МІНІСТЕРСТВО ОСВІТИ І НАУКИ УКРАЇНИ
ДНІПРОВСЬКИЙ ДЕРЖАВНИЙ
АГРАРНО-ЕКОНОМІЧНИЙ УНІВЕРСИТЕТ

О.С. Резунова

АНГЛІЙСЬКА МОВА
ДЛЯ НАУКОВЦІВ

Дніпро – 2019

УДК 811.111

Резунова О. С. Англійська для науковців: Навчальний посібник. – Дніпро: ДДАЕУ, 2019. – 98 с.

Посібник містить автентичні англомовні тексти з методології наукового дослідження, а розроблений на їх основі комплекс завдань сприятиме формуванню вмінь іншомовного читання, аудіювання та мовлення в контексті науково-пошукової діяльності.

Матеріали призначено для здобувачів вищої освіти ступеня доктора філософії, магістрантів та науковців, які мають бажання представити результати своєї роботи англійської мовою.

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Навчальний посібник рекомендовано до видання вченою радою Дніпровського державного аграрно-економічного університету протокол № 8 від 30.05.19.

ПЕРЕДМОВА

Культура мовлення є невід'ємною складовою професійної та особистісної культури людини. Проте сучасному науковцю для успішної кар'єри необхідно володіти не лише культурою наукового мовлення державною мовою, але й англійською як мовою міжнародного спілкування. Маючи можливість вільно спілкуватися один з одним, ділитися результатами своїх досліджень та професійним досвідом, науковці матимуть змогу більш якісно вирішувати глобальні проблеми людства.

Навчальний посібник є частиною навчально-методичного комплексу для здобувачів вищої освіти ступеня доктора філософії, які вивчають англійську мову в закладах вищої освіти. Усі розділи містять багатий мовний матеріал і достатню кількість вправ, спрямованих на формування, розвиток і закріплення умінь і навичок як монологічного, так і діалогічного мовлення, полілогу, перекладу, роботи з документами.

Навчальний посібник складається з десяти розділів, які структуровані за такою тематикою: «The common European framework for languages(CEFR)» (Міжнародні вимоги до рівня володіння іноземною мовою», «Scientific communication» (Наукове спілкування), «Submission of written papers to scientific journals» (Процедура подачі статті до друку в науковому виданні), «Scientific methods» (Методи наукових досліджень), «Writing a scientific article» (Написання наукової статті), «Abstract writing» (Написання анотації до статті), «Writing an introduction section to scientific article» (Написання вступу до наукової статті), «Materials and methods section» (Написання розділу «Матеріали і методи»), «Writing results, discussion and conclusion sections» (Написання розділу «Результати, обговорення, висновки»), «Plagiarism in scientific writing» (Плагіат у науці)

Кожен розділ містить теоретичний матеріал, дотекстові та післятекстові вправи, матеріали для обговорення, практичні завдання. У посібнику запропоновано вправи для розвитку різних комунікативних компетентностей:

аудіювання, читання, усного та писемного мовлення. Певна частина завдань кожного розділу передбачає виконання самостійної роботи з подальшим обговоренням в аудиторії.

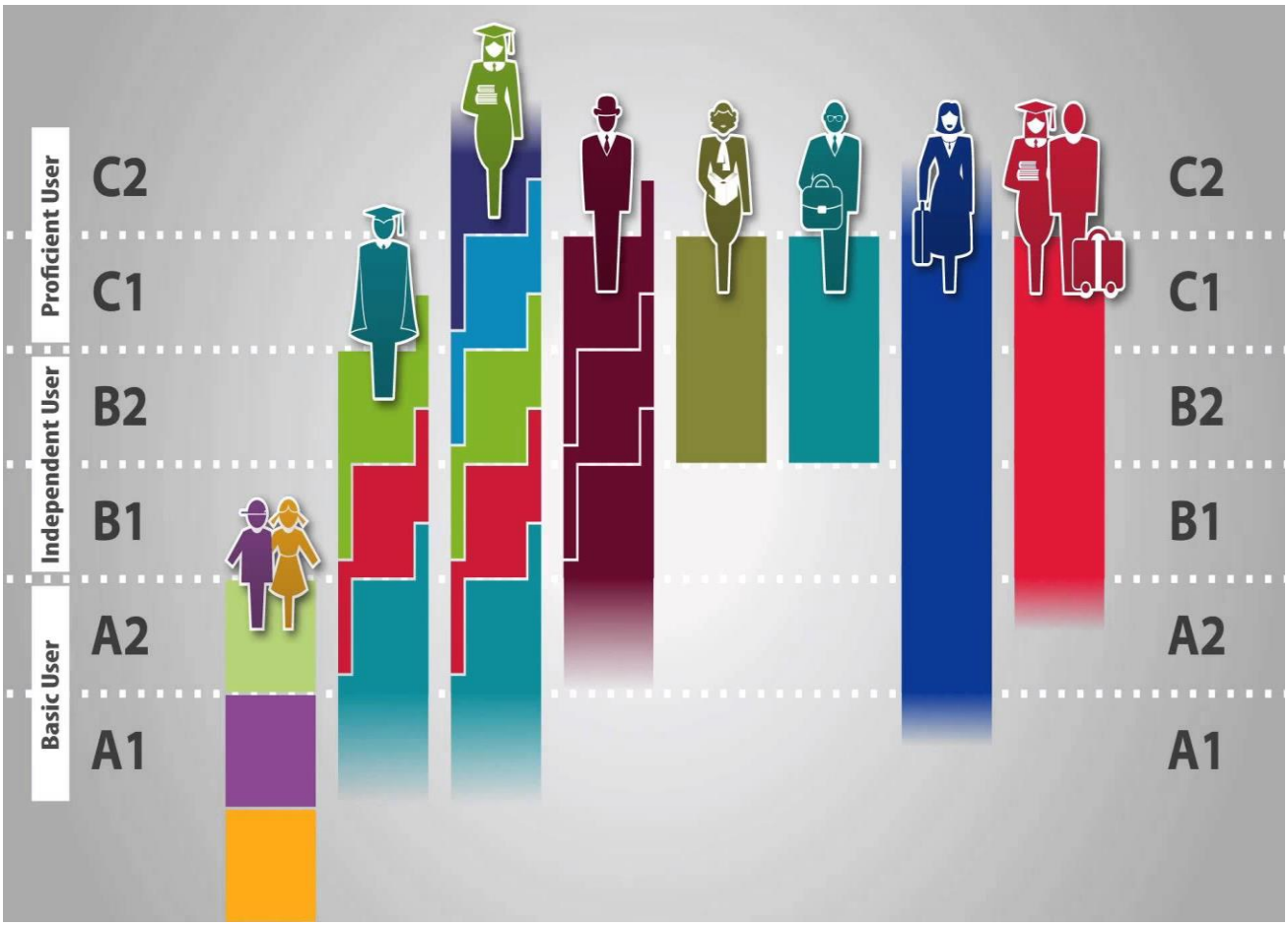
Посібник стане у пригоді тим, хто має бажання системно засвоїти сучасну лексику й граматику англійської мови науки, відпрацювати базові навички письма, перекладу та анотування, опанувати основи професійного спілкування англійською мовою з урахуванням її культурної специфіки.

ЗМІСТ

CONTENT

Unit 1

THE COMMON EUROPEAN FRAMEWORK OF REFERENCE FOR LANGUAGES (CEFR)



1. In pairs discuss the following questions.

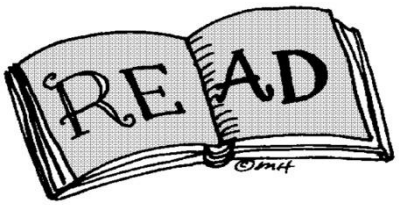
Do the modern scientists need to speak English? Why/ Why not?

How can you improve the level of English?

How can you test you English level?

Do you know any organizations which can certify your level of English?

2. Read the abstract from the website.



THE COMMON EUROPEAN FRAMEWORK OF REFERENCE FOR LANGUAGES (CEFR)

The Common European Framework of Reference for Languages: Learning, Teaching, Assessment, abbreviated in English as **CEFR** or **CEF** or **CEFRL** is a guideline used to describe achievements of learners of foreign languages across Europe and, increasingly, in other countries. It was put together by the Council of Europe as the main part of the project "Language Learning for European Citizenship" between 1989 and 1996. Its main aim is to provide a method of learning, teaching and assessing which applies to all languages in Europe. In November 2001, a European Union Council Resolution recommended using the CEFR to set up systems of validation of language ability. The six reference levels are becoming widely accepted as the European standard for grading an individual's language proficiency.

The CEFR is also intended to make it easier for educational institutions and employers to evaluate the language qualifications of candidates to education admission or employment.

The CEFR divides general competences in knowledge (descriptive knowledge), skills, and existential competence with particular communicative competences in linguistic competence, sociolinguistic competence, and pragmatic competence.

The CEFR has three principal dimensions: language activities, the domains in which the language activities occur, and the competences on which we draw when we engage in them.

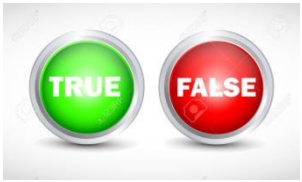
The CEFR distinguishes between four kinds of language activities: reception (listening and reading), production (spoken and written), interaction (spoken and written), and mediation (translating and interpreting).

General and particular communicative competences are developed by producing or receiving texts in various contexts under various conditions and constraints. These contexts correspond to various sectors of social life that the CEFR calls domains. Four broad domains are distinguished: educational, occupational, public, and personal.

A language user can develop various degrees of competence in each of these domains and to help describe them the CEFR has provided a set of six Common Reference Levels (A1, A2, B1, B2, C1, C2).

The Common European Framework divides learners into three broad divisions that can be divided into six levels; for each level, it describes what a learner is supposed to be able to do in reading, listening, speaking and writing. The following table gives an indication of these levels.

3. Mark the sentences T(true) or F(false).



1. The CEFR is a guideline used to describe achievements of learners of foreign languages across the world.
2. It is recommended to use the CEFR to set up systems of validation of language ability.
3. The three reference levels are becoming widely accepted as the European standard.
4. The CEFR helps employers to evaluate the language qualifications of candidates.
5. The CEFR divides general competences in knowledge and skills only.
6. According to the CEFR you don't need to have sociolinguistic competence.
7. Language activities is one of the principal dimensions of the CEFR :
8. The CEFR distinguishes between two kinds of language activities.
9. It is distinguished four broad domains by the CEFR.
10 The CEFR has provided a set of three Common Reference Levels.

4. Answer the following questions.

1. What is used as a guideline to describe achievements of foreign languages learners?
2. What is the main aim of CEFR?
3. What general competences do you need for foreign languages learning?

4. What communicative competences do you need to have?

5. What three principal dimensions does the CEFR have?

6. What kinds of language activities does the CEFR distinguish?

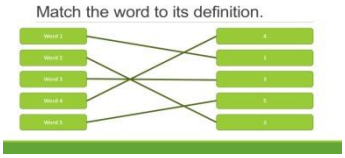
7. What four broad domains does the CEFR distinguish?

8. How many levels does the CEFR divide learners for?

9. What does each level describes?

10. Why PhD student should have B2 level?

5. Match the words in the left column with their definitions in the write column.



1. **ability**	*a) a system of communication consisting of sounds, words, and grammar*
2. **competence**	*b) to make marks that represent letters, words, or numbers on a surface, such as paper or a computer screen, using a pen, pencil, or keyboard*
3. **knowledge**	c) *to give attention to someone or something in order to hear him, her, or it*
4. **language**	*d) the physical or mental power or skill needed to do something*
5. **level**	*e) an ability to do an activity or job well, especially because you have practiced it*
6. listen	*f) understanding of information about a subject that you get by experience or study*
7. read	*g) to say words, to use the voice, or to have a conversation with someone*
8. skill	*h) the height of something; the amount or number of something*
9. speak	*i) to look at words or symbols and understand what they mean*
10. write	*j) the ability to do something well*

6. Complete the text with the word from the table

a) method	**b)** domains	**c)** dimensions
d) evaluate	**e)** individual's	**f)** communicative
g) levels	**h)** social	**i)** achievements **j)** activities

1. CEFR is a guideline used to describe _____of learners of foreign languages across Europe.

2. Its main aim is to provide a _____ of learning, teaching and assessing which applies to all languages in Europe.

3. The six reference levels are becoming widely accepted as the European standard for grading an _____ language proficiency.

4. The CEFR is intended to make it easier for employers to _____ the language qualifications of candidates.

5. The CEFR has three principal _____.

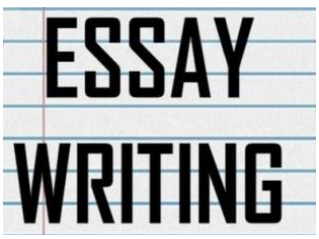
6. The CEFR distinguishes between four kinds of language _____.

7. General _____ competences are developed by receiving texts in various contexts.

8. These contexts correspond to various sectors of _____ life.

9. Four broad _____ are distinguished: educational, occupational, public, and personal.

10. The Common European Framework divides learners into six _____.



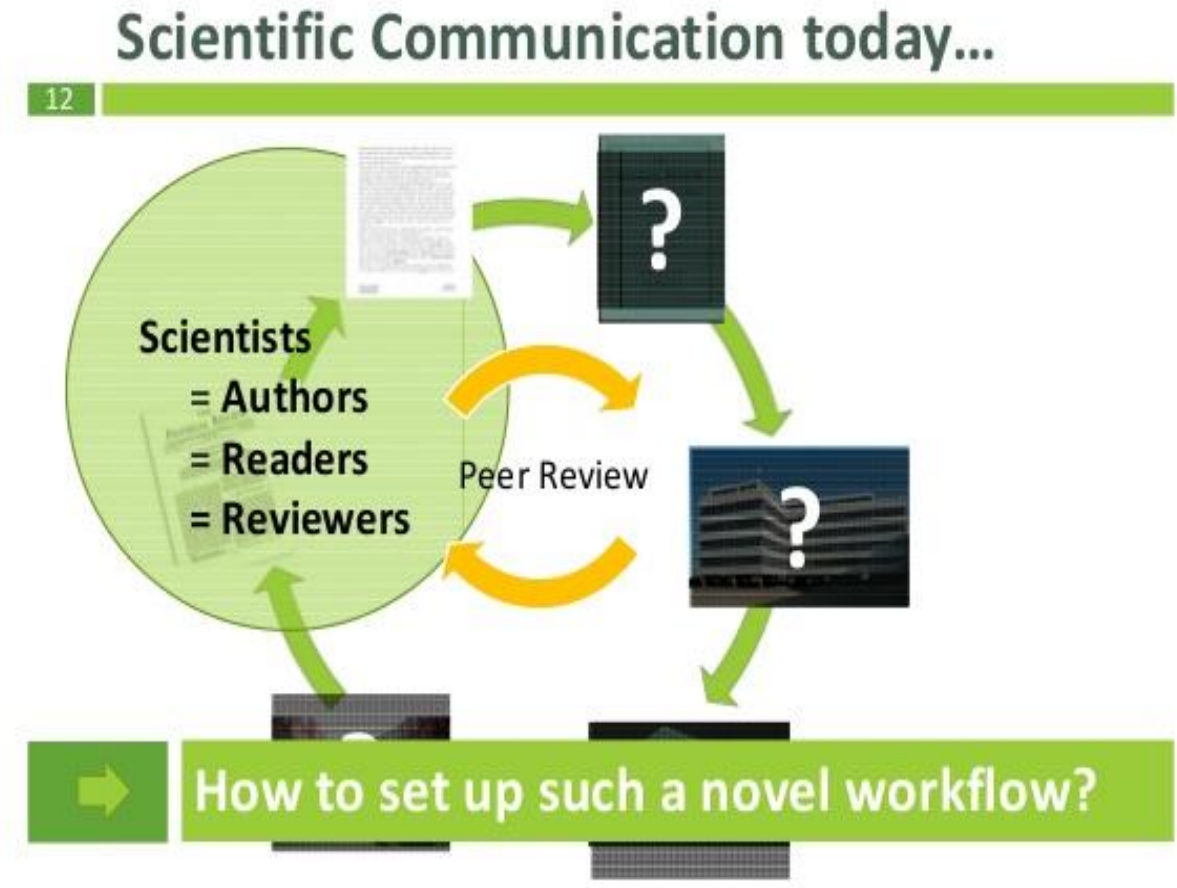
7. Write a short essay (100 words) on the topic "Importance of English for PhD students"

Unit 1

language	[ˈlæŋgwɪdʒ]	*a system of communication consisting of sounds, words, and grammar, or the system of communication used by people in a particular country or type of work*
learner	[ˈlɜːnər]	*a person who is still learning something*
method	[ˈmeθəd]	*a particular way of doing something*
teaching	[ˈtiːtʃɪŋ]	*the job of being a teacher*
validate	[ˈvælɪdeɪt]	*to make something officially acceptable or approved, especially after examining it:*
competence	[ˈkɒmpɪtəns]	*the ability to do something well*
ability	[əˈbɪləti]	*the physical or mental power or skill needed to do something*
level	[ˈlev.əl]	*the height of something; the amount or number of something*
knowledge	[ˈnɒlɪdʒ]	*understanding of information about a subject that you get by experience or study*
listen	[ˈlɪs.ən]	*to give attention to someone or something in order to hear him, her, or it*
skill	[skɪl]	*an ability to do an activity or job well, especially because you have practiced it*
read	[riːd]	*to look at words or symbols and understand what they mean*
speak	[spiːk]	*to say words, to use the voice, or to have a conversation with someone*
write	[raɪt]	*to make marks that represent letters, words, or numbers on a surface, such as paper or a computer screen, using a pen, pencil, or keyboard*
translate	[trænzˈleɪt]	*to change words into a different language*

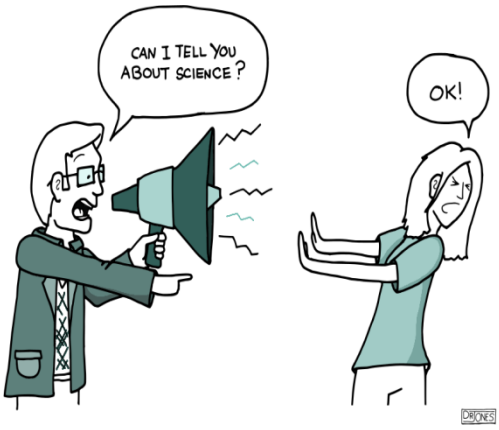
Unit 2

SCIENTIFIC COMMUNICATION



Unit 2

1. In pairs discuss the following questions.

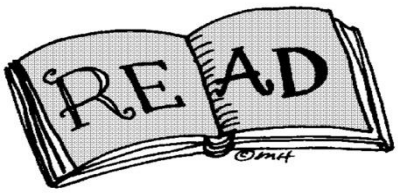


Is it important to communicate with other scientists? Why?

How can researchers commutate with other researchers?

Have you ever taken part in the scientific conference?

2. Read the text.



SCIENTIFIC COMMUNICATION

Communication is essential for scientific research. Science is a public knowledge and the aim of a scientist is to create, criticise and thus contribute to the progress of ideas. This aim is generally achieved through scientific publications and conferences. Articles in regular scientific journals carry from one research worker to another various discoveries, deductions, speculations and observations which are of common interest. Generally scientific papers are derivative and depend on previous research. References to other research are reflected in citations. A scientist relies on the citations to show the place of his investigation in the whole scientific structure.

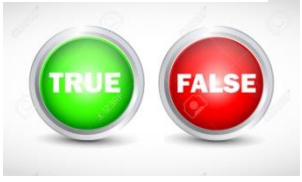
Another opportunity to share and exchange opinions and information is national and international conferences and symposia. They play an important role in coordinating scientific research. Usually scientific gatherings are sponsored by the central scientific organizations. An organizational committee is set up which decides where and when a conference should be held. Invitations are sent out to organizations interested in the topics discussed, together with the requests to submit applications and abstracts of papers. After receiving all necessary materials the committee publishes a program of the events.

At the conference the participants present their papers and listen to the reports read by others on the latest developments and the state of the art in their field. Papers on general topics are read before all the participants, those dealing with specific problems are presented at group meetings and plenary sessions held in subject areas under the chairmanship of distinguished scientists.

After the hearings the discussions follow. Scientists can discuss a given problem with other experts in their field, argue with their scientific opponents, find out the details of some experimental procedures. The materials of conferences and symposia are usually published to allow others to keep abreast of the achievements in science.

Another types of scientific meetings are a laboratory or work group seminar, colloquium or workshop. The members of the staff and guest speakers make reviews of the developments in their field and report the progress of their research. The speakers expect thorough discussion and criticism, advice and help of their colleagues. Such personal exchange of views is very essential for any scientist.

3. Mark the sentences T (true) or F (false).



1. Communication is very important for scientific research.

2. The aim of a scientist is only to criticize.

3. Articles inform researchers about various discoveries, deductions, speculations and observations.

4. References to other research aren't reflected in papers.

5. International conferences is a great opportunity for scientists to share and exchange opinions and information.

6. Participants decide where and when a conference should be held.

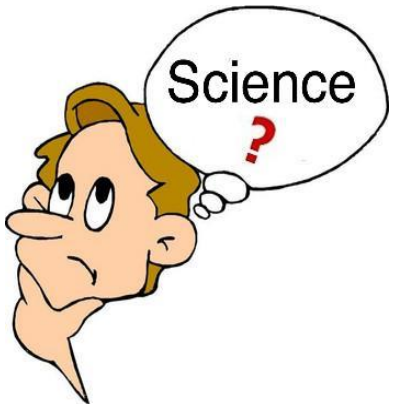
7. At the conference the scientists only listen to the reports read by others.

8. Papers dealing with specific problems are presented at plenary sessions.

9. The materials of conferences and symposia aren't usually published.

10 On the laboratory or work group seminar the speakers expect only criticize their colleagues.

4. Answer the following questions.



1. Is communication essential for scientific researchers?

2. What is the aim of a scientist?

3. What do the articles in regular scientific journals carry?

4. Where are references to other research reflected?

5. Why does a scientist rely on the citations?

6. Where can the scientists share and exchange opinions and information?

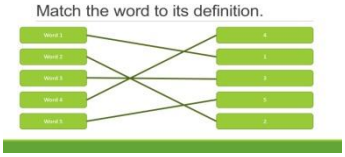
7. What is an organizational committee decide?

8. What do the participants do at the conference?

9. Why are the materials of conferences and symposia published?

10. What another types of scientific meeting are there?

5. Match the words in the left column with their definitions in the write column.



1. communication	*an occasion at which people who have great knowledge of a particular subject meet in order to discuss a matter of interest*
2. conference	*a small group of people chosen to represent a larger organization and either make decisions or collect information for it*
3. article	*to talk or write about a subject in detail, especially considering different ideas and opinions related to it*
4. journal	*a piece of writing on a particular subject written by an expert and usually published in a book or journal, or read aloud to other people*
5. paper	*a serious magazine or newspaper that is published regularly about a particular subject*
6.citation	*a person who takes part in or becomes involved in a particular activity*
7. symposium	*the act of communicating with people*
8. committee	*an event, sometimes lasting a few days, at which there is a group of talks on a particular subject*
9. participant	*a word or piece of writing taken from a written work*
10. discuss	*a piece of writing on a particular subject in a newspaper or magazine, or on the internet*

6. Complete the text with the word from the table

a) references **b) international** **c) experts** **d) colloquium**
e) publications **f) materials** **g) published**
h) communication **i) criticize** **j) journals**

1. _____ is essential for scientific research.

2. The aim of a scientist is to create, _____ and contribute to the progress of ideas.

3. This aim is generally achieved through scientific _____ and conferences.

4. Articles in regular scientific _____ carry from one research worker to another various discoveries.

5. _____ to other research are reflected in citations.

6. Another opportunity to share information is national and _____ symposia.

7. After receiving all necessary _____ the committee publishes a program of the events.

8. Scientists can discuss a given problem with other _____ in their field.

9. The materials of conferences and symposia are usually _____.

10. Another types of scientific meetings are a work group seminar, _____ or workshop.

7. Study the example of short conference paper. Pay special attention to the introduction and conclusion parts.

INNOVATIVE TECHNOLOGIES IN FOREING LANGUAGE STUDY

To achieve a high level of foreign language teaching it is important to know the newest teaching methods and special educational techniques. Today the most effective technologies are:

«Learning in collaboration». The aim of this technology is the acquisition of skills and abilities by every student at the level that answers his or her individual capabilities. This aim is achieved due to the basic idea of study in collaboration when a student works in a group where the general result depends on the contribution of each student.

«Project method». Such work requires from students independent transfer of knowledge, skills and abilities in the new context of activity. While executing creative tasks, every student has

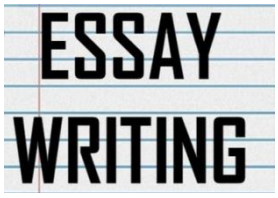
the opportunity to show his or her own initiative, fantasy, creativity, activity and independence in the decision of the problem.

«Games technology». A game always envisages certain tension of emotional and mental actions, ability to make decisions, gives an opportunity to the choice and self-expression. A game has a certain result and stimulates students to the achievement of aims and realization of ways of achievement of these aims.

«Student's portfolio». The portfolio of personality development shows a set of socially meaningful descriptions and qualities are investigated in the dynamics of development and personality building. Portfolio is aimed at cognition and improvement of the student's personality qualities creating for the sake of correction and planning of their own achievements.

«Interactive technology». These are forms of work with the computerized educational programs during the lessons of foreign language. Such forms include: study of vocabulary, working on the pronunciation, studying of dialogical-monological language, working on the grammatical phenomena, decision making.

It is possible to draw conclusion that the use of above-mentioned innovative technologies in foreign language study will assist the improvement of student's foreign communicative competence as well as the development of their intellectual flairs, personality and learning abilities.



8. Write a short report (200 words) of your research for scientific conference

Unit 2

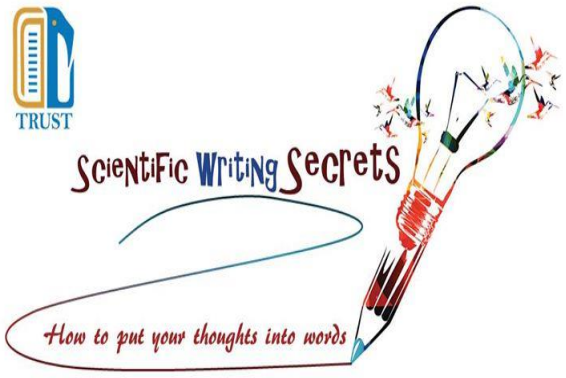
communication	[kəmjuːnɪˈkeɪʃən]	*the act of communicating with people*
research	[rɪˈsɜːtʃ]	*a detailed study of subject, especially in order to discover (new)information or reach a (new) understanding*
science	[ˈsaɪəns]	*the careful study of the structure and behaviour of the physical world, especially by watching, measuring, and doing experiments, and the development of theories to describe the results of these activities*
scientist	[ˈsaɪəntɪst]	*an expert who studies or works in one of the sciences*
conference	[ˈkɒnfərəns]	*an event, sometimes lasting a few days, at which there is a group of talks on a particular subject:*
article	[ˈɑːtɪkəl]	*a piece of writing on a particular subject in a newspaper or magazine, or on the internet*
journal	[ˈdʒɜːnəl]	*a serious magazine or newspaper that is published regularly about a particular subject*
paper	[ˈpeɪpər]	*a piece of writing on a particular subject written by an expert and usually published in a book or journal, or read aloud to other people:*
citation	[saɪˈteɪʃən]	*a word or piece of writing taken from a written work*
symposium	[sɪmˈpəʊziəm]	*an occasion at which people who have great knowledge of a particular subject meet in order to discuss a matter of interest*
committee	[kəˈmɪti]	*a small group of people chosen to represent a larger organization and either make decisions or collect information for it*
participant	[pɑːˈtɪsɪpənt]	*a person who takes part in or becomes involved in a particular activity*
discuss	[dɪˈskʌs]	*to talk or write about a subject in detail, especially considering different ideas and opinions related to it*
speaker	[ˈspiːkər]	*a person who gives a speech at a public event*
criticize	[ˈkrɪtɪsaɪz]	*to express disapproval of someone or something*

Unit 3

SUBMISSION OF WRITTEN PAPERS TO SCIENTIFIC JOURNALS

Unit 3

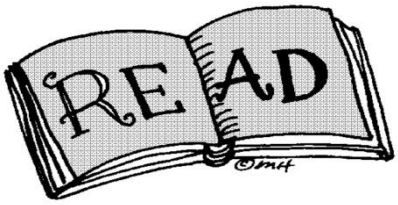
1. In pairs discuss the following questions.



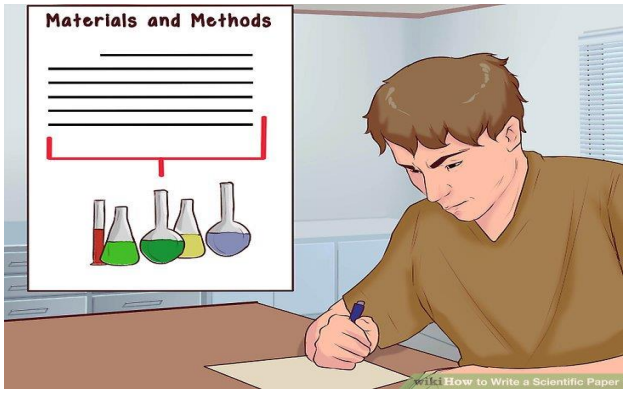
What written papers should scientists write? Why?

What skills should a scientist have to write scientific papers?

2. Read the text.



SUBMISSION OF WRITTEN PAPERS TO SCIENTIFIC JOURNALS



Successful production of a written product for submission to a peer-reviewed scientific journal requires substantial effort.

Conducting scientific research is only the beginning of the scholarship of discovery. In order for the results of research to be accessible to other professionals and have a potential effect on the greater scientific community, it must be written and published.

The task of writing a scientific paper and submitting it to a journal for publication is a time consuming and often hard task. Barriers to effective writing include:

- lack of experience,
- poor writing skills,

- unfamiliarity with the requirements of scholarly writing,
- fear of failure

However, the process of writing can be a helpful tool for promoting the process of scientific thinking, and effective writing skills allow professionals to participate in broader scientific conversations. Furthermore, peer review manuscript publication systems requiring these technical writing skills can be developed and improved with practice. Having an understanding of the process and structure used to produce a peer reviewed publication will surely be resulted in a successful publication.

Reviewers consider the following top criteria to be the most important in decisions about whether to accept manuscripts for publication:

1) the importance, timeliness, relevance, and prevalence of the problem addressed;

2) the quality of the writing style (i.e., that it is well-written, clear, straightforward, easy to follow, and logical);

3) the degree to which the literature review was thoughtful, focused, and up-to-date;

For these statements to be true there are also reasons that reviewers reject manuscripts. The following are the top reasons for rejecting papers:

1) inappropriate, incomplete, or insufficiently described statistics;

2) use of inappropriate, suboptimal, or insufficiently described instruments;

3) text that is poorly written or difficult to follow.

With these reasons for acceptance or rejection in mind, it is time to review basics and general writing tips to be used when performing manuscript preparation.

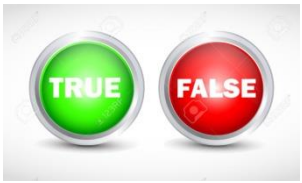
When you begin writing about your research, begin with a specific target journal in mind. Every scientific journal should have specific lists of manuscript categories that are preferred for their readership.

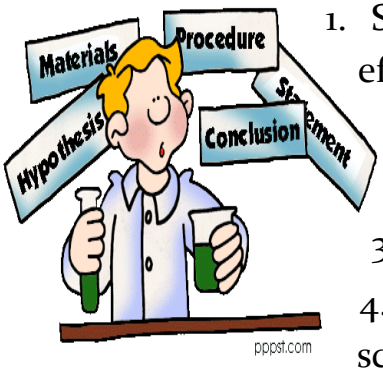
Write with a measure of formality, using scientific language and avoiding conjunctions, slang, and discipline or regionally specific terms.

Avoid first person language and instead write using third person language. Some journals do not ascribe to this requirement, and allow first person references.

Finally, use citations to your benefit. Cite frequently in order to avoid any plagiarism. When using direct quotations, provide not only the number of the citation, but the page where the quote was found. All citations should appear in text as a superscripted number followed by punctuation. It is the authors' responsibility to fully ensure all references are cited in completed form, in an accurate location. Please carefully follow the instructions for citations and check that all references in your reference list are cited in the paper and that all citations in the paper appear correctly in the reference list. Please go to a journal submission guidelines for full information on the format for citations.

3. Mark the sentences T(true) or F(false).





1. Successful production of scientific article requires large effort.
2. To be accessible to other professionals your research results must be published.
3. It is easy to submit your scientific paper to a journal.
4. You don't need to have a lot of experience to write a scientific paper.
5. It is important to know scientific language to write scientific reports.

6. You don't need to have effective writing skills to participate in scientific conversations.

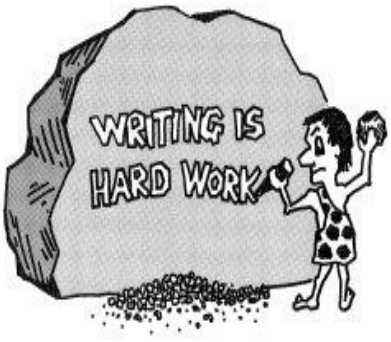
7. You should understand structure of journal publication.

8. You shouldn't pay much attention to literature review.

9. It is not important to know a specific journal when writing your article.

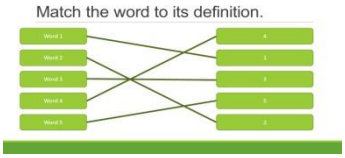
10. When using direct quotations you must provide the number and the page of the citation.

4. Answer the following questions.



1. What does successful production of a written product require?
2. Why must you write and publish your experiment results?
3. How lacks of experience influence the quality of your papers?
4. How poor writing habits influence the quality of your papers?
5. What other barriers of effective writing are there?
6. What are the criteria to the literature review?
7. What are the requirements to the quality of the writing style?
8. What language should you use instead of first person language?
9. Why do you need to cite frequently?
10. Do all journals have the same lists of manuscript categories?

5. Match the words in the left column with their definitions in the write column.



1. criterion	*the use another person's ideas or work and pretend that it is your own*
2. discovery	*a standard by which you judge, decide about, or deal with something*
3. experience	*the process of finding information, a place, or an object, especially for the first time*

4. manuscript	*something that you must do, or something you need*
5. plagiarism	*a writer or a book, article, etc. that is mentioned in a piece of writing, showing you where particular information was found*
6. publish	*knowledge or skill from doing, seeing, or feeling things*
7. quotation	*the act of giving a formal document for a decision to be made by others*
8. reference	*to make information available to people, especially in a book, magazine, or newspaper*
9. requirement	*the original copy of a book or article before it is printed*
10. submission	*a phrase or short piece of writing taken from a longer work of literature, poetry*

6. Complete the text with the word from the table

a) scientific b) thinking c) plagiarism d) first
e) language f) rejecting g) specific
h) publication i) written j) submitting

1. Successful production of a _____ product requires substantial effort.

2. Conducting _____ research is only the beginning of the scholarship of discovery.

3. _____ a scientific paper to a journal for publication is a hard task.

4. The process of writing can be a helpful tool for promoting the process of scientific _____.

5. Having an understanding of the process used to produce a paper will be resulted in a successful _____.

6. There are some reasons for _____ manuscripts.

7. When you begin writing about your research, begin with a _____ journal in mind.

8. Write with a measure of formality, using scientific _____.

9. Avoid _____ person language and instead write using third person language.

10. Cite frequently in order to avoid any _____.

7. Analyze the letter to the editor of the scientific journal to accept your article for publication and add it with your own information in the specified phrases:

1) (Date)_____

Editorial Department of ***2) (Journal name)***

3) (University name)

4) (Address)

Dear Editor of ***5) (Journal name),***

I am submitting a manuscript for consideration of publication in ***6 (Journal name).*** *The manuscript is entitled* ***" 7) (The title of your article) ".***

It has not been published elsewhere and that it has not been submitted simultaneously for publication elsewhere.

8) (Explanation the importance of your research (3-4 sentences)

Thank you very much for your consideration.

Yours Sincerely,

9) (Your name and title)

10) (Your university name)

11) (Your address)

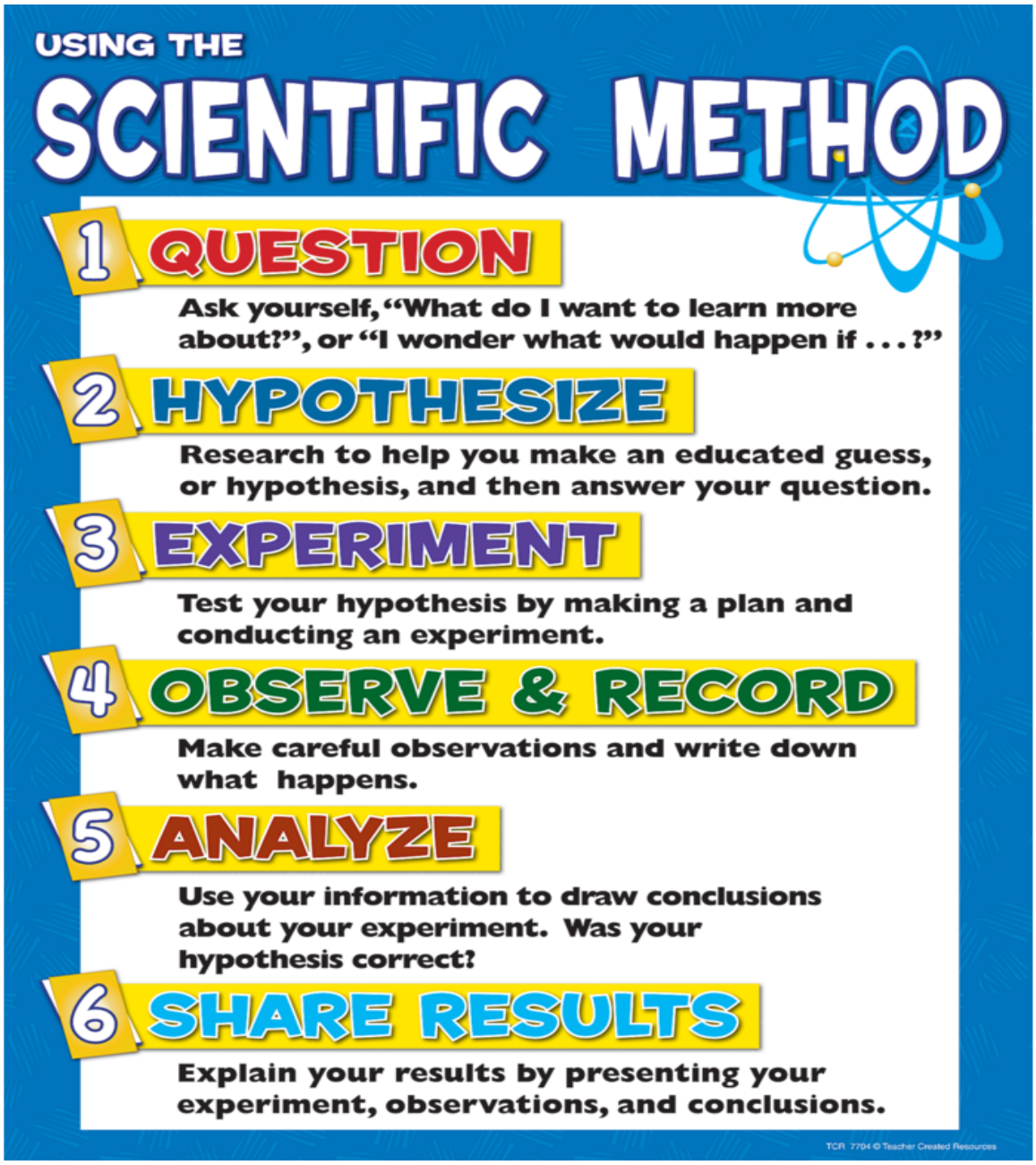
12) (Your contact details)

Unit 3

acceptance	[əkˈseptəns]	*general agreement that something is satisfactory or right, or that someone should be included in a group*
conduct	[kənˈdʌkt]	*to organize and perform a particular activity*
criterion (criteria)	[kraɪˈtɪəri.ən] [kraɪˈtɪəri.ə]	*a standard by which you judge, decide about, or deal with something*
discovery	[dɪˈskʌvəri]	*the process of finding information, a place, or an object, especially for the first time*
experience	[ɪkˈspɪə.ri.əns]	*knowledge or skill from doing, seeing, or feeling things*
manuscript	[ˈmænjəskrɪpt]	*the original copy of a book or article before it is printed*
plagiarism	[ˈpleɪdʒərɪzəm]	*the use another person's ideas or work and pretend that it is your own*
professional	[prəˈfeʃənəl]	*having the type of job that is respected because it involves a high level of education and training*
publish	[ˈpʌblɪʃ]	*to make information available to people, especially in a book, magazine, or newspaper*
quotation	[kwəʊˈteɪʃən]	*a phrase or short piece of writing taken from a longer work of literature, poetry*
reference	[ˈrefərəns]	*a writer or a book, article, etc. that is mentioned in a piece of writing, showing you where particular information was found*
rejection	[rɪˈdʒekʃən]	*the act of refusing to accept*
requirement	[rɪˈkwaɪə.mənt]	*something that you must do, or something you need*
result	[rɪˈzʌlt]	*the information you get from something such as a scientific experiment or medical test*
submission	[səbˈmɪʃən]	*the act of giving a formal document for a decision to be made by others*

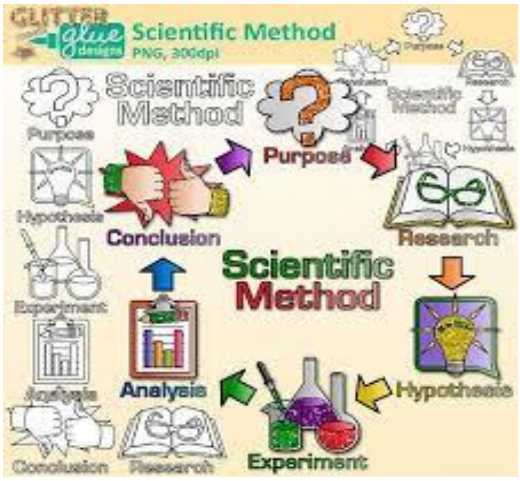
Unit 4

SCIENTIFIC METHODS



Unit 4

1. In pairs discuss the following questions.

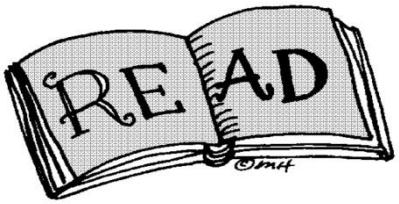


Have you ever done any predictions about natural phenomena?

What method did you use?

Was your hypothesis right?

2. Read the text.



SCIENTIFIC METHODS

As man's knowledge of natural phenomena increased, there came a time when he recognized that his growing knowledge of nature was the result of his application of a particular method of investigation. It seemed clear that a special sequence of procedures was applied to establish the working principles of science. The emphasis passed from the knowledge itself to the method by which that knowledge was obtained. This rather well defined procedure has come to be known as the **Scientific Method**.

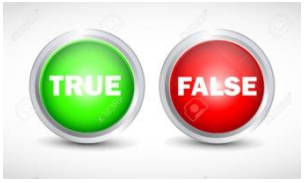
The steps in the procedure may be listed as follows:

First — the recognition of the problem. Second — collection of relevant facts or data. Third — analysis of data and proposing a solution (i. e. a hypothesis). Fourth — performance of test experiments. Fifth — acceptance, modification or abandonment of the hypothesis in the light of the results of the test experiments.

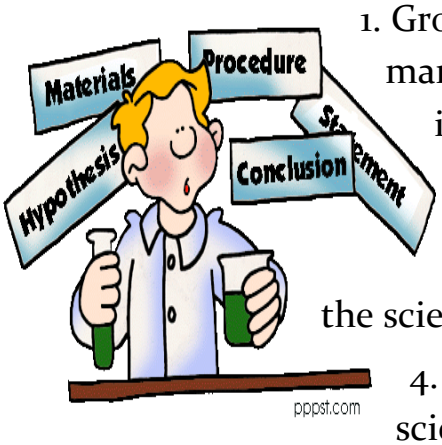
If the hypothesis is discarded as the result of the test experiments, a new one will be set up and steps three, four and five will be repeated until an explanation is found which accounts satisfactorily for all the known experimental facts. As the amount of substantiating data becomes larger and larger, the hypothesis advances to the rank of a theory and eventually may be accepted as true.

It should be noted that in general one adopts first the most obvious hypothesis, that is, the one that at the moment seems to offer the simplest explanation of the observed facts. This hypothesis may or may not prove to be satisfactory in the light of later evidence.

In coming to a conclusion about any hypothesis, the true scientists are swayed only by experimental evidence. They are not, for instance, governed principally by what they or anyone else want the result to be, by the reputation of the man who advanced the hypothesis, by what the majority of people think about it, or by any similar emotional reaction to the problem. They will constantly check their conclusions and hypotheses by experiment and be guided solely by the results thus obtained.



3. Mark the sentences T (true) or F (false).



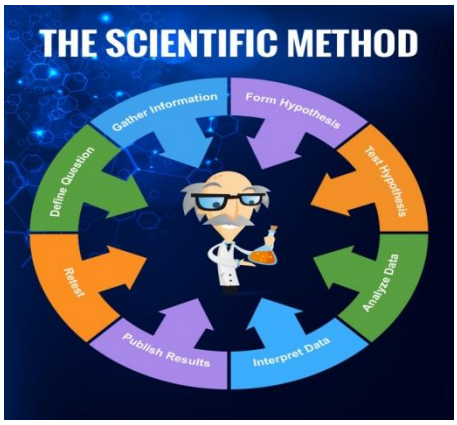
1. Growing knowledge of nature was the result of man's application of a particular method of investigation.
2. Knowledge can be obtained by different methods.
3. The procedure of obtaining new knowledge is called the scientific method.
4. Recognition of the problem is the second step of scientific method.
5. It isn't important to collect all relevant facts or data for doing experiments.
6. Analysis of data and proposing a solution is a third step of scientific method.
7. Abandonment of the hypothesis can be the the final step.

8. Steps three, four and five can be done only once.

9. The hypothesis is always true.

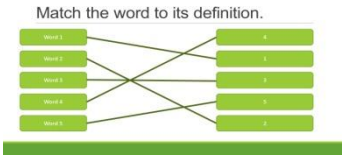
10. The true scientists always check their hypotheses by experiment.

4. Answer the following questions.



1. Why do people use scientific method?
2. What is the first step of the procedure?
3. What should scientists do during the second step?
4. What should scientists do during the third step?
5. Is the scientific hypothesis always true?
6. What should the scientist do if his hypothesis is false?
7. What hypothesis do the scientists usually adopt?
8. What are the true scientists swayed by?
9. Should the scientist be governed only by other scientists opinion?
10. How will true scientists check their conclusions and hypotheses?

5. Match the words in the left column with their definitions in the write column.



1. result	***a)*** *the act of analyzing something*
2. observe	***b)*** *the answer to a problem*
3. investigate	***c)*** *one or more reasons for believing that something is or is not true*
4. collect	***d)*** *a test done in order to learn something or to discover if something works or is true*
5. analysis	***e)*** *to examine something carefully, esp. to discover the truth about it*

6. solution	*f) to bring information together from different places*
7. hypothesis	*g) to watch carefully the way something happens especially in order to learn more about it*
8. theory	***h)** an idea or explanation for something that is based on known facts but has not yet been proved*
9. evidence	***i)** something suggested as a reasonable explanation for facts, esp. a systematic or scientific explanation*
10. experiment	***j)** something that happens or exists because of something else*

6. Complete the text with the word from the table

a) collection	**b) check**	**c) knowledge** **d) hypothesis**
e) prove	**f) scientists**	**g) obvious**
h)acceptance	**i) recognition**	**j) solution**

1. A man recognized that his growing _____ of nature was the result of his application of a particular method of investigation.

2. The first step in the procedure is the _____ of the problem.

3. The second step in the procedure is _____ of relevant facts or data.

4. Analysis of data and proposing a _____ is the fourth step.

5. _____, modification or abandonment of the hypothesis is the final step.

6. If the _____ is discarded, a new one will be set up.

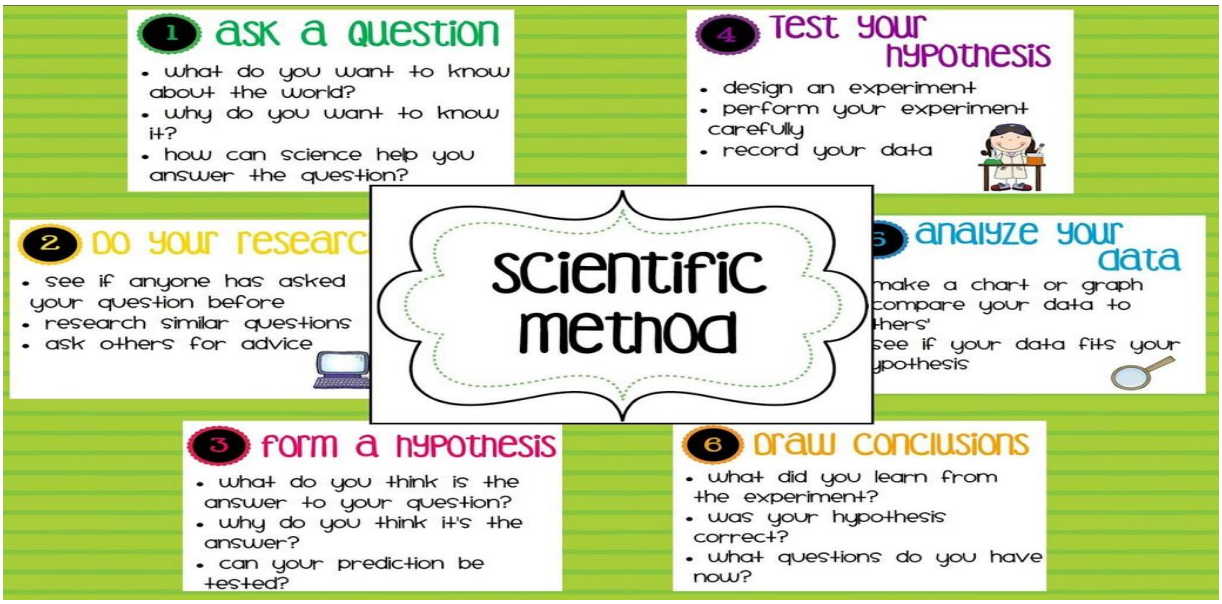
7. It should be noted that in general one adopts first the most _____ hypothesis.

8. This hypothesis may or may not _____ to be satisfactory in the light of later evidence.

9. The true _____ are swayed only by experimental evidence.

10. They will constantly _____ their conclusions and hypotheses by experiment.

7. Use the following figure to answer the questions of the first, second and the third steps about your own research work.



8. Watch the video (https://www.khanacademy.org/science/biology/intro-to-biology/science-of-biology/v/the-scientific-method) and mark the sentences T (true) or F (false).

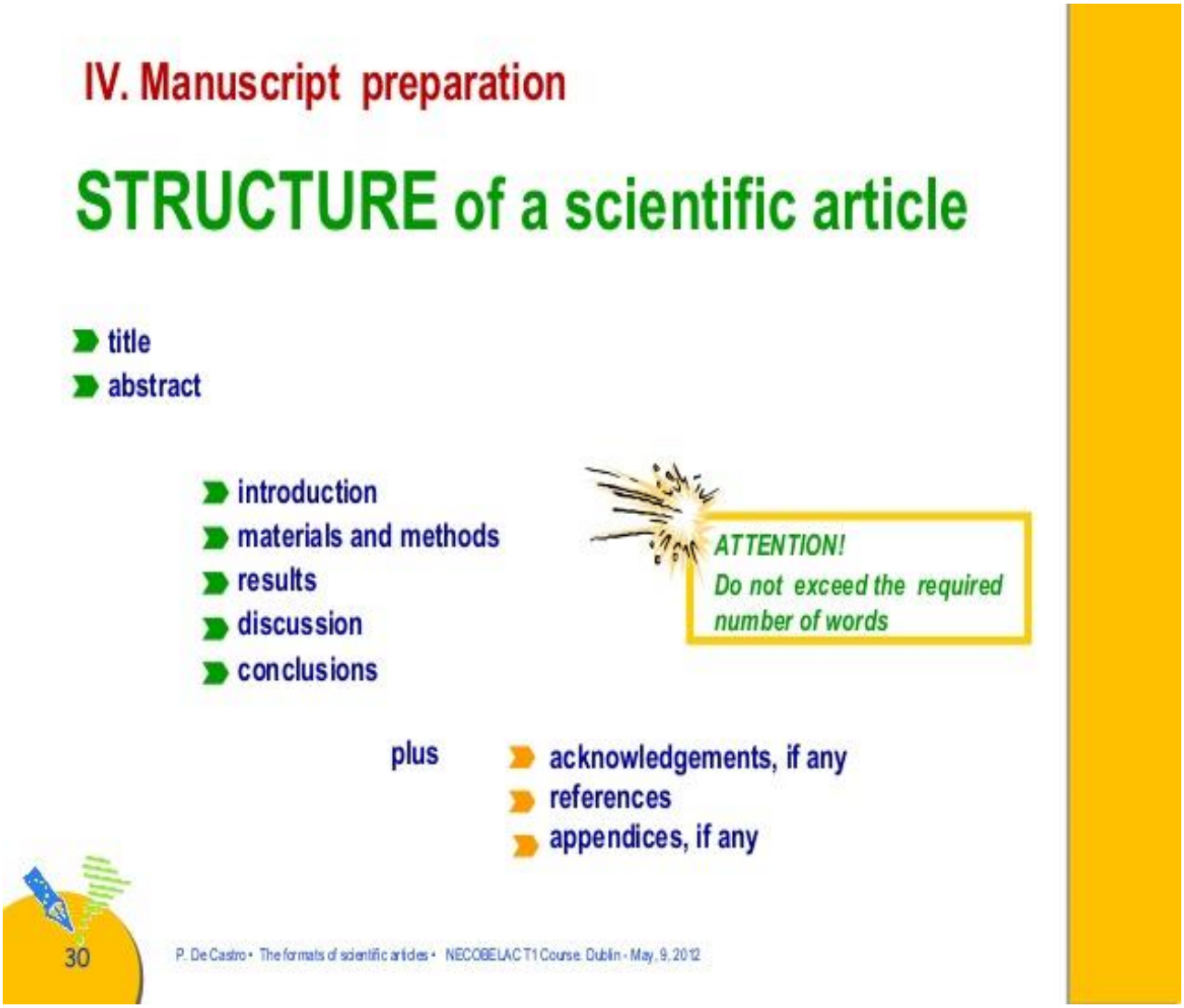
1. Scientist observes pond and ocean water.
2. The pond water needs higher temperature to freeze.
3. Scientist's hypothesis is that the salt water freezes slower because of its salinity.
4. Author thinks that the third step of scientific method is testable explanation.
5. You mustn't use unproved hypothesis.
6. He used 2 bottles for doing an experiment.
7. He used water from the ocean for doing an experiment.
8. The scientist thinks that you don't need to do more experiments to prove your hypothesis.
9. The father of the scientific method was from Europe.
10. The scientist must believe other scientists without evidence.

Unit 4

result	[rɪˈzʌlt]	*something that happens or exists because of something else*
observe	[əbˈzɜːv]	*to watch carefully the way something happens especially in order to lear n more about it*
investigate	[ɪnˈves·tɪgeɪt]	*to examine something carefully, esp. to discover the truth about it*
procedure	[prəˈsiːdʒə]	*a set of actions that is the official or accepted way of doing something*
recognition	[ˌrekəgˈnɪʃən]	*agreement that something is true*
collect	[kəˈlekt]	*to bring information together from different places*
analysis	[əˈnæləsɪs]	*the act of analysing something*
solution	[səˈluːʃən]	*the answer to a problem*
hypothesis	[haɪˈpɒθəsɪs]	*an idea or explanation for something that is based on known facts but has not yet been proved*
record	[rɪˈkɔːd]	*to keep information for the future, by writing it down or storing it on a computer*
acceptance	[əkˈseptəns]	*general agreement that something is right*
theory	[ˈθɪəri]	*something suggested as a reasonable explanation for facts, esp. a systematic or scientific explanation*
evidence	[ˈevɪdəns]	*one or more reasons for believing that something is or is not true*
conclusion	[kənˈkluːʒən]	*the opinion you have after considering all the information about something*
experiment	[ɪkˈsperɪmənt]	*a test done in order to learn something or to discover if something works or is true*

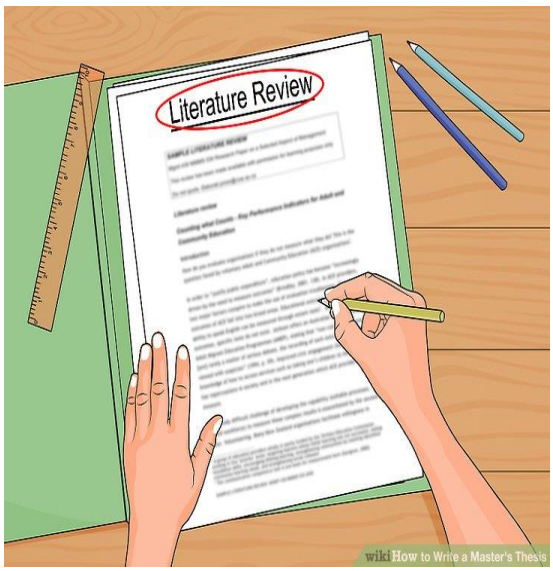
Unit 5

WRITING A SCIENTIFIC ARTICLE



Unit 5

1. In pairs discuss the following questions.

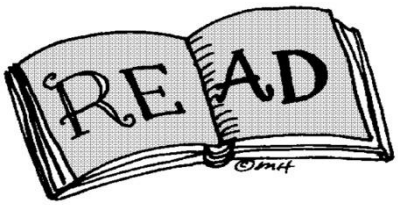


What sections did your bachelor's or master's paper include?

How many pages did it have?

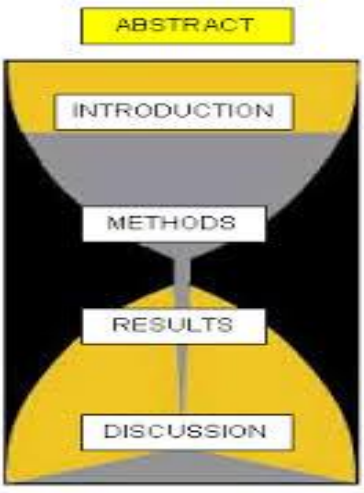
Were there any technical requirements about fonts, spacing, headings, tables, figures?

2. Read the text.



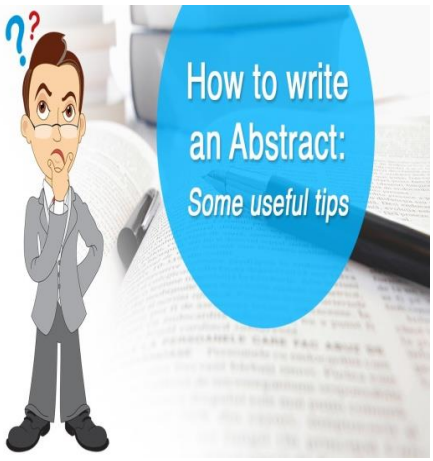
WRITING A SCIENTIFIC REPORT

A scientific report should conform to the following general arrangement:



- **TITLE**
- **ABSTRACT**
- **INTRODUCTION**
- **MATERIALS AND METHODS**
- **RESULTS**
- **DISCUSSION**
- **REFERENCES**

The **TITLE** should clearly and briefly indicate what the report is about. The title is never a complete sentence, and articles (a, an, the) are usually omitted. Use maximal capitalization.



The **ABSTRACT** should be no longer than 200 words and should include the main objectives, findings (i.e. results) and the conclusions. A reader should be able to grasp the full scope and significance of the work reported without having to read the entire report.

The **INTRODUCTION** discusses the theoretical background to the investigation and places the present work in context. Relevant references should be cited and the reader's attention moved from the general to the specific. The aims of the present study should be clearly stated at the end of the introduction.

The **MATERIALS AND METHODS** section should include all information required for an exact repetition of the work performed. Since you are reporting on work already done, it is customary to use the PAST PASSIVE tense. Compare the following:

PAST ACTIVE: We performed the experiment over three weeks.

PAST PASSIVE: The experiment was performed over three weeks.

The methods should not be written as instructions to the reader, nor presented as an itemized list. Subheadings may be appropriate. For work conducted in class, a reference to the appropriate practical manual may be enough in this section.

The **RESULTS** consist of data and some comment which draws attention to the most significant aspects of the results. The data are usually presented in tables or graphs, but do not present the data in more than one format. Any comment on the results should be quantitative, not just qualitative; that is, any comments should be backed up with data.

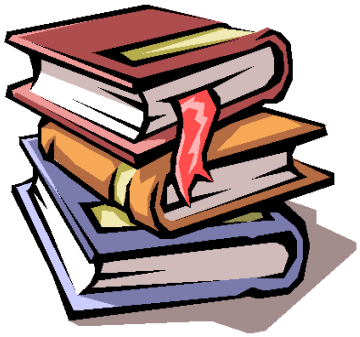
NO The treatment was more effective.

YES The treatment was 50% more effective.

The **DISCUSSION** is usually the most important section of the report. It should include comments on the results, especially any unexpected results. The results should be compared to the standard value and be explained or justified in light of the original aims.

A scientific report moves from general to particular to general. It begins in the Introduction with the theory related to the experiment, moves on to the work carried out in the Methods and Results sections and returns to general ideas in the Discussion by discussing whether the results obtained are, or are not, consistent with the theory. In many cases, it may be appropriate in the discussion to comment on the suitability of the method used in the experiment.

THE CONCLUSIONS are usually included in the discussion, but they can be separated. If they are separate, the discussion should be summarized and a comment made on the success, or failure of the experiment.



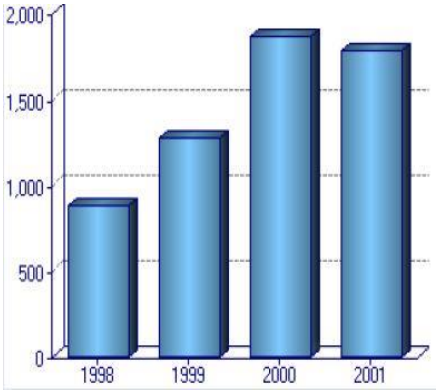
The **REFERENCES** should be an accurate listing of all the sources referred to. Entries must conform to the conventions of the referencing system used. Begin the

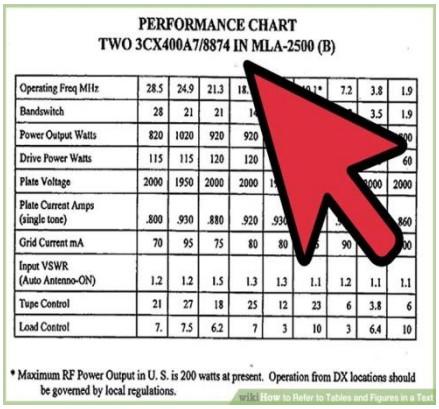
list of references on a new page with the heading 'References' centred.

FONTS AND SPACING

Fonts should be a minimum of 12 point and double line spacing is recommended, unless otherwise specified. Titles and headings may be in a **bold font**. A blank line is usually used between paragraphs, but no indentation is used.

TABLES AND FIGURES





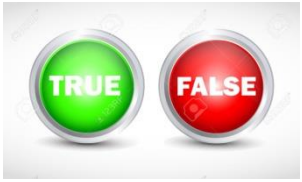
PERFORMANCE CHART
TWO 3CX400A7/8874 IN MLA-2500 (B)

Operating Freq MHz	28.5	24.9	21.3	18.		7.2	3.8	1.9
Bandswitch	28	21	21	1			3.5	1.9
Power Output Watts	820	1020	920	920				
Drive Power Watts	115	115	120	120				60
Plate Voltage	2000	1950	2000	2000	1		2000	2000
Plate Current Amps (single tone)	.800	.930	.880	.920	.93			.860
Grid Current mA	70	95	75	80	80		90	
Input VSWR (Auto Antenno-ON)	1.2	1.2	1.5	1.3	1.3	1.1	1.2	1.1	1.1
Tupe Control	21	27	18	25	12	23	6	3.8	6
Load Control	7.	7.5	6.2	7	3	10	3	6.4	10

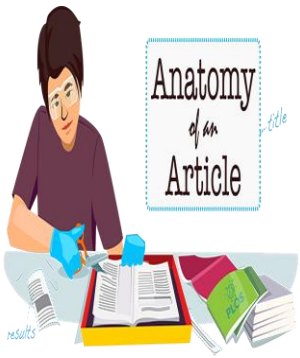
* Maximum RF Power Output in U. S. is 200 watts at present. Operation from DX locations should be governed by local regulations.

wiki How to Refer to Tables and Figures in a Text

Tables, graphics and photos are placed immediately after where they are first referred to in the text. The reader should also be referred (by number) to the diagrams at the appropriate time in the text and the most important features pointed out to them. Tables, and graphics and photos (called figures), should be sequentially numbered. In large reports with many chapters, they are sequentially numbered in each chapter (i.e. for Chapter 2 you will begin from Table 2.1, Figure 2.1). Titles for tables are centred above the table. Titles for figures are centred below the graphic. The source of the table or figure should also be included. The source is usually in a smaller font (e.g. 10 point) and aligned on the left hand margin under a table, and under the title of a figure.



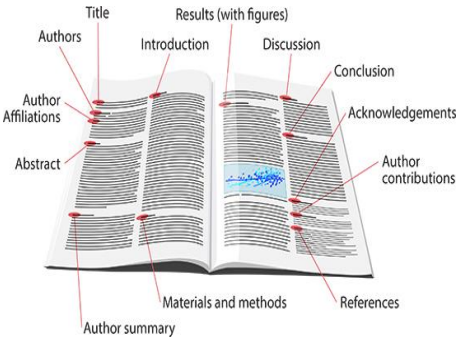
3. Mark the sentences T(true) or F(false).



1. The title can have the point (.) at the end.

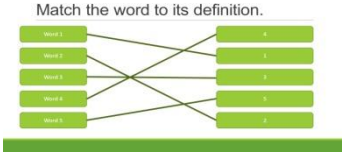
2. The abstract presents **the** full scope and significance of the work.
3. The abstract includes only the main objectives and the conclusions.
4. The introduction includes the theoretical background to the investigation.
5. You mustn't write the subheadings in the materials and methods section.
6. In the results section data are usually presented in tables or graphs.
7. Discussion section may include comments on unexpected results.
8. The conclusions are always included in the discussion.
9. The references should include only the most important sources referred to.
10. Titles for tables are centred below the table.

4. Answer the following questions.



1. What letters should be used to write the title?
2. What should the abstract include?
3. What should be clearly stated at the end of the introduction?
4. Can subheadings be written in the materials and methods section?
5. What does the results section include?
6. What is the most important section of the report? Why?
7. Can the conclusions sector be separated?
8. What should be written in the references section?
9. What font can be used for titles and headings?
10. Where are the titles of the figures centred?

5. Match the words in the left column with their definitions in the write column.



1. title	***a)*** *a short form of a speech, article, book, etc., giving only the most important facts or ideas*
2. report	***b)*** *words written or printed at the top of a text as a title*

3. abstract	***c)*** *information about something*
4. introduction	***d)*** *a writer or a book, article, etc. that is mentioned in a piece of writing, showing you where particular information was found*
5. material	***e)*** *the act of talking about something with other people and telling them your ideas or opinions*
6. discussion	***f)*** *the writer of a book, article, play, etc.*
7. reference	***g)*** *a short speech or piece of writing that comes before a longer speech or written text, usually giving basic information about what is to follow*
8. key words	***h)*** *information used when writing something such as a book or a scientific article*
9. heading	***i)*** *the name of a film, book, article, painting, piece of music*
10. author	***j)*** *particular words or phrases that describe the contents of the whole article*

6. Complete the text with the word from the table

a) materials and methods **b)** are placed **c)** figures
d) bold font **e)** introduction **f)** title **g)** abstract
h) results **i)** discussion **j)** references

1. The _____ should clearly and briefly indicate what the report is about.

2.The _____ should include the main objectives, results and the conclusions.

3. The _____ discusses the theoretical background to the investigation.

4. The _____ section should include all information required for an exact repetition of the work performed.

5. The _____consist of data and some comment about the most significant aspects of the results.

6. The _____ includes comments on the results.

7. The _____ should be an accurate listing of all the sources referred to.

8. Titles and headings may be in a _____.

9. Tables, graphics and photos _____ immediately after where they are first referred to in the text.

10. Titles for _____ are centered below the graphic.

7. Watch the video about scientific article structure (use the link https://www.youtube.com/watch?v=bwDnbWrZSvA (3.53). Read the sentences and make false sentences true. Write Ok near the true sentences.

1. The article is about ~~bananas~~. **(apples)**
2. After the abstract we should write Materials Section.
3. The Introduction includes the purpose of the study. **(OK)**
4. The Methods Section can be called Methods and Materials**.**
5. Methods section of this article includes 4 smaller subsections.
6. Subsection 2.1 explains the reason of the choices.
7. Table 1 is in the Subsection 2.1.
8. In the subsections 2.3 and 2.4 the means of experiments are described.
9. Subsection 2.4 includes statistical analysis.
10. The Methods section should include 2 main topics.

Unit 5

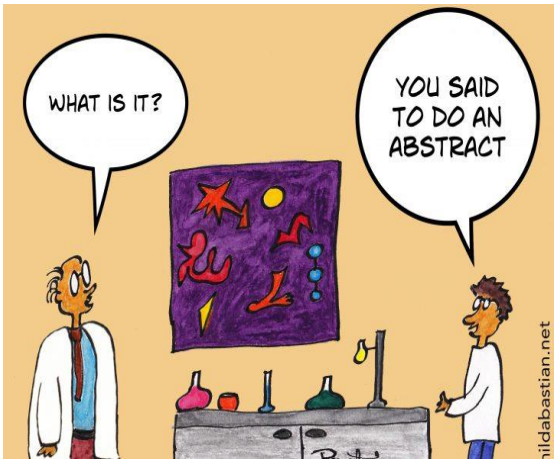
title	[taɪtəl]	*the name of a film, book, article, painting, piece of music*
abstract	[ˈæbstrækt]	*a short form of a speech, article, book, etc., giving only the most important facts or ideas*
introduction	[ɪntrəˈdʌkʃən]	*a short speech or piece of writing that comes before a longer speech or written text, usually giving basic information about what is to follow*
material	[məˈtɪəriəl]	*information used when writing something such as a book*
discussion	[dɪˈskʌʃən]	*the act of talking about something with other people and telling them your ideas or opinions*
reference	[ˈrefərəns]	*a writer or a book, article, etc. that is mentioned in a piece of writing, showing you where particular information was found*
key words	[ˈkiː] [wɜːdz]	*particular words or phrases that describe the contents of the whole article*
graph	[grɑːf] [græf]	*a drawing that shows how different types of information are related, usually using two axes, a line or curve*
heading	[ˈhedɪŋ]	*words written or printed at the top of a text as a title*
figure	[ˈfɪgər]	*a picture or drawing, often with a number, in a book or other document*
table	[ˈteɪbəl]	*an arrangement of facts or numbers in rows or columns, especially in printed material*
picture	[ˈpɪktʃər]	*a drawing, painting, photograph, etc.*
diagram	[ˈdaɪəgræm]	*a drawing that explains how a system, machine, process, plan, etc., operates or is organized*
author	[ˈɔːθər]	*the writer of a book, article, play, etc.*
report	[rɪˈpɔrt]	*information about something*

Unit 6

ABSTRACT WRITING

Unit 6

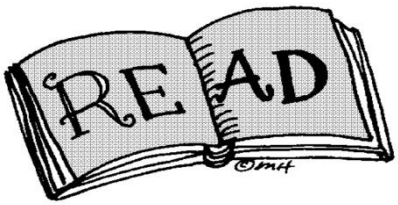
1. In pairs discuss the following questions.



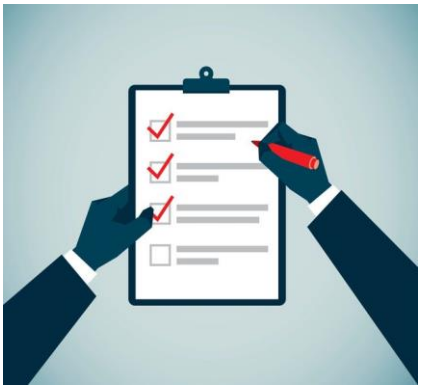
Have you ever watched a film trailer? Why?

Have you ever read a short description of a book? Why?

2. Read the text.



ABSTRACT WRITING



What is an abstract? An abstract is a condensed version of a longer piece of writing that highlights the major points covered, concisely describes the content and scope of the writing, and reviews the writing's contents in abbreviated form.

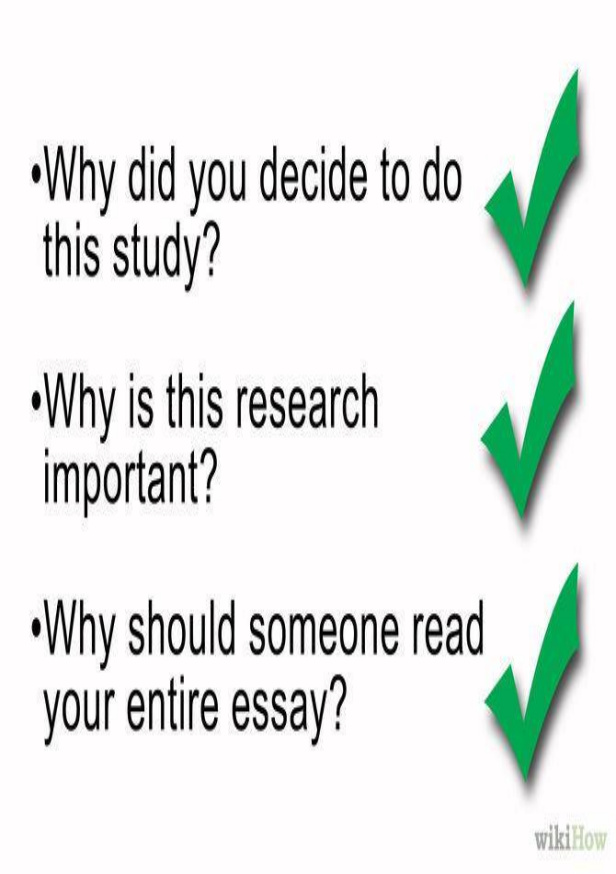
Why is an abstract so important?

• Help readers decide if they should read an entire article

• Help readers and researchers remember key findings on a topic

• Help readers understand the text by outlining key points prior to reading the full document

• Index articles for quick recovery and cross-referencing



What are the key elements that should be included?

• Background: A simple opening sentence or two placing the work in context.

• Aims: One or two sentences giving the purpose of the work.

• Method(s): One or two sentences explaining what was (or will) be done.

• Results: One or two sentences indicating the main findings (or what you hope to accomplish with the project).

• Conclusions: One sentence giving the most important consequence of the work – what do the results mean? How will they be used?

Questions an abstract should answer:

• Why did you do this study or project? (Or why are you undertaking the project/study?)

• What did you do, and how? (What will you do? How?)

• What did you find? (What do you expect to find?)

• What do the findings mean?

HELPFUL TIPS WHEN WRITING AN ABSTRACT:

• Reread your article or proposal with the goal of abstracting in mind.

(It is not easy to include all this information in just a few words. Start by writing a summary that includes whatever you think is important, and then gradually prune it down to size by removing unnecessary words, while still retaining the necessary concepts.)

• Look specifically for these main parts of the article or proposal: purpose, methods, scope, results, conclusions and recommendations.

• Use the headings and table of contents as a guide to writing your abstract.

• After you've finished rereading the article or proposal, write a rough draft without looking back at what you're abstracting.

• Don't merely copy key sentences – you'll put in too much or too little information.

•Don't rely on the way material was phrased – summarize information in a new way.

• Revise your rough draft to:

- Improve transitions from point to point

- Drop unnecessary information

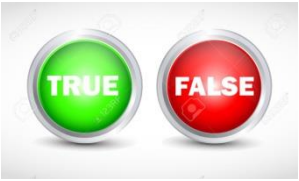
- Make sure it is complete and accurate

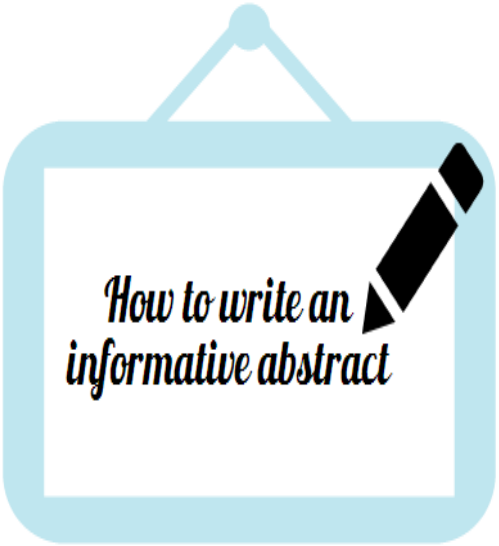
- Eliminate wordiness

- Fix errors in grammar, spelling and punctuation

- Make sure it's written in the same voice as the paper

3. Mark the sentences T (true) or F (false).





1. An abstract is a shorter version of a longer piece of writing.

2. An abstract helps readers to decide if they should read an entire article.

3. An abstract helps readers to understand the text by outlining the article title.

4. An abstract cannot be used to index articles for cross-referencing.

5. Results are one or two sentences explaining what was (or will) be done.

6. An abstract should answer 5 main questions.

7. Usually it is difficult to include all this information in some words.

8. It is ok to copy key sentences for an abstract writing.

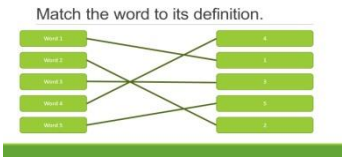
9. An abstract should be complete and accurate.

10. An abstract can be written in the different voice as the paper.

4. Answer the following questions.

1. What is an abstract?
2. How do the abstract help readers?
3. How do the abstract help readers to understand the text?
4. How many key elements should the abstract include?
5. What should be written about the aims?
6. What should be written about the results?
7. How many Questions should an abstract answer?
8. What should be used as a guide to write your abstract?
9. What should you do after you've finished rereading the article?
10. What should you eliminate in abstract writing?

5. Match the words in the left column with their definitions in the write column.



1.abstract	***a)*** *a person who reads*
2.topic	***b)*** *the final part of something*
3.document	***c)*** *a short, clear description that gives the main facts or ideas about something*
4.reader	***d)*** *a short form of a speech, article, book, etc., giving only the most important facts or ideas*

5.aim	***e)*** *a mistake*
6.conclusion	***f)*** *a subject that is discussed, written about, or studied*
7.summary	***g)*** *a paper or set of papers with written or printed information, especially of an official type*
8.purpose	***h)*** *forming words with the correct letters in the correct order*
9.error	***i)*** *a result that your plans*
10.spelling	***j)*** *why you do something*

6. Complete the text with the word from the table

a) paper b) conclusions c) unnecessary d) researchers e) unnecessary f) an abstract g) errors h) summary i) headings j) results

1. _____is a condensed version of a longer piece of writing.

2. An abstract helps _____ to remember key findings on a topic.

3. The main findings of the research are written in the _____.

4. The most important consequence of the work are written in the_____.

5. Start by writing a _____ that includes whatever you think is important.

6. Use the _____ of contents as a guide to writing your abstract.

7. You should drop _____ information in your abstract.

8. You should fix _____ in grammar, spelling and punctuation.

9. Make sure it's written in the same voice as the _____.

10. You should drop _____ information.

7. Read the examples of abstract and analyze it according to the requirements for abstract writing. Are there answers for 4 main questions that an abstract should answer? (See text)

ABSTRACT

Many physicians have left Iraq due to security concerns or were killed because of war or political conflicts in the last several decades. Despite the challenges that physicians experience in Iraq and the importance of the issue of physician stress and depression globally, little is known about stress and depression related to job satisfaction and work environments among physicians in Iraq. The purpose of this study is to elucidate factors that may improve the current challenges experienced by physicians in Iraq.

Data were collected for two months from October to December 2017 from physicians practicing in Iraq using an online survey.

Safety and work environments are major concerns among physicians in Iraq. Lower job satisfaction is associated with higher levels of stress and depression. The following factors are also related to higher levels of stress or depression: lower satisfaction with resources, fewer work hours, and sleep problems.

Iraq faces a potentially crippling brain drain situation since 87.5% of the study participants expressed interest in leaving Iraq, and are also concerned with safety in the workplace. Physician migration from developing to developed countries is a global phenomenon. But in the case of Iraq, since the percentage of leaving or intending to leave Iraq is very high, it is important to develop strategies to reduce push factors and to increase physician retention.

Keywords: Depression; Iraq; Job satisfaction; Job stress; Physicians

Unit 6

abstract	[ˈæbstrækt]	*a short form of a speech, article, book, etc., giving only the most important facts or ideas*
heading	[ˈhedɪŋ]	*words written or printed at the top of a text as a title*
result	[rɪˈzʌlt]	*something that happens or exists because of something else*
topic	[ˈtɒpɪk]	*a subject that is discussed, written about, or studied*
document	[ˈdɒkjəmənt]	*a paper or set of papers with written or printed information, especially of an official type*
reader	[ˈri·dər]	*a person who reads*
background	[ˈbækgraʊnd]	*used to refer to something that is done before*
aim	[eɪm]	*a result that your plans*
method	[ˈmeθəd]	*a particular way of doing something*
conclusion	[kənˈkluːʒən]	*the final part of something*
summary	[ˈsʌməri]	*a short, clear description that gives the main facts or ideas about something*
purpose	[ˈpɜːpəs]	*why you do something*
draft	[drɑːft]	*a piece of text often containing the main ideas*
error	[ˈerər]	*a mistake*
spelling	[ˈspelɪŋ]	*forming words with the correct letters in the correct order*

Unit 7

WRITING AN INTRODUCTION SECTION TO SCIENTIFIC ARTICLE

Thesis Introduction Chapter

- **Background**
- **Problem Statement**
- **Purpose of the Study**
- **Research Questions, Specific Objectives, or Hypotheses**
- **Rationale of the Study**
- **Scope of the Study**
- **Definition of Terms**
- **Chapter Summary**

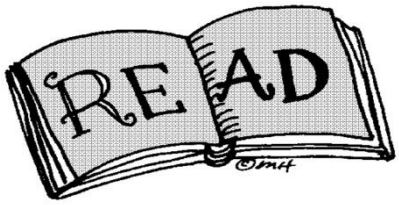
Unit 7

1. In pairs discuss the following questions.

Tip 3 - Introduction: work on that funnel shape!

Is the first impression about a person important for you? Why?

How can you capture the audience's attention at the beginning of your speech?



2. Read the text.

WRITING AN INTRODUCTION SECTION TO SCIENTIFIC ARTICLE

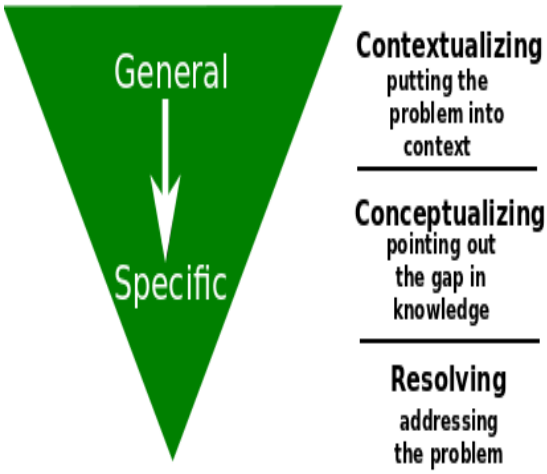


Fig. 1. The inverted pyramid approach (© P. Regoniel)

The main goal of the introduction is to convey basic information to the readers without obligating them to investigate previous publications and to provide clues as to the results of the present study. It is useful to analyze the issues to be considered in the 'Introduction' section under 3 headings.

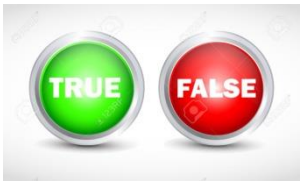
Firstly, information should be provided about the general topic of the article in the light of the current literature which paves the way for the disclosure of the manuscript objective. Then the specific subject matter, and the issue to be

focused on should be dealt with, the problem should be brought forth, and fundamental references related to the topic should be discussed. Finally, our recommendations for solution should be described, in other words our aim should be communicated. When these steps are followed in that order, the reader can understand the problem, and its solution from his/her own perspective under the light of current literature. Otherwise, even a perfect study presented in a non-systematized, confused design will lose the chance of reading. Indeed inadequate information, inability to clarify the problem, and sometimes concealing the solution will keep the reader who has a desire to attain new information away from reading the manuscript.

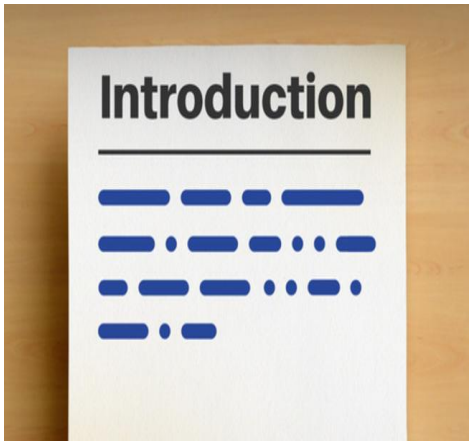
First of all, explanation of the topic in the light of the current literature should be made in clear, and precise terms as if the reader is completely ignorant of the subject. In this section, establishment of a warm rapport between the reader, and the manuscript is aimed. Since frantic plunging into the problem or the solution will push the reader into the dilemma of either screening the literature about the subject matter or refraining from reading the article. Updated, and robust information should be presented in the 'Introduction' section.

Then main topic of our manuscript, and the encountered problem should be analyzed in the light of the current literature following a short brain exercise. At this point the problems should be reduced to one issue as far as possible. Of course, there might be more than one problem, however this new issue, and its solution should be the subject matter of another article. Problems should be expressed clearly. If targets are more numerous, and complex, solutions will be more than one, and confusing.

Finally, the last paragraphs of the 'Introduction' section should include the solution in which we will describe the information we generated, and related data. Our sentences which arouse curiosity in the readers should not be left unanswered. The reader who thinks to obtain the most effective information in no time while reading a scientific article should not be smothered with mysterious sentences, and word plays, and the readers should not be left alone to arrive at a conclusion by themselves. If we have contrary expectations, then we might write an article which won't have any reader. A clearly expressed or recommended solutions to an explicitly revealed problem is also very important for the integrity of the 'Introduction' section.



3. Mark the sentences T(true) or F(false).

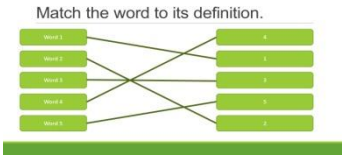


1. The main aim of the introduction is to give basic information to the readers.
2. It is useful to analyze the issues to be considered under 5 headings.
3. Information should be provided about the general topic of the article in the light of the connected literature.
4. It is not important to discuss fundamental references related to the topic.
5. The author(s) recommendations for solution of the investigated problem are usually described.
6. The topic should be made in clear and precise terms.
7. Information in this section should be updated.
8. There might be more than one solution of investigated problem.
9. All the solutions of the problem must be the subject matter of one article.
10. The last paragraphs should include the recommended solutions of the problem.

4. Answer the following questions.

1. What is a main goal of the introduction?
2. What information should be provided at the beginning?
3. What references related to the topic should be discussed?
4. What should be described at the end of the introduction?
5. Why is it important to follow given steps for introduction writing?
6. Why should problems be reduced to one issue?
7. What can be the subject matter of another article?
8. How should problems be expressed?
9. What should the last paragraphs of the 'Introduction' section include?
10. What is very important for the integrity of the 'Introduction' section?

5. Match the words in the left column with their definitions in the write column.



1.related	***a)*** *to make something more modern or suitable for use now by adding new information*
2.systematize	***b)*** *the quality of being whole and complete*
3.integrity	***c)*** *a situation or thing that needs attention and needs to be solved*
4.target	***d)*** *the answer to a problem*
5.current	***e)*** *the organ inside the head that controls thought, memory, feelings, and activity*
6.brain	***f)*** *to plan a system for something*
7. update	***g)*** *a statement that something would be good or suitable for a purpose*
8. problem	***h)*** *connected*
9. recommendation	***i)*** *of the present time*
10. solution	***j)*** *a level or situation that you intend to achieve*

6. Complete the text with the word from the table

a) related	**b)** non-systematized	**c)** integrity
d) targets	**e)** information	**f)** headings
g) current	**h)** brain **i)** precise	**j)** updated

1. The main goal of the introduction is to give basic _____ to the readers.

2. It is useful to analyze the issues under three _____.

3. The general topic of the article should be provided in the light of the _____ literature.

4. Explanation of the topic should be made in clear and_____ terms.

5. Even a perfect study presented in a _____ design will lose the chance of reading.

6. _____ and robust information should be presented in the 'Introduction' section.

7. The encountered problem should be analyzed after a short instance of _____ exercise.

8. If _____ are more numerous, and complex, solutions will be more than one.

9. The last paragraphs should include the solution in which we will describe _____ data.

10. A clearly expressed solutions to the problem is also very important for the _____ of the 'Introduction' section.

7. Read the examples of introduction to the article "Invited commentary how to write a scientific article" by Barbara J. Hoogenboom and Robert C. Manske.

Does the introduction include?

- ✓ Introduction of research topic
- ✓ Creation of some context and background.
- ✓ Information about the research that is planned to carry out.
- ✓ Explaination the importance of research
- ✓ Hypothesis.

INTRODUCTION

Conducting scientific and clinical research is only the beginning of the scholarship of discovery. In order for the results of research to be accessible to other professionals and have a potential effect on the greater scientific community, it must be written and published. Most clinical and scientific discovery is published in peer-reviewed journals, which are those that utilize a process by which an author's peers, or experts in the content area, evaluate the manuscript. Following this review the manuscript is recommended for publication, revision or rejection. It is the rigor of this review process that makes scientific journals the primary source of new information that impacts clinical decision-making and practice.

The task of writing a scientific paper and submitting it to a journal for publication is a time-consuming and often daunting task. Barriers to effective writing include lack of experience, poor writing habits, writing anxiety, unfamiliarity with the requirements of scholarly writing, lack of confidence in writing ability, fear of failure, and resistance to feedback. However, the very process of writing can be a helpful tool for promoting the process of scientific thinking, and effective writing skills allow professionals to participate in broader scientific conversations. Furthermore, peer review manuscript publication systems requiring these technical writing skills can be developed and improved with practice. Having an understanding of the process and structure used to produce a peer-reviewed publication will surely improve the likelihood that a submitted manuscript will result in a successful publication.

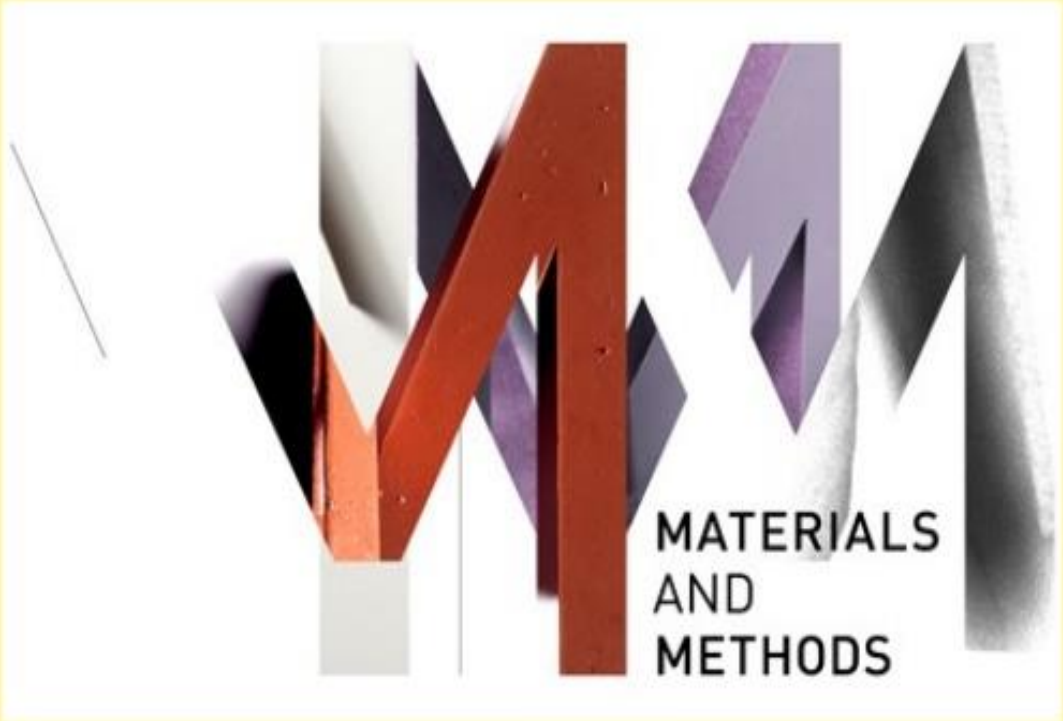
Clear communication of the findings of research is essential to the growth and development of science and professional practice. The culmination of the publication process provides not only satisfaction for the researcher and protection of intellectual property, but also the important function of dissemination of research results, new ideas, and alternate thought; which ultimately facilitates scholarly discourse. In short, publication of scientific papers is one way to advance evidence-based practice in many disciplines, including sports physical therapy. Failure to publish important findings significantly diminishes the potential impact that those findings may have on clinical practice.

Unit 7

introduction	[ɪntrəˈdʌkʃən]	*a short speech or piece of writing that comes before a longer speech or written text*
related	[rɪˈleɪtɪd]	*connected*
systematize	[ˈsɪstəmətaɪz]	*to plan a system for something*
integrity	[ɪnˈtegrəti]	*the quality of being whole and complete*
target	[ˈtɑːgɪt]	*a level or situation that you intend to achieve*
current	[ˈkʌrənt]	*of the present time*
brain	[breɪn]	*the organ inside the head that controls thought, memory, feelings, and activity*
precise	[prɪˈsaɪs]	*exact and accurate in form, time, detail, or description*
update	[ʌpˈdeɪt]	*to make something more modern or suitable for use now by adding new information*
topic	[ˈtɒpɪk]	*a subject that is discussed, written about, or studied*
problem	[ˈprɒbləm]	*a situation or thing that needs attention and needs to be solved*
objective	[əbˈdʒektɪv]	*something that you plan to do or achieve*
recommendation	[ˌrekəmenˈdeɪʃən]	*a statement that something would be good or suitable for a purpose*
clear	[klɪəʳ]	*easy to understand, hear, read, or see*
solution	[səˈluːʃən]	*the answer to a problem*

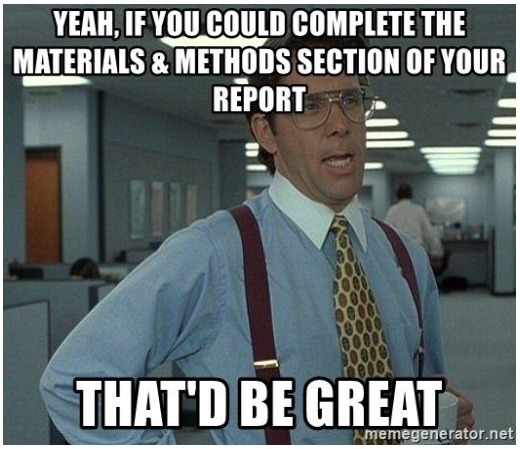
Unit 8

MATERIALS AND METHODS SECTION



Unit 8

1. In pairs discuss the following questions.

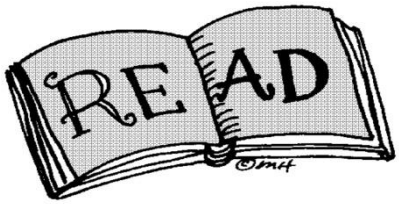


Have you ever done any experiments?

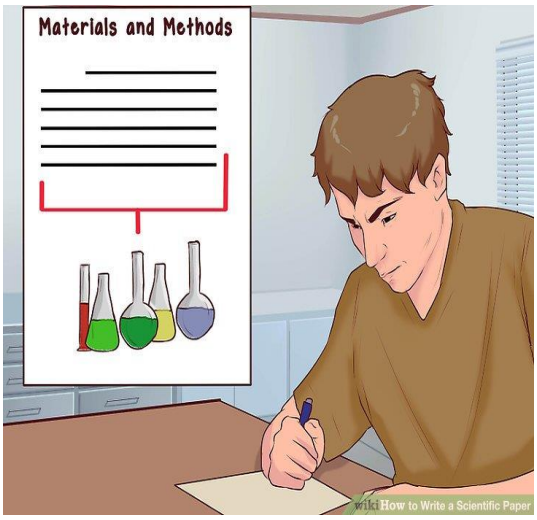
What materials and methods did you use?

How much time did you need to do an experiment?

2. Read the text.



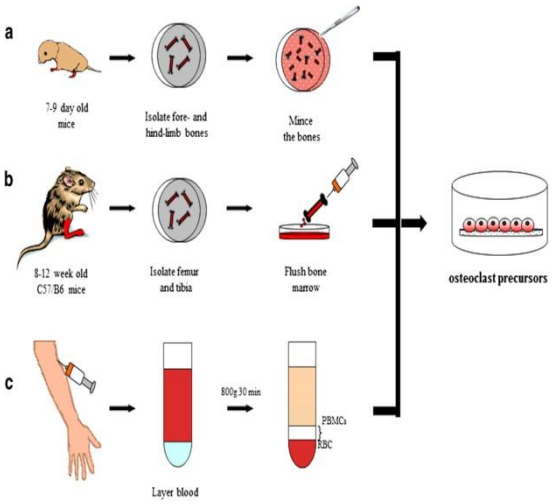
MATERIALS AND METHODS SECTION



The methods section is the most important aspect of a research paper because it provides the information by which the validity of a study is ultimately judged. Therefore, the author must provide a clear and precise description of how an experiment was done, and the rationale for the specific experimental procedures chosen. It must be written with enough information so that:

(1) the experiment could be repeated by others to evaluate whether the results are reproducible

(2) the audience can judge whether the results and conclusions are valid.



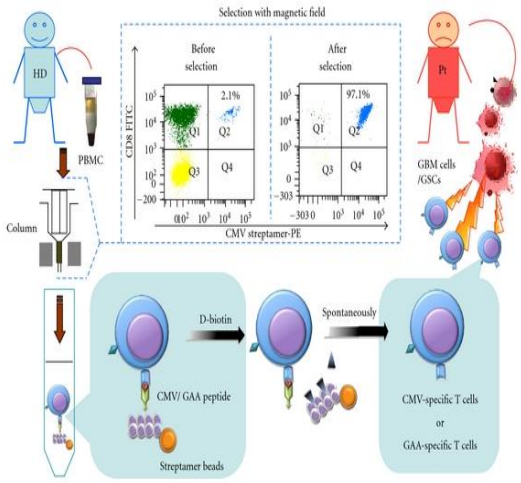
Historically, the methods section was referred to as the "materials and methods" to emphasize the 2 distinct areas that must be addressed. "Materials" referred to what was examined (eg, humans, animals, tissue preparations) and also to the various treatments (eg, drugs, gases) and instruments (eg, ventilators) used in the study. "Methods" referred to how subjects or objects were manipulated to answer the experimental question, how measurements and calculations were made, and how the data were analyzed.

The complexity of scientific inquiry necessitates that the writing of the methods be clear and orderly to avoid confusion and ambiguity. First, it is usually helpful to structure the methods section by:

1. Describing the materials used in the study
2. Explaining how the materials were prepared
3. Describing the research protocol
4. Explaining how measurements were made and what calculations were performed
5. Stating which statistical tests were done to analyze the data

Second, the writing should be direct and precise and in the past tense. Compound sentence structures should be avoided, as well as descriptions of unimportant details.

Once all elements of the methods section are written down during the initial draft, subsequent drafts should focus on how to present those elements as clearly and logically as possibly. In general, the description of preparations, measurements, and the protocol should be organized chronologically.



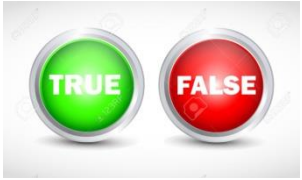
For clarity, when a large amount of detail must be presented, information should be presented in subsections according to topic. Within each section and subsection, material should always be organized by topic from most to least important.

The next step in the methods section is to describe what variables were measured and how those measurements were made. The description of measurement instruments should include the manufacturer and model, calibration procedures, and how measurements were made. It also may be necessary to justify why and how certain variables were measured. This becomes particularly important when the object of the experiment can be approached only indirectly.

The last step in the methods section is to describe how the data will be presented in the results section, which statistical tests will used for the inferential data, and what value is deemed to indicate a statistically significant difference.

The methods section is the most important part of a research paper because it provides the information the reader needs to judge the study's validity. Providing a clear and precise description of how an experiment was done, and the rationale for specific experimental procedures are crucial aspects of scientific writing.

3. Mark the sentences T(true) or F(false).



1. The methods section provides the information by which the validity of a study is judged.

2. The results of the research must be reproducible.

3. “Materials” referred only to the various treatments and instruments used in the study.

4. “Methods” section can include the information about made measurements and calculations.

5. You don’t need to structure the methods section.

6. You should avoid compound sentences and unimportant details.

7. Material should always be organized by topic from the least to the most important.

8. It is not necessary to justify why and how certain variables were measured.

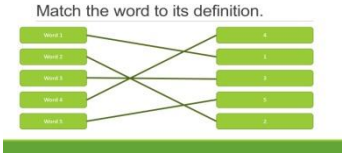
9. The final step in the methods section should describe how the data will be presented in the results section.

10. The methods section helps readers to judge the study’s validity.

4. Answer the following questions.

1. Why is the methods section the most important aspect of a research paper?
2. What must the author provide?
3. What did “Materials” section refer to?
4. What did “Methods” section refer to?
5. Why must writing of the methods be clear and orderly?
6. What tense should be used in the methods section?
7. How should the description of preparations and measurements be organized?
8. What should the description of measurement instruments include?
9. What does the last step in the methods section describe?
10. What do the readers need to judge?

5. Match the words in the left column with their definitions in the write column.



1.validity	***a)*** *to show or do something again*
2.judge	***b)*** *a tool or other device used for doing a particular work*
3.description	***c)*** *to do something more than once*
4.repeat	***d)*** *the process of finding an amount or number using mathematics*
5.reproduce	***e)*** *the size, shape, quality, etc. of something, which you discover by measuring it*
6.preparation	***f)*** *to form, give, or have as an opinion, or to decide about something or someone*
7.instrument	***g)*** *the way in which the parts of a system or object are organized*
8.calculation	***h)*** *the state of being ready for something that will happen*
9.measurement	***i)*** *the state of being acceptable or reasonable*
10.structure	***j)*** *something that tells you what something or someone is like*

solution

6. Complete the text with the word from the table

a) chronologically **b) subsections** **c) description**
d) ambiguity **) calibration** **f) crucial** **g) valid**
h) paper **i) logically** **j) were manipulated**

1. The methods section is the most important aspect of a research _____.

2. The author must provide a clear and precise _____ of how an experiment was done.

3. The audience can judge whether the results and conclusions are _____.

4. “Methods” referred to how subjects or objects _____ to answer the experimental question.

5. The writing of the methods can be clear to avoid confusion and _____.

6. Subsequent drafts should focus on how to present elements as clearly and _____ as possibly.

7. The description of preparations, measurements, and the protocol should be organized _____.

8. When a large amount of details must be presented, information should be given in _____.

9. The description of measurement instruments should include the _____ procedures.

10. Providing a clear and precise description of how an experiment was done is _____ aspect of scientific writing.

7. Stydy the the examples of "Materials and methods" section to the article "Spermicidal effects of lemon juice and juices from other natural products" by Somsak Suthutvoravuta and Ourawan Kamyarat and analyze it according to the requirements for "Materials and methods" section writing. (Appendix 2)

Try to answer the following questions.

1. Is there sufficient detail so that the experiments can be reproduced?

2. Is there excess information that could be removed without affecting the interpretation of the results?

3. Are all the appropriate controls mentioned?

4. Are all appropriate citations included?

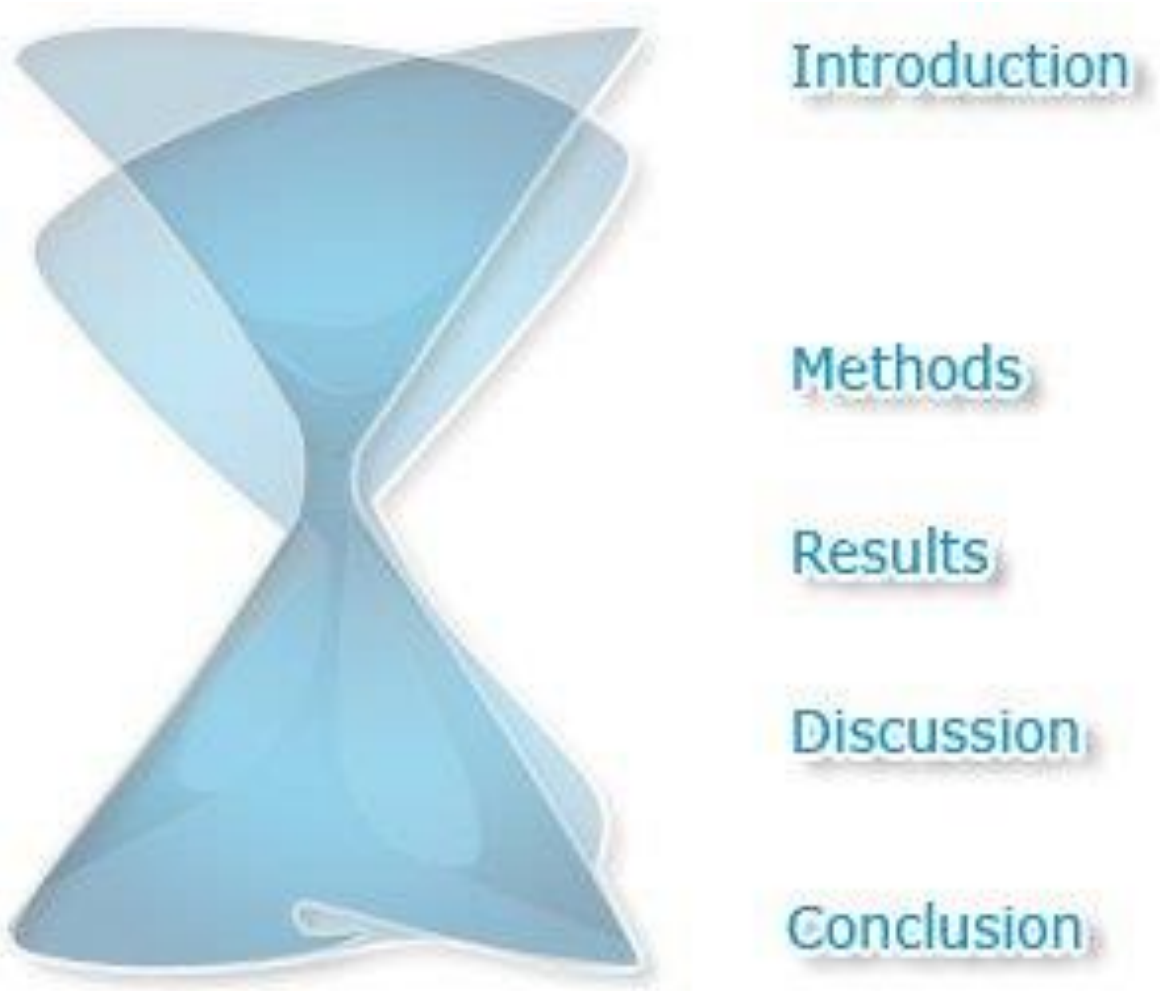
5. Is the source of each reagent listed?

Unit 8

experiment	[ɪkˈsperɪmənt]	*a test done in order to learn something or to discover if something works or is true*
procedure	[prəˈsiːdʒɚ]	*a set of actions that is the official or accepted way of doing something*
material	[məˈtɪəriəl]	*information used when writing something such as a book*
result	[rɪˈzʌlt]	*the information you get from something such as a scientific experiment or medical test*
method	[ˈmeθəd]	*a particular way of doing something*
validity	[vəˈlɪdəti]	*the state of being acceptable or reasonable*
judge	[dʒʌdʒ]	*to form, give, or have as an opinion, or to decide about something or someone*
description	[dɪˈskrɪpʃən]	*something that tells you what something or someone is like*
repeat	[rɪˈpiːt]	*to do something more than once*
reproduce	[ˌriːprəˈdʒuːs]	*to show or do something again*
preparation	[ˌprepəˈreɪʃən]	*the state of being ready for something that will happen*
instrument	[ˈɪnstrəmənt]	*a tool or other device used for doing a particular work*
calculation	[ˌkælkjəˈleɪʃən]	*the process of finding an amount or number u sing mathematics*
measurement	[ˈmeʒəmənt]	*the size, shape, quality, etc. of something, which you discover by measuring it*
structure	[ˈstrʌktʃəʳ]	*the way in which the parts of a system or object are organized*

Unit 9

Writing Results, Discussion and Conclusion Sections

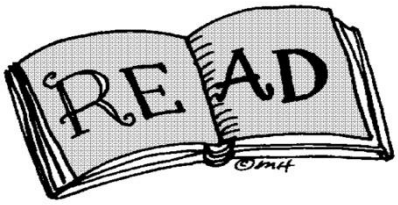


1. In pairs discuss the following questions.

Is the result of your work important? Why?

How can you prove the results of your work?

2. Read the text.



WRITING RESULTS, DISCUSSION AND CONCLUSION SECTIONS

Results

The results section is the part of the scientific paper around which everything else is built. The introduction describes why the results needed to be obtained, the methods how they were obtained and the discussion explains the results.

The results section is just a presentation of the data. There should not be any discussion in the results section (that goes in the discussion section). The results need to be presented in enough detail for someone not familiar with the scientific paper to understand them. All the results should be explained in the text of the results section as well as being presented in either figures or tables. Each result should only be presented

once. Do not show the same data in two forms (data should be presented as either a table or a figure not both).

The text of the results section should introduce each table or figure and provide a summary of the main points from each.

The results should:

- Be simple and clear
- Present summaries of large data sets (means with standard error or deviation)
- Detailed data should be reported in tables or figures and not as lists in the text
- Only give the data which is relevant to the paper
- Refer to every table or figure in the text

Each figure or table should be identified by a unique number e.g. table 1, table 2, figure 1, figure 2. The numbers should be sequential, in the same order as the tables or figures are presented in the text.

Discussion

In the discussion you should explain your results, how they relate to the literature and any implications they might have for future use.

A good discussion will explain why your results and the whole paper are important. You'll show that your results can add new knowledge to your chosen area of work.

In the discussion you should refer to the literature when explaining and discussing your results. This should be related to the interpretation of your results and not restating what was said in the introduction when you reviewed the relevant literature.

The discussion should:

- Not repeat information from the results and introduction sections
- Relate the results to the aims
- Show how the results agree or disagree with previously published literature
- Indicate the significance of the results
- Suggest future work or planned follow-up research

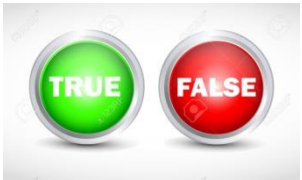
Conclusion

Often the conclusion will be in the final paragraph of the discussion but it can sometimes be in a separate section.

This is the overall main point or points that you want your readers to remember. They should be clearly stated.

The conclusion should not repeat information from the discussion section but restate the main conclusions in a new concise way for your readers, so that they are in no doubt what you have achieved while doing the research presented in your paper.

3. Mark the sentences T(true) or F(false).



1. The results section is the most important part of the scientific paper.
2. The results section is just a presentation of the information.
3. There should be some discussion in the results section.
4. You don't need to explain all the results in the results section.
5. Each result should be presented many times.
6. Each figure or table should be identified by a unique number.
7. In the discussion you should explain your results.

8. In the discussion you don't need to refer to the literature when explaining and discussing your results.

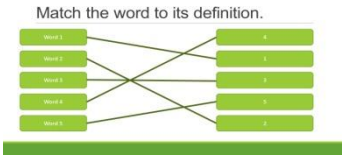
9. The conclusion is always a separate section.

10. The conclusion should repeat information from the discussion section.

4. Answer the following questions.

1. What is a results section presentation of?
2. Should there be any discussion in the results section?
3. How do the results should be presented?
4. How many times each result should be presented?
5. Can you show the same data in different forms?
6. What should the text of the results section introduce?
7. How each figure or table should be identified?
8. What should you explain in the discussion?
9. What should you refer to in the discussion?
10. Can conclusion be in a separate section?

5. Match the words in the left column with their definitions in the write column.



1.result	***a)*** *easy to understand, hear, read, or see*
2.discussion	***b)*** *the act of talking about something with other people and telling them your ideas or opinions*
3.conclusion	***c)*** *an arrangement of facts and numbers in rows or blocks, especially in printed material*
4.data	***d)*** *to give a written or spoken report of how something is done or of what someone or something is like*
5.figure	***e)*** *a sign or symbol representing a unit that forms part of the system of counting and calculating*
6.table	***f)*** *the final part of something or a decision made after a lot of consideration*

7.describe	***g)*** *to make something clear or easy to understand by describing or giving information about it*
8. number	***h)*** *the information you get from something such as a scientific experiment or medical test*
9. explain	***i)*** *information, especially facts or numbers, collected to be examined and considered and used to help decision-making*
10. clear	***j)*** *a picture or drawing, often with a number, in a book or other document*

6. Complete the text with the word from the table

a) <u>be explained</u> **b) <u>conclusion</u>** **c) <u>final</u>**
d) <u>refer</u> **e) <u>repeat</u>** **f) <u>data</u>** **g) figure** **h) <u>results</u>** **i) <u>discussion</u>** **j) <u>be presented</u>**

1. The _____ section is the part of the scientific paper around which everything else is built.
2. The results section is just a presentation of the _____ .
3. There should not be any _____ in the results section.
4. All the results should _____ in the text of the results section.
5. Each result should only _____ once.
6. Each _____ or table should be identified by a unique number.
7. In the discussion you should _____ to the literature when explaining and discussing your results.
8. The discussion should not _____ information from the introduction sections
9. Often the conclusion will be in the _____ paragraph.
10. The _____ should not repeat information from the discussion section.

7. Read the examples of results, discussion and conclusion sections to the article "Spermicidal effects of lemon juice and juices from other natural products" by Somsak Suthutvoravuta and Ourawan Kamyarat(Appendix 2).

Analyze these sections according to the following requirements.

RESULTS SECTION

- Are the results simple and clear?
- Do the results present summaries of large data sets?
- Is detailed data reported in tables or figures and not as lists in the text?
- Is each figure or table identified by a unique number e.g. table 1, table 2, figure 1, figure 2?

THE DISCUSSION SECTION

- Not repeat information from the results and introduction sections
- Relate the results to the aims
- Show how the results agree or disagree with previously published literature
- Indicate the significance of the results
- Suggest future work or planned follow-up research

THE CONCLISION SECTION

- It overalls main point or points that the readers should remember.
- The main points are clearly stated.
- The conclusion should not repeat information from the discussion section but restate the main conclusions in a new concise way for readers

Unit 9

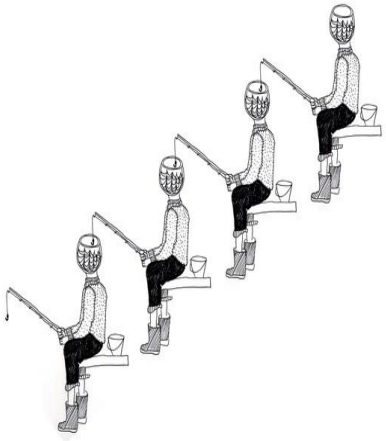
result	[rɪˈzʌlt]	*the information you get from something such as a scientific experiment or medical test*
discussion	[dɪˈskʌʃən]	*the act of talking about something with other people and telling them your ideas or opinions*
conclusion	[kənˈkluʒən]	*the final part of something or a decision made after a lot of consideration*
data	[ˈdeɪtə]	*information, especially facts or numbers, collected to be examined and considered and used to help decision-making*
figure	[ˈfɪgər]	*a picture or drawing, often with a number, in a book or other document*
table	[ˈteɪbəl]	*an arrangement of facts and numbers in rows or blocks, especially in printed material*
repeat	[rɪˈpiːt]	*a situation in which something happens or is done more than once*
describe	[dɪˈskraɪb]	*to give a written or spoken report of how something is done or of what someone or something is like*
number	[ˈnʌm.bər]	*a sign or symbol representing* *a unit that forms part of* *the system of counting and calculating*
present	[prɪˈzent]	*to give, provide, or make something known*
explain	[ɪkˈspleɪn]	*to make something clear or easy to understand by describing or giving information about it*
section	[ˈsekʃən]	*one of the parts that something is divided into*
indicate	[ˈɪn.dɪ.keɪt]	*to show, point, or make clear in another way*
significance	[sɪgˈnɪfɪkəns]	*importance*
clear	[klɪər]	*easy to understand, hear, read, or see*

Unit 10

PLAGIARISM IN SCIENTIFIC WRITING

Unit 10

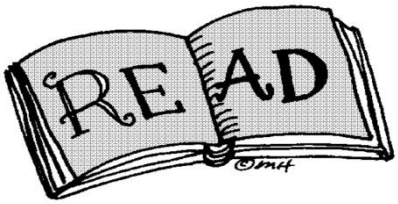
1. In pairs discuss the following questions.



Have you ever stolen somebody's ideas? Why? Why not?

Did you use somebody's text in your diploma?

2. Read the text.



PLAGIARISM IN SCIENTIFIC WRITING

Plagiarism refers to the act of "appropriation of another person's ideas, processes, results, or words without giving appropriate credit". Most academic researchers reach a consensus that plagiarism is a serious breach of publication ethics. Plagiarism has different forms but can be categorized into two general distinct categories – plagiarism of ideas and plagiarism of text (verbatim). No doubt, plagiarism of ideas is a blatant act of misconduct. Plagiarism of text and recycling of words are also a serious fault in humanities and literature where the essence of work and novelty are wordings and eloquence of the text. But, what about

science where the essence of the work is the originality of the scientific content no matter how eloquent it is presented (3).

In scientific writing the researcher whose audience are scholars looking for pure evidence-based facts, should mainly act as no more than a good observer and reporter. Unlike an author in the field of literature, the author of a scientific paper should follow certain well-established scientific methodology and always be careful not to be affected by his or her intuition or different sorts of biases that might jeopardize the judgment of a researcher. In this way, as long as the author is a fair observer and relies on the solid evidence, facts, and well-established scientific methods, no matter how eloquent he or she is, the scientific findings can be reported and published provided that he or she uses a universally well-accepted scientific methodology for conducting and reporting science. As a matter of fact, while in many fields like literature, the author and hence the wordings are the most important part of the article, in scientific writing the scientific content is more important than the author and wordings as long as the text is comprehensible, no matter if it is written by a layperson or a well-educated first-class eloquent author. Here, the originality is not in wordings; it is in the scientific content. In fact in many scientific writing courses we advise authors to convey the message in its simplest form – which is usually not its most eloquent form, since science itself, is complex enough and there is no need for sure to make it more complex using sophisticated writing. Especially since many of the audience of scientific articles are not native English speakers.

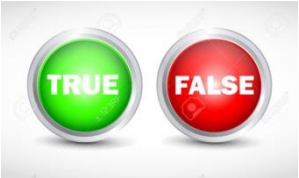
Duplicate publication and redundant publication are misconduct and waste of resources. ‘‘Readers deserve original content, and merely

recycling parts of previously published work constitutes, at best, academic laziness". "Readers" of scientific papers are just looking for science presented in an appropriate format (wordings, graphs, tables, layout, etc). We are not sure if they even care how well the words are used as long as they can understand what the author meant to convey.

If the originality of a scientific article is not in its wordings but is in its content, why should not one insert a piece of well-written phrase or even sentences (not ideas) from a previously published paper in his or her manuscript to better express him/herself because he or she is disinclined to sacrifice quality and accuracy of the statements either for want of linguistic expertise or "academic laziness". Obviously, it is a must that the author who does so should understand and interpret the original text correctly. As recently suggested, the damage to the integrity of the literature and seriousness of the misconduct associated with text plagiarism are less obvious compared to the consequences of plagiarism of idea (6).

Although many initiatives would help non-English speaking authors express themselves acceptably, the future would be completely different. Soon, we will have machine translation with enough quality to be used in online versions of scientific journals. The translation machinery is certainly very premature yet to translate efficiently the text in the field of literature – novels, dramas, poems, etc – but it is proficient enough in most cases to preserve the scientific content of scientific articles. Some of the algorithms used by these machines are so that they would result in text similarities in the translated texts. On the other hand, in how many ways can you describe how you take a blood sample or analyze it? If we still insist on preventing text similarities (even our own previous texts – self-plagiarism) in scientific writing, we have to think about inventing new words so we would fool the software programs used for checking plagiarism!

3. Mark the sentences T(true) or F(false).



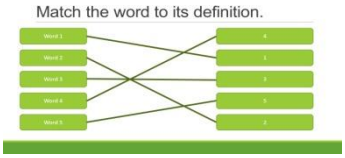
1. Plagiarism refers to the act of appropriation of another person's ideas.
2. Plagiarism can be categorized into plagiarism of ideas and plagiarism of text.
3. Scientific content should always be presented eloquently.
4. In scientific writing the audience of the researcher is scholars.
5. In scientific writing the scientific content is less important than the wordings.
6. Many scientific writing courses advise authors to convey the message in its simplest form.
7. Duplicate publication is misconduct and waste of resources.
8. Recycling parts of previously published work constitutes academic "laziness".
9. The translation machinery is proficient enough in most cases to preserve the scientific content of scientific articles.
10. To fool the software programs used for checking plagiarism we have to invent new words.

4. Answer the following questions.

1. What is plagiarism?
2. How can plagiarism be categorized?
3. What is the essence of the work in science?
4. What are the most important things in scientific writing?
5. Why do the scientific writing courses advise authors?
6. What will we have soon for translation?
7. How can we fool software programs used for checking plagiarism?
8. Why do the scientific writing courses advise authors?
9. What will we have soon for translation?

10. How can we fool software programs used for checking plagiarism?

5. Match the words in the left column with their definitions in the write column.



1. plagiarism	***a)*** *the writer of a book, article, play, etc.*
2. author	***b)*** *a system of ways of doing, teaching, or studying something*
3. idea	***c)*** *the ideas that are contained in a piece of writing, a speech, or a film*
4.text	***d)*** *the act of making information available to people in a printed or electronic form*
5. fault	***e)*** *the programs that you put into a computer to make it do particular jobs*
6. methodology	***f)*** *the process or practice of using another person's ideas or work and pretending that it is your own*
7. content	***g)*** *the written words in a book, magazine, etc., not the pictures*
8.appropriation	***h)*** *a mistake, especially something for which you are to blame*
9.publication	***i)*** *the act of taking something for your own use, usually without permission*
10.software	***j)*** *knowledge or understanding about something*

6. Complete the text with the word from the table

a) recycling b) methodology c) duplicate
d) preventing e) translation f) papers
g) content h) plagiarism i) ethics j) ideas

1. _____ refers to the act of appropriation of another person's ideas.

2. Most academic researchers sure that plagiarism is a serious breach of publication _____.

3. Plagiarism can be categorized into two general distinct categories – plagiarism of _____ and plagiarism of text.

4. Plagiarism of text and _____ of words are also a serious fault in humanities and literature.

5. The author of a scientific paper should follow certain well-established scientific _____.

6. In scientific writing the scientific _____ is more important than the author and wordings.

7. _____ publication is misconduct and waste of resources.

8. "Readers" of scientific _____ are just looking for science presented in an appropriate format.

9. The _____ machinery is certainly very premature yet to translate efficiently the text in the field of literature.

10. If we still insist on _____ text similarities, we have to think about inventing new words.

7. Study the basics of a Reference List entry for a journal article (Harvard referencing). Are there any differences with Ukrainian standard for Reference List?

- Author or authors. The surname is followed by first initials.
- Year of publication of the article.
- Article title (in single inverted commas).
- Journal title (in italics).
- Volume of journal.
- Issue number of journal.
- Page range of article.

Example:

Gray, L 2018, 'Exploring how and why young people use social networking sites', Educational Psychology in Practice, vol. 34, no. 2, pp. 175-194.

Unit 10

plagiarism	[ˈpleɪdʒərɪzəm]	*the process or practice of using another person's ideas or work and pretending that it is your own*
ethics	[ˈeθɪks]	*the study of what is morally right and wrong*
author	[ˈɔːθər]	*the writer of a book, article, play, etc.*
idea	[aɪˈdɪə]	*knowledge or understanding about something*
text	[ˈtekst]	*the written words in a book, magazine, etc., not the pictures*
fault	[fɒlt]	*a mistake, especially something for which you are to blame*
literature	[ˈlɪtrətʃər]	*all the information relating to a subject, especially information written by specialists*
methodology	[meθəˈdɒlədʒi]	*a system of ways of doing, teaching, or studying something*
content	[kənˈtent]	*the ideas that are contained in a piece of writing, a speech, or a film*
duplicate	[ˈdjuːplɪkeɪt]	*to do something again that has already been done, when this is unnecessary*
paper	[ˈpeɪpər]	*a piece of writing on a particular subject written by an expert and usually published in a book or journal*
appropriation	[əprəʊpriˈeɪʃən]	*the act of taking something for your own use, usually without permission*
publication	[ˌpʌblɪˈkeɪʃən]	*the act of making information available to people in a printed or electronic form:*
software	[ˈsɒftweər]	*the programs that you put into a computer to make it do particular jobs*
reference	[trænzˈleɪt]	*a writer or a book, article, etc. that is mentioned in a piece of writing*

APPENDIX 1

THE COMMON EUROPEAN FRAMEWORK OF REFERENCE FOR LANGUAGES (CEFR)

Level group	Level group name	Level	Level name	Description
A	Basic user	A1	Breakthrough or <u>BEGINNER</u>	• Can understand and use familiar everyday expressions and very basic phrases aimed at the satisfaction of needs of a concrete type. • Can introduce themselves and others and can ask and answer questions about personal details such as where he/she lives, people they know and things they have. • Can interact in a simple way provided the other person talks slowly and clearly and is prepared to help.
		A2	Waystage or <u>ELEMENTARY</u>	• Can understand sentences and frequently used expressions related to areas of most immediate relevance (e.g. very basic personal and family information, shopping, local geography, employment). • Can communicate in simple and routine tasks requiring a simple and direct exchange of information on familiar and routine matters. • Can describe in simple terms aspects of their background, immediate environment and matters in areas of immediate need.
B	Independent user	B1	Threshold or <u>INTERMEDIATE</u>	• Can understand the main points of clear standard input on familiar matters regularly encountered in work, school, leisure, etc. • Can deal with most situations likely to arise while travelling in an area where the language is spoken. • Can produce simple connected text on topics that are familiar or of personal interest. • Can describe experiences and events,

				dreams, hopes and ambitions and briefly give reasons and explanations for opinions and plans.
		B2	**Vantage or** **<u>UPPER INTERMEDIATE</u>**	• Can understand the main ideas of complex text on both concrete and abstract topics, including technical discussions in their field of specialization. • Can interact with a degree of fluency and spontaneity that makes regular interaction with native speakers quite possible without strain for either party. • Can produce clear, detailed text on a wide range of subjects and explain a viewpoint on a topical issue giving the advantages and disadvantages of various options.
C	**Proficient user**	**C1**	**Effective operational proficiency or <u>ADVANCED</u>**	• Can understand a wide range of demanding, longer clauses, and recognize implicit meaning. • Can express ideas fluently and spontaneously without much obvious searching for expressions. • Can use language flexibly and effectively for social, academic and professional purposes. • Can produce clear, well-structured, detailed text on complex subjects, showing controlled use of organizational patterns, connectors and cohesive devices.
		C2	**Mastery or <u>PROFICIENCY</u>**	• Can understand with ease virtually everything heard or read. • Can summarize information from different spoken and written sources, reconstructing arguments and accounts in a coherent presentation. • Can express themselves spontaneously, very fluently and precisely, differentiating finer shades of meaning even in the most complex situations.

APPENDIX 2

Agriculture and Natural Resources 50 (2016) 133–138

Contents lists available at ScienceDirect

Agriculture and Natural Resources

journal homepage: http://www.journals.elsevier.com/agriculture-and-natural-resources/

Original article

Spermicidal effects of lemon juice and juices from other natural products

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ARTICLE INFO

Article history:
Received 3 October 2014
Accepted 21 September 2015
Available online 9 June 2016

Keywords:
Lemon juice
Natural products
Spermicide

ABSTRACT

The study of spermicidal effects of lemon juice and juices from other natural products consisting of pineapple juice, apple juice and aloe vera juice, was carried out to develop methods of contraception using natural products. Semen was donated by 20 men from infertile couples who came to an infertility clinic at the Department of Obstetrics and Gynecology, Ramathibodi Hospital, Bangkok, Thailand from 1 November 2007 to 31 March 2010. Spermicidal effects were measured by observing changes in sperm viability, morphology and motility after the semen was mixed with lemon juice and the juices from the other natural products (pineapple juice, apple juice and aloe vera juice). Changes in sperm characteristics were compared with pure semen left at room temperature. After the semen was mixed with lemon juice, sperm were instantaneously immobilized and irreversibly deformed. A reduced spermicidal effect was observed when the semen was mixed with the other juices. A second, profound spermicidal effect was observed when semen was mixed with pineapple juice. The least effects were observed when the semen was mixed with aloe vera juice. This information can be used for the further development of natural barrier methods of contraception.

Introduction

The use of available household or commercial products as spermicidal agents for contraception has long been investigated. Umpierre et al. (1985) found that Coca-Cola had a spermicidal effect. However, the study of Hong et al. (1987) provided quantitative evidence that Coca-Cola and Pepsi-Cola have little, if any, spermicidal effect and thus their application as a postcoital douching is a practice lacking scientific foundation. Lemon juice solutions have been shown to immobilize sperm in the laboratory (Short et al., 2004), as has Krest Bitter Lemon drink (Nwoha, 1992). While the author of the Krest Bitter Lemon study suggested its use as a postcoital douche, this is unlikely to be effective, as sperm begin leaving the ejaculate (out of the reach of any douche) within 1.5 min of deposition. No published studies appear to have been done on the effectiveness of lemon juice preparations in preventing pregnancy, though they are advocated by some as 'natural' spermicide.

Short et al. (2004) from the University of Melbourne reported that lemon juice is not only an effective form of contraception, but also had effect on the HIV virus. The study of Sagay et al. (2009) on genital tract abnormalities among female sex workers who had douched with lemon/lime juice in Nigeria found that the practice of douching with citrus juice may be a risk factor for cervical dysplasia. They suggested that further studies to explore the association between douching with lime juice and cervical dysplasia are warranted in communities where this practice is common. Besides using lemon juice as a spermicidal agent, other natural products from plants have been studied to evaluate their effects on sperm (Farnsworth and Wall, 1982).

The current study investigated the spermicidal effects of lemon juice (*Citrus limon*) and juices of other natural products available—juice from pineapple (*Ananas comosus*), apple (*Malus estica*), and aloe vera (*Aloe vera*). Changes in sperm characteristics were compared with changes in control semen which was left at room temperature without mixing with any juices. The effects of the juices could lead to applicable information for the development of natural techniques of contraception.

Materials and methods

This research was approved by the Ethical Clearance Committee on Human Rights Related to Researches Involving Human Subjects,

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http://dx.doi.org/10.1016/j.anres.2015.09.004

Faculty of Medicine, Ramathibodi Hospital, Mahidol University (MURA 2007/194) issued on 14 June 2007.

Semen samples were obtained from 20 volunteers who came to the Infertility Clinic, Ramathibodi Hospital, Bangkok, Thailand from 1 November 2007 to 31 March 2010. The semen samples were collected in the Reproductive Biology Laboratory of Ramathibodi Hospital and then were allowed to liquefy for at least 20 min at 37 °C in an incubator and were analyzed within 60 min. One milliliter of semen was mixed with 1 mL of each natural product (1:1 by volume) consisting of pure and diluted lemon juice, pineapple juice, apple juice and aloe vera juice. Changes in the characteristics of sperm were observed and compared with control semen which was left at room temperature without mixing with any of the solutions. Sperm concentration, viability, morphology and motility were evaluated using standard techniques (Schrader et al., 1992; World Health Organization, 1999). Sperm morphology was scored using the Tygerberg Kruger strict criteria (Kruger et al., 1987). Volunteers were aged 25–55 yr with no history of medical diseases such as diabetes mellitus, hypertaion, hyper or hypothyroid or any autoimmune diseases and no history of chemotherapy or radiation. They had not been vasectomized and were not heavy smokers or heavy alcohol drinkers.

All 20 semen samples were processed and analyzed by researchers at the laboratory. A routine semen analysis was performed which included the following parameters: semen volume, sperm concentration, sperm viability, sperm morphology and sperm motility.

Sperm concentration

Measurement of sperm concentration was carried out under a microscope (40×) after the semen had been dropped into a Neubauer Hemocytometer. Scanning the slide and estimating the numbers of spermatozoa (both viable and non-viable) per field or part of a field equivalent to 1 mL gave an approximate sperm concentration in millions per milliliter.

Sperm viability

The viability of sperm was determined using eosin staining and examination under a microscope (100×). Two hundred spermatozoa were counted with a light or phase contrast microscope before differentiating the live (unstained) spermatozoa from the dead (stained) cells.

Sperm morphology

Morphological measurements of the sperm were undertaken by examining the sperm under a microscope (100×) after staining with methyl alcohol, eosin, and methylene blue. The percentage of normal morphological sperm was recorded. As each slide was examined systematically from one field of the microscope to the next, all normal spermatozoa were assessed and scored and the defects of the abnormal spermatozoa were noted. For normal morphology characteristics of sperm, the sperm must be vigorously motile and the sperm head must be a symmetrical, oval shape of the appropriate size (World Health Organization, 1999).

Sperm motility

Sperm motility was observed and classified. At least five fields of the microscope were assessed in a systematic way to classify 200 spermatozoa. The motility of each spermatozoon was graded *a*, *b*, *c* or *d*, according to whether it showed the following characteristics: *a* indicated rapid progressive motility (at least 25 μm/s at 37 °C and at least 20 μm/s at 20 °C); *b* indicated slow or sluggish progressive motility; *c* indicated non-progressive motility (less than 5 μm/s); and *d* indicated immotility.

Within a defined area of the fields indicated by lines A and B formed by a graticule in the focal plane of the microscope, all spermatozoa with grade *a* and *b* motility were counted first. Subsequently, the spermatozoa with non progressive motility (grade *c*) and immotile spermatozoa (grade *d*) were counted in the same areas. The numbers of spermatozoa in each category were tallied with the aid of a laboratory counter. The count of 200 spermatozoa was repeated on a separate 1 mL specimen from the same semen sample and the percentages in each motility grade from the two independent counts were compared and averaged. Sperm motility was also scored for statistical analysis. Levels *a*, *b*, *c* and *d* were allocated score of 3, 2, 1 and 0, respectively.

Preparation of juices of natural products

1) The lemons bought from a supermarket were cleaned and washed with soap and tap water. Then, each lemon was divided in half before squeezing to obtain the juice which was filtered through a clean cloth. About 2 mL of juice was obtained from one lemon. Diluted lemon juice was prepared by adding 1 mL of sterile water into 1 mL of fresh lemon juice (1:1 dilution). Only 1 mL of diluted lemon juice was mixed with semen.
2) The natural products consisting of apple, pineapple, and aloe vera were bought from a supermarket. All the fruits were washed and cleaned with soap and tap water. The skins of the fruits were peeled before dividing each fruit into small pieces of 2–3 mm^3, which were then ground using a grinding machine and squeezed to obtain the juice. The juices were then filtered through a clean cloth to eliminate the sediments.

Each type of the juice was prepared fresh just before mixing with semen. Data analysis was done using the SPSS Statistics 18.0 Mahidol package (SPSS Inc; Chicago, IL, USA). Comparison of qualities of sperm within and between groups was undertaken using the General Linear Model (GLM) for repeated measurement.

Results

Sperm concentration

In the control semen, the mean number of sperm concentration was stable over time at 55–64 × 10^6 per mm^3. After the semen was mixed with pure lemon juice, the mean concentration of sperm decreased instantaneously to zero and remained so. When semen was mixed with the other kinds of juice, the mean concentration of sperm decreased gradually and significantly ($p < 0.001$) when compared with the control. Among the other juices, the pineapple juice had the lowest mean concentration of spermatozoa (Table 1). When the mean concentrations of sperms were compared between each mixture of sperm and juice from the natural products, there were statistically significantly differences between each type of mixture except between semen mixed with diluted lemon juice and semen mixed with aloe vera juice (both not significant) as shown in Table 1.

Sperm viability

The viability of sperm in the control semen left at room temperature gradually decreased over time. Mean numbers of viable sperm were significantly different ($p < 0.001$) between the control semen and the semen mixed with each kind of juice. The viability of the sperm after mixing with lemon juice decreased immediately to

Table 1
Mean concentration of sperm ($\bar{X}\pm SD$) in control semen and semen mixed with lemon juice, diluted lemon juice, pineapple juice, apple juice and aloe vera juice over time.

Time (min)	Control[1] $\bar{X}\pm SD$ ($\times 10^6/mm^3$)	Lemon[2] $\bar{X}\pm SD$ ($\times 10^6/mm^3$)	Diluted lemon[3] $\bar{X}\pm SD$ ($\times 10^6/mm^3$)	Pineapple[4] $\bar{X}\pm SD$ ($\times 10^6/mm^3$)	Apple[5] $\bar{X}\pm SD$ ($\times 10^6/mm^3$)	Aloe vera[6] $\bar{X}\pm SD$ ($\times 10^6/mm^3$)
0	69.65 ± 16.40	0.00 ± 0.00	28.08 ± 8.93	5.85 ± 3.23	18.00 ± 10.48	30.05 ± 15.74
5	63.45 ± 18.14	0.00 ± 0.00	24.17 ± 6.78	4.05 ± 2.67	13.15 ± 8.36	25.65 ± 15.80
10	57.85 ± 16.21	0.00 ± 0.00	20.92 ± 5.69	2.95 ± 2.21	13.05 ± 9.78	21.85 ± 14.30
20	54.15 ± 16.40	0.00 ± 0.00	17.42 ± 3.80	1.75 ± 1.48	11.50 ± 10.09	18.55 ± 12.59
30	50.65 ± 18.45	0.00 ± 0.00	12.67 ± 3.82	1.10 ± 0.91	9.80 ± 6.58	13.65 ± 13.07
60	46.40 ± 17.56	0.00 ± 0.00	7.33 ± 2.74	0.60 ± 0.50	6.50 ± 5.15	9.40 ± 12.60

Note: Test of statistically significant difference within and between groups by GLM (General Linear Model) for repeated measurement. All differences were significant ($p < 0.001$) for control semen with semen mixed with each kind of juice and between semen–juice mixture (1)–(6), except between semen mixed with apple juice and with aloe vera juice (5) versus (6), ($p < 0.05$) and between semen mixed with diluted lemon juice and with aloe vera juice (3) versus (6), with the latter being not significant.

zero and remained the same over time. The pure lemon juice killed the sperm instantaneously but the diluted lemon juice (1:1 by volume) did not. The mean number of viable sperm was less when the semen was mixed with pineapple juice than when mixed with diluted lemon juice, apple juice or aloe vera juice. When the semen was mixed with diluted lemon juice, apple juice or the aloe vera juice, the same pattern of change was observed with higher mean numbers of viable sperm. There was a significant difference ($p < 0.001$) between the semen mixed with each type of juices, except for the semen mixed with diluted lemon juice and with apple juice and between the semen mixed with diluted lemon juice and with aloe vera juice (Table 2).

Sperm morphology

In the control semen, the mean percentage of sperm with normal morphology was 5.00 ± 0.80 percent and it decreased steadily over time. There were significant ($p < 0.001$) differences in the mean percentage of sperm with normal morphology between the control semen and semen mixed with the juices of natural products (Table 3). No sperm with normal morphology were observed immediately after semen was mixed with the pure lemon juice. There were significant ($p < 0.001$) differences in the mean percentage of normal morphology sperm for the semen mixed with lemon juice compared with semen mixed with other kinds of juice. The percentage of normal morphology sperm in the mixture of semen and diluted lemon juice was not significantly different from the semen mixed with pineapple juice and with apple juice. There was no significant difference between the semen mixed with apple juice and with aloe vera juice (Table 3).

Sperm motility or progression

Motility or progression of spermatozoa was categorized as previously described. The levels of sperm motility were unchanged at level *b* (score = 2) when the control semen was left at room temperature at 5 min, 10 min, 20 min and 30 min. After 60 min at room temperature, 40 percent of spermatozoa had progressively decreased to level *c* (score = 1) as shown in Table 4.

After mixing the semen with the pure lemon juice, all the sperm showed immediate immobility with scores of *d* (score = 0). After the semen had been mixed with the pineapple juice, 85 percent of spermatozoa had progressively decreased to level *c* at 0 min (mean score = 1.15 ± 3.66), 80 percent at 5 min (mean score = 1.05 ± 0.36), and 100 percent at 10 min (mean score = 1.00 ± 0.00). However, at 20 min, 30 min and 60 min, the percentages of sperm progression in level *c* were 95 percent (mean score = 0.90 ± 0.30), 60 percent (mean score = 0.60 ± 0.50), and 50 percent (mean score = 0.5 ± 0.51), respectively (Table 4). After the semen was mixed with apple juice, the percentage of sperm was 95 percent at level *b* (mean score = 1.90 ± 0.31) at 0 min, 5 min, 10 min and 20 min, respectively, and 5 percent at level *b* (mean score = 1.05 ± 0.22) at 30 min and 60 min, respectively (Table 4).

Sperm progression after mixing with the aloe vera juice was unchanged, that is, 100 percent at level *b* at 0 min and 5 min, respectively, then at 10 min, 15 percent of spermatozoa had decreased to level *c* (mean score = 1.85 ± 0.37), at 20 min, 35 percent were at level *b* (mean score = 1.65 ± 0.49), at 30 min, 75 percent were level *c* (mean score = 1.25 ± 0.44), and at 60 min, 90 percent were level *c* (mean score = 1.10 ± 0.31) as shown in Table 4. When the semen was mixed with the diluted lemon juice, the level of progression of spermatozoa was unchanged (100% at level *b*) at 0 min, 5 min and 10 min. After that, at 20 min, 50 percent of sperm decreased to level *c* (mean score = 1.50 ± 0.52) and 100 percent of sperm decreased to level *c* (mean score = 1.00 ± 0.00) at 30 min and 60 min, respectively (Table 4).

pH of juices from natural products

The spermicidal effects of juices of natural products varied by the type of natural product. Several different characteristics of these juices could account for their spermicidal effects. One of these characteristics was acidity (pH). Pure lemon juice had the lowest pH (pH = 1), which resulted in immediate and profound

Table 2
Mean number of viable sperm ($\bar{X}\pm SD$) in control semen and semen mixed with lemon juice, diluted lemon juice, pineapple juice, apple juice and aloe vera juice over time.

Time (min)	Control[1] $\bar{X}\pm SD$ ($\times 10^6/mm^3$)	Lemon[2] $\bar{X}\pm SD$ ($\times 10^6/mm^3$)	Diluted lemon[3] $\bar{X}\pm SD$ ($\times 10^6/mm^3$)	Pineapple[4] $\bar{X}\pm SD$ ($\times 10^6/mm^3$)	Apple[5] $\bar{X}\pm SD$ ($\times 10^6/mm^3$)	Aloe vera[6] $\bar{X}\pm SD$ ($\times 10^6/mm^3$)
0	71.25 ± 21.27	0.00 ± 0.00	29.50 ± 3.50	6.35 ± 3.96	20.10 ± 7.20	23.30 ± 15.69
5	65.45 ± 20.51	0.00 ± 0.00	22.25 ± 4.84	4.55 ± 2.70	17.95 ± 7.72	20.35 ± 12.51
10	61.95 ± 20.31	0.00 ± 0.00	18.85 ± 3.23	3.00 ± 2.32	14.95 ± 5.46	16.35 ± 9.82
20	58.70 ± 22.64	0.00 ± 0.00	16.75 ± 4.00	2.10 ± 1.62	12.40 ± 5.36	13.25 ± 6.69
30	54.75 ± 21.87	0.00 ± 0.00	12.67 ± 2.10	0.85 ± 0.67	9.15 ± 8.09	13.70 ± 9.50
60	51.00 ± 17.00	0.00 ± 0.00	7.83 ± 2.08	0.50 ± 0.51	6.25 ± 5.50	9.50 ± 4.93

Note: Test of statistically significant differences within and between groups by GLM (General Linear Model) for repeated measurement. All differences were significant ($p < 0.001$) for control semen with semen mixed with each kind of juice and between semen–juice mixture, except between semen mixed with diluted lemon juice and with apple juice, (3) versus (5) and between semen mixed with diluted lemon juice and with aloe vera juice, (3) versus (6), which were both not significant.

Table 3
Mean percentage of normal morphology of sperm ($\bar{x}$±SD) in control semen and semen mixed with lemon juice, diluted lemon juice pineapple juice, apple juice and aloe vera juice over time.

Time (min)	Control[1] $\bar{x}$±SD (%)	Lemon[2] $\bar{x}$±SD (%)	Dil lemon[3] $\bar{x}$±SD (%)	Pineapple[4] $\bar{x}$±SD (%)	Apple[5] $\bar{x}$±SD (%)	Aloe vera[6] $\bar{x}$±SD (%)
0	5.00 ± 0.80	0.00 ± 0.00	3.75 ± 0.97	3.80 ± 1.61	3.50 ± 1.28	4.15 ± 1.31
5	4.15 ± 0.67	0.00 ± 0.00	2.75 ± 0.97	3.45 ± 1.57	3.10 ± 1.02	3.60 ± 1.19
10	3.35 ± 0.67	0.00 ± 0.00	1.67 ± 0.65	2.70 ± 1.22	2.45 ± 0.89	2.90 ± 0.91
20	2.70 ± 0.57	0.00 ± 0.00	1.33 ± 0.65	2.15 ± 0.93	2.05 ± 0.69	2.40 ± 0.82
30	2.05 ± 0.39	0.00 ± 0.00	0.17 ± 0.39	1.55 ± 1.00	2.00 ± 0.80	1.75 ± 0.72
60	1.40 ± 0.50	0.00 ± 0.00	1.17 ± 0.39	0.95 ± 0.69	0.95 ± 0.40	1.15 ± 0.49

Note: Test of statistically significant differences within and between groups by GLM (General Linear Model) for repeated measurement. All differences were significant ($p < 0.001$) for control semen with semen mixed with juices and between each kind of semen–juice mixture, except for semen mixed with diluted lemon juice and with pineapple juice (3) versus (4), between semen mixed with diluted lemon juice and with apple juice (3) versus (5) and between semen mixed with apple juice and with aloe vera juice (5) versus (6), which were all not significant.

Table 4
Mean score of sperm progression in control semen and semen mixed with lemon juice, diluted lemon juice pineapple juice, apple juice and aloe vera juice over time.

Time (min)	Control[1] $\bar{x}$±SD (score)	Lemon[2] $\bar{x}$±SD (score)	Dil. lemon[3] $\bar{x}$±SD (score)	Pineapple[4] $\bar{x}$±SD (score)	Apple[5] $\bar{x}$±SD (score)	Aloe vera[6] $\bar{x}$±SD (score)
0	2.00 ± 0.00	0.00 ± 0.00	2.00 ± 0.00	1.15 ± 3.66	1.90 ± 0.31	2.00 ± 0.00
5	2.00 ± 0.00	0.00 ± 0.00	2.00 ± 0.00	1.05 ± 0.36	1.90 ± 0.31	2.00 ± 0.00
10	2.00 ± 0.00	0.00 ± 0.00	2.00 ± 0.00	1.00 ± 0.00	1.90 ± 0.31	1.85 ± 0.37
20	2.00 ± 0.00	0.00 ± 0.00	1.50 ± 0.52	0.90 ± 0.30	1.90 ± 0.31	1.65 ± 0.49
30	2.00 ± 0.00	0.00 ± 0.00	1.00 ± 0.00	0.60 ± 0.50	1.05 ± 0.22	1.25 ± 0.44
60	1.60 ± 0.50	0.00 ± 0.00	1.00 ± 0.00	0.50 ± 0.51	1.05 ± 0.22	1.10 ± 0.31

Note: Score of sperm progression: level $a = 3$, level $b = 2$, level $c = 1$, level $d = 0$. Test of statistically significant difference within and between groups by GLM (General Linear Model) for repeated measurement. All differences were significant ($p < 0.001$) for the control semen with semen mixed with different juices and between each semen–juice mixture (1)–(6), except between semen mixed with diluted lemon juice and with pineapple juice (2) versus (3) and between semen mixed with apple juice and with aloe vera juice, (5) versus (6), which were both not significant.

spermicidal action. Diluted lemon juice had pH = 2 at the beginning and increased in pH after 10 min and later. Pineapple juice which had the second best spermicidal effects had pH = 3 at the beginning and increased to pH = 4 at 5 min and 10 min and then to pH = 5 later. Apple juice had pH = 4 at the beginning and pH = 5 for most of the time after that. Alove vera juice had pH = 6 during most of the experiment (Fig. 1).

Discussion

This study confirmed that the natural products from plants are likely to make practical fertility-regulating agents. In the past, lists of plants were investigated to discover some practical and safe contraception. Plants are definitely sources of many useful and widely-employed drugs, and so practical fertility-regulating agents are likely to be discovered eventually from these sources (Farnsworth and Wall, 1982).

Farnsworth and Wall (1982) noted that the mechanisms of the agents that inhibit fertility by changing the characteristics of human sperm include disruption of spermatozoon plasma membranes (nonoxynol 9). Numerous enzymatic systems in viable sperm are also susceptible to inhibition, such as those involving glycolysis and energy productive myosin contraction. A large number of plants have been randomly selected and screened for spermicidal activity *in vitro* and several appear promising. For example, oleanolic acid and saponins in roots and seeds of several plants were found to have spermicidal effects (Farnsworth and Wall, 1982).

The current study confirmed a previous study that lemon juice immobilized sperm in the laboratory (Short et al., 2004) as did Krest Bitter Lemon drink. The mechanisms for this action are postulated to be due to its high acidity (pH = 2) which destroys spermatozoon plasma membranes. The study of Nwoha (1992) also found that the alkalinity of all drinks decreases spermicidal action. Coca-Cola and Krest bitter lemon juices may achieve very high

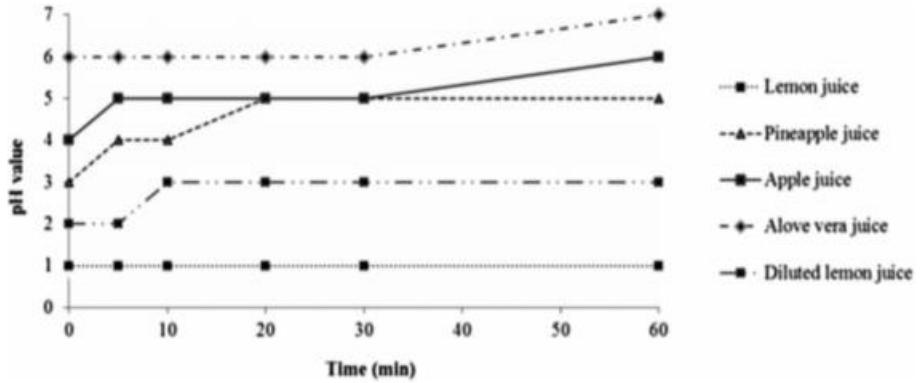

Fig. 1. pH from juices of natural products.

efficacy if used as a post-coital douche, especially in the impoverished and densely populated third worlds. While the authors of the Krest Bitter Lemon study suggested its use as a postcoital douche, it is unlikely to be effective as no published studies have been done on the effectiveness of lemon juice preparations in preventing pregnancy, though they are advocated by some as a 'natural' spermicide (Short et al., 2004). Proper applications of spermicidal agents in conjunction with other barrier methods (such as a cervical cap or diaphragm or a tampon soaked with lemon juice or any kind of juice which has spermicidal effects, inserted into upper vagina just before intercourse) might be likely to have contraceptive effects, especially in an emergency and where no other method is available.

The study of Sagay et al. (2009) from the University of Jos, Nigeria on genital tract abnormalities among female sex workers who douched with lemon or lime juice, showed that the practice may be a risk factor for cervical dysplasia and further studies to explore the association between vaginal douching with lime juice and cervical dysplasia are warranted in communities where this practice is common. However, daily intravaginal administration of lime juice to macaque monkeys for one month causes no vaginal pathology (Sagay et al., 2009).

Nowadays, intravaginal lemon and lime juice douches are used by women in Nigeria to protect themselves from pregnancy and supposedly from sexually transmitted infections (Short et al., 2004). They advocated that lemon juice is not only an effective form of contraception, but also had an effect on the HIV virus. His study was based on his finding that intravaginal lemon juice applied prior to intercourse had been used as a contraceptive by women around the Mediterranean for more than 300 years. His findings also confirmed the contraceptive properties of lemon juice by showing that a 20 percent final concentration of lemon juice in a fresh human ejaculate irreversibly immobilized 100 percent of sperms within 30 s. In the current study, the diluted lemon juice (1:1 by volume) was not as effective as the pure lemon juice.

Investigations into spermicidal effects of juices from natural products have two major benefits. First, if the spermicidal effects are significant, they could be used as a component of a barrier contraceptive method when they are soaked into a tampon that is then inserted into the upper vagina just before sexual intercourse. Because juices are available in households or nearby markets, this type of contraception can be suitable for use as an emergency method. Second, as these juices are all natural products, their toxicity would be nonexistent or mild when compared to synthetic products.

Penniston et al. (2008) discussed lemon juice and its components from which the following information is sourced. Lemon juice had the lowest pH at 1–2 because of citric acid which is the main component. Lemons are a rich source of vitamin C, providing 64 percent of the Daily Value in a 100 g serving whereas other essential nutrients are not present. As with other citrus fruits, they have a substantial concentration (about 47 g/L in juice) of citric acid. Lemons contain numerous phytochemicals, including polyphenols and terpenes (Rauf et al., 2014). Morton (1987) studied pineapple, one of the fruits from a warm climate and provided the following information. In addition to being used as food and drink, pineapple juice contains bromelain which is composed of a variety of substances, including peroxidase, acid phosphatase, calcium, and protease inhibitors. However, the main active ingredients are two enzymes known as fruit and stem bromelain, which cause break down dietary proteins, easing the body's digestive burden. Commonly applied as a meat tenderizer, when used appropriately, bromelain can tenderize overly inflamed and fibrin-congested muscles and connective tissues with its enzymes. Bromelain's fibrinolytic properties can contribute to thinning the blood; however, those on blood-thinning medications must be careful, especially when consuming any part of the bromelain-rich core. Furthermore, bromelain has the ability to enhance the absorption of other nutrients and drugs due to its ability to modulate intestinal permeability. This can be a good thing, for instance, if one is trying to absorb more of a therapeutic herb or nutrient, but a bad thing if one does not wish to disrupt the delicate pharmacokinetics of the bodily absorption and distribution of potent drugs. Bromelain has even been found to be superior to the highly toxic chemotherapy agent 5-fluorouracil as an anti-tumor agent in preclinical research (Báez et al., 2007). Pineapple juice, due to its low pH and other constituents in the juice, has been found to be effective at inactivating rotavirus, while honeydew and papaya juice failed (Yap et al., 2008). In the current study, pineapple juice was found to be the second most potent spermicide after the pure lemon juice. The role of pineapple juice as a spermicidal agent needs further investigation.

Eisele and Drake (2005) discussed apple juice and its ingredients and provided the following information. Apple juice usually has a pH in the range 3.37–4.24. Its main ingredient that contributes to its acidity is malic acid; although it also contains citric and quinic acid at the average concentration of 11.9 mg/100 mL and 41.8 mg/100 mL respectively, the concentration of malic acid is as high as 847.7 mg/100 mL. Apple juice also contains high concentrations of potassium and phosphate.

Atherton (1998) studied the *Aloe vera* plant and its components and provided the following information. *Aloe vera* contains 75 potentially active constituents: vitamins, enzymes, minerals, sugars, lignin, saponins, salicylic acids and amino acids. The active acid components of *Aloe vera* are ascorbic acid in leaves, and glutaminic acid, aspartic acid, aloetic acid, fomic acid, palmitic acid and estearic acid in plants. Minerals in *Aloe vera* include calcium, magnesium, potassium, zinc, phosphorus, manganese and aluminum.

Shelton (1991) studied the therapeutic properties of *Aloe vera* and provided the following information. Aloin is a compound found in the exudate of some *Aloe* species and was a common ingredient in over-the-counter (OTC) laxative products in the United States until 2002 when the Food and Drug Administration banned it because the companies involved in its manufacture failed to provide the necessary safety data. *Aloe vera* has potential toxicity, with side effects occurring at some dose levels both when ingested or applied topically. Although toxicity may be less when the aloin is removed by processing, *Aloe vera* that contains aloin in excess amounts may induce side effects. Aloe vera juice has been marketed to support the health of the digestive system, but there is neither scientific evidence nor regulatory approval to support this claim and the extracts and quantities typically used for such purposes appear to be dose-dependent for toxic effects (Cosmetic Ingredient Review Expert, 2007).

Among the four tests of sperm characteristics, sperm concentration and sperm viability are two characteristics which showed apparent changes from control semen to semen mixed with the juices of natural products. On the contrary, sperm morphology and sperm progression showed less significant changes. Semen mixed with lemon juice produced immediate sperm death, morphological changes and immobility. Pineapple juice produced the second most potent spermicidal effects especially when sperm concentration and sperm viability were considered. Apple juice and diluted lemon juice showed comparable effects when mixed with semen. Aloe vera juice showed the least effects on sperm characteristics.

Pure lemon juice had profound spermicidal effects. Other juices from natural products showed less effective spermicidal effects to varying degrees. Pineapple juice had a greater effect than apple juice, aloe vera juice, and diluted lemon juice. However, the apple

juice and diluted lemon juice had slow but significant spermicidal effects over a longer period. The aloe vera juice produced the least spermicidal effects.

Conflict of interest statement

The authors declare that there are no conflicts of interest.

Acknowledgment

This study was partially supported by the Chulalongkorn University Graduate School's Scholarship to commemorate the 72nd anniversary of his Majesty the King Bhumibol Adulyadej.

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Вихідні дані

Навчальне видання

ОЛЕНА СЕРГІЇВНА РЕЗУНОВА

АНГЛІЙСЬКА МОВА ДЛЯ НАУКОВЦІВ

Навчальний посібник

Здано на складання 04.07.2019 р.
Підписано до друку 04.07.2019р. Формат 210х297 Папір офсетний. Друк різографічний. Гарнітура Times.
Ум. друк. арк. 11,16
Наклад 50 прим. Замовлення № 0870.
Видавництво ***ПП Кулик В.В.***
Адреса видавництва та друкарні:
49000, м. Дніпро, вул. ім. О. Гончара, буд 15б