. Explain to a partner in your own words:

1. why CaP is used on metallic bone implants
2. two advantages of CaP-coated implants
3. two problems there are of using plasma-spraying to CaP-coat metal

Exercise 5. Pia has written a review of the literature she has found. Read the summary of her review below and then answer the questions.

1. Does Pia's summary include key information on why CaP coating is used on implants?
2. Does it describe advantages and disadvantages of the process?
3. Has she used the same words as the original authors did in extracts A-E?
4. How does she refer to the work of other scientists?
5. What does et al. mean in 'Yang et al., 2005'?

(1) The surface of metallic bone implants is often sprayed with calcium phosphates (CaPs) to improve the biological response (Yang et al., 2005; Paital and Dahotre, 2009). (2) Studies have found better survival rates for coated implants (Havelin et al., 2000). (3) However, the usual plasma-spray technique cannot coat all surfaces evenly (Pilliar, 2005). (4) In addition, the plasma-spraying process causes CaP input powders to break down into other compounds such as tetra calcium phosphate (Radin and Ducheyne, 1992).

Exercise 6. In a literature review, it is important to combine information from different sources and show how different pieces of information relate to each

other. Look at Pia's summary again and answer the following question. What word or phrase does Pia use to show that?

- a) there is a contrast between the information in Pilliar (2005) and Havelin et al. (2000)?
- b) Radin and Ducheyne's (1992) research shows another problem with spraying, different from Pilliar (2005)?

Exercise 7. Complete extracts 1 - 5 with the words below. There may be more than one possible answer.

As a result; In contrast; Moreover; On the other hand; Therefore

1. Kurella et al. (2006) used a continuous-wave Nd:YAG laser system to melt a CaP precursor on Ti-6Al-4V substrate _____, Paital et al. (2009) used a pulsed Nd:YAG laser system.
2. Coating crystallinity was observed to increase at higher temperatures. _____, sputtered coatings heat-treated in the presence of water vapour at 450 °C resulted in a significant increase.
3. Thiriau et al. (2008) showed that the procedure results in more light-weight implants. _____, Amrani & Guyton (2011) reported that surface damage in the CaP coating can also be observed.
4. A surface with a greater texture enhances cell interaction with complex tissue such as bone. _____, creating three-dimensional features or textures on the surface of a biomaterial is becoming a reality.
5. Sliding and/or vibratory motions resulted in adhesion and cohesion at the interface of the two surfaces _____, adhesive damage caused bound particles to transfer from one surface to the other.

Exercise 8. The linking words in Exercises above show a relationship between two different sentences. We can also describe a similar relationship in a single sentence using the correct word **and or **but**. Look at Pia's summary in Exercise 4 and:**

- combine sentences (2) and (3) by replacing *However*, with *and* or *but*.
- combine sentences (3) and (4) by replacing *In addition*, with *and* or *but*.

Exercise 9. We can describe the relationships between sentences (2), (3) and (4) in Pia's summary in different ways. In pairs, look at the four ways below of organising the sentences and then decide which way (a-d) is best. Think about the style and the effect on the reader as well as the meaning of the sentences.

- (Sentence 2]. However, (Sentence 3]. In addition, (Sentence 4).
- (Sentence 2). However, (Sentence 3) and (Sentence 4).
- (Sentence 2) but (Sentence 3). In addition, (Sentence 4).
- (Sentence 2) but (Sentence 3) and (Sentence 4).

Exercise 10. Look at another extract from Pia's literature review. Complete the gaps with the linking words in the box. There is one word you do not need.

and but first however in addition so

Biomimicry has been used to develop alternative coating techniques.

(1) _____, the metal is treated with strong base or acid (Kim et al,

1996). This treatment transforms the surface into an alkali salt or hydrated oxide.

These show negative surface charges, (2) _____ they can attract Ca^{2+}

and cause CaP to grow on the implant. (3) _____, a disadvantage of this method is that it can cause surface problems, (4) _____ these can affect the survival of the implants.

(5) _____, these methods cannot be used to coat stainless steel because its alkali salts and oxides do not show negative surface charges (Miyazaki et al., 2000).

Практическое занятие № 8

Describing approaches to data collection

Exercise 1. A) The scientific method is a process in which experimental observations are used to answer questions. Complete the collocations for describing the stages in the scientific method using the words and phrases in the box.

a hypothesis an experiment (x2) conclusions data (x3) the question

- analyse_____
- collect_____
- conduct (or run)_____
- define _____
- design_____
- draw_____
- form _____
- interpret_____

B) Number the stages (1 -8) in the order you would normally do them.

Exercise 2. Read this extract from a student website and check your answers to Exercise 1 B.

The scientific method is a process in which experimental observations are used to answer questions. Scientists use the scientific method to search for relationships between items. That is, experiments are redesigned so that one variable is changed and the effects of the change observed. While the exact methodologies used vary from field to field, the overall process is the same. First, the scientist must define the question - what exactly they are trying to find out. Next comes the formation of a hypothesis, which is an idea or explanation for a situation based on what is currently known. The next stage of the method is the design of an experiment which will allow this hypothesis to be tested. Usually a primary run of the experiment is conducted, and any changes to the experimental set-up made. In each experimental run, data collection takes place, followed by data analysis. Finally the data is

Exercise 3. Read the extract again to find the noun forms of the verbs in the box. Which word(s) in the box use(s) the same form for the verb and the noun?

analyse collect design explain form observe relate run vary

Exercise 4. Below are the summaries of five experiments. Read each summary and then choose which word correctly completes the heading.

1. Practical / Theoretical research

Murray Gell-Mann and George Zweig proposed that particles such as protons and neutrons were not elementary particles, but instead were composed of combinations of quarks and antiquarks.

2. Field / Laboratory experiment

Mark-and-recapture models were used to measure seasonal and habitat changes in house mouse densities on sub-Antarctic Marion Island.

3. External / Internal validity

The students were carefully matched for social status, subject area, ethnicity, education level, parental smoking, and exposure to targeted advertising.

4. Descriptive / Experimental study

The amount of soy products eaten by each participant was assessed at the start of the study. During the 30 years of the study, the women's incidence of breast cancer was recorded.

5. Qualitative I Quantitative research

To investigate the effect of eating dark chocolate on stress levels, a blood sample was taken and the levels of stress hormones measured. After eating the chocolate, a second sample was taken and hormone levels measured again.

Exercise 5. In pairs, can you think of an example of an experiment which describes the alternative heading in 1-5 of Exercise 2a (for example, an experiment which is practical not theoretical)?

Практическое занятие № 9

Describing an experiment1

Exercise 1. Silvana is going to discuss her design for an experimental set-up with Mauritz, a more experienced researcher. Look carefully at Silvana's diagram and notes. Then fill in the gaps with the words from the box you think might complete the gaps (a-h).

activation weight ceramic/steel steel/ceramic furnace temperature cooling nitrogen

Carbon Fibre (CF) (a) plan

CF carbonised @ 1273K or 973K

activate CF with KOH or NaOH ratio

4: 1 & 10:1 based on (b)

1. Sample tray - use unreactive material, e.g. (c) _____

or (d) _____ (ask Mauritz)

2. Tube (e) _____

3. Inner tube - What material? What size? (ask Mauritz)

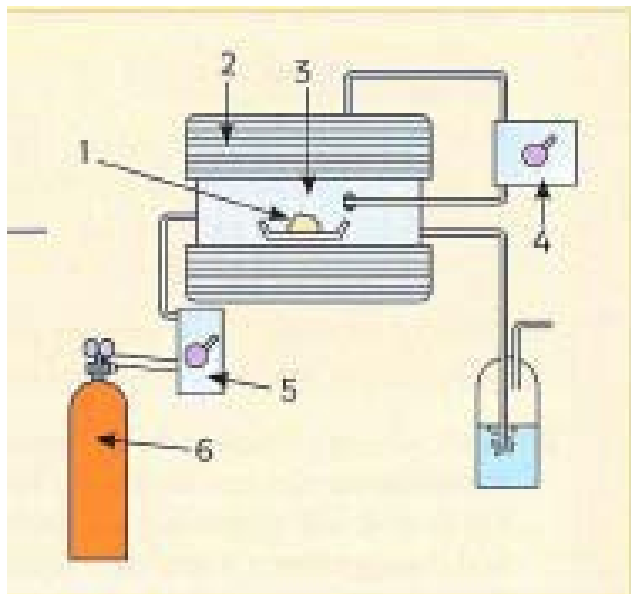
4. (f) _____ controller (for furnace)

Increase temperature 5 K/min. up to 1025 K for how long? (ask Mauritz)

Maybe add (g) _____ mechanism later

5. Flow controller

6. (h) _____ flow - 500 ml/min.



Exercise 2. Read the dialog below.

Silvana: Mauritz, do you have time to talk to me about your adsorption protocols? Dominique suggested that I talk to you.

Mauritz: Sure, just let me set this ... OK, so what is it you're going to be doing?

Silvana: OK, well, I've been working on a plan for the activation of carbon fibers. I'm going to start off with fibers which have been carbonized at two different temperatures. And then I'm going to activate each one with either potassium or sodium hydroxide, at two different ratios. And then after that I'll look at hydrogen adsorption.

Mauritz: Sounds good. OK, so first you would need to do the activation.

Silvana: Yeah. I was thinking of simply mixing the fibers with the hydroxides in pellet form, at the relevant ratios.

Mauritz: Ratios based on weight or volume?

Silvana: Oh, weight of course.

Mauritz: Just checking!

Silvana: I think the literature suggests 2 grammes of fibers with the relevant amount of hydroxide, so I think I'll try using those quantities first.

Mauritz: OK, so what ratios are you going to use?

Silvana: 4:1 and 10:1. But then they need to be heated ...

Mauritz: OK, fine. And have you thought about the set-up for that?

Silvana: Yeah, a little bit. Here's a quick sketch I made of what I was thinking of. On the inside, I thought I should have the sample on a tray in an inner tube.

Mauritz: The tray's steel?

Silvana: Mmm, yes. Or ceramic. I'm not sure yet, but I figure as long as it's unreactive it should be OK.

Mauritz: I guess, but if I were you, I'd use steel. The ceramic trays tend to be a bit bigger.

Silvana: OK, thanks. And then the inner tube is surrounded by a tube furnace, which you can see here.

Mauritz: Uh -huh.

Silvana: But I'm not sure what the tube should be made from, or even sizes for that matter.

Mauritz: I know someone who used to do something similar to this. She had a, maybe metre and a half, quartz tube, but it was quite narrow, less than 10 centimetres. I'd guess a t maybe 6 to 7 .5 centimetres across. Why don 't you try that to start with?

Silvana: Sure. So, I'll just note those dimensions down - 1.5 metres and 10 centimetres.

Mauritz: No, I'd use less than 10 centimetres. Between 6 and 7.5.

Silvana: Oh, OK. So then the furnace needs to be linked to a temperature controller. That's up here.

Mauritz: And doesn't 't heating rate play a role here?

Silvana: Yes, it does. But Dominique suggested picking just one rate initially. The papers I've looked at suggest 5 kelvins a minute, up to 1025 kelvins, and then constant for an hour, so I'm planning to stick with that.

Mauritz: Hmm, personally I think slightly longer would be better. I think you should maintain the temperature for 75 minutes.

Silvana: Great. OK, so I'll go for 75 minutes at temperature.

Mauritz: And then it just cools naturally?

Silvana: I think so. I haven't included any cooling apparatus here, so I'll try relying on natural convection first, and if it doesn't work, I can add some kind of cooling mechanism later on.

Mauritz: Great. So what's this on the left?

Silvana: That's the nitrogen cylinder. There'll be a constant flow of nitrogen. I was planning on running it through at 500 mils a minute, through the entire heat treatment.

Mauritz: Well, it really sounds like you have that all worked out. It looks like it should work. And you have the washing and drying figured out?

Silvana: Yeah, again from what I've read, the best thing to do ...

Exercise 3. Match the beginnings (1 -7) to the endings (a-g) of some of Silvana's sentences from the conversation.

1 I'm going to	<i>a</i> have the sample on a tray in an inner tube.
2 I was thinking of	<i>b</i> simply mixing the fibres with the hydroxides in pellet form, at the relevant ratios.
3 I think I'll try	<i>c</i> relying on natural convection first.
4 I thought I should	<i>d</i> running it through at 500 ml a minute, through the entire heat treatment.
5 I'm planning to	<i>e</i> start off with fibres which have been carbonised at two different temperatures.
6 I'll try	<i>f</i> stick with that.
7 I was planning on	<i>g</i> using those quantities first.

Exercise 4. Phrases 1-7 in Exercise 3 can all be used to discuss future plans.

1. Which phrases can we use to sound more confident about a future plan? Which are used to sound more tentative (i.e., less confident, more cautious)? Divide the phrases into two groups (more confident and more tentative).
2. Which phrases are followed by the *INFINITIVE*? Which are followed by a *VERB*-ing form?

Exercise 5. Think of an experiment you are planning to do or would like to do in the future. Draw and label a sketch of the set-up as you plan it.

Практическое занятие №10 Describing Experiment 2

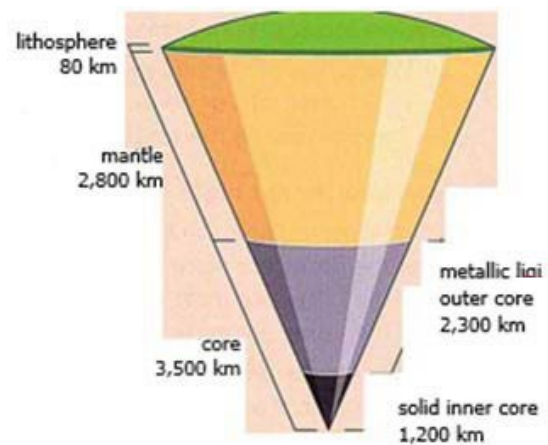
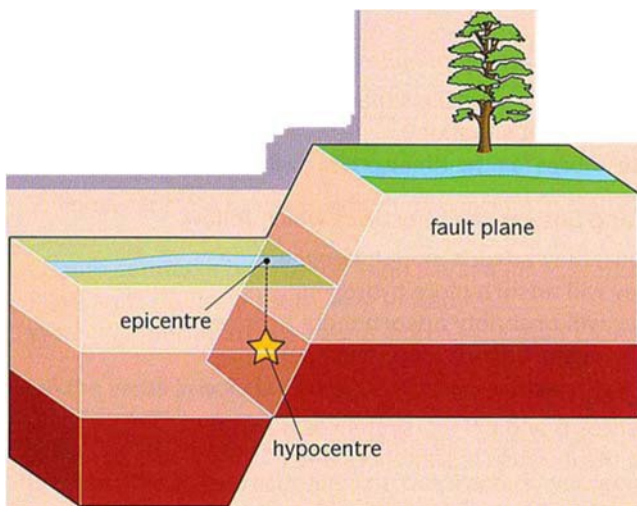
Exercise 1. Think over the following questions.

1. What processes do you need to describe in your field of research? Who do you describe them for?
2. How much detail do you need to include in your descriptions?

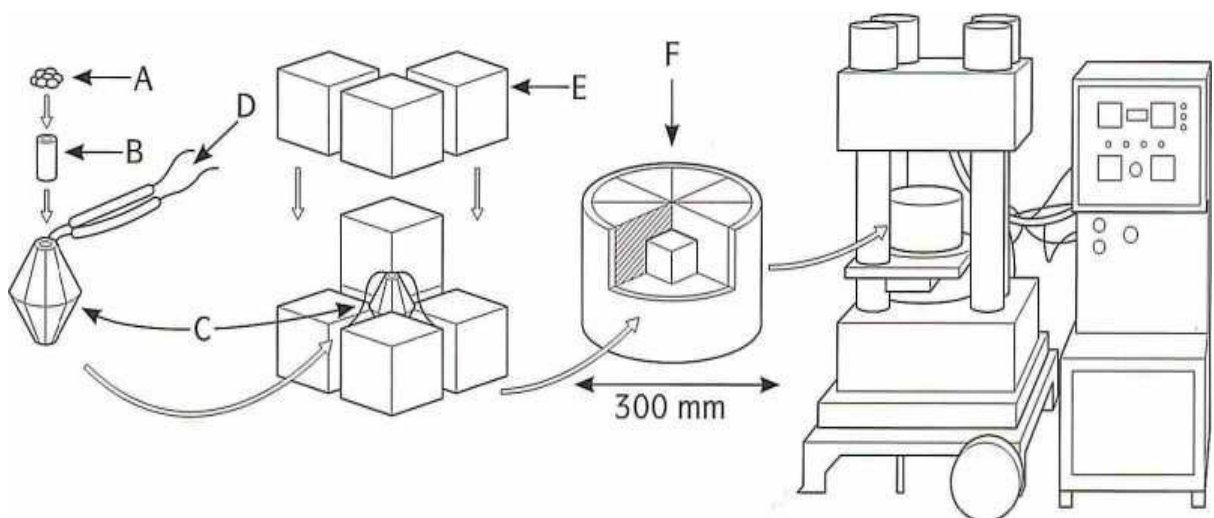
3. What do you think are the most important points to remember when describing a process for other scientists?

Exercise 2. Alex is researching seismicity (earthquake activity). Answer the following questions. Use the diagrams below to help you.

1. Do you know what causes earthquakes?
2. How might the Earth's mantle be involved in seismicity?



Exercise 3. Alex is investigating how the strength of different minerals in the Earth's mantle changes at high pressure and temperature, and how this relates to seismicity. Look at the sketch below of the process he uses to measure mineral strength. Using the diagram, can you describe the process in your own words?



Exercise 4. Read Alex’s summary of his procedure below. Then read the first paragraph again and say what labels A-F in the diagram represent.

(1) Multi-anvil high pressure apparatus was used to generate the high pressure and temperature for the specimen. (2) The powdered mineral sample was placed into a tube of rolled rhenium. (3) The rhenium tube was loaded into a ceramic octahedron. (4) Two tungsten-rhenium thermocouple leads were attached to the octahedron. (5) The octahedron was surrounded by a set of eight tungsten carbide cubes. (6) The cubes were placed into the space formed by six secondary anvils in the press. (7) The press was pumped up to the correct pressure. (8) The anvils transform the directed force of the hydraulic press to hydrostatic pressure on the sample. (9) Heating of the tube was carried out using an electrical current conducted through the anvils. (10) Temperature was controlled with a programmable temperature controller. (11) Energy diffraction patterns were collected using a germanium solid state detector. (1 2) The patterns were analysed to work out the material's strength.

Exercise 5. Underline the main verb in each sentence of the summary in Exercise 4 (the first one has been done for you). Then answer the following questions.

1. Which main verb form is used in almost all the sentences?
2. How is this structure formed?
3. Why is this structure often used in describing a process?
4. Which main verb is different? Why?

Exercise 6. When you are reading the scientific literature, it is useful to record any VERB + PREPOSITION combinations you find. Read the summary again and find at least five VERB + PREPOSITION combinations.

Exercise 7. Complete the sentences by choosing the correct preposition (a, b or c).

1. First, leucine *was separated* other amino acids in the protein hydrolysate.
a for *b* from *c* with
2. Many bacteria, such as *Bacillus* spp., *can be isolated* insects.
a from *b* to *c* with
3. Subsequently, the specimens *were embedded* methacrylate.
a at *b* in *c* to
4. The sections *were stained* uranylacetate and lead citrate solutions.
a with *b* to *c* under

5. MIP-1 p was added to wells which *had been coated* BSA.

a by *b* from *c* with

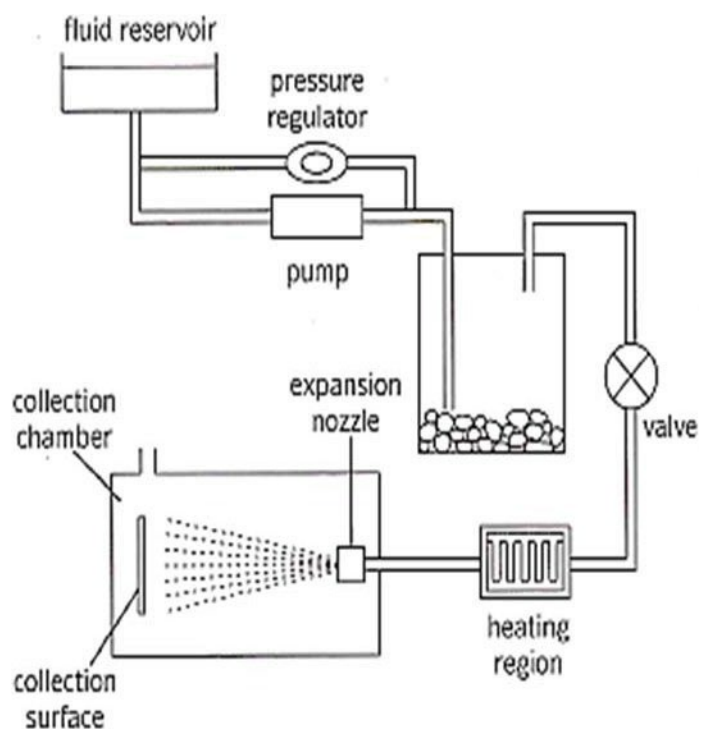
6. pH *is maintained* 6.5, using Waterlife Buffer and Sera pH Minus.

a at *b* in *c* to

Exercise 8. A) Look at the diagram from a review of supercritical fluid technology. Complete the description of the process using the words in the box.

at	first	then	was	which (x2)
----	-------	------	-----	------------

The diagram provides a schematic view of the rapid expansion of supercritical solutions (RESS) process. (1), the supercritical fluid (SF) (2) pumped into the vessel (3) contained the solid solute. The SF dissolved and became saturated with the solute. The resultant solution was (4) introduced into a precipitation chamber by expansion through a laser-drilled nozzle. The precipitation unit was maintained (5) conditions where the solute had low solubility in the SF. As the SF expanded, its solubility decreased, (6) resulted in a high degree of solute supersaturation and subsequent precipitation.



B) Think of a process you know well. Draw a sketch and write a short description.

Exercise 9. Think about an experiment you have done recently. Describe it according to the plan below.

1. Briefly describe the experimental process.
2. Explain what you predicted would happen.
3. Describe what actually happened.
4. Explain what you learned from the experiment.
5. Explain what you did as a follow-up to the experiment.

Практическое занятие 11

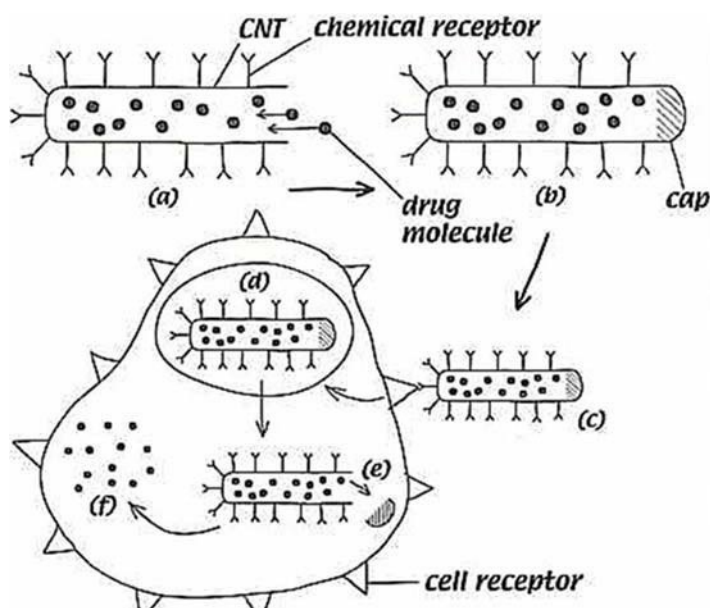
Materials and methods

Exercise 1. Match the beginnings (1 – 9) to the endings (a – i) to make definitions of the words in bold.

1 A biodegradable substance is one which	<i>a</i> can be put in one place then taken away again,
2 A nanocapsule is a capsule which has	<i>b</i> into your body.
3 A removable object is one which	<i>c</i> between cells in the same organism,
4 Endocytosis is a process by which	<i>d</i> decays naturally,
5 If a cell overexpresses a protein, it expresses	<i>e</i> put inside something else,
6 If someone is given multiple doses of a drug, they receive	<i>f</i> it many times.
7 Intercellular communication is communication which happens	<i>g</i> molecules can move inside cells,
8 When a drug is encapsulated , it is	<i>h</i> a diameter smaller than 200 x 10's metres,
9 If you ingest a substance, you take it	<i>i</i> too much of it.

Exercise 2. Underline the key words in the sentence endings (a – i) which summarise the meaning of the prefixes in (1 – 9) (for example, bio- = naturally).

Exercise 3. One application of nanotechnology is in pharmaceutical research. Kimiko, a PhD student, has drawn a sketch of a targeted drug delivery for the materials and methods section of her paper. What do you think is happening at each stage (a – f)?



Exercise 4. The sentences below describe processes in different experiments. Match the verb in bold in each sentence (1 – 5) to the correct definition (a – e).

1 A microtome was used to slice 4 pm sections of the paraffin-embedded tissue.	a to change from a gas to a liquid or solid state
2 As the gas cools, the water vapour condenses and is caught in the conical flask.	b to change the colour of something using a chemical
3 Devices in the two chimneys would filter out radioactive dust.	c to cut something into thin, flat pieces
4 Haemotoxylin-Eosin stains the cell nucleus blue and the cytoplasm pink.	d to remove or take something away
5 Plutonium 239 was extracted from the sample using nitric acid.	e to remove solids from liquids or gases

Exercise 5. Write the verbs in the correct form to complete the sentences.

dilute	fuse	together	grind	into	purify	rinse	with
--------	------	----------	-------	------	--------	-------	------

- 50 pl test plasma samples were _____ 1:10 with sterile water.
- The remaining material was _____ powder for examination.
- Steam distillation could be used to _____ the nitrobenzene because of its high boiling point.
- The product was _____ distilled water four times using an Amicon filter.

5. When two deuterons _____ at low energy, the neutron is liberated with an energy of 2.45 MeV.

5. Why don't you talk me through it and make some notes as you go?

Exercise 6. Draw a diagram of a process you are working on or one you know well. Then role play a conversation in which you ask a colleague to check your diagram and your explanation of the process, using the phrases in Exercise 9 to help you.

Практическое занятие 12

Data

Exercise 1. Tom has checked Kimiko's second draft of the materials and methods section of her paper and underlined some changes he thinks she should make. Read the following extract and say how you could improve Kimiko's text.

The magic bullet process uses carbon nanotubes to send a drug to a specific target. Firstly, I functionalise the surface of the nanotube by coating it with chemical receptors. For example, for target a tumour which overexpresses folic acid, folate receptors are attached to its surface. Secondly, I encapsulated the drug molecules within the nanotube. Third, the tube is capped and the nanotubes are ingested. For example, the patient can swallow them or inhale them or have the capsules injected into them. Once inside the body, the nanotube locates to the target site. Fifth, the target cell internalises the nanotube by receptor- mediated endocytosis. After that, the cap is either removed or biodegraded and the drug molecules are released into the cell.

Exercise 2. We use the passive when the person or thing which performs the action is not the main point of interest in the process we are describing in the materials and methods section. Re-write sentences 1 – 5 using the passive voice so that they focus on the underlined word.

1. I rinsed the tissue surface with ice-cold isotonic saline solution.
2. After incubation at 37 °C for 60 minutes, the scientist diluted the suspension to 100 ml with water.
3. A mesh filters out particles as small as 10 um.
4. The experiment measures the audiometric thresholds at six frequencies from 250 Hz to 8 kHz.
5. I used densitometry to analyse the autoradiograph.

Exercise 3. Which of the sentences (1 – 5) in Exercise 2 describe a process in general? Which report a particular procedure carried out in one particular experiment or set of experiments?

Exercise 4. Read extracts below and answer the questions.

1. As this was a dosage of 0.166 milligrams of fluoride per kilogram body weight, the equivalent amount needed to achieve a similar peak in a 20-kilogram child would be 3.33 milligrams of fluoride.
2. The sensitivity of the assay was 0.2 picomoles.
3. The output impedance is about 0.02 ohms at the 5 volt end and 0.1 ohm at the 15 volt end of the range.
4. Six-amp three-core mains flex is used for the mains input which connects straight to the p.c.b.
5. Inserting a few atoms of potassium makes the compound a superconductor which, below a critical temperature of about 1.9 kelvins, conducts electricity with no resistance.
6. This shows that where two moles of hydrogen gas combine with one mole of oxygen gas to form two moles of liquid water, at a pressure of one atmosphere and a temperature of 298 kelvins, the enthalpy change is minus 571.6 kilojoules.
7. Isolated young mice squeak repeatedly at frequencies of 45 kilohertz to 88 kilohertz, until their mother comes and returns them to the nest.
8. In a similar form of these experiments, conventional, 50-nanosecond laser pulses were used.

1. What was the dosage of fluoride per kilogram of body weight?
2. What was the sensitivity of the assay?
3. What is the enthalpy change when 2 moles of water are formed at a pressure of one atmosphere and a temperature of 298 kelvin?
4. What is the lowest frequency at which young mice squeak (make a noise) when isolated from their mother?
5. What speed laser pulses were used?

Exercise 5 Match the values from the columns and complete the values (a – l) with the phrases (1-10).

a. $\frac{\quad}{4}$	1. A quarter
b. $5 \times 10 \quad$	2. Fifteen percent
c. $\quad 7$	3. One point three five six

d. ___ %	4. Two million, nine hundred and five thousand, seven hundred and forty
e. -___5	5. Five times ten to the nine
f. 17 5/___	6. Minus thirty-five
g. 1___6	7. Ten to the power of six
h. ___6	8. Ten thousand, eight hundred and ninety-three
i. 0___	9. Minus fifty-seven
j. 2, 9___, 7___	10. Seventeen and five eighths
k. 1___,893	11. Nought point nought nought three
l. 1 5, ___, 019	12. Five million, ninety thousand and nineteen

Exercise 6. Write in numbers.

- a three quarters
- b five eighths
- c four ninths
- d ten to the power of seven
- e ten to the power of minus nine

The International System of Units (SI) is the most common measurement system around the world, particularly in the fields of science, commerce and trade. It is a modern form of the metric system and as such is devised around the number 10. The system consists of 7 base units and a set of prefixes. There are a number of other common SI-derived units.

Exercise 7. Match the SI unit in column A to its abbreviation in column B and the quantity it measures in column C.

A UNIT	B ABBREVIATION	C QUANTITY
1 metre	K	temperature
2 kilogram	cd	electric current
3 second	mol	frequency
4 ampere	kg	thermodynamic temperature

5 kelvin	s	time
6 candela	m	amount of substance
7 mole	A	mass
8 hertz	Ω	length
9 joule	°C	energy
10 ohm	Hz	resistance
11 degree Celsius	J	luminous intensity

Exercise 8. Answer the following questions.

1. What units of measurement do you commonly use in your everyday life?
2. What units do you use in your work?
3. Which SI prefixes do you know? How do they change the quantity?

Практическое занятие 13 Graphs and Tables

Exercise 1. Answer the following questions.

1. Why are visuals used in scientific papers?
2. What visuals do people in your field commonly use to show data? Why?

Exercise 2. Match the beginnings and endings of the sentences about setting data in tables and charts.

1) Tables, graphs, etc. are necessary	a) be consistent with them.
2) Visual summaries allow	b) reduced in size in a
3) Deciding how to present data visually makes you	c) show trends; tables to show exact numbers,
4) Visuals need to be clear even when	d) the reader to check the data for themselves.
5) Graphs should be used to	e) think carefully about what your results mean.
6) Too much information in a visual	f) to avoid filling up the text with lists of numbers.
7) Use standard symbols and	g) will confuse the reader.

Exercise 3. Which advice in Exercise 4b do you think is the best? What other advice would you give to someone producing visuals to portray their data?

Exercise 4. Look at the visuals. Complete the labels (1 -16) using the words in the bold.

column, row

1 _____
2 _____

Tables

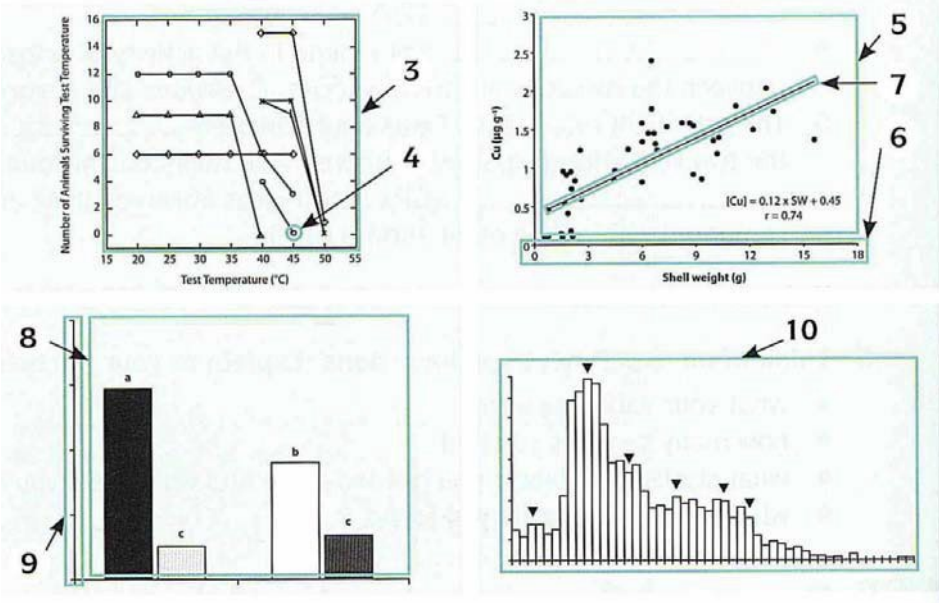
Site	Ria Formosa 37°03' N; 07°47' W	Rainbow 36°13' N, 33°54' W	Seawater
T (°C)	17.3 ^a	365 ^c	-
pH	8.28 ^a	2.8 ^c	7.8
H ₂ S (mm)	-	1.0 ^c	~0
CO ₂ (mm)	-	< 16 ^c	-
CH ₄ (mm)	-	2.2-2.5 ^c	~0
Cd (mm)	0.9 - 4.5 ^a	130 ^c	0.7
Cu (μm)	0.02 - 0.05 ^a	140 ^c	0.0033
Zn (μm)	0.02 - 0.03 ^a	160 ^c	0.028
Fe (μm)	8 - 52 ^b	24000 ^c	0.0045
Mn (μm)	2.5 - 6.3 ^b	2250 ^c	0.0013
Cl (mm)	-	750 ^c	546
Co (μm)	-	13 ^c	<2
Ag (nm)	-	47 ^c	0.023
Ni (μm)	-	3 ^c	<2
Si (mm)	-	6.9 ^c	<0.2

^aInstituto Hidrográfico (1998). ^bCaetano et al. (1997).
^cDouville et al. (2002).

Two-variable graphs

bar chart, histogram, line graph, line of best fit, point, scatter plot, x-axis, y-axis

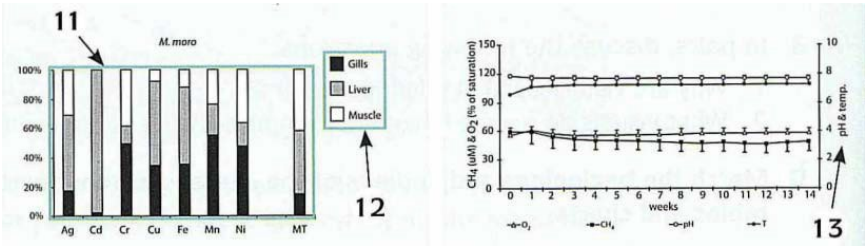
3 _____
4 _____
5 _____
6 _____
7 _____
8 _____
9 _____
10 _____



Three-variable graphs

key, label, stacked bar chart

11 _____
12 _____
13 _____

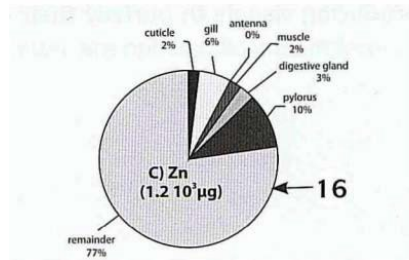
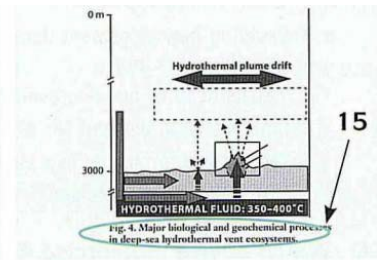
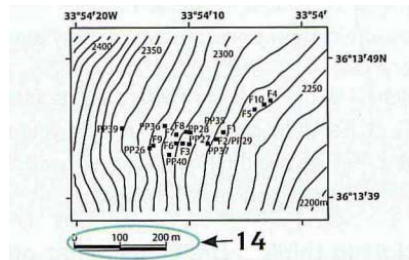


Other
caption, pie chart,
scale

14 _____

15 _____

16 _____



Exercise 5. The statements below describe which type of visual is best for representing different kinds of information. Complete them using the words in the box.

bar chart, diagram, histogram, line graph, map, pie chart, scatter plot, stacked bar chart, table

It is best to use a:

a _____ or _____ to show a comparison between items

b _____ to show a correlation

c _____ to describe a location

d _____ or a _____ to show proportions of a whole

e _____ to describe a structure

f _____ or a _____ to show trends

Практическое занятие 14 Visual Data

Every visual in a scientific paper should have a caption. The caption is a short text which tells the reader what the visual is showing.

Exercise 1. In pairs, discuss the following questions.

- 1 Should the caption appear above or below the visual it describes? Why?
- 2 What kind of information should the caption include?
- 3 What difficulties might there be when writing a caption in English?

Exercise 2. Read four captions (A-D) for four different figures. Then answer the questions which follow each one.

A

*Fig. 3. The relationship between the weight of shell and strontium concentration in the shell of *B. azoricus* from the Mid- Atlantic Ridge ($n = 51$).*

1. How is the information about sample size represented?
2. Can you see a similarity in the grammatical structure of caption A and the underlined part of caption D?

B

Table 1. Temperature, pH and concentration of chemical species in the end -member fluids of lagoon system Ria Formosa (South Portugal) and MAR vent field (Rainbow) compared with average sea water (adapted from Caetano et.al., 1997; Douville et. al., 2002).

3. Are the results in Table 1 from the author's research? How do you know?
4. Which two-word phrase explains the main purpose of the information in Table 1?

C

*Fig. 1. Thermal tolerances for the three symbiotic species under investigation (*Alviniconcha* sp. *Ifremeria nautilei* and *Bathymodiolus brevior*). For all experiments each temperature was held for 1 h, then the temperature was reduced to the starting temperature, the animals removed and mortality assessed. If alive, animals were returned to the aquarium and temperature was increased to the next point.*

5. What phrase has a similar meaning to being studied?
6. How are the names of the organisms presented? Why?
7. What information do(es):
 - a. the underlined part of the caption give us?

b. the other parts of the caption give us?

D

Fig. 2. Metallothionein concentrations (MT) in the edible tissues of hydrothermal (Rmicaris exoculata and Mirocaris fortunata) and coastal shrimp (Palaemon elegans and Palaemonetes varians). The data represent average $\pm$ standard deviation (SD), $n = 16$. Values followed by the same letter are not statistically different ($p > 0.05$).

8. What phrase has a similar meaning to the results show?

9. What phrase has a similar meaning to the same for the purposes of the analysis?

10. Can you see a difference in the grammatical structure of the underlined part and the rest of the caption?

Exercise 3. Captions often begin with a noun phrase which tells the reader what the visual shows (see captions A and B and the underlined parts of captions C and D above). Remove four words from each sentence (1-3) to make noun phrases.

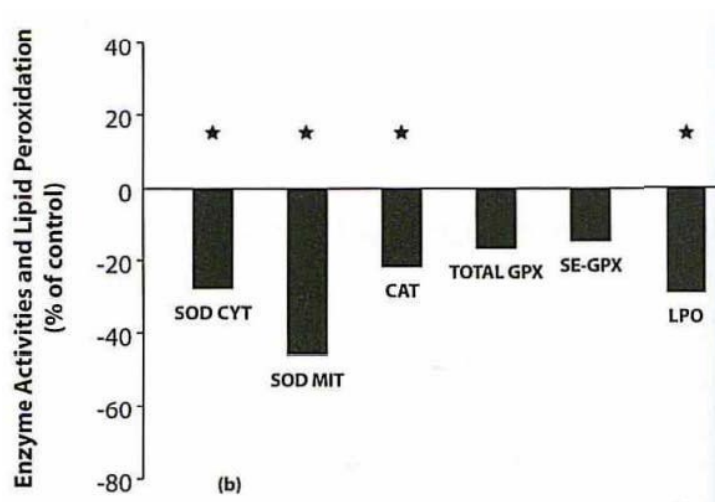
1 The figure depicts the length-frequency of four samples of mussels collected at three different sites of the Lucky Strike area.

2 The figure shows the copper concentration in the soft and exoskeleton tissues of four shrimp species.

3 The table presents a comparison of the physical and chemical characteristics of the hydrothermal fluids at Menez Gwen, Lucky Strike and Rainbow (adapted from Douville et al. 2002).

Exercise 4. Tiago's colleague, Nour, has written a caption for the following figure. Complete the caption below with the words in the box.

($p < 0.05$), B. azoricus, expressed, Fig. 1, represent, values



(1) _____ The activity of SOD cytosolic and mitochondrial, CAT, total and Se-dependent GPx, and lipid peroxidation in the gills of (2) _____ exposed to Cu 0.4 μ M for 24 h in IPOCAMP and (3) _____ as percentage of unexposed gills n=10. (4) _____ marked* (5) _____ a significant difference between contaminated and control antioxidant enzyme activity or lipid peroxidation levels (6) _____.

Exercise 5. Sketch a graph for some data you are working on at the moment or that you have worked on. Write a short caption which includes all the necessary information to help explain the graph.

Практическое занятие 15 Presentation

Exercise 1. Answer the following questions.

1. Have you ever presented your research to your team or study group? How did you prepare?
2. Have you ever given a paper to a large audience at a conference?
3. Why might presenting your research at an international conference be more difficult than presenting to your team or study group?

Exercise 2. Look at the online poster advertising a conference and answer the following questions.

1. Who might be interested in attending this conference?
2. If a researcher applies on 7 May, could he/she give a paper at this conference?
3. If you were interested in this conference, how could you find out more?

7th annual European Malaria Conference

July 31 – August 5

Trinity College Cambridge
United Kingdom
www.eimr.org/con7

Keynote speakers

- **Zoltán Szabó**
European Institute of Malaria Research (EIMR)
- **Mirembe Kabasomi**
Makerere University, Kampala, Uganda

Preliminary Programme
A list of other invited speakers and preliminary session topics is currently being developed by the Conference Chair and will be announced in due course. Please check back for updates.
For further information about us see www.eimr.org

ONLINE REGISTRATION ONLY
www.eimr.org/con7/registration
Registration is on a strictly first-come, first-served basis.

Application deadlines
4 April for abstract or poster presentation submissions
7 May for attendees

Registration fees
Academia – €450
Students – €350
Commercial/Industry – €650

Exercise 3. Complete the following words and phrases from the poster using the following words: basis, course, deadline, keynote, preliminary, presentation, registration (x2), strictly, submit, updates

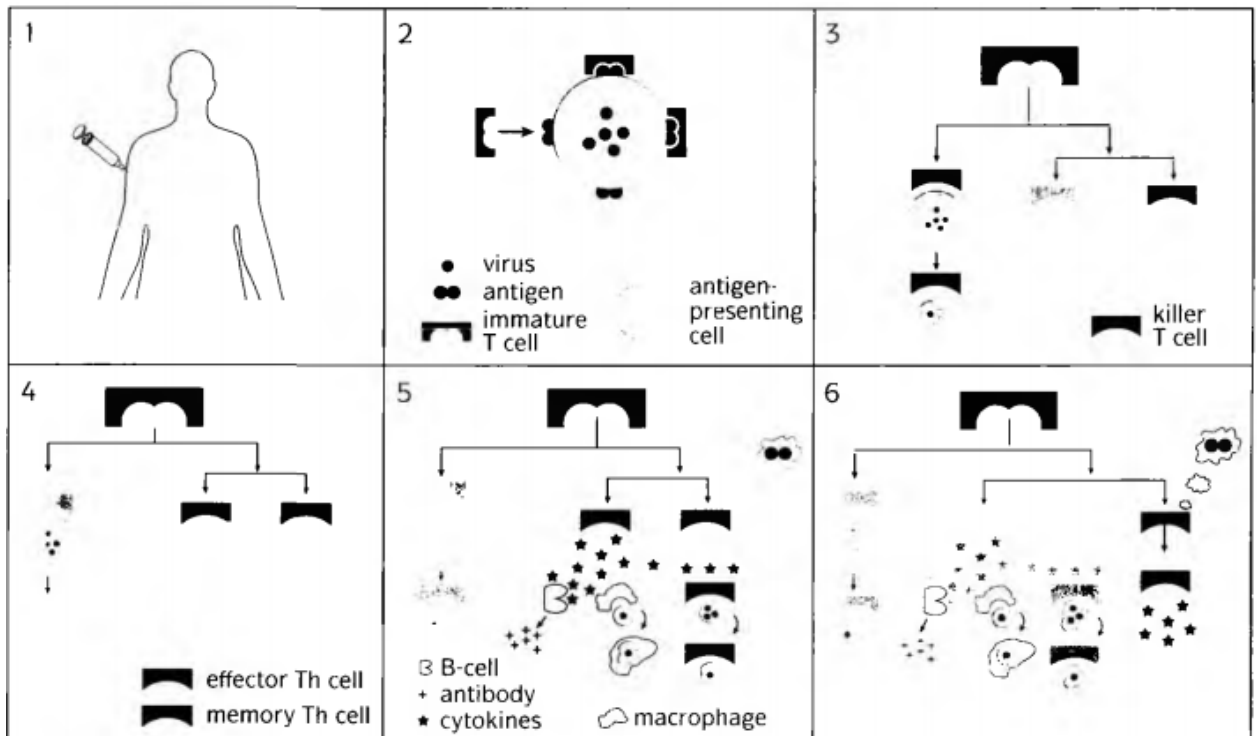
1 application_____	6 _____programme
2 on a _____first-come, first-served_____	7 _____fees
3 _____speakers	8 to _____an abstract
4 online_____on	9 in due _____
5 poster_____	10 check back for_____

Exercise 4. Match the words and phrases (1-10) in Exercise 3 to the definitions (a-j).

- research summarised in a visual display_____
- an early plan for the conference (some details may change later)_____
- look for further information_____

- d. money you must pay to attend the conference _____
- e. soon _____
- f. the Internet must be used to send personal information for the conference
- g. the last date that personal information can be sent to the conference organisers _____
- h. the most important presenters at the conference _____
- i. the organisers will only accept applications in the order they receive them
- j. to send a written summary of your research because you want to present a paper _____

Exercise 5. The diagram below shows how the adaptive immune system responds after vaccination with an attenuated (weakened) virus. In pairs, discuss what you think the diagram shows.



Exercise 6. Match the descriptions (a-f) to the correct parts of the diagram (1-6) in Exercise 2a. The first one has been done for you.

a. When foreign material like bacteria or viruses is introduced into the body, the immune system acts to protect the body against the material. Vaccination makes this process happen, so the body is more ready to act if the same material is met again.

b. Th cells cannot kill infected cells themselves. Instead, they activate and direct other immune cells. There are two groups of Th cells: effector Th cells and memory Th cells. _____

- c. Effector Th cells secrete cytokines. These are signalling molecules which stimulate other cells such as B cells, which produce antibodies; macrophages, which 'eat' infected cells; and Killer T cells, which attack infected cells. _____
- d. The memory Th cells on the other hand remember the original antigen which showed that foreign material had entered the body. If they meet this antigen again, they can immediately act like effector Th cells. In this way, vaccination can prepare the body to respond more quickly if there is reinfection with the same virus. _____
- e. The immature T cells then develop into either Helper T [Th] cells or Killer T cells. Killer T cells can directly attack cells which have been infected by foreign material. _____
- f. After vaccination, antigen-presenting cells (APC) take in the virus and then start the immune response by presenting antigens on their surface. Immature T cells bind to the antigen and recognise that it is foreign material.

Практическое занятие 16

Conference

Exercise 1. All the phrases in italics below are appropriate when giving a formal talk on your research. Read extracts 1-8. Then listen and underline the phrase Milan uses in each one.

- 1 Good afternoon, everybody. / Welcome, ladies and gentlemen.
- 2 To start, thank you / I'd like to start by thanking you all for coming to my talk today.
- 3 I'm Milan Poborski and at present / My name is Milan Poborski and I'm a PhD candidate at Northumbria University.
- 4 I'm going to talk today / My talk today is about my recent research investigating ...
- 5 I'll begin by explaining / To start with, I'll explain briefly how T-cell responses
- 6 After that, I'll I'll go on to describe the alternative method I have been investigating...
- 7 Finally, I will discuss I'll conclude by discussing why this method could be useful as a way ...
- 8 I plan to talk for about 40 minutes, leaving plenty of time for / I will talk for about 40 minutes and then I'll answer any questions at the end of my talk.

Exercise 2. Match each pair of phrases (1-8) to their correct function (a-f) below. Note that one of the functions may be expressed with three different pairs of phrases.

- a. Give instructions for asking questions. _____
- b. Greet the audience. _____
- c. Introduce the topic of the presentation. _____
- d. Introduce yourself. _____
- e. Outline the structure of the presentation. _____
- f. Thank the audience for coming. _____

Exercise 3. Read Milan's speech where he explains the organisation of his presentation to his audience. What do you notice about the way Milan is going to organise his talk?

Milan is an immunology PhD student researching T-cell responses to viral-based malaria vaccines. He is presenting his research at the 7th European Malaria Conference at Trinity College Cambridge.

Milan: Good afternoon, everybody.

I'd like to start by thanking you all for coming to my talk today. My name is Milan Poborski and I'm a PhD candidate at Northumbria University. I'm going to talk today about my recent research investigating the possibility of detecting the secretion of the cytokine MIG, or CXCL9, as a way to measure vaccine-induced T-cell responses. The research was done in the context of a phase 1 vaccine trial of a recombinant viral vector vaccine. To start with, I'll explain briefly how T-cell responses have generally been assessed and outline some of the reasons why this method is imperfect. After that, I'll describe the alternative method I have been investigating, and present the results I have obtained using this method. Finally, I will discuss why this method could be useful as a way to measure vaccine-induced T-cell

responses. I plan to talk for about 40 minutes, leaving plenty of time for questions at the end of my talk.

Exercise 3. Think of a piece of research you have done recently. Use the words and phrases in Exercise 3a to help you plan the introduction to a presentation about your research.

Exercise 4. Below are five extracts from the main part of Milan's presentation. Match the beginnings (1 -5) to the endings (a-e). Then read and check your answers.

1. A number of potential vaccine types have been developed and

a. counting IFN- γ secreting cells has been the preferred method to date.

2. <u>As I have already said,</u>	b. using flow cytometry to detect MIG secretion gives us a more accurate way of measuring immune responses
3. <u>As you can see from this image.</u>	c. <u>I will be returning to those shortly.</u>
4. <u>Let's begin by looking at</u> the size of the malaria problem.	d. Malaria kills over one million people every year in 109 countries.
5. <u>That's all I have to say about</u> the vaccine itself,	e. <u>so now I'd like to move on to</u> looking at judging the response of the immune system to the vaccine.

Exercise 5. The underlined phrases in Exercise 4a help speakers to organise their presentation clearly and guide listeners through the information. Write the correct underlined phrase to complete the advice below.

Use:

a _____ : to introduce a new part of the talk

b _____ : to conclude one part of the talk and then begin another

c _____ : to refer back to an earlier part of the talk

d _____ : to refer forward to a later part of the talk

e _____ : to refer to a visual aid

Exercise 5. In pairs, take turns to practise giving the presentation you have been preparing in this section. Give your partner feedback on their delivery and their use of the functional phrases for organising a presentation.