МИНИСТЕРСТВО ОБРАЗОВАНИЯ И НАУКИ РОССИЙСКОЙ ФЕДЕРАЦИИ

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Учебно-методическое пособие

"In the Biology Lab”

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Пояснительная записка

Учебно-методическое пособие “In the Biology Lab” предназначается для студентов 1-2 курсов биологических специальностей университетов. Его целью является формирование иноязычной коммуникативной компетенции в сфере будущей профессиональной деятельности студентов-биологов, что предполагает успешное овладение английским языком как средством их дальнейшего профессионального развития.

Предлагаемое учебно-методическое пособие ориентировано на создание условий для приобретения студентами опыта использования языковых знаний и умений в различных ситуациях общения, связанных с работой в лаборатории; развития творческого подхода к решению профессиональных задач; формирования умений самостоятельной работы; активного использования современных информационных технологий; коллективной познавательной деятельности; самоконтроля и оценки усвоения формируемых навыков и умений.

В пособии вводятся и закрепляются терминологические единицы, характерные для биологических специальностей, развиваются и совершенствуются коммуникативные навыки и стратегии автономного обучения.

Учебно-методическое пособие также содержит приложение, которое включает текстовую основу для прослушивания (script).

Типология используемых в пособии заданий разнообразна и представлена следующими рубриками:

Lead in – включает задания, имеющие своей целью выяснить фоновые знания, мнения, суждения студентов по обсуждаемой тематике.

Reading – предлагает задания на развитие навыков различных видов чтения, извлечение информации, понимание структуры, организации и

содержания текста.

Listening – представляет собой аудиозапись монолога профессиональной направленности и сопровождается заданиями, нацеленными на извлечение конкретной информации, развитие навыков конспектирования, переработки и передачи информации на английском языке.

Focus on language – акцентирует внимание на определенных грамматических аспектах, ключевых словах и словосочетаниях, включает задания на расширение общего и терминологического словарного запаса студентов.

Discuss – предлагает вопросы, позволяющие выявить отношение к прочитанному материалу и соотнести его с собственными знаниями, интересами и опытом.

Get real – предполагает использование умений поиска информации на интернет сайтах и в научно-популярных публикациях в условиях, максимально приближенных к ситуациям реальной учебной и профессиональной деятельности.

Speaking – предлагает задания, направленные на формирование умений диалогического, а также неподготовленного и подготовленного монологического высказывания.

Writing – предлагает различные задания, направленные на развитие умения фиксировать информацию на английском языке с использованием различных форм записи.

Summarizing – имеет своей целью формирование навыков аннотирования научно-популярных русскоязычных текстов на английском языке.

In the Realm of Science – включает дополнительный справочный

материал, отражающий специфику естественнонаучных специальностей (общепринятые сокращения, символы и т.д.).

В данное пособие включены также специальные рубрики:

Study help – содержит полезные советы по использованию стратегий изучения английского языка, а также рациональные приемы работы над лексическим и грамматическим материалом и т.д.

Progress Monitoring – представляет собой задание, стимулирующее рефлексивную самооценку процесса изучения английского языка и позволяющее студентам последовательно и адекватно отслеживать свои учебные достижения, успешность продвижения в овладении иностранным языком.

Progress Test – представляет собой тест рубежного контроля, включающий задания на проверку, осмысление и закрепление изученного материала.

Учебно-методическое пособие разработано с использованием аутентичных материалов, основными источниками которых являются британские и американские академические и научно-популярные издания, Интернет, проспекты ведущих университетов англоязычных стран, энциклопедии, словари. При подборе учебных материалов учитывались такие характеристики, как новизна информации, ее познавательность, соответствие учебным и профессиональным потребностям студентов.

Для осуществления самооценки предполагается использование балльно-рейтинговой системы контроля знаний. Пособие включает таблицу итогового контроля, который предполагает полное и правильное выполнение ключевых заданий и теста рубежного. Выполнение заданий рассчитывается в баллах и оценивается по следующей шкале: оценка «5»-100-85%, оценка «4» - 84-70%, оценка «3» - 69-50%, оценка «2» - 49% и менее.

In the Biology Lab

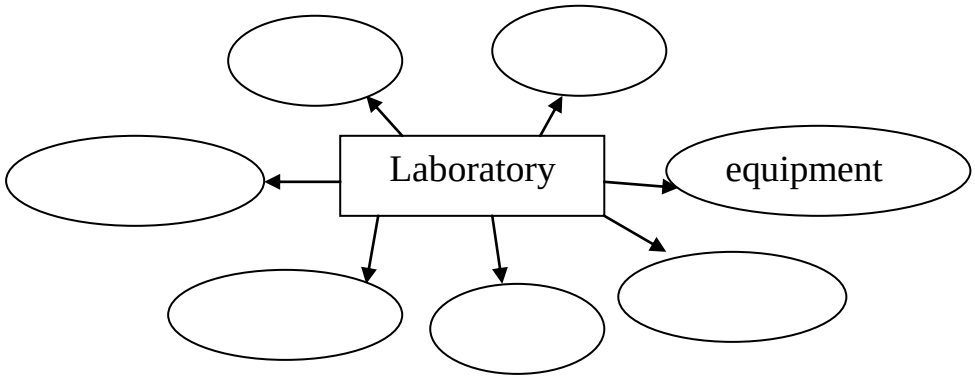
"I am sorry for the poor fellows that haven't got labs to work in."
1st Baron Rutherford of Nelson Ernest Rutherfor

Learning Objectives:

- ✓ to learn the terms connected with the work in biology laboratory
- ✓ to distinguish international words from 'false friends' words
- ✓ to revisit different functions of modal verbs
- ✓ to talk about the importance of laboratory classes
- ✓ to write a brief description of a tool/device
- ✓ to study the structure of a lab report
- ✓ to practise summarising skills

Lead in

1. Work in small groups. Brainstorm 7-10 words to complete the mind map for the word ‘laboratory’. Compare your results as a class.



2. Give a definition to the word *“laboratory”*. Compare your definitions as a class.

3. Answer the questions.

- Are there many laboratories at your faculty? What are they?
- Do you often work in the lab?
- Which courses in biology require doing lab work?
- What kind of laboratory equipment and tools do you use?
- What do you like/dislike most about laboratory classes?

Reading

1. Give the Russian equivalent to the words and phrases on the list. Compare your list with a partner’s. Use a dictionary if necessary.

- to get a benefit
- life processes
- profitable time
- to experience the thrill of discovering
- to draw conclusions

- to plan in advance
- a scientific technique
- hand-on approach/experience
- to prepare solvents and specimens
- a laboratory manual
- to correlate
- to think for yourself
- valuable products
- innumerable examples
- command

2. Read the text about the importance of laboratory work in biology.

THE LABORATORY

The laboratory work in biology can be an exciting or boring part of the course depending upon your attitude toward it. If you regard it as an obstacle to your getting through the course, probably you will not enjoy it and, get very little benefit from it. On the other hand, if you approach laboratory work with the thought that it is an opportunity to learn and with a desire to make the most out of it, then it is almost certain you will find the time you spend on it profitable, interesting and even fun.

There are several ways in which you may expect to benefit from the laboratory work. It helps you to understand and remember the material you have studied by applying it to real cases. This hands-on approach gives you both a real sense of biological concepts and some skill in the use of scientific instruments and techniques. Lab sessions also give you a chance to get hands-on experience of techniques you have learnt about in lectures.

It is true that you are not likely to be the discoverer of anything new in biology during your first-year course, as most (but not all) of the material in first-

year biology has been known for decades. Anyway, in the laboratory you are certain to experience the thrill of discovering for yourself main processes and mechanisms of life. With the equipment in front of you, you have the chance to try out your own ideas, to reason about the results, and to draw conclusions from them. In brief, you should regard the laboratory as a place for *intellectual* exploration.

Before you come to the laboratory, study the laboratory manual so that you will know what you are going to do and so that you can plan in advance how to use your time and equipment efficiently. As you do the experiment, make an effort to correlate the behavior of the apparatus and/or specimen investigated with the material discussed in lecture. Pay special attention to the lab safety rules, preparing solvents and specimens for your tests and experiments.

Keep your mind open to the possibilities of the experiment. Constantly ask yourself such questions as: Why do we do it this way? What would happen if we did it another way? What does this test show or prove?

A student must realize that laboratory work has applications outside the laboratory. For instance, laboratory tests on microbial processes showed that they can be managed effectively to enhance the degradation of harmful pollutants, produce valuable products from waste. The experiments on genome sequencing allowed producing better vaccines, diagnosing diseases more quickly and developing treatment against cancer and Aszgaimer's disease. There are, of course, innumerable other examples.

Writing laboratory reports is a significant part of your professional training. Speaking and writing are the most important tools of the experimentalist. Learn to handle them well. Your report should be well-organized, accurate, clear, concise, and easy to read. Since you will have to write reports anyway, while you're doing them try to improve your command of your native language. Do not try to impress

the reader with your own learning but write as if you were trying to explain the matter to an intelligent personal friend. Ability to express oneself clearly is extremely important for the professional man, even if a few people may tell you otherwise.

3. Mark the statements below **T** for 'true' or **F** for 'false'. Correct the false ones and expand on the true ones.
   a) The laboratory work in biology is always boring. ( )
   b) You are unlikely to discover something new during your lab work. ( )
   c) It is the lab work that gives you skills in the use of scientific instruments and techniques. ( )
   d) If you follow all the instructions during the lab work you will never be able to try out your own ideas. ( )
   e) Studying a laboratory manual is optional and not very helpful. ( )
   f) A professional man's scientific or technical laboratory reports should be brief and easy to understand. ( )

Discuss

Agree or disagree with the following statements. Give reasons. Make use of the functional language in the box below.

- You should regard a laboratory as a place for intellectual exploration.
- A student must realize that laboratory work has applications outside the laboratory.
- When doing lab work students' initiative is not encouraged.
- Writing laboratory reports is a significant part of your professional training.

Functional language: **Agreeing and disagreeing**	
Opinions	I think (that)… In my opinion… As for me…
Agreeing	Absolutely/ Right/ That's right/ I agree/ You're right
Disagreeing	I know, but… I take/see your point, but… I'm not sure… That's not true…

Focus on language

1. Translate these words into your native language. Use a dictionary to check your translation.

course manual accurate intelligent directivity example

International words vs. "False friends"

The words mostly of Greek and Latin origin that are used in many other languages especially in different areas of science and technology are called international words, e.g. *geometry, atom, mathematics, radio, integral, theorem, structure, etc.*
Knowledge of such words helps a lot in reading and translation.
However, there are the so called 'false friends". These are words that look like international but have different meanings in English and in Russian:

e.g. **a list** (*a series of names, items, figures, etc*), ***actual*** *(real, existing in fact, etc), etc.*

2. Sort out the words below into categories. Check their meaning in a dictionary to avoid mistakes.

International words	***"False Friends"***
lecture	*accurate*

lecture form accurate technology magazine fact
logic mixture repetition intelligent prospect problem
actual technique example original paragraph
lamp transparent focus list test category
activity priority sodium application fabric metal
guarantee type vibration physician data encyclopedia
menu clay system probe familiar unique

Listening

1. Listen to a lab instructor telling students about the laboratory work classes they will do during the semester. Answer the questions.
   a) How many lab work classes will students do during the semester?
   b) What are students required to do after performing experiments?
   c) Which day of the week should lab reports be turned in?
   d) In what case can students get a lower grade for their report?
   e) What two methods are students going to explore when doing the labs?
   f) Which method helps to learn data analysis skills and basic laboratory skills?
   g) How many times can students be excused for being absent from the lab class?

2. Choose the correct word from the box to fill in the gaps in the extract below. Listen to part 2 of the talk to check your guesses.

graphs	to evaluate	nature	actively	to share
experience	procedure	reports	to include	information

In all aspects of this class you will be investigating the 1) _____ of science. I believe that the best way to do this is through hands-on 2) _____ and laboratory activities. The lab is a place for you to 3) _____ engage in the process of "SCIENCE". Along with this goes the importance of writing a laboratory report. The lab report is not only the time for you 4) _____ the results discovered during experimentation, but it is also an opportunity for you to analyze your 5) _____, and 6) _____ any mistakes you may have made. Remember that science is imperfect - we learn new 7) _____ by trying out new things and continuing to ask questions outside the classroom. In this class, lab 8) _____ must always be word processed. Figures and 9) _____ should be generated on the computer and must 10) _____ a title and units.

3. Listen to the rest of the talk about the procedure of writing a lab report. As you listen, mark the components of the report in the order the speaker mentions them.

__ Materials	__ Introduction/Purpose	__ Conclusions
__ Discussion/Analysis	__ Methods	__ Results
__ Title	__ Figures and Graphs	

4. Listen again and take notes on the key elements of each section.

5. Sum up the information you have heard in your own words.

Discuss

Comment on the statements:

- When in doubt, leave it out!

- You can't explain something to someone else if you don't understand it yourself.

Focus on language

Modal verbs and their meaning

The main modal verbs are *must, can, could, may, might, should, ought to.*
Most of the meanings of all these modal verbs can be divided into two groups: obligation and freedom to act, prohibition or permission and ability.

*e.g. You **must** know how to solve this equation in order to pass your exam.*

degrees of certainty (modal verbs can be used to say that a situation is certain, probable, possible or impossible)

*e.g. You **must** be very clever if you know how to solve this equation.*

1. Identify the function of the modal verbs.

Certainty		**Probability**		**Impossibility**		**Permission**	
	Prohibition		**Possibility**		**Obligation**		**Ability**

a) I *can* speak English and German fluently.
b) He *must* be right, he's an expert in this area.
c) You *can't* work with the device without protection goggles.
d) She *could* observe this rare phenomenon, but I doubt it.
e) Now that your classes are over, you may look for a holiday job if you like.
f) We *ought to* take all the necessary measurements tomorrow.
g) Your hypothesis *couldn't* be proved without experiment.
h) I've done my test. *May* I go now?
i) You *must* remember to get a lab manual before the lab class.
j) If your report is not well-organized, clear and accurate you *may* get a lower grade or may be asked to rewrite it.

Speaking

1. How often do you work in the lab?
2. Have you ever had an accident there? What happened?
3. Which lab safety rules do you have to keep to? Why?

- follow all written and verbal instructions carefully
- read all procedures thoroughly before entering the laboratory
- any kind of clothes and shoes are acceptable. No lab coat is required during the experiment
- report any accident (spill, breakage, etc.) or injury (cut, burn, etc.) to the teacher immediately
- look into a container that is being heated
- use equipment with care for the purpose for which it is intended
- handle broken glass with bare hands
- use laboratory glassware as containers for food or beverages
- set up and use the equipment as directed by your teacher
- fool around in the lab
- interfere with the laboratory experiments of others
- use your mouth for pipetting substances
- place hot apparatus directly on the laboratory desk if there is no an insulated pad
- get the instructor's permission before you try something original
- biological waste should be placed in the appropriate waste container
- when working with a Bunsen Burner do not reach over the flame or pass items across a lab desk

4. Work in small groups. Discuss and sort out the things you **should do** and things you **shouldn't do** when working in the lab under the headings.

Do's	**Don'ts**
_____	_____
_____	_____

5. What else could you add to these lists? Hold a cross-groups discussion and compare your lists.

Reading

1. Label the pictures and give a definition to the devices.

1_____	2_____	3_____	4_____
			

a) Bunsen Burner b) microscope c) petri dish d) magnifying glass

- ✓ Do you use them at your biology lab classes?
- ✓ What other instruments and devices do you use in your university laboratories? How are they applied?

2. Look at the words in the box. What parts of speech are they? Check if you know their meaning. Use a dictionary if necessary.

Study help
You should be able to recognize the different parts of speech. Knowing the different parts of speech will help in improving your sentence structure, identifying unfamiliar words and improve your overall English level.

• improvements	• lens	• surface
• three dimensional	• reflection	• refractive
• magnification	• finest	• transmission
• electron-sensitive	• focal	• focused
• curvature	• enlarged	• microscopy
• electrons	• scanning	• preparation

3. Complete the text using the words in the box. Compare as a class.

A microscope is an instrument for viewing objects that are too small to be seen by the naked or unaided eye. The earliest simple microscope was merely a tube with a plate for the object at one end and, at the other, a 1) _____ which gave a 2) _____ less than ten diameters - ten times the actual size.

Many 3) _____ have been made since the Dutch biologist Anton van Leeuwenhoek of Holland taught himself new methods for grinding and polishing tiny lenses of great 4) _____ which gave magnifications up to 270 diameters, the 5) _____ known at that time. These led to discoveries in biology for which he is famous – discovery of bacteria, yeast* plants, the life in a drop of water, and the circulation of blood corpuscles* in capillaries.

Technical innovations improved microscopes resulting in the ultramicroscope that could study objects below the wavelength of light and the phase-contrast microscope that allowed to study of colorless and transparent biological materials. As a result 6) _____ became popular among scientists.

The most common type of microscope is the optical microscope. It is an optical instrument containing one or more lenses that produce an 7) _____ image of an object placed in the 8) _____ plane of the lens(es). Optical microscopes typically use 9) _____ glass to focus light into the eye or another light detector.

The invention of electron microscopes allowed scientists view individual cells, even living ones. This kind of microscope depends on 10) _____ rather than light to view an object. Beams of fast-moving electrons are 11) _____ on a cell sample and are absorbed or scattered by the cell's parts so as to form an image on an 12) _____ photographic plate. Electron microscopes make it possible to view objects as small as the diameter of an atom. There are many electron microscope designs: scanning electron microscope, transmission electron microscope, etc.

Scanning electron microscope (SEM) looks at the 13) _____ of bulk objects by 14) _____ the surface with a fine electron beam and measuring 15) _____ and produces a three dimensional image.

16) _____ electron microscope (TEM) passes electrons completely through the sample, analogous to basic optical microscopy. This requires careful

sample 17)_____, since electrons are scattered so strongly by most materials.

Scanning Tunneling Microscope (STM) gives 18)_____ images of objects down to the atomic level. It is the strongest microscope to date.

* the naked eye- невооружённый глаз
* yeast - дрожжи
*blood corpuscles - форменный элемент крови

Focus on language

1. Practice the pronunciation of the following terms. Check their meaning in a dictionary.

microscope	['maɪkrəskəʊp]
microscopy	[maɪ'krɔskəpi]
electron	[ɪ'lktrɔn]
electronic	[ɪˌlek'trɔnɪk]
surface	['sɜ:fɪs]
to measure	[tə 'meʒə]
image	['ɪmɪdʒ]
atom	['ætəm]
atomic	[ə'tɔmɪk]
sample	['sɑ:mpl]
specimen	['spesɪmən]

2. Match the words in **A** with their definitions in **B**.

A	**B**
example	*a) something such as an object, a fact or a situation that shows, explains or supports what you say*
sample	*b) a small amount or example of sth that can be looked at or tried to see what it is like*
specimen	*c) a small amount of sth that shows what the rest of it is like*

Discuss

- Can you name a tool or a device that was used to make a significant discovery in biology:
- Has it changed since that time?
- Is it still being used in scientific research or for educational purposes?

Get real

Search the Internet to find information about one of the modern devices or tools used in modern biology.

Writing

Write a brief description of this tool/device. Make sure to include the information about its parts and components, operation and application.

Speaking

Work as a team. Describe the tool or device from your writing task without naming it. Follow the guidelines below to help your fellow students to make the right guess about this tool/device.

- the purpose the tool/device is used for
- the way it operates/works
- its parts and components
- areas of its application

Example: This tool/device is extremely important for/when measuring…
It's very simple in operation… and it consists of…
It serves/is used to measure/to analyze/to obtain…

Summarizing

1. Read the text below to find the Russian equivalents to the following English word combinations.
    1) major laws of natural science
    2) to reveal/manifest the essence of various natural phenomena
    3) theoretical foundations/basis
    4) thorough knowledge of measuring instruments and their capabilities
    5) to make observations
    6) to make corrections
    7) to obtain/get more accurate results
    8) to carry out/to perform/to make an experiment
    9) additional preparation for a lab work outside the classroom
    10) to complete a laboratory work
    11) to learn the procedures of the experiment
    12) to interpret the results

Лабораторные занятия

Усвоить такие естественные науки, как биологию, химию и другие, в которых исследуются важнейшие законы естествознания, раскрывается сущность различных природных явлений, невозможно, изучая только теоретические основы этих наук. Нужно наблюдать многие явления экспериментально, а для этого необходимо владеть экспериментом, уметь проводить его. Такие навыки приобретаются на лабораторных занятиях, практикумах, требующих дополнительной внеаудиторной подготовки к ним. Лабораторные работы и практикумы по зоологии, ботанике, физико-химическим методам в биологии способствуют как практическому освоению

научно-теоретических основ изучаемых дисциплин, так и овладению техникой эксперимента.

При проведении опыта необходимо знать цель работы и правила пользования лабораторным оборудованием, отбирать необходимое оборудование для проведения эксперимента и выполнять измерения, вносить поправки для получения более точных результатов, интерпретировать результаты и делать выводы, соотносить изученный материал и полученные результаты.

Лабораторная работа считается выполненной только в том случае, если по ней принят отчет. Чем скорее составлен отчет о выполнении работы, тем меньше будет затрачено труда и времени на ее оформление.

Add new vocabulary to your vocabulary notebook. ✍

2. Read the text again and summarize it in English. Make use of the phrases in the box.

Phrases for summarizing	
The article discusses / considers…	The article informs / presents information about…
It is reported /said /stated that…	It is pointed out / claimed that…
Actually; In fact; In particular; For example; Also; Moreover; etc.	

In the Realm of Science

1. Read and remember the names of the instruments used in biology. Give their Russian equivalents.

Balance	an instrument for weighing things
Bunsen burner	an instrument used in scientific work to produce a hot gas flame
Burette	a device for measuring out amounts of a liquid
Colony counter	an instrument used to count colonies of bacteria or other microorganisms growing on an agar plate
Condenser	a device that cools gas in order to change it into a liquid
Forceps	an instrument used for picking up and holding small objects
Funnel	an instrument used for pouring liquids or powders into a small opening
Germinator	a device for growing seeds
Glovebox	a sealed container designed to manipulate objects while being in a different atmosphere from the object or in a vacuum chamber
Homogenizer	a piece of laboratory equipment used for the homogenization of various types of material, such as tissue, plant, food, soil, and many others
Laminar flow cabinet (laminar flow closet or tissue culture hood)	a carefully enclosed bench for preventing contamination of semiconductor wafers, biological samples, or any particle sensitive device
Magnifying glass	an instrument that makes things look bigger than they really are
Microbiological safety cabinet	a piece of laboratory equipment that provides a safe working area for people handling material potentially contaminated with pathogens
Operant conditioning chamber (the Skinner box)	a laboratory apparatus used in the experimental analysis of behavior to study animal behavior
Stand	a tool for holding a piece of glassware in place
Tongs	a tool used for picking up and holding things
Vortex mixer	a simple device used commonly in laboratories to mix small vials of liquid
Wire gauze	a tool used to spread heat of a burner flame

2. Read and remember the names of the glassware used in laboratories. Give their Russian equivalents.

Agar plate	a sterile petri dish used to culture microorganisms or small plants
Beaker	a container used for measuring liquids
Crucible	a pot used to heat a small amount of a solid substance at a very high temperature
Flask	a bottle for mixing, storing chemicals, measuring precise volumes
Glass funnel	a tool for funneling liquids from one container to another, or for filtering when equipped with filter paper
Gas syringe	a tool used to measure gaseous products from a reaction
Graduated cylinder	a container for measuring an amount of liquid.
Petri dish	a shallow glass or plastic cylindrical lidded dish that biologists use to culture cells
Picotiter plate	a flat plate with multiple wells used as small test tubes
Pipette (dropper)	an instrument used to transport a measured volume of liquid
Test tube	a container used as holder of small amount of solution, small samples or for containing small-scale reactions
Vacuum flask	a container like a bottle with double walls with a vacuum between them, used for keeping liquids hot or cold
Wash bottles	a container for dispensing small quantities of distilled water.

Progress Monitoring

You have worked on the vocabulary on the topic ***"Laboratory work"***. Tick (**V**) the points you are confident about and cross (**X**) the ones you need to revise.

	1. laboratory work / procedure / manual / equipment
	2. to get hands on experience
	3. to write / submit a laboratory report
	4. to perform instructions

5. scientific instruments and techniques
6. to have applications outside the laboratory
7. a place for intellectual exploration
8. to complete laboratory work
9. to draw conclusions
10. to evaluate mistakes
11. to state / reflect back on / support / reject a hypothesis
12. to learn data analysis skills
13. to do research / investigation
14. to obtain results
15. to obtain / summarize / generate the data
16. to take / to make accurate measurements
17. to organize and present results in a written report
18. to make / conduct an experiment
19. to follow lab safety rules
20. to explain the objectives / purpose of the investigation

Progress test

1. Cross out the ***"false friend"*** word.
   a) test, activity, instrument, logic
   b) system, vibration, application, guarantee
   c) intelligent, unique, experimental, metal
   d) type, technique, category, scheme
   e) to practice, to test, to experiment, to probe
   f) geographer, physician, engineer, programmer

2. Give English equivalents to the following Russian word combinations.

a) важнейшие законы естествознания

b) раскрывать сущность природных явлений

c) соотносить изученный материал и полученные данные/результаты

d) получать точные результаты

e) получить практический опыт

f) проводить наблюдения/эксперимент

g) объяснить цель исследования

h) составить письменный отчет

i) приобрести навыки анализа данных

j) придерживаться правил/следовать правилам

k) получить и обобщить данные эксперимента

l) подтвердить гипотезу

3. Write the word and the Russian equivalent next to each transcription.

a) [prə'si:ʤə]	*procedure*	*процедура*
b) [ɪn'strʌkʃn]		
c) [ˌ lə'bɔrətrɪ]		
d) ['ɪnstrəmənt]		
e) [haɪ'pɔθəsɪs]		
f) [tek'nɪk]		
g) ['mænjəl]		
h) ['seɪfti]		
i) ['ækjərət]		
j) ['deɪtə]		
k) [ɪk'sperɪmənt]		
l) ['ænəlaɪz]		

m) [ə'næləsıs]		
n) ['spesımən]		

4. Put a ***V*** if a sentence expresses **probability** and an ***X*** if not. What is their meaning?

	a) You may become famous if you prove the Fermat's theorem.
	b) I've done my test. May I go now?
	c) If you feel you are not coping you should ask your tutor to help you.
	d) It shouldn't be too difficult to do a Combined Science course.
	e) With the help of new software scientists can create a more accurate model of the process.
	f) Things might not be as bad as they seem.
	g) Do you think we might take a break now?
	h) Students must register at the tutorial office in the first week of term.
	i) Books may not be taken out of the library.
	j) You can't be saying this! It doesn't make any sense.

Credit Points

Tasks	**Listening**	**Speaking**	**Get real**	**Writing**	**Speaking**	**Summarizing**	**Progress test**	**Total**
Maximum score	10	10	10	10	10	10	40	100
Your score								
%								

Script

Part 1

Hello, everybody. My name is Keith Gower. For the next 11 weeks I'll be your lab instructor.

There will be about 11 laboratory experiments during the semester. You are required to write a laboratory report for each of the experiments and turn it in by the Monday following the lab. Lab reports must be submitted as *professional* documents. For this reason, points will be taken off for spelling and grammatical errors.

It's been proven that using the "Discover" method for labs is a more effective method for learning. So we will explore this by trying to do a few of the labs using the "Discover" method and others using the traditional "Verify" method. The "Verify" method is very useful for learning data analysis skills and basic laboratory skills.

I am eager to help you succeed in the course. If you need assistance, or if you just wish to discuss some aspect of the course, you should feel free to contact me. My office hours are posted on the office door.

There are some general rules you should keep to. In order to participate effectively, you should attend class faithfully and keep up with daily assignments. Only one excused absence from a laboratory can be made up in the semester. If you regularly cut class I reserve the right to lower your grade accordingly.

And finally, if you are 15 minutes late for class don't bother coming, borrow notes from another student, and be punctual the next time.

Part 2

Let's change direction now and focus on how to write a lab report. In all aspects of this class you will be investigating the nature of science. I believe that the best way to do this is through hands-on experience and laboratory activities. The lab is a place for you to actively engage in the process of "SCIENCE". Part of this process is writing a laboratory report. The lab report is not only the time for you to share the results discovered during experimentation, but it is also an opportunity for you to analyze your procedure and

evaluate any mistakes you may have made. Remember that science is imperfect - we learn new information by trying out new things and continuing to ask questions outside the classroom.

In this class, lab reports must always be completed with the word processor. Figures and graphs should be generated on the computer and must include a title and information about units. So, your lab reports are the most accurate and helpful record of what goes on in science class this year. OK? Good.

Part 3

Now let's take a look at the sections of a lab report. Every lab report must consist of eight sections. The first one is the ***Title***. The title should indicate what the laboratory report is about. It should be brief, start with a key word, and indicate the nature of the investigation. Then comes ***Introduction or Purpose***. It should be a paragraph long, explain the objectives, or purpose of the investigation. In one clear sentence, state your hypothesis. You may briefly summarize how the experiment was conducted, the findings and the conclusions of the experiment.

The third section is ***Materials***, which is a list of everything you needed to complete your experiment.

The section ***Methods*** is a detailed description of the steps you completed during the lab work. It is your procedure. Anyone should be able to read this section and duplicate your experiment. Write it as if you are writing instructions for someone else to complete the lab.

Results is the next part of the lab report, in which you organize and summarize the data generated by your experiment. A data table is used to represent the results of an experiment. You should discuss your data table in words.

In the ***Discussion or Analysis*** section you must discuss and interpret the results of your investigation. It is important to reflect back on your hypothesis in this section - can you support your hypothesis? Must you reject it? Also, use this section to discuss any mistakes you may have made while performing the experiment. If your data are

contradictory try to figure out where you went wrong. Finally, suggest how the investigation might have been improved.

Of course, there should be the ***Conclusions*** section and it has to be a good solid paragraph. It is the most important part of the report. For every report you must answer the following questions in the conclusion section:

- What do your data tell you about the experiment?
- What happened in the experiment?
- What did you learn from completing the experiment?

Finally, comes ***Figures & Graphs***. Graphs and figures must both be labeled with a descriptive title. Both axes on a graph must be labeled with specific units of measure. The independent variable should always be recorded on the X-axis. The dependent variable is recorded on the Y-axis.

All right. That's enough for the first class. I'll see you next time. Oh, one more thing, don't forget to make yourself familiar with the lab safety instructions beforehand. OK? That's it for today. Bye, for now.

List of materials used

1. How to Write a Lab Report. Retrieved from http://www.geocities.com/chris_castellana/labreport.htm
2. Biology Lab Safety Rules // About.com. Retrieved from http://biology.about.com/od/biologylabhowtos/p/labsafety.htm
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4. Oxford Advanced Learner's Dictionary, 7th edition, Oxford University Press, 2005
5. Longman Language Activator, New edition, Pearson Education Limited, 2002
6. English Russian Dictionary of "False Friends" by K.V.Krasnov, ISBN: 5-9875-034-5 80 p. Retrieved from http://www.falsefriends.ru/smalllist.htm