МІНІСТЕРСТВО ОСВІТИ І НАУКИ, МОЛОДІ ТА СПОРТУ УКРАЇНИ
Національний університет кораблебудування
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COMPASS for Research Students

Навчальний посібник
для підготовки до кандидатського іспиту
з англійської мови

Рекомендовано Міністерством освіти і науки, молоді та спорту України як навчальний посібник для студентів вищих навчальних закладів

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Навчальний посібник призначений для магістрів, аспірантів і здобувачів технічних спеціальностей, які готуються до кандидатського іспиту з англійської мови. Структура орієнтована на те, щоб допомогти молодим науковцям розвинути навички читання, говоріння та письма на основі типових комунікативних ситуації. Він складається з п’яти розділів, тезаурусу і чотирьох додатків.

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РОЗДІЛ І

Особливості науково-технічного функціонального стилю

Learning the academic
skills necessary to succeed in a tertiary
environment can be an arduous, difficult and complex
process.

Kathy Cox, David Hill "EAP now!"

Питання та відповіді

Чому дослідникові необхідно їх розуміти?

1. Яку роль відіграє сучасна англійська мова як глобальна мова науки?

Наука - це одна з основних сфер, в яких реалізується домінуюче положення англійської мови в світі, першої глобальної мови в історії людства.

Наука - це одна з функціональних сфер, яка за останнє десятиріччя набула особливої ваги в соціальній комунікації. Вона пов'язана з технологією, виробництвом, бізнесом, економічним успіхом. Останній фактор робить мову привабливою для вивчення і виявляється головним для функціональної активності мови.

Після Другої Світової війни величезна кількість наукових і технологічних ресурсів була зосереджена у США, англійська мова почала представляти мову науки, освіти, технології, новітніх комунікаційних технологій (WWW), які стали третьою цивілізаційною революцією після створення письменництва і друку. Накопичення величезних ресурсів

інформації у кінці XX сторіччя створило потребу в її упорядкуванні, структуруванні, збереженні, обробці.

Позитивна роль глобальної англійської мови полягає в тому, що створення інформаційних ресурсів (банків даних), їх поповнення, в основному, відбувається на англійській мові, і тому володіння інформацією приносить економічну вигоду, тобто англійська мова стала привабливою не тільки тому, що відкриває доступ до величезних інформаційних ресурсів (85% наукової англомовної світової інформації), але і забезпечує доступ до більш високих життєвих стандартів (кількість наукової інформації на англійській мові різко зросло, а на інших мовах залишалося незмінною або зменшувалося). Разом з тим розповсюдження англійської мови у всьому світі - це результат цілеспрямованої політики урядів англомовних країн: викладання, видання - це вигідний бізнес і розвинуті індустрії, оскільки існує потреба в існуванні лінгва-франка, (універсального інтердіалекта) - мови міжнародної наукової і технологічної комунікації. Англійська мова – це загальна мова науки в цілому, забезпечення створення універсального набору понять і стандартів , своєрідної понятійної і термінологічної мови – еталону. Крім того, позитивна роль англійської мови (як середньовічної латини) полягає у тому, що вона виступає у функції "зв'язування " різних національних наукових шкіл (особливо у сфері точних наук, де англійська мова - це засіб передачі безособового об'єктивованого знання).

Негативна роль англійської мови полягає в тому, що в області соціальних і гуманітарних наук актуалізується інша функція мови - функція передачі національної, специфічної, етнокультурної інформації. Існує такий аргумент проти використання глобальної, мови: середньовічна латинь була мертвою мовою, тобто не існувало колективу її істинних природних носіїв, тому латина була „культурно нейтральною" мовою. Такою і повинна бути світова (глобальна) мова - звільнена від

національно-культурного контексту. Англійська мова - це жива мова англомовних країн, вона є провідником цінностей їх образу життя. З цієї точки зору глобальне розповсюдження англійської мови відіграє негативну роль, тому, що воно руйнує культурно-мовне багатство наукових шкіл і загрожує мультилінгвізму, плюролінгвізму та багатокультурності, які являються соціальними цінностями.

Домінуюча позиція англійської мови - це факт (спроби ввести мультилінгвізм як наукову практику в Австралії позитивного результату не принесли: англійська мова повністю задовольняє потреби наукової комунікації). Носії англійської мови, до деякої міри, стають «привілеєвою» частиною наукового співтовариства: вони не відчувають труднощів, пов'язаних з вивченням мови і продукування лінгвістично правильних текстів. Тому створюється ситуація нерівноправ'я як мов (функціонального), так і їх носіїв (соціального): носії англійської мови як другої або іноземної мови ніколи не зможуть досягти рівня мовної компетенції носіїв англійської мови як першої іноземної мови - пасивне знання домінує над активними (читання текстів vs усне мовлення) Але наукова значимість текстів на англійській мові оцінюється як більш висока (на правильній, грамотній мові). Недостатнє володіння англійською мовою є перепоною для досягнення високого рівня на світовій арені, тому поняття мовного домінування не зводиться тільки до використання мови, воно означає і більш вигідне інформаційне і соціально-економічне положення носіїв цієї мови.

Привертає увагу і той факт, що представники різних держав і різних мовно-культурних співтовариств по-різному відносяться до цього факту. Наприклад, уряд Фінляндії визнає, що англійська мова дозволяє брати активну участь у процесах глобалізації, розробляти стандарти, методологію, нові продукти. У Філіппінах розглядають англійську мову як мову, яка регламентує сфери спілкування, і тому вона розцінюється як

нейтральна. У Бразилії, Угорщині англійська мова – це мова залучення до „західного" світу, з яким пов'язана ідея економічного розквіту. У Канаді (провінція Квебек) динаміка мовної політики включає п’ять компонентів: 1) соціально-історичний контекст (науково-технічну політику, соціальні цінності, мовну ситуацію); 2) мовну ідеологію (мовна лояльність суспільства, адаптованість до англійської мови); 3) тип знання (природничі, технічні, соціальні, гуманітарні науки); 4) етап науково-технічної діяльності (інновація, визнання, публікація, комерціалізація); 5) мовну політику (створення програмного забезпечення, баз даних, мовних ресурсів, спеціальної термінології, навчальних програм); завдяки такій схемі стриміння англійської мови і підтримки французької мови доля англійської мови у науковій комунікації залишалася тією ж, а доля французької мови виросла.

В Україні українська та російська мови залишаються домінуючими мовами наукового спілкування, а англійська мова обслуговує потреби міжнародного наукового спілкування (зміст, анотації, реферати, статті). Глобальне розповсюдження англійської мови призводить до виникнення змішаної мови як наукового, так і повсякденного спілкування (Малайзія).

Англійська мова теж змінюється: існує ряд етнічних і регіональних варіантів (філіппінський, індійський), тому існування стандарту піддається сумніву, існує тенденція злиття різних функціональних стилів англійської мови: мови науки, технології, бізнесу.

Таким чином, глобальне розповсюдження англійської мови як міжнародної мови науки визнається і отримує всіляку підтримку, але тільки тоді, коли вона обмежена сферою наукової міжнародної комунікації (особливо технічною, тоді її негативний вплив зникає і не вступає у протиріччя з концепцією плюралізму мов і культур).

2. Що таке стиль?

С***тилю*** зв'язаний з використанням спеціальної групи систем словесного вираження в даній сфері спілкування для забезпечення найбільш ефективного спілкування та порозуміння в даній діяльності людини: напр., публіцистичний, науковий стиль. Різниця стилів обумовлюється різним характером і різним призначенням того, що висловлюється. Використання лексичних граматичних одиниць мови підкоряється впливу функціонального стиля і вони починають залежати від комунікативних завдань кожного окремого функціонального стилю.

3.Що таке науковий стиль?

Науковий стиль – це специфічна система мовного вираження (фонетика, графіка, лексика, граматика) для забезпечення ефективного спілкування у науковій діяльності, результати якої описуються та інтерпретуються в наукових творах: статтях, монографіях, підручниках, посібниках, методичних рекомендаціях, анотаціях, резюме. Призначення наукової публікації виражається у формулюванні та доказі наукової гіпотези, нових наукових концепцій, формулюванні внутрішніх законів існування та розвитку нових явищ.

4. Які специфічні якості наукового стилю?

У відповідності до комунікативного завдання наукового стилю відбираються прийоми, які дозволяють досягти таких якостей:

- ясність (експліцитність);
- логічність;
- об'єктивність;

- точність;
- узагальненість;
- абстрактність;
- краткість.

5. Які основні комунікативні завдання вирішує дослідник?

Дослідник вирішує такі комунікативні завдання:

- формулювання наукової гіпотези;
- висунення нових наукових концепцій;
- пояснення розвитку явищ, процесів;
- доказ гіпотези;
- обговорення.

6. Що таке жанр тексту?

Жанр, в загальному розумінні, – це засіб вираження конкретної комунікативної мети. Для наукового стилю характерні такі жанри: стаття, монографія, патент, інструкція, анотації, реферати, доповіді та ін.. Жанр визначає особливості стилю, особливості мови конкретного тексту.

7. Чи проявляється різниця різних культур у науковому стилі?

Будь-який текст, написаний на будь-якій мові, сприймається як зв’язний і зрозумілий тільки в умовах реальної комунікації, з урахуванням всіх факторів, які визвали його появу. Тому треба не тільки вивчити граматику та лексику, але й навчитися соціокультурним особливостям, які роблять його (текст) культурно прийнятним для носіїв мови. “Серед таких

особливостей є національно- та культурно-специфічні засоби висловлювання думки" (О.Б. Тарнопольський). Наприклад, англомовне письмо передбачає пряме та послідовне висловлювання думок без будь-яких відхилень, тобто зразу йдеться про головну ідею, і саме вона повинна підкріплюватися аргументами, а надання зайвої, з точки зору головної ідеї, інформації не дозволяється. В україномовному письмі припустимі відхилення від головної думки, екскурси в різних напрямках, які мають досить віддалене відношення до провідної інформації абзацу або тексту в цілому. В першу чергу, національні особливості стосуються композиції та структури наукових текстів різножанрової представленості (есе, стаття), напр., в англомовних наукових текстах більш чітко вимагається презентація комунікативної мети тексту і послідовне дотримування цієї мети у всьому тексті.

Завдання

1. *Спробуйте порівняти тези доповідей, анотації статей, статті, які написані англійською та українською мовами, присвячені одній темі, або ж принаймні пов'язані однією тематикою (структура тексту, граматичні, лексичні особливості).*

2. *Try to answer the following question: Why do men take up science? Read the following meditations of C. P. Snow on this subject. Do you agree with the author? Make use of the vocabulary given below.*

"One can do science because one believes that practically and effectively it benefits the world. A great many scientists have had this as their chief conscious reason. One can do science because it represents the truth. One selected one's data — set one's puzzle for oneself, as it were—and in the end solved the puzzle by showing how they fitted other data of the same kind. It is

rather as though one was avidly interested in all the countryside between this town and the next: one goes to science for an answer, and is given a road between the two. One can also do science because one enjoys it. Many people like unraveling puzzles. Scientific puzzles are very good ones, with reasonable prizes. So that either without examining the functions of science, being indifferent to them or taking them for granted, a number of men go in for research as they would for law; living by it, obeying its rules, and thoroughly enjoying the problem-solving process. This is a perfectly valid pleasure, among them you can find some of the most effective of scientists. Nowadays I should allow more for accident; many men become scientists because it happens to be convenient and they may as well do it as anything else. But the real urgent drives remain."

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to do science; to benefit the world/one's nation (to be a benefit to the world/nation); to represent the truth; to like unravelling/solving puzzles; to go in for/to take up; to do; research; to enjoy the problem-solving process; to be devoted to science; to be a devoted scientist; to gain enjoyment from research; to enjoy science; to examine the functions of science; to take smth for granted; to have a belief in scientific values; one's dedicated search for scientific truth, a capacity for (detailed) scientific analysis/criticism; to have a scrupulous / tidy / analytical mind; to be out of one's reach; to have insight / imagination / drive, etc.; to envy smb. for the precision / rapidity / elegance of one's experiments; one's subtle / fertile mind; to be quick / bright / slow, etc.; to be full of facts / speculations / ideas, etc.; to overflow with a sort of scientific wit; to be a born scientist / scholar; to rush into work; to tackle / to solve the problem; to strike / to keep up to a useful line of one's own; to have a sudden flash of an idea; spurred by the success; to develop / to use a method of...; to generalize.

3. Answer the questions about your university studies and research:

- How long did your University course last?
- Did you have ample (enough) time to discover your interests?
- Where the syllabuses overloaded? When you studied of University?
- Did every scrap of knowledge find application?
- Is there any thing as useless knowledge?
- Should textbooks be more self-instructive?
- Does what is taught in science sometimes lag behind present-day concepts?
- Have you seen how "science in done"?
- When did you choose your special field?
- What did you specialize in?
- Hove you acquired skills in research? What are they?
- Did you do your research mainly for your graduation paper?
- Who was your supervisor (scientific advisor)?
- Were the results valuable enough for professional journal publication?
- Is there a gap between "pure" and applied sciences?
- Applied sciences are of prime importance in our time; aren`t they?
- Are you the person who can advance a new theory, work out a new method; find a suitable technique for the experiment; see a new approach to the problem; develop a new technique, create a new device.
- Do you like to be a man of wide interests, to be a team leader, to develop new skills, to get help and support?
- What is a very productive research year for you? (to give a report, to write a paper, to participate in a scientific conference, to apply data to feather research) make quick progress in your research, to be though with your research.

- What, in your opinion, is the most important problem today?
- What conditions are necessary for its successful solution?
- There are scientists who have exception all excellent minds who work independently, others are creators of scientific schools who share their experience, knowledge they possess with their pupils.

4. What are main characteristics of academic writing style?

Academic English

In your years of studying English you have probably become aware of the fact that there is a difference between English that is used in informal situations and English that is used in formal situations. When you are speaking, it is sometimes difficult to determine how formal your English should be. In writing it is less difficult to determine which style of language is appropriate. The research paper is the most formal kind of academic activity you will be required to complete, and the language that you use in writing it must be suitable to the formality of the assignment.

Although not all teachers agree on the exact characteristics of formal English, there are several commonly accepted conventions of language use that should be followed when you write your paper. The following are some general guidelines to help you use formal language when you write research papers:

1. Do not use contracted forms of verbs (e.g., doesn't, it's, etc.).
2. Avoid two-word verbs, especially those that have one-word synonyms (e.g., bring up, look over, etc.).
3. Do not use slang expressions or colloquial expressions. A good dictionary will help you identify these (e.g., blow off, kid, etc.).
4. Avoid the use of" a lot of'; use the more formal equivalents of" a great deal of," "a large number of," or "many."

5. Make your word choices as accurate as possible. Words like "thing" and "way" should be avoided in favor of more precise terms.

6. Avoid the use of the dash (—) as a punctuation mark. If your sentence is properly composed, a comma, colon, or semicolon can be substituted.

Using formal English in writing your paper does not mean using "unnatural" language. Formal English is clear and logical.

5. Read the following. What is important for understanding Academic English style?

1. "The language of the science^ is a peculiarly difficult subject, for language is a product of complex and ever-changing conditions. Words cannot be fixed or stabilized and they carry with them a history that needs to be traced right up to the moment of their usage." Emeritus Prof. Charles Singer in the Encyclopaedia Britannica 1965, under SCIENCE, Vol. 20, pp. 122-3.

2. "The form of an article is more important than most professional scientists are willing to admit. Authors who earn a living by writing, and who are thus persuaded that it is a great indulgence on the part of readers to consent to read any article from start to finish, must constantly be surprised at the assumption by part-time authors that the written word is instantly devoured by all who see it. The problem is not simply language but the lack of conviction that authors must take trouble to help their readers understand." John Maddox (then Editor of Nature), in Nature, vol. 221, January 11, 1969, pp. 128 - 30.

3. "The best English writers occasionally use some of the strange constructions mentioned in this article, often to produce a special effect for a particular occasion. They do so, however, only at long intervals. The greater part of their writing is so smooth and fluent that the reader forgets that he is reading and knows only that he is absorbing ideas." Dr. John R. Baker, in Nature, vol. 176, November 5, 1955, pp. 851-2.

4. "People prefer to read well below their education level. . ." Douglas Mueller, president of the Gunning-Mueller Clear Writing Institute in Santa Barbara. California, quoted by William E. Blundell in The Asian Wall Street Journal.

5. ". . . in the words of another old grammarian, the golden rule of writing is 'that the words or members most nearly related should be placed in the sentence as near to one another as possible, so as to make their mutual relation clearly appear'." A Dictionary of Modern English Usage by H. W. Fowler, 2nd ed. revised by Sir Ernest Gowers, Clarendon Press, 1965.

РОЗДІЛ ІІ

Phonetic Basics in Use

1. Read the poem about the intricacies of the English pronunciation.
What is your experience in reading in English?
Have you got any problems?
What problems have you got?

When the English tongue we speak,
Why is “break” not rhymed with “weak”?
Will you tell me why it’s true,
We say “sew”, but likewise “few”?
And the maker of a verse
Can’t rhyme his “horse” and “worse”.
“Beard” sounds not the same as “heard”.
“Cord” is different from a “word”.
“Cow” is “cow”, but “low” is “low”,
“Shoe” is never rhymed with “toe”.
Wherefore “done”, but “gone” and “lone”.
Is there any reason known?
And in short it seems to me
Sounds and letters disagree.

UNKNOWN

Give your examples of reading difficulties if any.

***2**. Study the following tables:*

Таблиця № 1. **Таблиця графічних відповідностей англійських букв і буквосполучень**

Букви і буквосполучення	Місце вживання	Звукова відповідність	Приклад
-a- -ai- -ei-, -ey- -ea- -eigh- -aight-	I тип читання	[ei]	wave, trade mail, daily they, grey great, break eight straight
-o- -oa- -ow- -ought-	I тип читання gthtl -l-, -ll-, -ld-, -st-, -th- в кінці слова	[ou]	globe, ocean, old, post boat, coast bow, tow though
-e- -ea- -ee- -ie- -ei-	I тип читання перед –v- (-e-), -f-, перед -l-, після -c- перед -v-(-e-), -l-	[i:]	me, we sea, speak see, meet believe, chief ceiling, receive
-i-,-y- -igh-	I тип читання перед –nd-, –ld-	[ai]	my, line, find high, right

-u- -ew- -ui- -oo- -ou-, -o-	I тип читання	[ju:] [u:]	cube, rule few, new fruit, cruise cool, tool you, route, do
-e- -ea-	II тип читання перед -d-, -t-, -th-, -l-	[e]	west, deck ready, weather
-i-, -y- -y- -age -edge	II тип читання в кінці слова	[i]	in, it many, very language knowledge
-o- -a-	II тип читання після -w-, -wh-, -qu-	[ɔ]	on, long want,water
-u- -ful -oo-	у закритому складі після -b-, -p-, -f- перед -k-	[u]	full, pull peaceful book, took
-u- -o- -ou-	II тип читання у закритому складі перед -n-, -m-, -v-, -th- у деяких словах	[^]	up, hull mother$_s$ ton country, young
-ar- -a-	III тип читання перед -ff-, -ph-, -f-, -ss-, -s-, -th- -n- + голосна	[a:]	barge, far craft, class, past

-or- -au-, -aw- -a- + -l-, - ll-, -k- -a-, -ar- -oar- -ough- -augh-	III тип читання після -w-, -wh-, - qu-	[o:]	port, sport august, draw all, talk warm quarter board though daughter
-er- -ur- -ir- -ear- -or-	III тип читання III тип читання III тип читання після -w-	[ə:]	serve, stern turn, surface first, third early, learn work, world
-oi- -oy-		[oi]	boil, toil boy, voyage
-ou- -ow-	у закритому складі в кінці складу перед -n-, -l-, -d-	[au]	out, south now, how, town, crowd
-are- -air- -ere-	 у деяких словах	[ɛə]	prepare, square chair, pair where, there
-ere- -ear- -eer-		[iə]	here, sphere hear, dear engineer, pioneer
-ire- -io- -ia-		[aiə]	fire, wire lion, pioneer
-ure- -our-		[uə] [juə]	pure, Urals tour, contour

-our- -ower-		[auə]	hour, our power, flower

Таблиця № 2. **Читання приголосних і поєднання з приголосними**

Приголосні та їх сполучення	Місце вживання	Звукова відповідність	Приклад
-c- -ch- -ck-	 перед -e-, -i-, -y- у запозичених з франц. мови у словах грецького походження у середині слова	[k], [s] [tʃ], [ʃ] [k]	cargo, act, face, cycle, cinema, chair, change machine, Chicago mechanical, anchor pack, deck
-g- -igh- -gh-	 перед -e-, -i-, -y- у деяких словах	[g] [dʒ] [ai] [f]	go, regular, barge, logic night, light, enough, laugh
   -x-	 перед ударним складом, якщо немає інших приголосних	[kx] [gz]	text, mix, example, exact
-th- -ti-	в оточенні голосних і в службових словах у середині слова	[ɵ] [p] [ʃ]	thick, youth, weather, the partial, ambition
kn-	на початку слова	[n]	know, knot
-wr-		[r]	white, wrong
	у деяких випадках	[h]	who, whom, whose,

-wh-	у деяких випадках	[w]	what, why, when
-ph-	у словах грецького походження	[f]	physics, photo
-sh- -si-	у середині слова	[ʃ]	ship, show Asia

Таблиця № 3. **Читання голосних і сполучення голосних**

Голосна та їх сполучення	Звукова відповідність тип читання				Сполучення голосних	Звукова відповідність	Приклади
	I	II	III	IV			
-a-	[ei] name	[əe] lab	[a:] car	[ɛə] care	ai au, aw a – lf, lf, lve a – l , ll a – ss, st, sk, sp, nt, nce, ft	[ei] [ɔ:] [a:] [ɔ:] [a:]	sail launch, saw half small, salt past class dance craft
-o-	[ou] no	[ɔ:] stop	[ɔ:] port	[ɔ:] shore	oo ou, ow oa oi, oy oor, our, oar o – ld ou – gh - t o	[u:] [u] перед k [au] [ou] [u] [ʌ] [ou] [oi] [ɔ:] [ou] [ɔ:] [ʌ]	cool book now round grow group double boat oil door, your car cold thought some

-e-	[i:] me	[e] and	[ə:] term	[iə] here	ea ear ee ew, eu eer, ear eight	[i:] [e] [ei] [iə] [ə:] [i:] [ju:] [iə] [ei] [ai]	dean head great real early deep new newtral year eight height
-u-	[ju] cube	[ʌ] hull	[ə] turn	[ju] purl	ui	[u]	cruise
-i-, -y-	[ai] line	[i] six	[ə:] firm	[aiə] wire	ie i - nd, ld, gh	[i] [ai]	chief find bright child

3. Practice the following:

A

cake – cat – car – care

1. Haste makes waste.
2. Tastes differ.
3. Take care of a penny and a pound will take care of itself.
4. Accidents will happen in the best families.
5. Manners make the man.
6. First catch your hare, then cook it.
7. Bad news has wings.
8. Practice is the best master.
9. A drowning man catches at a straw.
10. Standing pools gather filth.
11. Forewarned is forearmed.
12. Each day has its care and each care has its day.
13. All cats are grey in the dark.
14. Caution is the parent of safety.
15. A clean hand wants no washing.
16. You can't eat your cake and have it.
17. No pains – no gains.
18. There is one thing about baldness: it is neat.
19. He laughs best who laughs last, but who laughs first sees the point.
20. A great ship asks deep water.
21. After rain comes fair weather.
22. Life is not clear sailing in calm waters.
23. Many commanders sink the ship.
24. Make every bargain clear and plain that none may afterwards complain
25. Fancy that!

O

code – cod – corn – core

1. A rolling stone gathers no moss.
2. No rose without a thorn.
3. No news – good news.
4. Every dog has his day.
5. Honesty is the best policy.
6. Drop by drop the sea is drained.
7. Lost time is never found again.
8. No cross, no crown.
9. The world is moving so fast these days that a man who says it can't be done is generally interrupted by someone doing it.
10. Better short of pence than short of sense.
11. Any port in a storm.
12. A fool and his money are soon parted.
13. Good clothes open all doors.
14. Too good to be true.
15. Too many cooks spoil the broth.
16. Between two stools one falls to the ground.
17. Confession is good for every soul.
18. A pound in a purse is worth two in a book.
19. Politeness oils the wheels of life.
20. Joy and sorrow are as near as today and tomorrow.
21. None is so busy as those who do nothing.
22. Exception proves the rule.
23. Money makes money.
24. A man is as old as he feels, and a woman as old as she looks.
25. Cowards die many times, the brave but once.

E

he – hell – her – here

1. Extremes meet.
2. He who hesitates is lost.
3. A hedge between keeps friendship green.
4. Best defence is attack.
5. Every family has a black sheep.
6. Every little helps.
7. Better an egg today than a hen tomorrow.
8. Better late than never.
9. Never ask of money spent.
   Where the spender thinks it went.
   Nobody was ever meant.
   To remember or invent.
   What he did with every cent.
10 Good to begin with, better to end well.
11. East or West – home is best.
12. Too far East is West.
13. Better short of pence than short of sense.
14 Experience teaches us wisdom.
15. He who has ears let him hear.
16. A new broom sweeps clean.
17. Where the river is deepest it makes least noise.
18. A friend in need is a friend indeed.
19. Let sleeping dogs lie.
20. The only way to keep your health eat what you don't want, drink what you don't like and do what you don't rather not.
21. Live and learn.
22. Easily earned money is quickly spent.

23. Early to bed and early to rise makes a man healthy, wealthy and wise.

24. There is a skeleton in every house.

25. Seeing is believing.

I – Y

site – sit – sir – siren

1. Time flies.
2. Lost time is never found again.
3. Old friends and old wine are best.
4. A stitch in time saves nine.
5. He gives twice who gives quickly.
6. Time is money.
7. Strike while the iron is hot.
8. What greater crime then loss of time.
9. After dinner sit a while, after supper walk a mile.
10. Better kiss a miss than miss a kiss.
11. A little explained, a little endured, a little forgiven, the quarrel is cured.
12. Speech is silver but silence is gold.
13. Wishes do not wash dishes.
14. More wishes are silly fishes.
15. A little learning is a dangerous thing.
16. Alcohol is like love, the first kiss is magic, the second is intimate, the third is routine.
17. To find a girl's faults, praise her to her girl-friends.
18. The early bird catches the worm.
19. Fire and water are good servants but bad masters.
20. No smoke without fire.
21. If wishes were horses, beggars might ride.
22. Out of sight, out of mind.

23. To live in hearts we leave behind is not to die.

24. Idleness is the mother of all evil.

25. There is no place like home.

U

cute – cut – curve – cure

1. It is the duty of a student
   Without exception to be prudent.
   If smarter than his teacher.
   Tact demands that he conceals the fact.
2. Too good to be true.
3. Exception proves the rule.
4. Lucky at cards, unlucky in love.
5. A hungry man is an angry man.
6. Love in a hut, with water and a crust is cinders, ashes and dust.
7. Much will have more.
8. Old love does not rust.
9. So many countries, so many customs.
10. The customer is always right.
11. The tongue is not steel, yet it cuts.
12. Well begun is half done.
13. Measure twice and cut once.
14. Still water runs deep.
15. It is a good wife who never grumbles,
    It is a good horse that never stumbles.
16. It's double Dutch.
17. Tough luck.
18. Business before pleasure.
19. Let him put in a finger and he will put in his whole hand.
20. Curiosity is incurable.

21. Curiosity killed the cat (Satisfaction brought it back).

22. Business is business.

23. Buy now, pay later.

24. Don’t put off till tomorrow that which they should have done yesterday.

25. Judge not that cannot be judged.

4. Practice the following tongue – twisters:

***

If a white chalk chalks on a black blackboard,

will a black chalk chalk on a white blackboard?

***

They cheered the hero when he appeared.

***

The theatre is somewhere here.

***

I'll have a proper cup of coffee in a proper coffee-cup.

***

Peter Piper picked a peck of pickled pepper;

A peck of pickled pepper Peter Piper picked;

If Peter Piper picked a peck of pickled pepper,

Where's the peck of pickled pepper Peter Piper picked?

***

The hammerman hammers the hammer on the hard highroad.

***

Tommy Trot, a man of law,

Sold his bed and lay upon straw;

Sold the straw and lay on grass

To buy his wife a looking-glass.

***

Robert Rowley rolled a round roll round.
A round roll Robert Rowley rolled round.
Where is the round roll Robert Rowley rolled round?

***

Little Lady Lilly lost her lovely locket.
Lucky little Lucy found the lovely locket,
Lovely little locket lay in Lucy's pocket –
Lazy little Lucy lost the lovely locket!

***

When the Twister twists me a twist,
The twisting of his twist he three times does untwist;
And if one of the twines of his twist does untwist,
The twine that untwisted, untwists the whole twist.

***

Swan swam over the sea.
Swim, swan, swim:
Swan swam back again.
Well swam, swan!

***

A thatcher of Thatchwood went to Thatchet a-thatchfag:
Did a thatcher of Thatchwood go to Thatchet a-thatching?
If a thatcher of Thatchwood went to Thatchet a-thatching,
Where's the thatching the thatcher of Thatchwood has thatched?

***

As I was going along, along, along,
A-singing a comical song, song, song,
The lane that I went was so long, long, long,
And the song that I sang was as long, long, long,
And so I went singing along.

5. Do you like practicing phonetics? Why? Read the following poems and discuss the efficient ways of mastering phonetics.

JUST FOR FUN

The Joys of the Language Lab

Well, I come to classes every day,
because I can't understand what the English say:
It's Double Dutch, I'm out of touch,
but I want to learn the modern way.
So they set me on top of a tape machine
and say: "Do you know what this sentence means?"
I say, "Errr... No." "Well, press that button and away we go."
I've been sentenced. Just like being in jail.
Fifty-five times I say the same old phrase,
fifty-five times the same old way.
That three-phase drill makes me feel so ill,
J shout: "Let me out, I've had my fill;
haven't you heard of overkill?"
A voice replies: "You've got to stay.
Our goal is to reinforce your skill.
There's no escape, so just sit still.
Linguistic Science will save your soul.
It won't be long, you'll be on parole
when you've learned to speak and play each role —
but you've got to work, this is not the dole."
By about now my head is dazed,
I've got pins-and-needles and my eyes are glazed:

"It's the third degree, I've been hypnotised,
I've been grilled and drilled and dehumanised."
But the reassuring voice replies:
"You can't fool us, your accent's a very poor disguise,
Confess you're fluent, or you'll be breathanalysed.
Get wise, relax, it's the latest craze,
sitting on top of an electric chair —
these days you'll find them everywhere —
so just sit tight, out of sight, well all right."
After half an hour my headache's bad;
I'm going deaf as well as mad.
I can't see my cellmates, can't laugh with the boys;
all I can hear is this foreign noise
going on and on, inside my head.
I can still hear it when I go to bed.
Brainwashing, I call it...
"Better to be alive in the language lab
than speechless and dead, laid out on a slab."I think Skinner said.
Or was it Chomsky? Bad influence that chap.
Trying to transform my generation.
Someone should inform him of motivation.
... Now please don't think that I object;
I'm full of praise and great respect.
But there is one thing, to tell the truth:
I get so lonely in my booth.
All I do is moan and groan
sitting shackled between two phones.
I just want to TALK to someone:
I've got a mouth and talking's fun.

But I get no mercy from this microphone,
I might as well talk to a brick or a stone.

(From "English Teaching Forum",
1974, No 3, July —Sept.)

***

The more we study, the more we know,
The more we know, the more we forget.
The more we forget, the less we know.
The less we know, the less we forget.
The less we forget, the more we know. Why study?

***

Multiplication is vexation,
Division is as bad;
The rule of Three it puzzles me,
And Fractions drive me mad.

Philosophic Advice

He who knows not, and knows not that he knows not; he is a fool; shun him.
He who knows not, and knows that he knows not; he is simple, teach him.
He who knows, and knows not that he knows; he is asleep, wake him.
He who knows, and knows that he knows; he is wise, follow him.

РОЗДІЛ ІІІ

Reading Basics in Use

1. Read the information on climate change and pick up words and word – combination on: a) the reasons; b) the consequences; c) the measures for improving the situation.

Climate Change – the Global Problem

Reasons	Consequences	Measures

1. Just 100 months left to save Earth

Unjust 100 months' time, if we are lucky, and based on a conservative estimate, we could reach a tipping point for the beginnings of runaway climate change. Let us be clear exactly what we mean. The concentration of carbon dioxide (CO_2) in the atmosphere today, the most prevalent greenhouse gas, is the highest it has been for the past 650,000 years.

In just 250 years, as a result of the coal-fired Industrial Revolution, and changes to land use such as the growth of cities and the felling of forests, we have released more than l,8 obi tones of CO_2 into the atmosphere. Currently, approximately 1,000 tonnes of CO_2 are released into the atmosphere every sec-ond, due to human activity. Greenhouse gases trap incoming solar radiation, warming the atmosphere. When these gases accumulate beyond a certain level - a "tipping point" - global warming will accelerate, potentially beyond control.

Faced with circumstances that threaten human civilisation, scientists at least have the sense of humour to term what drives this process as "positive feedback". In climate change, a number of feedback loops amplify warming through physical processes that are either triggered by the initial warming, or the increase in greenhouse gases. One example is the melting of ice sheets. The loss of ice cover reduces the ability of the Earth's surface to reflect heat and, by revealing darker surfaces, increases the amount of heat absorbed. Other dynamics include the decreasing ability of oceans to absorb CO_2 due to higher wind strengths, linked to climate change. This has already been observed in the Southern Ocean and North Atlantic, increasing the amount of CO_2 in the atmosphere, and adding to climate change.

Because of such self-reinforcing feedbacks, once [a critical greenhouse concentration threshold is passed, global warming will continue even if we stop releasing greenhouse gases into the atmosphere. If that happens, the Earth's climate will shift into a more volatile state, with different ocean circulation, wind and rainfall patterns, the implications of which are potentially catastrophic for life on Earth. This is often referred to as irreversible climate change.

So, how do we arrive at the ticking clock of 100 months? It's possible to estimate the length of time it will take to reach a tipping point. To do so you combine current greenhouse gas concentrations with the best estimates for the rates at which emissions are growing, the maximum concentration of greenhouse gases allowable to forestall potentially irreversible changes to the climate system, and the effect of those environmental feedbacks.

We followed the latest data for CO_2, then made allowances for all human interferences that influence temperatures. We followed the judgments of he mainstream climate science community, represented by the Intergovernmental Panel on Climate Change (IPCC), on what it will take to retain a good chance of not crossing the critical threshold of the

Earth's average surface temperature rising by 2^0C above pre-industrial levels. We were cautious in several ways, optimistic even, and perhaps too much so. A rise of 2^0C may mask big problems that begin at a lower level of warming. Collapse of the Greenland ice sheet is more than likely to be triggered by a local warming of 2.7^0C, which could correspond to aglobal mean temperature increase of 2C or less. The disintegration of the sheet could correspond to a sea-level rise of up to 7 metres.

We also used the lower end of threats in assessing the impact of vanishing ice cover and other carbon-cycle feedbacks. But the result is worrying enough. Given all of the above, in 100 months' time we will reach a concentration of greenhouse gases at which it is no longer "likely" that we will stay below the 2^0C temperature rise threshold. "Likely" refers to the definition of risk used by the IPCC. But, even just before that point, there is still a 33% chance of crossing the line.

And it is wildly unrealistic to think that individuals alone can effect a comprehensive re-engineering of the nation's fossil-fuel-dependent energy, food and transport systems. The government must lead. In their inability to take action commensurate with the scale and timeframe of the problem, the government is mocked both by Britain's own history, and by countries much smaller, poorer and more economically isolated.

The challenge is rapid transition of the economy to live within our environmental means, while preserving and enhancing our wellbeing. We've been here before, and can learn lessons from history. Britain achieved astonishing things while preparing for, fighting and recovering from the Second World War. Between 1938 and 1944, the economy was re-engineered and there were dramatic cuts in resource use and consumption. These coincided with rising life expectancy and falling infant mortality. We consumed less of almost everything, but ate more healthily and used our disposable income on low-carbon good times. Very public energy restrictions were introduced in

government and local authority buildings, shops and railway stations. This was so successful that the results beat cuts previously planned. The public largely assented to measures to curb consumption because they understood that they were to ensure "the fairest possible distribution of the necessities and comforts of daily life".

Now, 2008, we face the credit crisis, high oil and rising food prices, and the massive added challenge of having to avert climate change. Does a war comparison sound dramatic? In April 2007, Margaret Beckett, then foreign secretary, gave a lecture called “Climate Change: The Gathering Storm”, and said of the second world war: “Climate change is the gathering storm of our generation. And the implications - should we fail to act – could be no less dire: and perhaps even more so.”

Cuba provides an embarrassing example to show up our national tardiness. In 2006 Cuba had a nationwide scheme to replace inefficient incandescent lightbulbs with low-energy alternatives. At the end of the cold war, after losing access to cheap Soviet oil, it switched over to growing most of its food on small, often urban plots, using low-fossil-fuel organic techniques. Half the food eaten in the capital, Havana, was grown in the city's gardens.

Each of these challenges will draw on things that we already know how to do, but that we lack the political will to do (Andrew Simms, “The Guardian”).

2. Get Ready to Itch and Sneeze

A warmer planet could mean we'll suffer more (and stronger) allergies.

As one of 40 million Americans who suffer from hay fever, Lewis Ziska carries an inhaler in his pocket and takes a whiff to clear his lungs on bad allergy days. But hay fever is more than a personal-health issue for Ziska. A weed ecologies with the U.S. Department of Agriculture's Crop Systems and Global Change Laboratory, Ziska is a leading researcher in allergies and climate change. His findings regarding ragweed, an invasive plant whose pollen is the

leading trigger of fall hay fever, are nothing to sneeze at. Global warming and increased atmospheric carbon dioxide from burning fossil fuels appear to supercharge the growth of ragweed. And not only does ragweed grow larger and produce more pollen, its pollen is more allergenic, studies show.

People allergic to ragweed aren't the only ones who'll be sniffling more. Studies show that increased $C0_2$ levels increase the level of tree pollen, a common source of allergies in springtime. There's evidence that warmer temperatures in Alaska have led to increases in yellow-jacket stings, bad news for people with bee-sting allergies. Not even your basement will be safe: fungal spores also proliferate in warmer temperatures and thrive when carbon-dioxide levels rise.

To test his ragweed hypothesis, Ziska planted the weed in three plots: a rural farm, a semi-rural county park and downtown Baltimore. The urban plot's ragweed produced four times the pollen count of the rural site. "Cities already have more carbon dioxide than rural areas and are hotter," Ziska says. "Cities are a surrogate for global warming."

The impact of global warming and increased CO2 on allergies is also being studied by government agencies, scientists and doctors. The Environmental Protection Agency's National Center for Environmental Research is soliciting proposals for climate change and allergy studies to receive funding. The Intergovernmental Panel on Climate Change—the leading international authority on man-induced warming— and the EPA both cited increased allergic reactions due to climate change as a growing concern in 2007 reports.

Allergists are also worried. One new concern: a startling rise in the amount of tree pollen. Warmer temperatures in Europe are causing birch trees to bloom earlier, prompting an earlier and perhaps longer allergy season. Studies at Duke University show that elevated carbon dioxide increases pollen production of loblolly pines. Allergists suspect that record pollen counts are contributing to the

onslaught of new allergy and asthma patients. "I'm seeing an epidemic of new cases," says New York City allergist Clifford Bassett.

Christine Rogers of the School of Public Health and Health Sciences at the University of Massachusetts is working with the USDA's Ziska on a study of fungal spores, which cause allergies in about 10 percent of the public. "We have a greater proportion of the public that is sensitive to allergens, so the question of how climate change affects this is ever more important," says Rogers. Fungi—everything from mushrooms in the woods to fungus that grows in damp basements—play an important role in the ecosystem by decomposing plants. If plant biomass increases due to elevated $C0_2$ and global warming, fungi may proliferate as well, they suspect.

Fungal spores are problematic because they affect air quality indoors as well as out. Higher temperatures will lead to increased use of air conditioners, which spread spores if improperly maintained. Heavier rainstorms and floods predicted under climate-change scenarios will also increase indoor dampness, allowing fungal spores to proliferate in homes and buildings, according to the 2007 study "Climate Change, Aerobiology, and Public Health in the Northeast United States." City dwellers who suffer from asthma already are being hit by a "nasty synergy" of hotter temperatures, smog and increasing pollen counts, says Paul Epstein of Harvard's Center for Health and Global Environment. A large percentage of asthmatics are also allergic to pollen. These patients suffer from a double whammy of pollen and smog on days when ground-level ozone levels are high.

Country folk face new challenges, too. Poison ivy, a woodland plant that causes itching and a weepy rash, is becoming more toxic. Researchers at Duke University stumbled across this discovery while conducting an experiment that involved pumping extra carbon dioxide into a plot of pine trees to see whether the forest would soak up and sequester more carbon, mitigating climate change. But they noticed that poison ivy on the forest floor proliferated. Subsequent

testing showed that the poison ivy's rash-causing oil, urushiol, was more potent than normal.

Climate change could also spell trouble for people allergic to stinging insects. Alaska, which is warming faster than the rest of the country, could be a test case.

In some areas, reports of severe stings from Hymenoptera—the insect order that includes bees, wasps and yellow jackets—are up 600 percent in eight years. Jeffrey De-main, an allergist with the Allergy, Asthma and Immunology Center of Alaska, says yellow jackets and wasps are showing up in places they never lived before.

Skeptics sometimes cite increased crop yields and more-prolific plant growth as reasons to be unconcerned about global warming. But if Ziska and his cohorts are right, the coming global greenhouse will be a sneezier, wheezier and rashier place— and many more people may be whiffing from inhalers (Paul Tolme, "The Time").

3. Saving the world begins at home, with just one therm at a time

Up to 25% of energy use is in homes, but simple efficiency measures can easily cut this by 40%.

If you are reading this at the kitchen table, in the bath, or on the sofa, then you are inside one of the biggest causes of global warming. Our houses are an enormous source of greenhouse gases such as carbon dioxide, and they rarely feature high enough on our list of environmental concerns. But houses are also an opportunity to do something; we can reduce our carbon footprint, and save money as well as pollution.

Mark Levine, an expert in energy efficient buildings at the Lawrence Berkeley National Laboratory in California, says: "The energy use in houses results in between 20% and 25% of all emissions of carbon worldwide. They

don't get nearly the attention they deserve. Energy efficiency measures can cut use in houses by 40% or more. There is no other approach that has the potential to reduce carbon emissions nearly as much in a cost-effective manner."

Last year, the UN's Intergovernmental Panel on Climate Change (IPCC) published its latest reports on global warming. The chapter on buildings, co-written by Levine, said they were responsible for 8.6bn tonnes of carbon dioxide each year, more than half due to electricity use. That could grow to 11.1bn tonnes by 2020, and 14.3bn tonnes in 2030.

Where does it all come from? That depends on where the house is built, and how it is designed. It can be divided into emissions from electricity consumption and emissions from energy used in heating and cooling, both of space (rooms) and water. Keeping the house warm is usually the biggest emitter. Water heating is next. Cooking, lighting and refrigeration all feature. If the house is built in a hot climate, air conditioning can also use energy. Electricity consumption also covers everything plugged into sockets, from television and kettle to computer and digital radio.

How much energy is used depends on habits and cultures and varies between countries. A survey of 5,000 Europeans by the Energy Saving Trust in London found the British were the worst among several European countries in wasting energy, with people admitting 32 wasteful actions in a typical week. Germans logged just 14 wasteful acts.

The Spanish were the most conscientious about heating and cooling, with only 12% leaving their heating or air conditioning on when they go out, compared to 28% in Britain. Italians were the worst for leaving electrical appliances on standby, 80% regularly leaving six appliances that way. The French were the most likely to wear a sweater instead of turning up the thermostat, while the Germans were more likely to wash clothes at an energy-sapping 60C; 60% did so on a regular basis, compared to just 20% in Spain.

In Britain, 71% of people left appliances on standby, while 66% boiled more water than was needed in the kettle, left electrical chargers plugged in and forgot to switch off lights in empty rooms; 33% snubbed the washing line for a tumble drier. What was the main reason for Britain's bottom place? Almost 50% of the people surveyed said they were too lazy to change their behaviour.

Donna Dawson, a behavioural psychologist, said this was not necessarily a bad thing: "Habits are an example of learned behaviour so, by their very nature, they can be unlearned again. With more than double the number of people citing laziness rather than lack of awareness as the cause of their bad energy habits, the findings should be seen as fairly positive." So energy-wasters just need to focus on developing environmentally friendly habits.

What else can be done about our homes? The IPCC report's key conclusion was that "substantial reductions in C02 emissions from energy use in buildings can be achieved over the coming years using mature technologies that already exist widely and that have been successfully used. A significant portion of these savings can be achieved in ways that reduce life cycle costs".

Levine said: "It is possible to build a new house and equip it efficiently so that it uses less than 50% as much energy as a typical existing house, and saves the homeowner money. For existing houses, energy savings are more difficult, but almost all houses can reduce energy use by 20% to 25% with no inconvenience and with very good returns on investment."

Insulation, such as cavity wall fillers or rolled-out layers in a loft, is cheap and effective. Less heat escaping through the walls and roof means less energy needed to keep the house warm. Double-glazing insulates windows, and plugging leaks and draughts helps insulation do its job. Experts say these improvements to a house's "thermal envelope" can substantially reduce heating requirements (David Adam and Paul Evans, “The Guardian”).

4. Young builders shape the zero-carbon home

Trainees learn to lower labour and energy costs and to focus on lower material wastage.

The Smart Life Centre, based at Cambridge Regional College, is the UK's first facility to focus on green construction. It is part of the Interreg North Sea Programme, funded by the EU to promote sustainable housing in northern Europe, and is partnered with similar institutions at Malmo, Sweden and in Hamburg, Germany. It cost $4.6m.

Smart Life helps the house-building industry to research modern methods of construction, such as factory pre-fabrication and energy-efficient building materials, including timber frame construction.

It offers training in the skills that house builders in Britain will need to meet a government target for all new homes to achieve a zero-carbon standard. The deadline for the implementation of that standard is 2016.

Trials of zero-carbon homes built with ultra-high insulation and generating their own renewable energy are already under way at the Building Research Establishment (BRE) in Watford, which is in north-west of London.

This work is taking place under the Carbon Challenge, a government initiative that is meant to accelerate the building industry's response to climate change.

At Smart Life, young trainees, who have mostly just left school, learn about photovoltaic and ground-source heat pumps, condensing boilers and the recycling of grey water.

Barrie Wicklen, director of learning and skills at Cambridge Regional College, says: "Young people are excited by the possibilities of green construction. They can progress from entry level... up to being an architectural or a civil engineering technician, a quantity surveyor or to a degree in construction."

The county council in Cambridgeshire, which helped to fund the centre, is building low-carbon homes in Cambridge and is also taking part in zero-carbon homes trials by the Building Research Establishment.

Richard Bateman, the manager of Smart Life UK, says that the trials are a step forward in the design of sustainable housing. "The houses we built were a mix of timber frame, light gauge steel and sprayed concrete.

BRE's report is due out early next year, but we made big savings in build time and labour costs. And we generated a third less waste, which helps the environment."

With their energy saving features, ecohomes will reduce harmful C02 emissions. Bateman believes that Smart Life can learn from its partner institutions in Malmo and Hamburg, both cities that also have a shortage of land for development and a need to reduce greenhouse gases.

Tor Fossum, who is head of the environmental strategy unity at the Helix Centre in Malmo, says important lessons have been learned.

"In the start of the project there were different definitions of what actually sustainable construction and modern methods of construction meant among the project partners. During the project these definitions and the differences were sorted out. Smart Life has given us a great exchange of experiences between the project partners."

The Malmo centre hosts important research into sustainability. There is a regional energy agency in the centre focusing on energy efficiency and renewables, providing a valuable resource for the local building sector. "The result of the dialogue is a special focus on energy efficiency, phasing out dangerous chemicals from building materials, and an emphasis on biodiversity," Fossum says (Stephen Hoare, “The Guardian”).

5. Roof: Is white right for your home?

White roofs create an additional 20 percent energy savings by cutting cooling costs, some say this built-in financial incentive should propel urban rooftops around the globe to lighten up.

Think much urban rooftops reflect, called albedo (al-BEE-doh) in scientific terms: lit would be a one-time carbon-offset equivalent to preventing 44 billion tons of $C0_2$ from entering the atmosphere. It's about the same as taking all the earth's automobiles off the road for 11 years.

Geoengineers have had similar ideas: covering the Sahara with enormous sheets of white plastic, for instance, or painting the Black Hills of South Dakota white.

"Now that we know what a great help it is on climate change, we expect more utilities to give incentives for homeowners who go entirely white with their roofing material, not just 'cool' colors like pastel blues, reds, and greens".

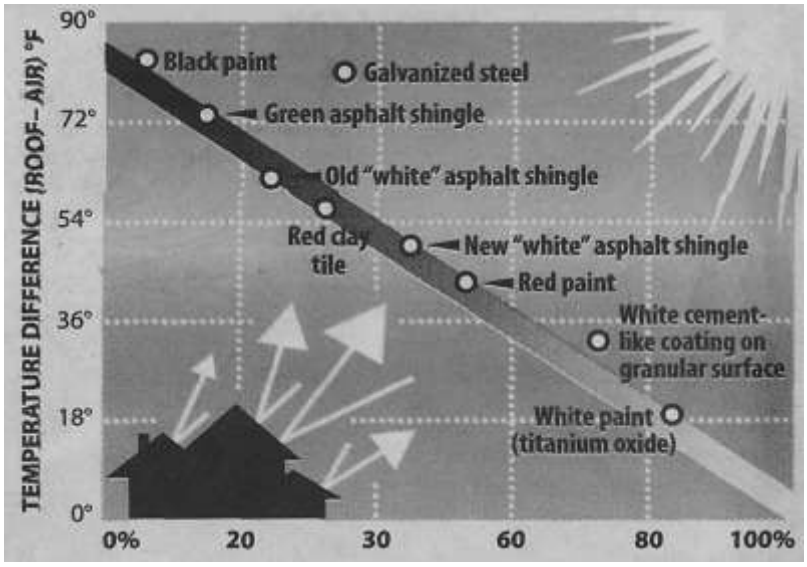
To promote energy efficiency, Georgia and Florida already give incentives to owners who install white or light-colored roofs. Going a step further, California has since 2005 mandated that all flat roofs (mostly commercial and industrial) must be white. Some utilities also now offer homeowners an incentive of 20 cents per square foot on a tile roof that may cost $1.20 a foot.

Still, the cost of going with a "cool roof" usually isn't much more than a typical darker roof. Asphalt shingles with a white or light tint are roughly the same cost as other shades. Painting a black asphalt roof with the reflective white coating, however, is obviously more expensive than the black surface alone. But energy savings largely offset the price of painting through reduced air conditioning costs. In the southwest, cool-roof pastel colors or bright white tile can cost a bit more than the standard reddish color - although there are tile suppliers that charge about the same cost for cool colors, roofing industry experts say. "I went through their calculations and got roughly the same

numbers," says Michael MacCracken, former director of climate-change research under President Bill Clinton. "Some of it is a bit idealized. But what they say is a valid thing to do for any single building ... and seems valuable for an urban area to try to reduce heat-island effects while realizing some contributions for the globe as well." Still, not everyone is enthusiastic. Roofing contractors who specialize in solid black asphalt-based roofs and roofing materials have told Akbari they think the idea is for the birds. Even those who like the idea worry it will run into resistance from homeowners who don't like white.

In July 2009 California begins requiring sloping rooftops (mostly residential) to be light-colored cool-roof colors. One reason: The mandate will be an economic boon to homeowners, he says. Past studies have shown that white roofs' net energy savings (cooling-energy savings minus heating-energy penalties) are around 20 percent. Such savings would save the United States more than $1 billion a year on air conditioning, the study says.

The material and color of the top of your house has a big impact on how much hotter the roof is, compared with the air around it.



SOLAR REFLECTIVITY

While geoengineers say the research was worthwhile to focus attention on the issue, the study "greatly overstates the benefits," he wrote in'e-mailed

response to the study. Mr. Gaskill, president of Environmental Reference Materials, a consulting firm in Research Triangle Park, N.C., argues that something much larger and more direct is needed. For example, aircraft could spray sulfur-based compounds into the high atmosphere to reflect sunlight back into space. The effect would be similar to what clouds from volcanic eruptions have done over history. (He also had proposed the idea of plastic sheeting for the Sahara.)

India and China are already eligible under Kyoto's Clean Development Mechanism (CDM) to be paid for projects that qualify as carbon offsets. Prices for CDM offsets for $C0_2$now run $25 per ton, Rosenfeld says. Putting cool-roof standards into building codes could mean CDM payments of $250 for every 1,000 square feet of white roof area (“The Christian Science Monitor”).

6. Ecofriendly clothing care

Heat up that iron: a guide to ecofriendly clothing care

Greener options can be as simple as washing in cold water.

Even if a person's closet doesn't contain a single item made of organic or recycled fabric, she can still help the environment – without heading to the store. That's because more energy goes into caring for and cleaning a garment than making it.

In fact, about 60 percent of the energy use associated with a piece of clothing comes from cleaning it, according to a 2006 University of Cambridge Institute for Manufacturing study.

Greener options can be as simple as switching to an environmentally friendly detergent, washing in cold water (which can save you $65 a year and cut your washer's energy use by 75 percent), and skipping the fabric-softener sheets. Spending extra time on the laundry means greater energy savings and, often, cost savings as well.

Air-drying is the cheapest and most environmentally friendly way to dry clothes. It's not effort-free, and clotheslines may not be an option if you live in an apartment or a neighborhood where they're against regulations. But there are ways to work around that.

For example, people uses a drying rack for their clothes.

Their garments that are labeled dry clean-only. However, the Los Angeles mother of three isn't up for long sessions with her iron, so she says she buys only things that will look good coming off the drying rack.

If your budget has room for a new appliance, a dryer with an automatic sensor can cut energy costs significantly, ultimately paying for itself. It's a great way for consumers to save energy without even trying."

Because front-loading washers spin so much faster than top loaders (allowing them to use less water), those owners will be spending more time with an iron, smoothing out the creases in natural fibers that set in during the wash. On the other hand, "with a top loader and polyester, the wrinkles are literally going to fall out of clothes. But for those living in areas where conserving water is a big concern a front-loading washer is absolutely the best choice (Yvonne Zipp, “Christian Science Monitor”).

7. Think you can recycle?

Meet the villagers of Kamikatsu, Japan, who sort their trash 34 ways

It was not that long ago that life in Kamikatsu revolved around the state of the rice crop and the number of tourists arriving to soak in the waters of the local hot spring. Now the tiny village, in the densely wooded mountains of Shikoku island in south-west Japan, has a new obsession: rubbish.

Since 2003 Kamikatsu's 2,000 residents have been part of a so far un-heralded ecological experiment that, if successful, could force bin men across the country to look for new jobs.

Urban Japanese householders, who balk at having to divide rubbish into flammable and inflammable items, bottles and cans, should consider their counterparts in Kamikatsu.

Here, household waste must be separated into no fewer than 34 categories before being taken to a recycling centre where volunteers administer firm, but polite, reprimands to anyone who forgets to remove the lid from a plastic bottle or rinse an empty beer can.

At stake is Kamikatsu's quest to end its dependence on incineration and landfill by 2020 and claim the title of Japan's first zero-waste community.

An hour's drive from the nearest city and 600km from Tokyo, the village was forced to change the way it managed its waste in 2000, when new regulations on dioxin emissions forced it to shut down its two incinerators.

"We were no longer able to burn our rubbish, so we thought the best policy was not to produce any in the first place," said Sonoe Fujii of the village's Zero Waste Academy, a nonprofit organisation that oversees the scheme.

Despite initial opposition, the zero-waste declaration, passed by the village assembly in 2003, has spawned an unlikely army of ecowarriors.

When Kikue Nii is not tending her allotment or catching fish from the river at the bottom of her garden, she is up to her elbows in garbage.

"At first it was very hard work," said the 65-year-old, as she emptied another bowl of vegetable peelings into the electric garbage disposal unit next to her back door. In the corner of her garden, more kitchen waste sat in a conventional composter.

"I was working when the scheme started and found myself spending my lunch break dealing with our rubbish," she said. "It took ages to sort everything into different types. But it comes naturally now."

However, she draws the line at her husband's empty beer cans: "They are his responsibility," she said.

That Nii and her neighbours struggled in the early days of the zero-waste campaign is understandable, given the daunting myriad of rules.

Glass bottles must be relieved of their caps and sorted by colour. Plastic bottles for soy sauce and cooking oil must be kept separate from Pet (polyethylene teraphthalate) bottles that once contained mineral water.

All bottles, cans and even plastic food wrappers must be washed; news-papers and magazines have to be piled into neat bundles tied with a twine made from recycled rnilk cartons.

Any waste that is not composted is taken to the village's zero-waste centre. Early one morning a trickle of cars turned into a deluge as residents arrived to drop off their rubbish on the way to work. The site can accommodate a dizzying array of items, from bottles, cans and newspapers to crockery, batteries, nappies, cigarette lighters, ballpoint pens and an improbably large number of broken mirrors.

Anything in good enough condition to be reused ends up at the Kuru Kuru recycling store, where residents are free to drop off or take home free of charge whatever they like, mostly clothes, crockery and ornaments.

All but a few categories of rubbish are recycled. Wooden chopsticks are pulped and made into paper, and cooking oil reappears in fertiliser.

But for other items, such as shoes, futons and carpets, the only option remains incineration. Glass and ceramic ware and lightbulbs are buried in landfills, while batteries have to be shipped to a recycling plant on the northern island of Hokkaido.

Critics point out that some of the composters use electricity and that most residents of Kamikatsu, spread out over an area that ranges from 100 metres to 800 metres above sea level, have no choice but to take their rubbish to the zero-waste centre by car.

"We're still some way from reaching our zero-waste goal, but the difference is amazing compared with a few years ago," said Yasuo Goto, a 75-year-old retired farmer who works part-time as a caretaker at the centre.

His optimism is supported by data showing that Kamikatsu's recycling rate has soared from 55% a decade ago to about 80% today.

"I can't say with absolute confidence that we will reach the target, but we're doing our best to make it happen," said Fujii. To stand any chance of reaching its 2020 goal the greenest citizens still have a public relations battle to win.

A recent poll showed that 40% of residents were still unhappy about at least one aspect of the zero-waste policy. "We still have opponents, particularly because almost everything has to be washed," Fujii said. "All we can do is talk to the doubters and explain why what they're doing is so important. I think consciousness is growing that this is a good thing; that it's not just the right thing to do, but the only thing to do" (Justin McCurry, "The Guardian").

2. *Read the text and answer the question "What are the key factors for the growing appeal of Ecospeed"?*

Faster and further with Ecospeed

Ecospeed is an extremely durable hull coating that will save on fuel costs and give increased speeds. It is expected to last for up to 25 years and is guaranteed for 10.

Amongst recent applications are a 275 metre, 5000 TEU container ship, several ice-class cargo vessels and a major cruise liner—with more of each category planned for the near future.

The Belgian Navy have been using Ecospeed on a number of their vessels since 2004 and have committed to applying it on the remainder of their fleet as the time comes for repainting.

The growing appeal of Ecospeed comes down to a number of key factors. The final hull surface has very low roughness levels. This, together with its

corrugated surface, gives fuel savings through reduced consumption and increased speed.

The strength and impermeability of the coating provides a very high degree of protection against mechanical impact and corrosion. The endless cycle of hull repainting every two to five years can therefore be dispensed with. Even after being tested under extreme Baltic winter and ice conditions it has proven to be an effective protection against mechanical impact.

In addition, the coating has no adverse effect on the environment as it is entirely toxic-free.

Ecospeed can be used on most ships, offshore vessels and structures. It has proven to be ideally suited for fast moving container and cargo ships, cruise vessels and ice-going ships. Its use can remove major headaches for ship superintendents. With no repainting necessary, yet protecting the hull surface against corrosion, there will be many additional advantages such as significant savings on repair and maintenance costs seat capacity, and the informal Lido buffet with a capacity of 450. The Golden Lion pub also offers traditional English food for lunch.

At the top of the ship is Hemispheres, an observational lounge with 270deg views which doubles as a lecture room by day and a nightclub in the evening. Queens Room is a two-deck high ballroom, and the Commodore Club observation lounge features a full bar and offers sweeping views over the bow.

3. *Using the following tables try to show reason – result and comparison relationships in the above information.*

A causes B by making B happen	
Why because of this	What that happened

cause sth, cause sb problems make sb/sm do sth give rise to bring about result in lead to	have an effect on take effect be a result of result from arise from come out of
because of … -ing due to …-ing (gerund) as a result of …-ing	
because as (for subordinate clauses of reason) since	
so thus (formal) hence (formal) (at the beginning of a sentence) therefore that's why	
<u>adverbs of degree:</u>	extremely very enough quite rather a little a bit

Degrees of comparison:	**Degrees of comparison;**		
<u>Regular:</u>	<u>Requlur:</u>	...than...	as... as
er/more (than)	- er/more	... as well	so ...as
est/rnost	- est/itiost	as ...	
<u>Irregular:</u>	<u>Irregular:</u>		
good-better-best	well-better-best		
bad-worse-worst	badly-worse -worst		
little-less-least	many/much-more-		
far-farther-farthest	most		
further-furthest			

3. *Discuss what "going green" means for you.*

РОЗДІЛ IV

Research Discussion Basics in Use

The following lists of necessary words can help you present your research and summarize the main points.

1. What does your research deal with?

What is the general field of your research?

Ecology	is the branch of is the study of deals with involves concerns refers to science	that deals with the relation ships living things have to each other and to their environment.
Economics	is the study	of how goods and services get produced and how they are distributed. By goods and services, economists mean everything that can be bought and sold. By producer, they mean the processing and making of goods and services. By distributed, they mean the way goods and services are divided among people.
Electronics	is the branch of science and engineering	closely related to the science of electricity making possible such modern wonders as television, radio, radar, computers, robotics.
Electrical	deals with	the development, production and

engineering		testing of electrical and electronic devices and equipment.
Environmental engineering	concerns	efforts to prevent and control air, water, soil and noise pollution.
Materials engineering	deals with	the structure, properties, production and uses of various materials.
Marine engineering	concerns	the design; construction and repair of ships and subenaries.
Computer engineering	involves	the design, development and improvement of computers, storage and printout units and computer information networks.

Description of a process or procedure

When we give a **general description of a process or procedure, we use:** the present passive tense {is produced, are used, is designed)

When we describe a particular procedure, we use: the past passive tense (was produced, were made, was designed)

When we describe a sequence or order, we use: the present active tense (it heats .... it melts, it becomes liquid).

Examples:

1. Deformation is the process in which an object's shape or form is changed permanently, e.g. the deformation of a rubber band by an excessive force, causing a permant change in shape. Deformation is also the amount by which an object is deformed from its natural state or the increase in length, e.g. when a metal wire is extended beyond its elastic limit, or when a long wire is stretched, there is a deformation of 3 cm.

2. Absorption is the formation of a thin layer of a substance attached to the surface of a solid or liquid, e.g. a clean metal surface in contact with a gas is

quickly covered by a thin layer of the gas. Molecules of the gas are held on the surface by physical or chemical forces. Often the layer is only one molecule thick. In some cases it may be two or more molecules thick. In adsorption the substance is held on the surface, in absorption It penetrates into the interior of the materials.

3. Electromagnetic radiation. The first electromagnetic waves were produced by Hertz (in 1888) using the apparatus shown. A and A^ were two square metal plates, one above the other, forming a kind of capacitor. The induction coil charged the capacitor, and when the insulation between T_1 and T_2 broke down, sparks passed between the knobs, forming a damped oscillatory current. The oscillatory current consisted of accelerating electric charges, which produced a changing electric field, in turn inducing a magnetic field at right angels to the gap between the knobs. A pattern of changing electric and magnetic fields was thus produced by the oscillatory current. Some of the lines of force formed closed loops which travelled into space carrying away some of the kinetic energy of the charges. An electromagnetic wave was produced with the electric vector parallel to T_1T_2; the corresponding magnetic vector was perpendicular to T_1T_2, and both vectors were perpendicular to the wave direction. A coil of wire, of one turn, with a gap between two knobs, R_1 and R_2, was held in a vertical plane in line with T_1T_2; it became linked with the magnetic field and an e.m.f. was induced in it, resulting in a spark discharge between R_1 and R_2. With the coil at right angles to T,T_2, no spark discharge took place, so the radiation was polarized. Using the apparatus, the radiation was shown to have all the properties of a wave: it could be reflected from a metal sheet, refracted by a non-conductor such as paraffin wax, and exhibited interference and the formation of stationary waves.

2. What are the aims and tasks of your research?

The main aim of my research is	to study to analyze to explain to predict to interpret (data) to draw (conclusions)	
	to obtain to work out to develop to collect and process	
	to define to classify to categorize to generalize	the nature of … the causes of …
	to solve to reveal to prove to find out	the role of … the action of … the results on …
	to consider to determine to establish	the behavior of …

	to describe to outline to clarify to demonstrate to illustrate to show	the dependences the relationships some details some facts
	to estimate to calculate to compute to measure	the assumption the hypothesis the advantages
	to examine to check to test to verify	
	to compare to evaluate to judge to criticize to justify	
	to plan (procedures) to carry out to arrange to note (changes)	

What is the aim of the following research?

The aim of "Robotics and Automated Manufacturing" by R.C.Dorf is to consider the fundamental concepts and applications of robotics and computer-aided manufacturing systems that may be effectively used in work places. This book first considers the problems of productivity and automation. It then

reviews the history, development and classification of robots, their mechanical and electrical components, sensors and vision systems.

What are the aims and tasks of new coating techniques?

Flame and plasma coating of metallic and ceramic film as a protection against corrosion and abrasion is a new reliable and economic coating technique.

For example, a valve ring with a diameter of about 340 mm is made of titanium alloy with a tungsten-cobalt abrasion protection coating applied to the inner and outer surface by plasma coating. To avoid stresses in the metal ceramic coating, the valve ring is heated on the inner side during the spraying and cooled during the final spray of the outer side. The surface is completed by abrasive methods. A new development in the thermic spraying field is demonstrated by vacuum plasma coating. Thanks to increased particle velocity and a gas-free atmosphere, comparatively dense, oxide-free and closely adhering coatings can be produced.

The chemical deposition from the gas phase is often used to produce abrasion- and corrosion-resistant coatings.

3. Is the research you are doing very important?

What problems are fundamental for your research?

Are they complicated?

What problems do you consider promising?

The research The problem is The study The investigation	rather very highly, extre-	necessary urgent significant important specific interesting	because is enables	-to increase (to raise) to reduce to modify to improve to change; -may

	mely	attractive complicated difficult promising useful fruitful up-to-date (updated) topical		provide a valuable information (on, for); -may provide a possible key to; -may contribute to; -may throw the light on; -may help to understand the mechanism of; -calls for (demands) further research; -requires much effort

4. What does the preliminary research show?

Up to	little lack	reliable satisfact	information	on the subject;	because it	deals with;

now ther e has / hav ebe en	of not enou gh	ory accurate sufficien t	data argumen ts proofs evidence	the problem	mainl y	concerns ; relates to

Previous Recent Preliminary	research data	was seems	unsatisfactory insufficient unreliable inaccurate incomplete fragmentary

5. What do you want further research for?

W e	wan t nee d	more further	reliable accurate complet e detailed	data informati on methods	to prove to determine to develop to improve to modify to intensify to increase to decrease to reduce	parameters , design, operating characteris -tics, efficiency, consumpti on

Some further Much further More reliable	informatio n	is required	to identify … to evaluate … to establish …
The information Some of our information Much of the information Much of the information		comes from experiments on … has come from recent studies of … is obtained from recent studies … obtained has been provided by …	

Read the text and explain what further information you might need.

The idea of building a car that is fast and stylish is a powerful attraction. Warren Mosler is a lifelong racing fan, he started driving stock cars in 1983. In 1985 he set up a car centre in Riviera Beach, Fla., and began developing a new super sports car under the aegis of a firm called Consulier Industries. Like others before him, Mosler had long envisioned crafting the automotive ideal. "I always believed it was possible to manufacture a car so light it could easily outperform the industry's production super sports cars". And now he has unveiled his new Consulier GTP. A limited-production two-seater, the Consulier features a streamlined design that some people find attractive and others don't. The car's body is certainly unusual: it has no metal. It is made entirely of lightweight composite materials. The Consulier weighs under 2,000 pounds, much less than other supper sports cars. Because it is so light, drivers can "decelerate in it much faster than in similar cars" and thus make turns more quickly. The car also features a "scooped" front nose and an air foil on the back – both designed to improve handling.

6. What methods do you use in your research?

The method	is (not) are (not) seem to be appeared to be	satisfactory conventional suitable adequate accurate precise effective (efficient) reliable sufficient simple complete detailed
		routine and conventional old, though still in use modified, greatly improved no longer used, unsuitable
		new (newly elaborated) promising up-to-date (updated)
		useful quite adequate (in terms of) most efficient valid practicable precise tedious but reliable

It should be further	improved corrected modified

At present the method of …	is	commonly widely often --- hardly rarely seldom --- never	used best suited (for) used (for) used of	in the studies of … in research for the determination of … --- in our country all over the world --- in laboratory conditions

Explain the following characteristics of the methods of research.

1. Observation	- наблюдать - обращать внимание - заметить - обнаружить	-спостерігати -звертати увагу -помітити -виявити	- observe, watch - discover, find out
2. Hypothesis	- предполагать, что - сделать вывод	-припускати, що -зробити	- assume, suppose - make a conclusion

	- рассуждать - исходить из предположения	висновок - розміркуовувати -виходити з припущення	that -conclude - - make an assumption
3. Experiment	- провести эксперимент - проверить предположение - убедиться на опыте (в правильности предположения) - исследовать - изучить - проанализировать - сравнить - измерить - вычислить - определить; - пренебречь	-провести експеримент -перевірити припущення - переконатись на досвіді (в правильності припущення) - досліджувати -вивчити - проаналізувати -порівняти -виміряти -обчислити -визначити	- make an experiment - - verify - to research - study - analyze - compare - measure - calculate - determine - neglect

		-знехтувати	
4. Theory	- открыть - установить (связь, зависимость) -создать - доказать - создать теорию, разработать - решить проблему - ввести понятие - описать	- відкрити -встановити(зв'язок, залежність) -створити -довести -створити теорію, розробити -вирішити проблему -ввести поняття -описати	discover -relate -create -prove - work out, develop - solve a problem -introduce - describe
5. Application	- применять (где, для чего) для производства, получения, в качестве - использовать (как, что) сырьё, исходное, источник - служить чем - идти на что	- застосовувати (де, для чого) для виробництва, отримання, в якості - використовувати (як що)сировину,	- use - apply - serve as - share - employ

	- изготавливать что - дать возможность - потреблять	вихідне, джерело -служити чим -йти на що -виготовляти що -дати можливість -споживати	- utilize

7. How can you interpret (explain) the data obtained, make generalized statements about information?

1. *Tables* and *figures* are used to present the results of experiments. When referring to a figure in the text, the word "Figure" is abbreviated as "Fig.", while "Table" is not abbreviated. Both words are spelled out completely in descriptive legends.

Figures and tables are numbered independently, in sequence with their appearances in the text, starting with Fig. 1 and Table 1 in each chapter (e.g. Fig. 2.1. or Table 3.2.). If, in revision, you change the presentation sequence of the figures and tables, you must renumber them to reflect the new sequence.

2. *A table* is used for a set of data. However, if you can bring a table or part of it into words, it is preferable to do so.

Figures are visual presentations of results. They can be graphs, diagrams, pictures, drawings, schematics, maps, etc. Graphs are the most common type of figures and will be discussed in detail; examples of other types of figures are included at the end of this section. Graphs show trends or patterns of

relationships; tables are mainly used to give exact data. Sometimes also in figures exact data are given as well.

The main purpose of figures is to show a certain trend, a prognosis or an extrapolation. The title is always given below the illustration and starts with "Fig…" No full stop is put at the end of the title.

3. There are different kinds of figures: *line graphs, surface graphs, bar diagram* or *histogram, bar group diagram* or *component bar diagram, pie chart diagram, pole diagram, flow chart, triangle diagram, cartogram* and *scheme*.

4. *A line graph* gives the relation between the independent variable (x-axis) and the dependent variable (y-axis) of observations on one object. Time is always set on the x-axis. Usually, the origin of both x and y axes starts at 0.

5. Accumulation of dependent variables leads to *surface graphs*. To distinguish; the different variables, the surfaces can be differently coloured or filled up.

6. When similar observations are carried out not on one object, but on many similar objects, the; use of *bar diagrams* or *histograms* is advisable.

7. In a *bar diagram* the bars are apart from each other. The distance between the bars is e.g. half of the bar width. In a histogram bars are joint together.

8. In a *pie chart diagram,* the total amount is given by the total surface of the pie. Ruts of that total amount can be given by circle segments. The disadvantage of such m figure is that it is difficult to compare the different parts.

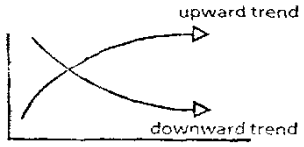
9. To show the route of different products in an overall production process a flow diagram can be drawn. A *flow scheme* in a discussion or a flow scheme in a biological process can be shown in a flow diagram as well. The width of the route can be a measure for the importance of the flow.

A histogram	shows	the percentage of …
A vertical axis	shows	the percentage of … .
A horizontal axis	compares	… .
A graph	shows	the manner of …
A diagram	shows	one way to measure
A pie chart	gives information about	… .

As can be seen	from in	the chart t he diagram	…
According	to	the table	…
As is shown	in	the graph the figures	…
It can be seen	from	the statistics	…

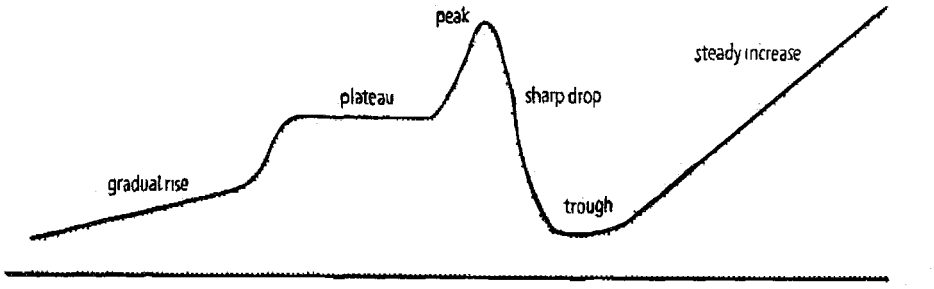
There was a	minimal slight small slow gradual steady marked large dramatic steep sharp rapid sudden	rise increase fluctuation decrease decline reduction fall drop	in relation to … compared with …

1. Study the useful vocabulary to interpret data in graphs:

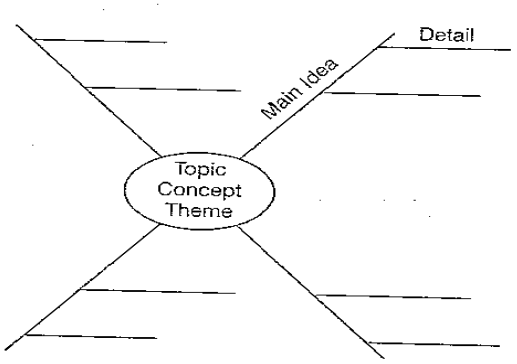


a *trend* involves a *direction:*

a *curve* involves a *shape* and *position:*



Spider Map is used to describe a central idea: a thing, process, concept, or proposition with support. Key frame questions: What is the central idea? What are its attributes? What are its functions?



Flow chart is used to describe the stages of something; the steps in a linear procedure; a sequence of events; or the goals, actions, and outcomes of a historical figure or character in a novel. Key questions: What is the object, procedure, or initiating event? What are the stages or steps? How do they lead to one another? What is the final outcome?

Initiating Event

Event 1

↓

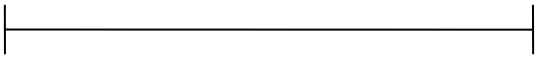
Event 2

↓

Final Outcome

Event 3

Continuum/Scale is used for time lines showing historical events or ages, degrees of something, shades of meaning, or ratings scales. Key questions: What is being scaled? What are the end points?



Low High

Compare/Contrast Matrix is used to show similarities and differences between two things (people, places, events, ideas, etc.). Key questions: What things are being compared? How are they similar? How are they different?

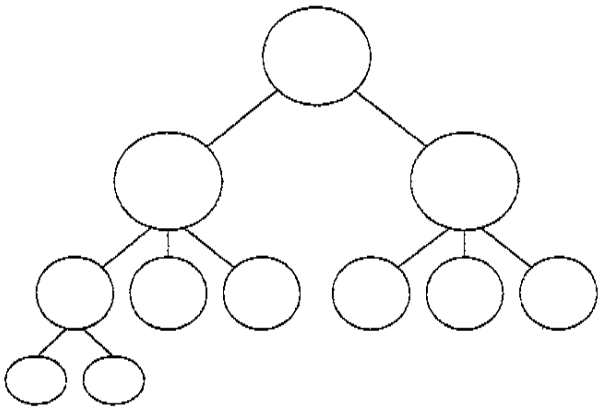
	Name 1	Name 2
Attribute 1		
Attribute 2		
Attribute 3		

Problem/Solution Outline is used to represent a problem, solutions, and results. Key questions: What was the problem? Who had the problem? Why was

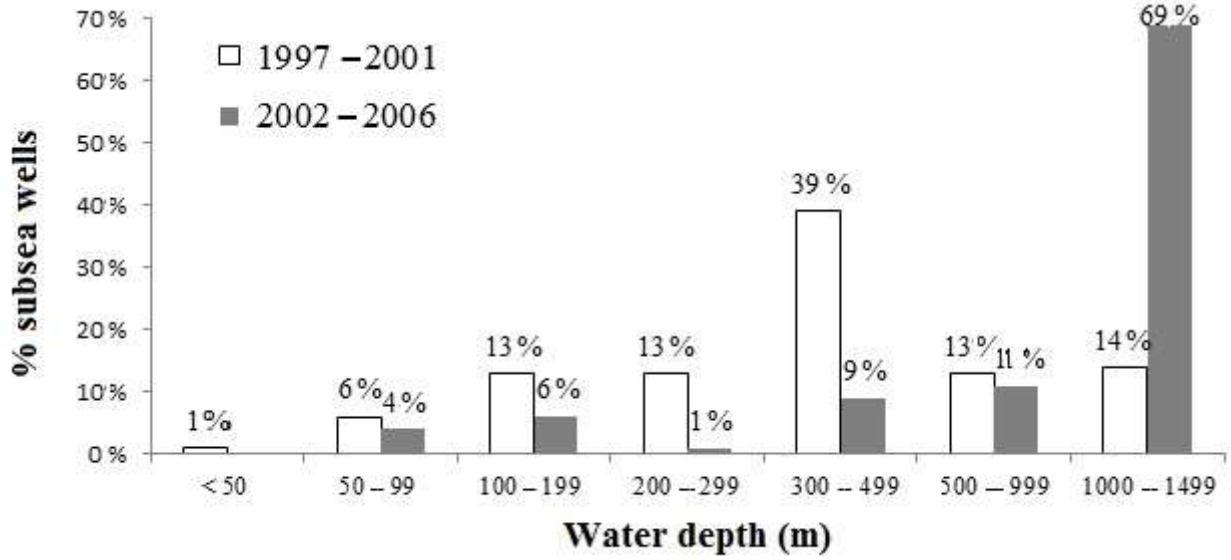
it a problem? What attempts were made to solve the problem? Did those attempts succeed?

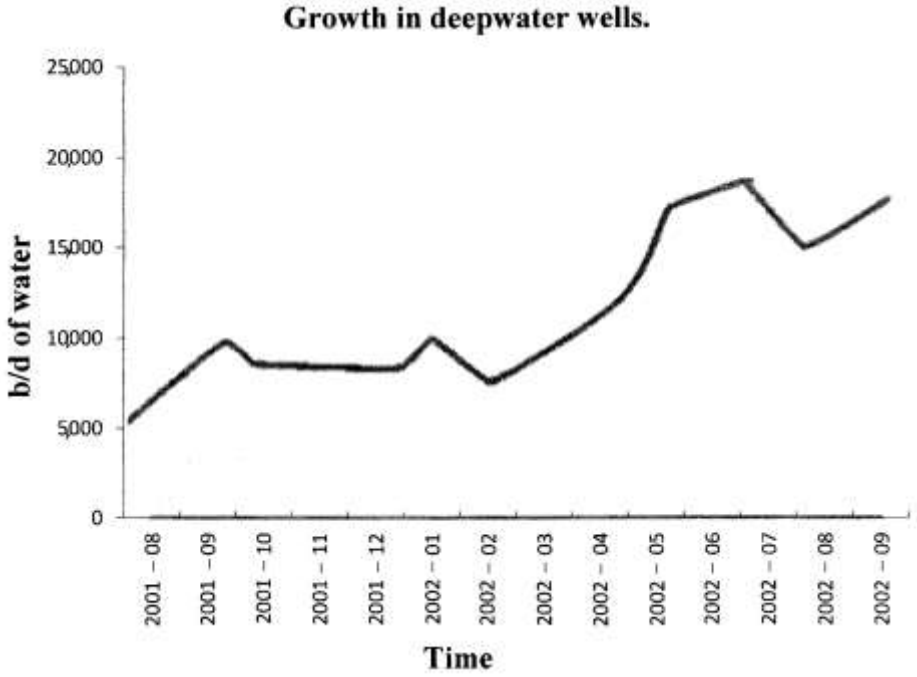
Problem	Who?	
	What?	
	Why?	
	How?	
	How many?	
	How much?	
	How long?	
Solution	Attempted Solutions 1. 2.	Results obtained 1. 2.
	End Result	

Network Tree is used to show causal information, a hierarchy, or branching procedures. Key questions: What is the super ordinate category? What are the subordinate categories? How are they related? How many levels are there?



2. Interpret the data in the following graphs.





The amount of produced water from the subsea separation-station injected in percent of the total water.

3. Using the information, interpret the data of your own.

What experiments are you planning to carry out?

We	carry out	the series of	to show to	reliable optimal	hypothesis data

	make conduc t	experimen ts	examine to test to obtain to measure to determine to reveal to correct to predict to accumulat e	necessa ry new	correlation parameters components facts changes information

The first experiments The preliminary experiments	were unsuccessful … showed
	helped to clear up … contributed to better understanding of the problem

It is	initial, early, previous, preliminary, precise, thorough, specific, promising, reliable, successful	experime nt
	discouraging, unreliable, unsuccessful	

Further experiments	led enable d	u s	to the conclusion that … to understand

What does the experimental set up consist of?

My research needs	sophisticated complex complicated updated specific	experimental installation
The experimental set up	consists of contains	…

To accumulate all the necessary data, we use	registers metres oscilloscopes
To make necessary measurements, we use	precise instruments various devices

Then we	process classify	the results obtained the data obtained

They seem/are	sufficient convincing reliable complete
	amazing striking encouraging
	insufficient fragmentary discouraging ambiguous

A modem research laboratory is an important part of any scientific centre. Their researchers make their experiments and collect necessary data. New research often requires sophisticated experimental installations (internal combustion engines, power turbines) and up-to-date experimental facilities to accumulate data for the advancement of science (metres, registers, oscilloscopes, etc.). As a rule, a researcher plans his experiments to test his hypothesis. At present research in all fields depends on computer handling very large amount of data obtained from various experiments. A lab chief tries to equip a lab with reliable modern devices, organizes research groups, re-equips a lab with up-to-date machines and devices, staffs them with more research workers and engineers, improves the working conditions of the staff, gets funds, improves research activities. Lab assistants and technicians keep lab equipment in good order, repair metres, check and adjust devices, clean instruments and apparatuses, adjust them, assemble new devices. If you want reliable information on the subject, if you want to verify your results, you learn the methods for your experiment, make all the necessary preparations, make all measurements, process the results. If the method (approach) is suitable, if the experiment is well-designed, the data are in fall conformity with the theory. Then you are satisfied with your results

9. What results have you obtained?

I think	the results	obtained	are	of some theoretical and practical importance of some interest of importance

	the data	-are compatible with -agree with -are fully consistent with -are in line with - contradict - confirm		the assumption predictions
		-have	many	advantages
			Some	positive features
			A number of	shortcomings faults

How did you analyse the previous results?

To	predict draw come search deduce	a conclusion on the advantages and disadvantages, as much as you can from the data
it was	necessary important	to like into account to discuss to weight up

- all the relevant aspects of the problem
- a range of variables

The results	show demonstrate indicate	an interesting trend tendency

10. What are the prospects of your research?

As a result of my research	I'd like I am planning	to show … to prove …

By the year 1990, there may be over 100,000 robots installed in the US. The form, design end technology of these robots will improve as time progresses. It will be made possible to use robots in hundreds of thousands of applications as a number of technical problems are overcome.

The first technical need is the improvement of the accuracy of positioning the robot. Through better calibration procedures and improved mechanical systems, the arbitrary accuracy of the system will be improved.

Another area needing improvement is the dynamic performance of robots. In many assembly tasks, present-day robots are too slow and clumsy to effectively work in cooperation with human labor. Much also remains to be done in the design of grippers. Sensors of many different kinds also need to be developed. Robots must become able to see, feel and sense the position of objects in a number of different ways. In addition, control systems are needed which can process sensory data from a large number of sensors simultaneously.

In the coming decade we can look for systems with improved reliability, lighter weight, lower cost and more extended sensor capabilities.

11. What are the spheres of its application?

It	must be can be	applied used employed utilized	for	intensifying … protecting … increasing … reducing …

One of the major potentialities of robotic devices is performing tasks in environments in which humans cannot operate safely or efficiently. One such

environment is under water where robots can be used for construction and repair of structures, retrieving lost objects, gathering underwater mining and drilling equipment. Undersea functioning will require on-board computer processing for sensing and mobility far greater than is currently available. Underwater robots could be weightless with their buoyancy controlled by filling or emptying air chambers. They could be maneuvered by propelling or by jets of water; even walking underwater could easily be accomplished by a two-legged robot.

12. What do you think about the results obtained?

Read the article which is related to the topic of your research using the following expressions:

The data / the results obtained	to be in agreement with
The findings presented	
The conclusions / the predictions made	to be consistent with
The evidence reported	to be in line with
The facts outlined	to be in keeping with
The information available	to be valid for
	to be true for

РОЗДІЛ V

Writing Research Basics in Use

Investigation – the process intended to explain or find the truth about something such as a situation, problem.

Research – serious study of a subject that is intended to discover new facts or test new ideas.

Exploration – examination or discussion of something carefully in order to find out more about it.

1. Study the following:

Basic framework for a research report

1. Title.
2. Introduction
    2.1. Outline (abstract) of the research.
    2.2. Statement of the problem (aims, tasks, importance)
3. Main body
    3.1. Historical background (review of the literature)
    3.2. Design of the investigation (plan)
    3.3. Methods and procedures (experiment, measurement, techniques used, methods)
    3.4. Results
4. Conclusion
    4.1. Recommendations and suggestions for further research (discussion and conclusions)
    4.2. Summary of conclusions
5. Extras

5.1. List of contents

5.2. List of figures/tables

5.3. Acknowledgements

5.4. Bibliography

5.5. Appendices

Acknowledgements

STRUCTURE OF A RESEARCH REPORT

A typical research report introduces the subject and presents a problem that needs to be addressed, describes a hypothesis for solving the problem, describes an experiment for testing the hypothesis, describes the results, and describes the implications of the results. Most research reports can thus be divided into four sections: introduction, materials and methods, results, and discussion (known as the IMRD format). The report is usually preceded by an abstract and followed by acknowledgments (when appropriate), references, and appendixes (if necessary).

INTRODUCTION

The introduction of a research report serves as a transition between a general subject area and the particular research of the report. It often presents the motivation for the study by describing an existing situation in relation to the problem, need, or inadequacy that must be addressed. It then presents a hypothesis for the resolution of the problem. Look at the following examples.

MATERIAL AND METHODS

The materials and methods section of a research report describes what materials were used in the study and how the data were collected. The methods section is usually presented in chronological order.

If the precise nature of the materials and methods is especially important, they are sometimes listed with separate subheadings, as shown in the following example.

DISCUSSION

The discussion section is concerned with the significance of the results Some common approaches are to discuss 1) the hypothesis in terms of the results, *2)* the experimental design, 3) possible sources of error, 4) the results of other researchers, and/or 5) possible scientific explanations of the results This is often followed by a description of the limitations of the study and suggestions for further research

2. Which explanation is appropriate for each section:

1	Definitions	…is a science about (study of… that deals with) (approach, method)
2	Structure	to be divided into …
3	Historical background (period, duration, interval, origin, source)	temporary, permanent, eventual, periodic, successive
		to originate, to form, to develop, to set up, to found, to raise (bring up) a hypothesis, to cause, to outline
4	State-of-the art	modern, up-to-date, contemporary, obsolete, preceding, outdated
		to become, to mark, to achieve, to widen, to deepen

5	Methods (mode, operation, system, procedure)	to use, to apply, to work out, to develop
6	Relation to other sciences	to be related to, applied, relationship, dependence
7	Importance	important, significant, leading, breakthrough
		to play an important role in…, to occupy an important place in….
8	Organization (grouping together, classification, differentiation)	to head, to lead, to found, to publish

a) the presentation in a logical order of information and data upon which a decision can be made to accept or reject the hypothesis;

b) a compilation of important data and explanatory material (outside the main body);

c) the sections in sequence;

d) a survey of selective and relevant reading;

e) the presentation of principles, relationships, correlations and generalizations, the interpretation of results, deductions, recommendations;

f) an accurate listing in strict alphabetical order of all the sources;

g) a concise summary, overview of the whole report;

h) thanking all those involved (friends, supervisors, sponsors, colleagues);

i) detailed descriptions and discussion of the hypothesis and the theoretical structure in which they will be tested and examined, the methods used;

j) a concise account of the main findings;

k) a statement and discussion of the hypothesis and the theoretical structure in which they will be tested and examined, the methods used;

l) the sequence of charts and diagrams;

m) a clear declaration of proposals and hypothesis.

3. Put down the definition of the sciences you major in the key terms you use for your research.

4. Fill in the chart describing a phenomenon you deal with: pressure, electricity, gravitation, heat and mass transfer.

1	essence	
2	sources	
3	characteristics/properties	
4	classification	
5	importance (application, impact)	
6	prospects for further research	

5. Fill in the chart (describing a process: preparation, production, manufacture, control, regulation, prevention, compensation).

1	topicality	
2	essence	
3	causes/factors	
4	problem – solution	
5	prospects for further research	

6. Fill in the chart (describing an experiment: tools, instruments, devices, machines, apparatuses, meters, mechanisms; to carry out, to demonstrate, to detect, to represent, to measure, to reveal)

1	object	
2	purpose	
3	methods of measurement	
4	equipment	
5	measurement results	
6	coordination, agreement with theoretical predictions	
7	conclusions	

7. Describe objects you deal with during your research:

1	Composition (склад)	- consists of - constitute (%) - be made up - contain - incorporate
2	State/condition (стан)	- change (from the initial to the final state) - pass (from one state to another)
3	Properties (властивості)	- be have the property - be characterized - be distinguished by
4	Change: properties; states; characteristics (зміни властивостей станів)	- be modified - be changed - vary from...to - be transformed - become - increase

		- decrease	
5	Relationship (зв’язки, взаємовідносини)	- depend on - be connected with - influence, have an effect, impact (on) - more - less - change in A with B - correspond to - connect (be connected) - establish (the connection with)	
6	Form/shape (форма)	- be shaped as, be in form (shape), take the form of - form - conform to - make the shape of - hold its shape	
7	Materials (засоби, властивості, характеристики)	- be made of - be made from - be manufactured - grade, classify - use, apply	Surface: smooth, grounded, chrome-coated, painted; front, rear, top, bottom, right, left
8	Arrangement/ location	- arrange - dispose	

	(розміщення, розподілення)	- place - arrange according to - some order - arrange in - be lined up with - be arranged - be placed - be positioned
9	Connection / joining	- joint - connect - fasten - secure
10	Size/ dimensions (габарити)	- breadth - height - thickness - mass - weight

8. Connectives are very important for making the text logical and clear.

Enumeration

prior to previously	
firstly, first of all, at first, to begin with, in the beginning	
first and foremost	
secondary, thirdly	
then, next, further	
afterwards, moreover	

finally, lastly, in the end	
last but not least	
in conclusion, to conclude, to sum up, in brief, thus	

In the air conditioner

Firstly, when cooling, warm room air is drawn across the indoor coil (evaporator) where heat is transferred to the refrigerant passing through the coil.

Secondly, this heat is then transferred via the refrigerant to the outdoor coil (condenser) where it is dissipated to the atmosphere.

Thirdly as the room air, which is being cooled, passes across the indoor coil, moisture may also be removed from it and drained to an outlet outdoors. This moisture condenses on the indoor coil in the same way as moisture in your breath when you breathe on a cold window.

First and foremost is the fact that as well as heat being extracted from the air in the area to be cooled and transferred outside, the indoor air is also dehumidified. This improves comfort conditions in hot, sticky weather.

The operation of most air conditioners is controlled by a thermostat which is either built into the air conditioner or independently mounted. The thermostat is adjustable so that once you set it to your desired temperature it automatically maintains it. And last but not least in domestic air conditioners the compressor is switched on by the thermostat, only as long as necessary to maintain the room temperature thus ensuring the lowest operating coast.

Addition

in addition to as previously mentioned	
in particular	

especially equally likewise correspondingly similarly	
besides except	
also again	
above all moreover	

Ship dehumidifying

The engine room includes associated spaces – control room, steering gear room, workshop and spare parts store, also needs protection. In addition, here is to be found various devices sensitive to humidity such as electric motors, regulation equipment, etc.

As previously mentioned, the dehumidification is arranged in a closed system with distribution of the dry air to the various departments of the engine room via a provisional duct system. The process air (return air) is obtained through free suction at the dehumidifier. For reactivation, use is made of external air conducted via a duct to the dehumidifier. The wet air from the dehumidifier is discharged into the open.

Especially important is dimensioning. As a standard value for dimensioning an adequate dry air flow can be determined at 0.1–0.2 air changes/h calculated in terms of the volume of the engine room. If it is acceptable that the humidity is not under control at certain times 0.05 air changes/h can be used for dimensioning. In such a case the control room should be supplied with a separate dehumidifier.

Besides engine room spaces, accomodation is also dehumidified. By dehumidifying cabins and public rooms the furnishing are protected against damage by moisture. Woodwork and textiles are preserved intact is the humidity can be limited to 50% RH, i.e. the same value which prevents corrosion attacks on steel details.

For the distribution of dry air use is made of the existing central unit for the air conditioning plant operating with 100% return air, and with the fan running at reduced speed.

Since the central unit deals with a comparatively large air flow only a part of the recirculated air is dehumidified. The dry air is conducted via a duct to the suction side of the central unit. The intake for reactivation air on the dehumidifier as well as the outlet for wet air are linked by ducts to the open.

The dehumidifier is set for a dry air flow corresponding to 0.2–0.3 air changes/h calculated in terms of the total volume of the spaces served.

Moreover wheel house, radio cabin and radar cabin are also dehumidified. These cabins are normally linked to the air conditioning system and are thus included in the spaces dehumidified via a central unit in accordance with the above. In other cases cabin separate dehumidification must be provided – closed system – to protect the sensitive electronic equipment.

Contrast

but however contrary to on the contrary on the one hand … on the other hand otherwise	
nevertheless	

although even is/even though in spite of despite that not with standing	
in any case at any rate	

Dehumidification systems within shipbuilding industry

In spite of the fact that ships are in water, water is a great problem. Munters Company deals with the problem of condensation. When a ship sweats, moisture condenses on its interior surfaces. Hulls rust, paint blisters, wiring and electronic circuits malfunction. Cans rust, produce rots and mildews, cartons get soggy and labels get stained. Liquid cargo becomes contaminated. Sandblasting and painting must be rescheduled or redone. The result is millions of dollars lost every year. And even more revenue is lost while ships sit idle for unnecessary repairs.

However condensation is a problem that can be solved, Munters has the solution. Condensation is prevented when the dew point temperature in the hold or tank is kept lower than that of the ship's structure and cargo temperature. In any case, a Munters dehumidifier will maintain a required dew point level, regardless of outside weather conditions or extreme temperature changes. All Munters dehumidifiers are designed on the principle, which uses a slowly revolving wheel, impregnated with desiccant, to draw moisture from air. As air moves through the wheel, it is dried and returned at a safe dew point level.

Although the dehumidification principle remains the same, each type of vessel, tank or container has its own unique and individual requirements. Munters offers a complete line of dehumidifiers, and control equipment, or systems specifically designed to meet the needs of differing situations.

On the other hand, one of the newest projects that Munters participating in is the inert gas system on LNG ships carrying cargo at -127^0C. Munters dehumidifier is an integral part of this system. Dry inert gas used to fill LNG tanks prevents the formation of a flammable atmosphere and ice build-up inside the LBG tanks. In a nutshell, this is how the system works: Gas from an inert gas generator is routed through a gas scrubber, which cools it and removes solid particles and acidic components from the gas. A Munters dehumidifier then dries the gas, which has become saturated in the scrubber.

Result

so	
therefore	
as a result	
consequently	
because of (this)	
thus	
hence	
for this reason	

Dehumidification

The relative humidity in painting is usually too high and there are different ways to lower it.

Thus a straight method is to decrease the moisture content of the air by dehumidification. At anti-corrosive painting, the method of sorption dehumidification is used, involving that a hygroscopic agent absorbs the moisture out of the air. For this reason, this method is equally good at all temperatures. One usually dehumidifies to a relative humidity of 35-50% RH, which is rust-preventing. At dehumidification, some kind of shielding to the open is necessary. Because of insufficient hightness it will do with awnings or a

plastic foil on a bolt arrangement. In closed premises and indoors the entire volume is dehumidified.

The dehumidifier is based on Munters' sorption rotor. It is divided into two zones, a working zone where the rotor absorbs moisture from the process air, and a reactivation zone where hot reactivation air absorbs moisture from the rotor. The rotor is turning slowly, about 10 r/h. The dehumidification and reactivation is continuous. Therefore the dehumidifier operates without problems also at temperatures below zero.

9. Put down the summary of your research.

Appendix 1

List of Irregular Verbs

A				
	arise	arose	arisen	**підніматися**
B				
	bear	bore	borne	**носити**
	become	became	became	**становитися**
	begin	began	Begun	**починати**
	bend	bent	bent	**згинати**
	bind	bound	bound	**зв’язуавти**
	bleed	bled	bled	**стікати кров'ю**
	blow	blew	blown	**дути**
	break	broke	broken	**ломати**
	breed	bred	bred	**вирощувати**
	bring	brought	brought	**gриносити**
	burn	burnt/burned	burnt/burned	**горіти**
	burst	burst	burst	**розриватися**
	buy	bought	bought	**купувати**
C				
	catch	caught	caught	**ловити**
	choose	chose	. chosen	**вибирати**
	cling	clung	clung	**чіплятися**
	come	came	came	**приходити**
	cost	cost	cost	**коштувати**

creep	crep	crept	**повзти**
cut	cut	cut	**різати**

D

deal	dealt	dealt	**мати справу з**
dig	dug	dug	**копати**
do	did	done	**робити**
dream	dreamt/dreamed	dreamt/dreamed	**мріяти**
drive	drove	driven	**водити (машину)**

E

eat	ate	eaten	**їсти**

F

fall	fell	fallen	**падати**
feel	felt	felt	**почувати**
feed	fed	fed	**годувати**
fight	fought	fought	**боротися**
find	found	found	**знаходити**
fly	flew	flown	**літати**
freeze	froze	frozen	**замерзати**

G

give	gave	given	**давати**
go	went	gone	**йти**
grind	ground	ground	**терти**
grow	grew	grown	**рости**

H

hang	hung	hung	**вішати**
have	had	had	**мати**

hide	hid	hidden	**ховати**
hit	hit	hit	**ударити**
hold	held	held	**тримати**
hurt	hurt	hurt	**спричинити (біль)**
K			
keep	kept	kept	**тримати**
know	knew	known	**знати**
L			
lay	laid	laid	**положити**
lead	led	led	**керувати**
lean	leaned/leant	leaned/leant	**опиратися**
leap	leaped/lept	leaped/lept	**плигати**
learn	learnt/learned	learnt/learned	**вивчати**
leave	left	left	**лишати**
lend	lent	lent	**позичати**
let	let	let	**дозволяти**
light	Lighted/lit	lighted/lit	**освітлювати**
M			
make	made	made	**робити**
mean	meant	meant	**означати**
meet	met	met	**зустрічати**
P			
pay	paid	paid	**платити**
put	put	put	**покласти**

R

read	read	read	**читати**
ride	rode	ridden	**їхати верхи**
ring	rang	rung	**звонити**
rise	rose	risen	**підійматися**
run	run	run	**бігати**

S

say	said	said	**казати**
see	saw	seen	**бачити**
sell	sold	sold	**продавати**
send	sent	sent	**посилати**
set	set	set	**установити**
shake	shook	shaken	**трясти**
shine	shone	shone	**сяяти**
shoot	shot	shot	**стріляти**
shrink	shrank	shrunk	**скорочуватися**
shut	shut	shut	**закривати**
sing	sang	sung	**співати**
sink	sank	sunk	**тонути**
sit	sat	sat	**сидіти**
steep	slept	slept	**спати**
slide	slid	slid	**ковзати**
smell	smellt/smelled	smellt/smelled	**нюхати**
speak	spoke	spoken	**говорити**
spell	spelt/spelled	spelt/spelled	**казати по буквам**
spend	spent	spent	**проводити**

	spin	spun	spun •	**крутити**
	spread	spread-	spread	**розповсюджу-вати**
	spring	sprang	sprung	**плигати**
	stand	stood	stood	**стояти**
	steal	stole	stolen	**красти**
	stick	stuck	stuck	**втикати**
	sting	stang	stung	**жалити**
	strike	struck	struck	**ударяти**
	swear	swore	sworn	**ругатися**
	sweep	swept	swept	**подкитати**
	swim	swam	swum	**плавати**
	swing	swung.	swung	**качати**
T				
	take	took	taken	**брати**
	teach	taught	taught	**навчати**
	tear	tore	torn	**розривати**
	tell	told	told	**казати**
	think	thought	thought	**думати**
U				
	understand	understood	understood	**розуміти**
W				
	wake	woke/waked	woken	**будити**
	wear	wore	worn	**носити**
	win	won	won	**вигравати**
	wind	wound	wound	**заводити (годинник)**

write wrote written **писати**

Quick irregular verb chart

bleed	bled	Bled
breed	bred	Bred
creep	crep	Crept
deal	dealt	Dealt
	felt	Felt
feed	fed	Fed
keep	kept	Kept
lead	led	Led
leap	lept	Lept
leave	left	Left
mean	meant	Meant
meet	met	Met
read	read	Read
sleep	slept	Slept
sweep	swept	Swept
bend	bent	Bent
lend	lent	Lent
send	sent	Sent
spell	spelt	Spelt
spend	spent	Spent
begin	began	Begun
ring	rang	Rung
shrink	shrank	Shrunk
sing	sang	Sung

sink	sank	Sunk
spring	sprang	Sprung
sting	stang	Stung
swim	swam	Swum
blow	blew	Blown
fly	flew	Flown
grow	grew	grown
know	knew	known

arise	arise	arisen
drive	drove	driven
ride	rode	ridden
rise	rose	risen :;'-
shine	shone	shone
write	wrote	written
bring	brought	brought
buy	bought	bought
catch	caught	caught
fight	fought	fought
teach	taught	taught
think	thought	thought
broad	broad	broad
burst	burst	burst
cast	cast	cast
cost	cost	cost
cut	cut	cut
hit	hit	hit
hurt	hurt	hurt

let	let	let
put	put	put
set	set	set
shut	shut	shut
spread	spread	spread
bind	bound	bound
find	found	found
grind	ground	ground
wind	wound	wound
bear. .	bore	borne
swear	swore	sworn
tear	tore	torn
wear	wore	worn
break	broke	broken
choose	chose	chosen
freeze	froze	frozen
speak	spoke	spoken
steal	stole	stolen
wake	woke	woken
lay	laid	laid
make	made	made
pay.	paid	paid
say	said	said
cling	clung	clung
dig	dug	dug
hang	hung	hung
spin	spun	spun
stick	stuck	stuck

strike	struck	struck
swing	swung	swung
win	won	won
eat	ate	eaten
fall	fell	fallen
give	gave	given
hide	hid	hidden
sell	sold	sold
shake	shook	shaken
slide	slid	slid
take	took	taken
tell	told	told

Appendix 2

Nouns that are always singular.

Some nouns are always singular in English. Compare "money" with "coins" and "notes".

Advice	He gave me **much** excellent advice.
Damage	All the **damage was** done during July. **Damage** to buds and shoots of spruce is heavy.
Equipment	All **equipment was** purchased in 2006.
Evidence	Further **evidence** is needed.
gear [=equipment]	The **gear** is simple. Different **types** of gear **are** heeded for sampling.
Glassware	**All glassware is** heated to **180**°C.
Information	Much **information is** needed on many points., Individual ants convey **scraps of information (**an **item**/a **piece**/a considerable **amount/of information** a large **fund of information** on the subject)
Knowledge	Most of our **knowledge is** limited to a few species. All **knowledge is** assumed to be tentative. A **good knowledge** of all these aspects is essential.
Work [=energy]	The **work** done by a moving force **is** measured in joules.
work [=research]	The **work** of Mendel **was** overlooked for 35 years. Much of the earlier **work** was not valid.

Nouns that have specific plural forms

alumna	*колишня студентка*	alumnae
alumnus	*колишній студент*	alumni
analysis	*аналіз*	analyses
antenna	*антена*	antennae / antennas

appendix	*додаток*	appendices / appendixes
axis	*вісь*	axes
bacillus	*бацила*	bacilli
bacterium	*бактерія*	bacteria
basis	*базис, основа*	bases
bureau	*письмовий стіл*	bureaux / bureaus
cactus	*кактус*	cacti / cactuses
codex	*кодекс*	codices
crisis	*кризис*	crises
criterion	*критерій*	criteria
curriculum	*навчальний план*	curricula
datum	*дана величина*	data
diagnosis	*діагноз*	diagnoses
erratum	*опечатка*	errata
foot	*нога(ступня)*	feet
formula	*формула*	formulae
fungus	*грибок*	fungi
hypothesis	*гіпотеза*	hypotheses
index	*індекс*	indices *(indexes)*
locus	*траєкторія*	loci
matrix	*матриця*	matrices
maximum	*максимум*	maxima
medium	*середовище*	media
memorandum	*замітка*	memoranda
minimum	*мінімум*	minima
nucleus	*ядро*	nuclei
oasis	*оазис*	oases
parenthesis	*дужки*	parentheses
phenomena	*явище*	phenomena
radius	*радіус*	radii
syllabus	*конспект*	syllabi
stimulus	*стимул*	stimuli
stratum	*слой*	strata

tempo	*темп*	tempi
terminus	*кінцева станція, мета*	termini
thesis	*дисертація*	theses
tooth	*зуб*	teeth

Appendix 3

Pronunciation of Greek Letters

alpha	[‘ælfə]	альфа
beta	[‘bi:tə, beitə]	бета
gamma	[‘gəmə]	гамма
delta	[‘deltə]	дельта
epsilon	[‘ep’sailən, ‘epsilon]	епсилон
zeta	[‘zi:tə, ‘zeilon]	дзета
eta	[‘i:tə , ‘eitə]	ета
theta	[‘θi:tə]	тета
iota	[ai’outə]	нота
kappa	[‘kæpə]	каппа
lambda	[‘læmbdə]	лямбда
mu	[mju:]	мю
nu	[nju:]	ню
xi	[ksi:]	ксі
omikron	[ou’maikrən]	омікрон
pi	[pai]	пі
rho	[rou]	ро
sigma	[‘sigmə]	сигма
tau	[tau]	тау
upsilon	[ju:p’sailəen, ‘ju:psilon]	іпсилон
phi	[‘fi:]	фі
chi	[‘hi:]	хі
psi	[‘psi:]	псі
omega	[‘oumigə]	омега

Appendix 4

Chemical Elements (with pronunciation)

Ac	Actinium	[æk'tiniəm]	Актиній
Ag	Argentum	['ɑ:gentəm]	Срібло
Al	Aluminium	[ˌælju'minjəm]	Алюміній
Am	Americium	[me' risiəm]	Америцій
Ar A	Argon	['ɑ:gɔn]	Аргон
As	Arsenic	['ɑ:snik]	Миш'як
At	Astatium	[ə'steitiəm]	Астат
Au	Auram = Gold	['ɔ:rəm], [gould]	Золото
B	Boron	['bɔ:rɔn]	Бор
Ba	Barium	['bɛəriəm]	Барій
Be	Beryllium	[bə'riljəm]	Берилій
Bi	Bismuth	['bizməө]	Бісмут
Bk	Berkelium	[bə:' keiljəm]	Барк(е)лій
Br	Bromine	['broumi:n]	Бром
C	Carbon	['ka:bn]	Вуглець
Ca	Calcium	['kælsiəm]	Кальцій
Cd	Cadmium	['kædmiəm]	Кадмій
Ce	Cerium	['si:riəm]	Церій
Cf	Californium	[ˌkæli'fɔ:niəm]	Каліфорній
Cl	Chlorine	[ˈklɔ:ri:n]	Хлор
Cm	Curium	['kju:riəm]	Кюрій
Co	Cobalt	[kə'bɔ:lt]	Кобальт
Cr	Chromium = Chrome	['kroum(əm], ['kroum]	Хром
Cs	C(a)esium	['si:ziəm]	Цезій
Cu	Cuprum = Copper	['kju:prəm], ['kɔpə]	Мідь

Dy	Dysprosium	[dis'prouʃiəm]	Диспрозій
Er	Erbium	[ˌəːbiəm]	Ербій
Es	Einsteinium	[ain' stɑiniəm]	Ейнштейній
Eu	Europium	[juː'roupiəm]	Європій
F	Fluorine	['fluəriːn]	Фтор
Fe	Ferrum = Iron	['ferəm], ['ɑiən]	Залізо
Fm	Fermium	['fəːmjəm]	Фермій
Fr	Fransium	['frænsiəm]	Францій
Ga	Gallium	['gæliəm]	Геллій
Gd	Gadolinium	[ˌgædə'liniəm]	Гадоліній
Ge	Germanium	[dʒəː'meiniəm]	Германій
H	Hydrogen	['haidridʒən]	Водень
He	Helium	['hiːljəm]	Гелій
H	Hafnium	['hɑːfniəm]	Гафній
Hg	Hydrargyrum = Mercury	[hai'drɑːdʒirəm], ['məːkjuri]	Ртуть
Ho	Holmium	['houlmiəm]	Гольмій
In	Indium	['indiəm]	Індій
Ir	Iridium	[ai'riːdiəm]	Іридій
J, I	Iodine	['aiədiːn]	Йод
K	Kalium = Potassium	['keilism], [pa'tagsjsm]	Калій
Kr	Krypton	['kriptɔn]	Криптон
La	Lanthanum	['lænθənəm]	Лантан
Lw	Lawrentium	[ˌlɔː'rentiəm]	Лоренцій
Li	Lithium	['liθiəm]	Літій
Lu	Lutecium	[ljuː' tiːʃiəm]	Лютецій
Md	Mendelevium	[ˌmendə'liːviəm]	Менделевій
Mg	Magnesium	[ˌmæg' niːzjəm]	Магній
Mn	Manganese	[ˌmæŋgə'niːz]	Марганець

Mo	Molybdenum	[mə'libdinəm]	Молібден
N	Nitrogen	['naitridʒən]	Азот
Na	Natrium = Sodium	['neitriəm], ['soudjəm]	Натрій
Nb	Niobium	[nai'oubiəm]	Ніобій
Nd	Neodymium	[,ni:ou' dimiəm]	Неодим
Ne	Neon	['ni:ən]	Неон
Ni	Nickel	['nikl]	Нікель
No	Nobelium	[,nou' bi:liəm]	Нобелій
Np	Neptunium	[nep' tju:niəm]	Нептуній
O	Oxygen	['ɔksidʒən]	Кисень
Os	Osmium	['ɔzmiəm]	Осмій
P	Phosphorus	['fɔsfərəs]	Фосфор
Pa	Prot(o)actinium	[,proutæk' tiniəm]	Протактиній
Pb	Plumbum = Lead	['plʌmbəm], [led]	Свинець
Pd	Palladium	[pə'leidjəm]	Паладій
Pm	Promethium	[prə'mi:θjəm]	Прометій
Pr	Praseodymium	[,prezi:ou'dimiəm]	Празеодимій
Pt	Platinum	['plætinəm]	Платина
Pu	Plutonium	[plu:'tounJəm]	Плутоній
Ra	Radium	['reidjəm]	Радій
Re	Rhenium	['ri:niəm]	Реній
Rh	Rhodium	[roudiəm]	Родій
Rn	Radon	['reidɔn]	Радон
Rz	Ruthenium	[ru:'θjniəm]	Рутеній
S	Sulphur	['sʌlfa]	Сірка
Sb	Stibium = Antimony	['stibjəm]	Сурьма
Sc	Scandium	['skændjəm]	Скандій
Se	Selenium	[si'li:niəm]	Селен
Si	Silicon	['silikən]	Кремній

Sm, Sa	Samarium	[sə'meiriəm]	Самарій
Sn	Stannium-Tin	['stænəm], [tin]	Олово
Sr	Strontium	['strɔnʃjəm]	Стронцій
Ta	Tantalum	['tæntələm]	Тантал
Tb	Terbium	['tə:biəm]	Тербій
Tc	Technetium	[tek'niʃiəm]	Технецій
Te	Tellurium	[te'lju:riəm]	Телур
Th	Thorium	['ɵlriəm]	Торій
Ti	Titanium	[tai' teinjəm]	Титан
TI	Thallium	['ɵæliəm]	Талій
Ти, Тт.	Thullium	['ɵju:liəm]	Тулій
U	Uranium	[juə'reinjəm]	Уран
V	Vanadium	[və'nəidjəm]	Ванадій
W	Wolfram(ium) =Tungsten ['wulfrəm]		Вольфрам
Xe	Xenon	['zenən]	Ксенон
Y, Yt	Yttrium	['itriəm]	Ітрій
Yb	Ytterbium	[i'tə:biəm]	Ітербій
Zn	Zinc(um), Zink	['ziŋk]	Цинк
Zr	Zirconium	[zə:' kounjəm]	Цирконій

Appendix 5

Математичні знаки,
символи, їх читання та значення

+	addition, plus, positive	знак додавання
		або позитивної величини
-	subtraction, minus, negative	знак віднімання
		або негативної величини
±	plus or minus	плюс мінус
+Ї	minus or plus	мінус плюс
Ч	multiplication sign,	знак множення,
·	multiplied by, times	множити на...
ч	division, divided by	знак ділення, ділити на ...
:, /, ─		
:	is to, divided by	знак відносини, ділений на ..
=	equals, (is) equal to	дорівнює
≠	not equal to	не дорівнює
≈	approximately equals	приблизно дорівненює
→	approaches	досягає значення
>	greater than	більше
<	less than	менше
≥	equal to or greater than	більше або дорівнює
≤	equal to or less than	менше або дорівнює
∞	infinity	безкінечність
square root of *a*		корінь квадратний з «*a*»
cube root of *a*		корінь кубічний з «*a*»
‖	parallel to	паралельно
⊥	perpendicular to	перпендикулярно

∴ therefore	тому, отже
6^4 *читається:*	six to the fourth power, six to the power four
a^b *читається:*	*a* to the power *b*
power	ступінь *(мат.)*
raise to power	підносити до степеня
exponent	показник
square	квадрат; квадратний; підносити до квадрата
cube	куб; кубічний; підносити до куба

Evolution (Витяг кореня)

$\sqrt{4}=2$ *читається:*	the square root of four is two
$\sqrt[3]{27}=3$ *читається:*	the cube root of twenty *seven* is *three*
radical sign	знак кореня
root	корінь
extract	добувати
extract the root of	добути корінь із
index (indices)	показник(и) *(мат.)*

Fractions (Дроби)

S *читається:*	*one* half, a half
$^1/_3$ *читається:*	one third
$^4/_7$ *читається:*	four sevenths
3⅓ *читається:*	three and a third
numerator	чисельник
denominator	знаменник

integer, whole number		ціле число (мат.)

Decimal Fractions (Десяткові дроби)

У десяткових дробах в англійскій мові ставиться крапка (point) замість коми.

·.·	since, because	оскільки
ABÏ	length of line from *A* to *B*	довжина лінії *AB*
□	angle	кут
∟	right angle	прямий кут
□	square	квадрат, квадратний
○	round; circle	коло, круглий
( )	parentheses	круглі дужки
[ ]	brackets	квадратні (або прямі) дужки
{ }	braces	фігурні дужки
μ	micron	мікрон (0,001 мм)
°	degree(s)	градус(и)
%	per cent	відсоток
′	minute(s); foot, feet	хвилина(и); фут(и)
″	second(s); inch(cs)	секунда(и); дюйм(и)
A′	*A* prime	
A″	*A se*cond	
B_1	*B* sub one	
B_2	B snb iwo	
C_b	*C* sub *b*	
N^b	number	число, цифра, сума *(мат.)*
No(s)	nuniber(s)	номер(и)
dx	differential of *x*	диференціал *x* (ікса)
dy/dx	derivative of *y* with	похідна *y*

	respect to *x*	no *x* respect to *x*
∫	integral of	інтеграл від
$\int_b^a$	integral between the limits *a* and *b*	інтеграл у межах від *a* до *b*
f(x), F(x)	function of *x*	функція від *x*
4|	factorial 4 *або* the factorial of 4	факторіал 4
| *x* |	absolute value of *x*	абсолютне значення *x*
&	and	і, та
&c	et cetera; and so on, and so forth	і так далі, і тому подібне
.	full slop	крапка (розділовий знак)
:	colon	дворапка (розділовий знак)
a-b=c	*читається:*	*a min*us *b* is equal to c і т. д.
subtract		віднімати
minuend		зменшуване *(мат.)*
subtrahend		від'ємник *(мат.)*
difference		різниця *(мат.)*

Multiplication (Множення)

1Ч1 = 1	once one is one
2Ч2 = 4	twice two is four
3Ч3 = 9	three times three is nine
11Ч7 = 77	11 multiplied by 7 equals seventy seven
*a*b=c*	*a* multiplied by *b* equals *c*
multiply	множити
multiplicand	множеня *(мат.)*
multiplier	множник

factor	множитель *(мат.)*
limes	раз(а)

Division (Деление)

15:3=5	fifteen divided by three equals five
a:b=c	*a* divided by *b* is equal to *c*
divide	ділити
dividend	ділиме *(мат.)*
divisor	дільник *(мат.)*
quotient	частка *(мат.)*
divided by	ділимий на...

Involution (Зведення до ступеня)

2^2 *читається:*		two squared
4^3 *читається:*		four cubed
,	comma	кома (розділовий знак)
;	semicolon	крапка з комою
’	apostrophe	апостроф
—	dash	тире
–	nyphen	дефіс
“ ”	inverted commas	дужки *або* quotation marks
*	asterisk	зірочка (знак посилання)
?	interrogation point	знак питання
!	note of exclamation	знак оклику

Addition (Сложение)

2+3=5	two plus three equals five

	two plus three is equal to five
	two and three is (are) five
	two added to three makes five
a+b=c	*a* plus *b* equals *c* і т. д.
quantity	кількість; величина
unknown quantity	невідоме *(мат.)*
add	додавати
item	доданок *(мат.)*
sum	сума; суммировать
total	ціле; сума; результат
equal	який дорівнює

Subtraction (Віднімання)

8-4=4	eight minus four equals four
	four from eight leaves four
	the difference between four and
eight is four	
0.2	nought (zero) point (wo
.2	point two
2.4	two point four

Ratio (Відношення)

4:2	the ratio of *four* to *two*
a:b	the ratio of *a* to b

Proportion (Пропорція)

2:3=4:0	*two* is to *three* as *four* is to *six*
	the ratio of *two* to *three* equals the ratio of *four to six*
a:*b=c:d*	*a* is to *b* as *c* is to *d*

$x=k/y$	x varies inversely as y x is inversely proportional to y
constant	постійная величина; константа
term	член; одночлен *(мат.)*
extremes	крайні члены
means	середні члены
proportional	пропорційний
vary directly as	змінюватися прямо пропорціально
vary inversely as	змінюватися пропорціально

Equations (Рівняння)

Вираз тотожності читається: $(a+b)$Ч$(a—b) = a^2—b^2$

The product of the sum and difference of two quantities is equal to the difference of their squares.

tons per square inch Ч 1.575	= kilos per square millimeter
pounds per square foot Ч 4.883	= kilos per square meter
tons per square foot Ч 10.936	= tons per square meter
tons per square yard Ч 1.215	= tons per square meter
pounds per cubic yard Ч 0.5933	= kilos per cubic meter
pounds per cubic foot Ч16.018	= kilos per cubic meter
tons per cubic yard Ч 1.329	= tons per cubic meter
pounds per gallon Ч 0.09983	= kilos per liter
gallons per square foot Ч 48.93	= liters per square metro
foot-pounds Ч 0.1382	= kilogram-meters
fool-tons Ч 0.310	= ton meters
heat units (B. Th. U.) Ч 0.252	= kilogram-calories

heat units per square foot Ч 2.713	= kilogram-calories per quare meter

Appendix 6

The Thesaurus of Basic Engineering Notions

Change

Maximize: multiply (number), add (number), swell (volume), expand (area), broaden, widen (width), extend, lengthen (length);

unite, amplify (energy), rise, heat (temperature), strengthen (force), accelerate (speed), improve (quality, performance);

Minimize: shorten (length), narrow (width), contact (area), compress (volume), subtract (number), divide (number);

worsen (quality, performance), slow, down (speed), weaken (force), drop, cool, freeze (temperature), abate (energy), separate.

Matter

material, substance, element, solid, body, fluid, liquid, property, entity, powder, paste, foil, consistency, nature, feature, behaviour;

physical, chemical, biological, biochemical, gaseous, natural, artificial, available, discrete, pure, elastic, impure, granular, granulated, mobile, stationary, plastic, aggregate, ductile, consistent, porous, perforated, coloured, colourless, transparent, dense;

contain, consist of, integrate, disintegrate, be composed of.

Measurement

sum, total, precision, accuracy, approximation, scale, zero, magnitude, correction, quantity, amount, unit, ratio, proportion, increase, increment, decrease, decrement, nothing, rate, convention, symbol, standard, constant, variable, consistency, inconsistency, reading, result, determination, range;

correct, standardize, normalize, measure, record, determine, tabulate, verify;

total, entire, partial, complete, precise, accurate, exact, correct, approximate, acceptable, fine, coarse, imprecise, inaccurate, inexact, quantitative, specific, critical, negligible, positive, negative, uniform, consistent, regular, irregular, steady, average, arbitrary, excessive, ample, adequate, inadequate, deficient, insufficient, scarce, rare.

Movement

motion, stationary, mobile, motionless, divergent, convergent;

impel, propel, activate, turn, conduct, transmit, shift, remove, replace, displace, substitute, exchange, actuate, travel, move, deviate, diverge, incline, decline, deviate, deflect, divert, reflect, transfer, transport, carry, flow.

Process

operation, method, procedure, routine, preparation, production, behaviour, mode, way, manner, action, function, accessory, application, association, condition, factor, feedback, effect, consequence, requirement;

derive, operate, provide, manufacture, prepare, produce, form, maintain, control, regulate, compensate, act as, apply, obtain, attract, repel, use, expend, consume, exploit;

operative, operational, complex, complicated, intricate, straightforward, available.

Relationships

contrast, reference, conformity, accordance, agreement, identity, classification, category, class, specimen;

relate, depend on/upon, correspond, conform, compare, contrast, match, classify, sample, represent;

relative, reciprocal, mutual, proportional, directly proportional, inversely proportional, different, distinct, dissimilar, contrasting, similar, identical, appropriate.

Shape

form, deformation, distortion, deformability, arrangement, structure, system, pattern, hierarchy, network, mesh, defect, flaw, fault, deficiency, disorder, tube, pipe, duct, channel, groove, edge;

distort, deform, restore;

initial, final, intermediate, ultimate, deformed, distorted, perfect, ideal, imperfect, non-ideal, concentric, rectangular, triangular, trapesoidal, circular, annular, cylindrical, tubular.

Space

place, position, point, boundary, limit, extent, path, range, course, spread, scope, surface, area, region, zone, volume, plot, track, location, dislocation, surroundings, environment, isolation, site;

extensive, voluminous, spatial, regular, marginal, isolated, single, sole, solitary, unique, adjacent, interconnected;

junction, joint, bond, combination, cluster, bunch, clump, blend.

Structure/Constitution

whole, part, portion, detail, component, ingredient, constituent, member, item, aggregate, content, essential, integral; separate, include, comprise; continuous, discontinuous, inclusive, exclusive.

Time

period, duration, interval, event, occasion, age, lifespan, epoch, era, origin, source;

interrupt, elapse, repeat;

latent, temporary, permanent, durable, perpetual, sudden, abrupt, instantaneous, rapid, fast, quick, brief, periodic, intermittent, slow, following, successive, consecutive, continuous, continual, simultaneous, preceding, obsolete, modern, up to date.

Appendix 7

Glossary

Academic Word List

abstract	a shortened form of an arbide, book, giving only the most important facts or arguments, usually printed at the beginning of the book or article
abundant	much, plenty of
acknowledge	to say that they have received it
aim	what you are hoping to achieve by a plan, action or activity, which is what makes you do it
allege(dly)	seems untrue
allocate	to assign, place
apparent	obvious, readily visible
assert	state clearly, declare
assign	fix (time, place, a task)
challenge	smth that tests strength, skill or ability, esp. in way that is interesting
compatible	able to exist successfully together
comprehensive	complete, full
consequence	result
controversy	a lot of disagreement or argument about smth
convincing	leaving no doubt
definition	to explain important terms to the reader
elucidate	explain, make clear

emergency	process of appearing or starting to exist
enhance	to improve the quality of
evidence	facts, information
general statement	to introduce the reader to the subject of the essay
goal	what a person, organization or country hopes to achieve in the future even it might take a long time
idea (sing.)	the effect or result that you hope or imagine smth you do will have, although in reality this might not happen
infer	form an opinion on the basis of indirect evidence
intrinsic	extremely important and basic characteristic of it
introduction	to give an overall view of the essay
judgement	the forming of an opinion, estimate, notion, conclusion
misinterpret	understand and explain in the wrong way
notable	important, deserving attention
object (sing.)	the intended result of plan…, esp. when this may be difficult to achieve
objective	esp. in business or politics meaning the result that someone is working (to achieve) towards
research paper	a formal presentation gathered from various sources
point	esp. when explaining this to someone who

	does not understand it or does not want to do it it
précis [preisi:]	a short form of a text which briefly summarises the important parts (restates the essential meaning of a longer piece of writing and should be no longer that one third the length of the original)
preliminary	introductory, preparatory
presumable	obviously
purpose	the result that you intend to achieve when you do smth or plan smth
target	the exact result, often the amount of money they want to get
thesis	to give the opinion of the writer
thesis statement	a statement of an essay's central theme that makes clear the main idea, the writer's purpose, the focus of the topic and the organizational pattern
sustainable	causing little or no damage to the environment
tentative	possible but not certain
transparent	obvious, clear
validity	basis in truth or reason

Appendix 8

Check yourself

Academic World Test

1. The ……. researchers collect can suggest an interesting conclusionII
   a) validity; b) evidence; c) controversy.
2. The evidence provides sufficient information because it is reliable and……. .
   a) abundant; b) notable; c) comprehensive.
3. The …… review (survey) of … has recently been made in Ukraine.
   a) abundant; b) notable; c) comprehensive.
4. A ……. information on the river pollution.
   a) abundant; b) notable; c) comprehensive.
5. In his revision the researcher gave the facts which showed his concern about the ……. of his analysis.
   a) validity; b) evidence; c) controversy.
6. These methods were considered to be …….. for proving the hypothesis.
   a) apparent; b) convincing; c) compatible.
7. The data collected ……. current approaches to solving the problem.
   a) acknowledge; b) challenged; c) elucidate.
8. If you use other persons' opinions facts, statistic, you should …… the source you cite or refer to.
   a) acknowledge; b) challenged; c) elucidate.
9. …… development relates to eliminating the negative impact of technology on the environment.
   a) tentative; b) sustainable; c) intrinsic.
10. Science and technology has ……. the quality of people's lives.
    a) enhanced; b) emerged; c) presumably.
11. The HUN ……. after World war II.

a) enhanced; b) emerged; c) presumably.

12. Experimenting is an …….. part of doing research.

a) tentative; b) sustainable; c) intrinsic.

13. There is a lot of ……. on a number of problems related to raising the efficiency of this engine.

a) validity; b) evidence; c) controversy.

14. The conclusion made by the research was rather …… because he was not certain as to a number of issues.

a) tentative; b) sustainable; c) intrinsic.

15. The disadvantages of the method applied were ……. because the results contained inconsistencies.

a) apparent; b) convincing; c) compatible.

16. Dean's assertion ….. seems very ……..

a) apparent; b) convincing; c) compatible.

17. They …….. the experimental tasks and decided to start the experiment at the beginning of September.

a) misinterpreted; b) assigned; c) inferred.

18. The impact of the invention seemed to be powerful but the …….. appeared unpredictable.

a) preliminary; b) transparent; c) consequences.

19. Mathematical modeling can be applied to …… the fundamental issues of structural mechanies.

a) acknowledge; b) challenged; c) elucidate.

20. The …… results offained appeared to be crucial for solving the problem.

a) preliminary; b) transparent; c) consequences.

21. The research …… came to some conclusions.

a) allegedly; b) transparently; c) presumably.

22. The definition offered by the author did not seem …….. because of using controversial terms.

a) preliminary; b) transparent; c) presumable.

23. Inadequate application of this method …….. the data obtained.

a) misinterpreted; b) assigned; c) inferred.

24. Students …… the meaning of the term though there were no definitions in the text.

a) misinterpreted; b) assigned; c) inferred.

25. The research …… leads to the results which can be widely applied.

a) enhanced; b) emerged; c) presumably.

Keys: 1b, 2a, 3c, 4b, 5a, 6c, 7b, 8a, 9b, 10a, 11b, 12c, 13c, 14a, 15a, 16b, 17b, 18c, 19c, 20a, 21a, 22b, 23a, 24c, 25c.

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