

Патяева Н.В., Михайлова Е.Б.

ENGLISH FOR ENGINEERING



ФЕДЕРАЛЬНОЕ АГЕНТСТВО ПО ОБРАЗОВАНИЮ
ГОСУДАРСТВЕННОЕ ОБРАЗОВАТЕЛЬНОЕ УЧРЕЖДЕНИЕ
ВЫСШЕГО ПРОФЕССИОНАЛЬНОГО ОБРАЗОВАНИЯ

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Патяева Н.В., Михайлова Е.Б.

ENGLISH FOR ENGINEERING

**Утверждено редакционно-издательским советом университета в качестве
учебного пособия для студентов инженерных специальностей**

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Учебное пособие составлено на материале аутентичных текстов интернет-сайтов и журналов (США, Великобритания, Канада) и предназначено для студентов инженерных специальностей. Основной целью пособия является развитие иноязычной коммуникативной компетенции студентов в сфере их будущей профессиональной деятельности, а также формирование профессионально-важных качеств современного инженера. Пособие снабжено адресами Интернет-сайтов для самостоятельного поиска информации.

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MODULE 1

WHAT COMES INTO LEARNING

Lead in

“They know enough who know how to learn”

Henry Brooks Adams (1838 –1918), an American novelist, journalist, historian and academic.

What do you think are the best ways to learn English?

1. Work in pairs or small groups. Look at the following ways of learning. Put them in order from the most effective to the least effective. Think of other ways to learn English.

1. Reading texts to retell them
2. Translating texts
3. Reading aloud
4. Discussing/brainstorming different topics
5. Doing grammar/ vocabulary exercises (filling the gaps, etc.)
6. Working with a partner/ in a group
7. Role-playing different situations
8. Listening to records
9. Watching videos
10. Doing projects
11. Writing letters and essays
12. Etc.

2. Compare your ideas with other pairs/ groups.

YOU ARE GOING TO READ, SPEAK AND WRITE ABOUT

- learning strategies and learning styles
- innovative products

YOU WILL PRACTICE

- comparative and superlative forms of adjectives
- Present Simple and Present Continuous
- Past Simple
- giving advice
- building topical vocabulary
- listening and reading
- working in groups

YOU WILL KNOW HOW TO

- create your portfolio
- read efficiently
- present a product
- write a report

UNIT 1

LEARNING STRATEGIES

“A university should be a place of light, of liberty and learning”

Benjamin Disraeli

Culture corner

Benjamin Disraeli (1804 –1881) was a British politician and writer. He served in government for three decades, twice as Prime Minister of the United Kingdom. He was the creator of the modern Conservative Party.

For a start

You have entered the university and become a student. It means that you had good grades at school and did well enough in the university entrance exams. What helped you to reach a success in your studies? What do you think can help you when studying at university? (the words below are for your help)

to attend, to take part in, to prepare, to revise for examinations, to improve, to set goals, to make progress, to learn by heart, to give a talk, to work in groups, to plan in good time, to complete tasks, to be responsible for, to cram, to rely on myself/ the others/ the Internet/ etc.

Activity 1.1 Learning Strategies



Many educators say that when a student has trouble learning a subject like math or history, the problem may lie not in the teacher’s ability or the student’s I.Q. Instead, it is often simply

because the student has never been taught how to learn.

Learning strategies are all about helping you learn how to be a more effective learner and develop the research skills that will help you now and in the future.

1. Read the list of the following learning strategies.

Work in pairs. Guess what they mean and write down words and phrases connected with each of them.

Learning Strategies:

1. Being an independent learner
2. Learning styles
3. Reading academically
4. Writing effectively
5. Working in groups
6. Giving a talk
7. Preparing effectively for examinations
8. Search strategy

2. The University of Southampton developed resources to support students in their studies (<http://www.studyskills.soton.ac.uk/develop.htm>). Read what is written in their site about being an independent learner. Underline the key words and phrases. Are any of them the same as you used to describe this strategy?

Your attitude to your studies will colour your experience of university life and affect the grades you get. In order to get the most out of your time at university, you should think about how you can become an independent learner - quality that will be important to you now, to your employer later and throughout your career.

<p>Help Box grade <i>A</i> = <i>E</i> for mark</p>

If you are an independent learner you will be motivated to learn; manage your own learning; and reflect on your learning. This will help you to become a successful learner. The responsibility for this is yours.

3. Emily is a high-achieving university student. Read her Academic Success Story and decide if she is an independent learner (for the moment, ignore gaps 1-7).

Studying at university is a lot different than in school. I study by reading a lot more than I ever have and I listen in class to make sure I remember what's been talked about in the lectures. It is strange, but I find that I am studying less now that I am in college, but I am studying the more important stuff. I have figured out which information is important in a text book, and which information is just a waste of space in my memory.

I..... Another difference is that I have to use a lot of outside resources other than the texts required for class. I spend many hours using online databases, library resources to complete tasks, while in school I could simply rely upon the sources given to me by my teacher.

II..... My mind is fresh and ready to learn. I find that I do so much better if I'm up early and study a little bit of each class every day. It is so important for me to review everything as I go along. It is impossible to do well if I cram it all in last minute. I tried that strategy once, not good!

III..... I make notes, and write out the key terms. I look at my notes sometimes during the weeks before the test. I make sure that I have it all down the night before the test, and the next morning I get up for a 2 hour cram study session to get it fresh in my head for the test that day. It works for me most of the time, but I am not the best test taker in the world, I get too nervous! So I study as hard as I can.



IV..... Keeping busy! I find that if I have nothing to do on a certain day, I am less likely to get things done. If I have a set schedule and a set place, I make sure I have things done. My biggest secret is my PLANNER!! I would die without it! I write everything in it and cross it off when its done. It makes me get things done and remember to do them.

V..... I choose times to study for each exam. I decide which subject needs more attention, and I focus more time on that one. I also take breaks in between. Nobody can study for 5 hours straight without going crazy! I have to get up and walk around, or go running, or paint my nails or something to give me a break from studying every once in a while. That way I will be totally focused when I am studying and not so tired and crazy that I don't understand what I'm reading.

VI..... These are my favourites!! I think brainstorming is the key to starting off a good task. I think you have to lay your ideas down before you can make sense of what you are going to write. I also think that grammar is so important, and you have to make sure that you at least sound intelligent through what you write.

VII..... Do your best and motivate other students to want to do as well as you. Show them how much it means to you and maybe they will follow your lead. Don't do it all by yourself. I've done this before and it is a lot of unnecessary stress that can be avoided when the others want to help you. Figure out what motivates your team and make it fun for everyone to work together!

(Adapted from <http://www.mycollegesuccessstory.com/success-stories/EmilyB.html>)

4. Choose the best subtitle for each paragraph.

- A. My time management secret.
- B. How I succeed in team projects.
- C. My method of revising.
- D. How I find information.
- E. How I study for end of term tests.
- F. My strategies for writing tasks.
- G. My study method is usually an early morning one.

5. Discuss the following questions:



- A. What other learning strategies (except “Being an independent learner”) does Emily use?
- B. Which of these strategies do you use in your studies?
- C. Do you use any other strategies that help you to learn effectively?

Activity 1.2
Grammar review

Present Simple and Present Continuous

Complete the rules with *present simple* or *present continuous*.

We use the to:

- give factual information.

The earth goes round the sun.

- talk about routine activities.

I look at my notes sometimes during the weeks before the test.

Some verbs are almost always used in the present simple rather than present continuous, for example, *like, want, know, understand, belong, seem, believe, remember*.

We use the to:

- describe activities in progress at the moment of speaking.

I am studying less now that I am in college.

- describe temporary situations.

That machine isn't working. It broke down this morning.

- describe changing situations.

The population of the world is rising very fast.

(See page 50)

1. Find examples of the present simple and the present continuous in the text above.
2. Complete these sentences with either the present simple or the present continuous form of the verbs in brackets:
 - a. The River Volga (flow) into the Caspian Sea.
 - b. your English (get) better?
 - c. I called the office, but I (not remember) who I spoke to.
 - d. How often you (go) to the library?
 - e. She (talk) to him on the phone right now.
 - f. Currently we (do) a project on history of space exploration.
 - g. you (belong) to any students society?

Activity 1.3
Internet use
Learning styles



Understanding your own preferred learning styles can help you study more effectively. Students learn in many ways — by seeing and hearing; reflecting and acting;

reasoning logically and intuitively; memorizing and visualizing and drawing analogies and building mathematical models; steadily and in fits and starts.

The VARK system assesses how much people rely on:



- sight (Visual),
- hearing (Auditory),
- Reading / Writing, and
- other sensations (Kinaesthetic, which includes touch and temperature as well as movement).

People say things like, 'I'm an auditory learner' (meaning that they are comfortable absorbing information which they've heard or discussed); or 'I'm a kinaesthetic learner' (if they prefer to learn through practical classes and hands-on activities, rather than by reading books and listening to lectures). In fact, each of us uses all available senses to absorb information.

If you want to find out what your learning style is, visit the VARK website, fill in the test, and check your results. (<http://www.vark-learn.com/english/page.asp?p=younger>).

Activity 1.4
Listening

1. How often do you have to take exams? How do you feel about exams? Do you enjoy them/ hate them/ nervous about them?

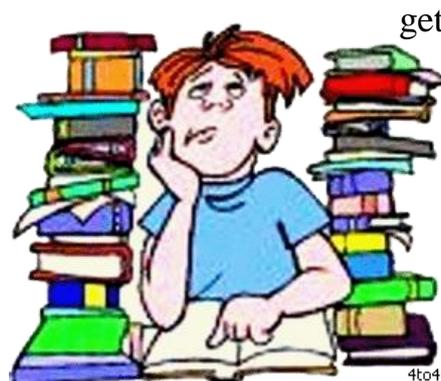
2. You are going to hear two students talking about exams.

a. Listen and find out the speakers attitude to the exams.

b. Now listen again and answer the following questions:

- Why isn't the first speaker good at exams? Note three reasons.

- What advantages does the second speaker see in taking exams?



Activity 1.5
Revising for Exams

Last-minute 'cramming' for exams is the worst of all - it is very stressful, is unlikely to lead to good marks and you won't be able to remember much of it after leaving the exam room. It makes much more sense to start exam revision in plenty of time

- all it takes is a little planning and self-discipline to avoid those late nights and so-so grades.

1. Here are eight tips on revising for exams. Choose three most useful tips and explain your choice.

a. Make use of your learning style when you revise

b. Plan in good time

c. Make your revision active

d. Look through old exam papers

e. Use your time well.

f. Revise with other people.

g. Mark your progress on your revision plan

h. Trust your memory.

Help Box

tip (*countable*) – a helpful piece of advice (*uncountable*)

2. Can you add some more tips?

Activity 1.6
Final words of wisdom

The most important thing that you need to keep in mind when going to university is the fact that **YOU ARE NOT IN SCHOOL ANYMORE**. Hours needed for studying will be longer, tasks will be more difficult and time consuming, and professors will expect a greater level of professionalism in reports and presentations.

Here is the advice for students who want to get better grades in university given by students on the site <http://www.mycollegesuccessstory.com/success-stories/EmilyB.html>.

1. Work in pairs. Read these pieces of advice and decide if each of them is:



- a. excellent advice
- b. quite useful advice
- c. not very useful advice

Find a strategy that works for you and stick with it! Everyone is different.

Go to class, make friends with people in class just in case you're absent, and remember that you should want to learn.

Read, read, read everything you are required, and do it on time. Nothing sets you back further and keeps you up later than having to read all the stuff you didn't over the past month.

While studying make sure you have plenty of small breaks. Get your mind off of the work even for just five minutes, and going back to it will be easier.

Actively participate in class. Constantly searching for questions to ask the professor is the best way to make sure you are paying attention.



Get as much sleep as possible. Staying out late during the week may be fun, especially because mom and dad aren't around, but it can greatly affect your performance on tests. Sleep, as a professor of mine says, should always be the number one priority.

Make sure you take advantage of all the opportunities your university has to offer. Don't be afraid to join clubs, take on new and exciting responsibilities, join a students' society, go on excursions, explore the surrounding area, etc.

Ask for help if you need it. It's not a bad thing to not understand, it's a bad thing if you don't do anything about it. If you don't understand, go to your teacher or find a classmate that does understand and is willing to help you.

Functions

When we want to give advice we can use the Imperative (побудительное наклонение).

In positive statements it has the same form as the infinitive (**without to**)

e.g. Find a strategy that works for you.

In negative statements *do not (don't)* is used *e.g. Don't wait.*



2. Find the examples of the Imperative in the advice above.

3. Work in pairs. Think of your own advice for students who want to get better grades in university. Work as a class. Give your advice to the other students.

Activity 1.7 Portfolio



how you
language abilities.

A **Portfolio** is a tool to help you learn a language. Your Portfolio will help you to think about how you learn English. It will help you to record the things you learn and learn them. You can also use it to show other people your language abilities.

There are three sections in a Portfolio:

1 Language Passport – show this section to other people when you apply for a job or change schools.

2 Language Biography – use this section to think about and improve the way you learn.

3 Dossier – use this section to record examples of your work.

Dossier

The Dossier is a collection of your work. You choose what goes in your Dossier and show it to other people when they want proof of your English language abilities.

Use a folder to keep your Dossier work clean and safe. Update the chart every time you put a new piece of work in your Dossier.

Type of work	Date	Content	Individual or shared work	Why I chose this

1. Choose examples of your work from this unit. You can also use work that you create outside class.

Ideas for your Dossier:

- Tests
- Emails
- Letters
- Articles
- Instructions
- Projects
- Web pages
- Songs and poems
- Presentations
- Reports
- etc.

Activity 1.8
Grammar review


Look at the table. Tick the grammar areas according to your knowledge.

Grammar area	Know well and can use when I speak and write	Know the form but not sure when and how to use	Need to revise	Have never heard of it
Present Simple				
Future Simple				
Past Simple				
Present Continuous				
Past Continuous				
Present Perfect				
Past Perfect				
Present Perfect Continuous				
Past Perfect Continuous				
Passive Voice				
Infinitive				
Participle I				
Gerund				
To be going				
Modal verbs and their equivalents				
Conditional I				
Conditional II				
Conditional III				
Articles				
Nouns (singular, plural)				
Pronouns				
Adjectives and adverbs (degrees of comparison)				
Much, many, few, little				
Numerals (ordinal, cardinal)				

UNIT 2

READING EFFICIENTLY BY READING INTELLIGENTLY

**Learning strategy: reading academically**

You are expected to do much more reading at university than at school or college. When you're reading for your course, you need to make sure you're actively involved with the text. It's a waste of your time to just passively read, the way you'd read a thriller on holiday. Always make notes to keep up your concentration and understanding.

For a start Quiz

Good reading strategies help you to read in a very efficient way. Using them, you aim to get the maximum benefit from your reading with the minimum effort. In this unit you will learn how to use different strategies to read intelligently. Do you use any strategies to help you read effectively?



Do the quiz and check yourselves (choose a, b or c for answer):

1. When a teacher asks me to read a text in English
 - a. I don't think about why I'm reading it.
 - b. I sometimes think about why I'm reading it.
 - c. I always think about why I'm reading it.
2. When I read
 - a. I never skip parts of the text which are not interesting.
 - b. I sometimes skip parts of the text which are not interesting.
 - c. I always skip parts of the text which are not interesting.
3. If I have to get just a general idea of what the text is about
 - a. I read the text from the first to the last sentence.
 - b. I sometimes read only introduction and the first sentence of each paragraph.
 - c. I always read only introduction and the first sentence of each paragraph.
4. When I read
 - a. I never underline anything in the text.
 - b. I sometimes underline the most important pieces of information in the text.
 - c. I always underline the most important pieces of information in the text.
5. When I read the text
 - a. I don't try to remember what I already know about the subject matter.
 - b. I sometimes try to remember what I already know about the subject matter.
 - c. I always try to remember what I already know about the subject matter.

Count your score and read the explanation.

1			2			3			4			5		
a	b	c	a	b	c	a	b	c	a	b	c	a	b	c
1	3	5	1	3	5	1	3	5	1	3	5	1	3	5

20-25 you are an active reader: you

- know what you are looking for and how to find it
- relate new knowledge to old knowledge
- make patterns and connections
- ask questions about the text.
- use skimming and scanning strategies
- highlight, underline and annotate it to focus on the relevant parts of a text

You must have no problems when dealing with reading tasks.

10-20 you are still on the way. To become an active reader you should be more consistent in using reading strategies in your studies.

5-10 you have to learn to become an active reader. Otherwise you'll have problems with reading tasks.

Help Box

Skimming means looking through a text quickly to get a general idea what it is about. You should look at the headings, pictures, graphs, and highlighted words. It is also good to read the introduction and the first sentence of each paragraph.

Scanning is reading a text quickly to find a specific word or piece of information. You do not need to read every word. Your eyes stop only when you find the word or information you are looking for. You will often need to do this when looking through TV program, or when selecting books in a library.

Extension Discuss the following questions:

1. Do you agree with the results? Do you think the test really helps to find out if you are an active reader?
2. Are you going to improve the way you read? How?

Activity 2.1
\$100 Laptop

1. You are going to read an article "Working on the \$100 Laptop by Mary Lou Jepsen, chief technology officer of One Laptop Per Child (OLPC).

Skim the text and answer the questions:

1. What was the purpose of designing the \$100 Laptop?
2. What companies are involved in developing this low-cost product?

Working on the \$100 Laptop

Early in 2005, I met Nicholas Negroponte the founder of the MIT Media Lab in a job interview. The subject of our interview was the design of a \$100 laptop and the organization that would use them as a vehicle to transform education in the developing world. I decided to join Nicholas in turning the \$100 laptop vision into reality.



Brazil, Thailand, Argentina and Nigeria were instantly attracted to our low price, well below the cost of the textbooks they'd replace after five years of use, as well as the promise of access, to an entire world of information. By the end of 2005, more than half the countries of the world had expressed strong interest at the head of state or minister of education level in getting laptops en masse ¹into their countries.

At the UN summit on the Digital Divide in Tunis in November 2005, U.N. Secretary General Kofi Annan and Nicholas Negroponte unveiled the first functional prototype and announced the United Nations support for the program. By the end of 2005, we announced that Quanta Computer, the largest maker of laptops in the world, would be manufacturing them for us. We are on track to ship next spring (2007).

The Chief Strategy Officer at AMD, Billy Edwards, describes our design of the \$100 laptop as the first fundamental revisit of personal computer architecture since IBM launched the PC in 1981. We're redesigning the whole architecture — **hardware, software, display** — and we're coming up with some remarkable inventions and innovations. This is not a cost-reduced version of today's laptop; it's an entirely new approach to the idea of a laptop.

Here are some things we have in our laptop that you may want in yours:

<ul style="list-style-type: none"> • Instant on • Flash memory instead of a moving hard disk • Display self-refresh (while CPU is asleep) • CPU fast-sleep and fast wake-up (~0.1 seconds) • Massive mesh networking via WiFi 3-4X the range of typical laptop WiFi antennae (up to ~1Km) 	<ul style="list-style-type: none"> • At 2 Watts, one tenth the power consumption of a typical laptop • Human-power input for battery recharge • Tolerance of multiple power charging sources like car batteries • E-book mode, in a form factor the kid can take to bed and curl up with for a good read. <p>Our Operating System: ~100Mbytes.</p>
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When closed it resists water and dust incursion. We're working on making the design increasingly "**green,**" (**eco-friendly**). We have also been developing a new battery chemistry that extends **battery lifetime** from typical today of 500 **charge/recharge cycles** to 2000 charge/recharge cycles. These laptops will run on batteries most of the time, and we want the batteries to last at least five years.

¹ French in large amounts

The display I've devised: a 7.5" diagonal 1200x900 pixel display. That's higher resolution than 95 percent of the laptops that ship today. It's 200 **dots per inch (dpi)**. It has a **sunlight readable, and room-light readable mode** — these in black and white. Our target: a display as readable as a newspaper with the backlight off. Then, when the **backlight** is turned on — the display becomes color — **color resolution** is ~800x600 color, and in some of our designs we can achieve 1024x768 color at very low power consumption. The entire display consumes about 1W with the backlight on, and about 0.2W with the backlight off. This at \$40 instead of the usual \$130 for a regular laptop display which consume ~7X the power of our display and is not sunlight readable.

So far, OLPC has received \$40 million of money and support from: 3M, AMD, Brightstar (largest distributor of cellphones), ChiMei (a large LCD maker), eBay, Google, Marvell (a large wifi chip maker), Rupert Murdoch's News Corporation, Nortel, Quanta Computer, UL and the United Nations.

The children of the world are going to go online with our machines. They are our future, our most valuable resource. This is real, it's happening now.

(For more information on the laptop go to www.laptop.org.)

2. Scan the article. What do these numbers refer to?

- a) 100
- b) 2007
- c) 2
- d) 500
- e) Five
- f) 40

3. Read the article more carefully. Which of the statements are true (T)? Which are false (F)? Correct the false ones.

1. Brazil, Thailand, Argentina and France were instantly attracted to the low price.
2. Kofi Annan developed the first functional prototype of \$100 laptop.
3. IBM will be manufacturing these low-cost computers.
4. The Chief Strategy Officer at AMD describes the design of the \$100 laptop as the first fundamental revisit of personal computer architecture.
5. These laptops will run on accumulator most of the time.

Activity 2.2
Grammar review
Past Simple

We use the past simple to talk about actions or situations in the past.

- Very often the past simple ends in **-ed**:

She passed her examinations because she studied very hard.

- Many verbs are irregular:

We all left the party at 11 o'clock.

- The past of the verb **be (am/ is/ are)** is **was/ were**:

I was angry because Tom and Ann were late.

- In past simple questions and negatives we use **did/ didn't** + the infinitive:

What did you do at the week-end?

We didn't invite her to the party, so she didn't come.

- But we do not use **did** with the verb **be (was/ were)**:

Why were you so angry?

They weren't ready for the lesson.

(See page 50)

3. Find examples of the past simple in the text above.
4. Put one of these verbs in each sentence in the past simple:

hurt	teach	spend	go	sell	throw	fall	catch
buy	cost						

- I was hungry, so I to the cafe.
- Tom's father him how to drive when he was 17.
- Don down the stairs this morning and his leg.
- We needed some money so we our car.
- Ann a lot of money yesterday. She a dress which \$100.
- Jim the ball to Sue who it.

Activity 2.3
Vocabulary focus
1. Fill in the gapped sentences with the following word combinations:

currently, entire world, output, new approach, manufacture, application, ship, launch, innovation, data

- It seemed like the was watching the television on the day Neil Armstrong landed on the moon.
- of integrated pollution control was introduced in 1990 in European Union.
- Ford decided to cars in its German factory and deliver them to its UK enterprise for sale in this country.
- is improved when conditions are made more comfortable for workers.

5. The new Apple i-Book was announced in April and they're planning toit in October to Western Europe.
6. They held a special party to the new Personal Communications Computer.
7. Remarkable in manufacturing, science, health care, technology, transportation and communications have resulted not only in new products and services but also in new kinds of employment.
8. computers have a wide range of for businesses.
9. Satellites collecton weather patterns and send it back to earth.

2. a. Match the following words and phrases. Translate them into Russian.

turn	version
access to	water and dust incursion
express	online
come up with	consumption
cost-reduced	vision into reality
resist	information
run on	money and support
power	batteries
receive	inventions
go	interest

b. Make up your own sentences using these expressions.

3. Explain the terms in bold in the text.

Activity 2.4

Grammar review

1. Look at the following sentences from the text:

- a. By the end of 2005, we announced that Quanta Computer, the largest maker of laptops in the world, would be manufacturing them for us.
- b. That's higher resolution than 95 percent of the laptops that ship today.
- c. They are our future, our most valuable resource.

How are the comparatives and superlatives of the following formed?

- adjectives of one syllable
- adjectives ending in -y
- adjectives of more than one syllable

(For more information, see page 51)

Complete the table

adjective	comparative	superlative
fast		
energy-efficient		
low		
cheap		
expensive		
new		
wide		
complicated		
difficult		
easy		
profitable		
safe		
environmentally-friendly		

2. Using the words from the previous exercises compare your computer to this new laptop.

Activity 2.5

Extension



Discuss the following questions:

1. How can computers help you in your studies?
2. What are the advantages and disadvantages of computers in comparison with books? Can computers replace printed textbooks?
3. What do you think Nicholas Negroponte meant when he said: *“It's an education project, not a laptop project”*?
4. Go on-line and find the information about the current state of the project.



Activity 2.6

Case Study

Innovative products

Background

IPF Investments provides the funding and support to develop and launch innovative products in Russian market. IPFI is run by a group of rich people who are willing to take risks and back projects which seem advanced and beneficial. However they also expect to make money.

A quarter of all European patents have their origins in Germany, the third largest research country. Scientists and engineers from Hamburg, Heidelberg and Berlin are counted the world's best. Thousands of researchers in Germany are working on tomorrow's world in a large number of disciplines such as laser technology, medical technology, biotechnology, renewable energies and others.

Help Box

An invention is an object, process, or technique which displays an element of novelty. While an invention is merely theoretical, an innovation is an invention that has been put into practice.

A team of IPFI investors is currently considering several innovative products developed in Germany to launch in Russia. After hearing presentations IPFI will decide which projects it will invest in.

Task 1

You are researchers who need finance for your project. Work in groups. Read the description of the products and choose the one you are going to present to the team of investors.

Powerful tool

More exact, faster and more **energy-efficient** – the disk laser developed by the ISFW at Stuttgart University underlines Germany's leading role in the field of laser technology. This new technology will be used in the **body assembly plant** at DaimlerChrysler. The laser involved in this new **welding system** does not move from one welding point to the next; instead the **beam of light** is directed at each point using mirrors and beam waveguides. As a result, assembly times should be **reduced** by 90%.



Metallic servants



Wouldn't it be nice to have a friendly machine to help with the house-work, to clear the table and fill the dishwasher? Who hasn't dreamt of that at some time? At Karlsruhe University's Institute for Technical Informatics, researchers like Professor Rudiger Dillmann are working hard at developing robotic helpers to the stage where they are ready for mass production. Initial prototypes of these humanoid robots are already walking around the labs in Karlsruhe. **Currently**, the specialists are working on a solution to one of the biggest problems: how does a machine get the skills that it will later need? The solution is for the robot's users to show the machine what it has to do. They perform the **appropriate** actions with **data** gloves on their hands while the process is also filmed by stereo cameras. The data is then directly transferred to the robot.

See-Through Display

In the past, **transparent** monitor **screens** only existed in science-fiction films like Minority Report. Now, however, they have become a reality at the Technical University of Braunschweig. For the first time, physicist Thomas Riedl has succeeded in **equipping** a transparent display with pixels that are both coloured and transparent at the same time. A possible **application**: the projection of navigation information onto a **car's windscreen**.

Intelligent models from Nature



Bionics involves the technological application of methods and procedures found in nature. German researchers are leaders in this field. Wilhelm Barthlott, the professor from Bonn, patented the self-cleaning lotus effect in the mid-1990s. In 1999 a new façade paint was put on the market that didn't allow dirt to stick – it simply ran off like raindrops on a lotus leaf. Another model from nature is being examined by researchers from the Max Planck Institute of Colloids and Interfaces in Potsdam. They discovered that the glass skeleton of an ocean glass sponge is practically **indestructible**. They want to use this knowledge to develop new, especially **stable** structures.

Revolution in the fuel tank

What the Saxon company Choren Industries produces in Freiberg is the dream of many ecologists: it is **tar-free, biodegradable and carbon-dioxide neutral**. The **fuel**, which has been named SunDiesel, is produced from biomass, such as wood, straw or agricultural waste, using the three-stage Carbo-V process, for which the east German producers own the global patents. Together with oil giant Shell, the company is currently investing 49 million euros in the world's first SunDiesel **refinery**. The planned **output** is 16.5 million litres of fuel a year, produced from 67,000 tonnes of biomass. Five large plants across Germany are already planned to be producing the new fuel by 2008.



Task 2. Prepare the presentation of your products. Write a structure for your presentation and make notes under key points. Then write an introduction and conclusion.

(See page 52)

Key points for product presentation.

1. A description of the product.
2. Its innovative features.
3. Its potential consumers and main buyers.
4. Field where you can use it.

Task 3

Practice your presentation until it sounds natural and make any necessary changes. Then present your proposal to the rest of the class.

Task 4

Once each group has presented, the class should consider which innovative product has the greatest potential.

**Writing**

You are head of the IPFI team of investors. Write a report to the chairman of IPFI. Describe the projects you have chosen and explain why IPFI should invest in them.

(See Sample report on page 53)

Progress Monitoring

Return back to the beginning of Module 1. Look at the list of different ways of learning English. Would you change your list of the most effective ones?

UNIT 3

REVISION

1. Put the verbs in brackets into the present simple or present continuous:

- a. Water (boil) at 100 degrees Celsius.
- b. Listen to those people. What language they (speak)?
- c. The number of people without jobs (increase).
- d. Jim (play) tennis every Saturday.
- e. I (not/know) your telephone number.
- f. What you usually (do) at weekends?
- g. Ron is in London at the moment. He (stay) at the Hilton Hotel.

2. Put the verbs in brackets into the past simple:

- a. When I (live) in Manchester, I (work) in a bank.
- b. Yesterday I (go) to London to see a friend of mine.
- c. She (not/be) interested in the book because she (not/understand) it.
- d. you (go) out last night?
- e. Yesterday Tom (have) a sandwich for lunch.
- f. (be) Jane at work last Friday?
- g. I (not/rush) because I (not/be) in a hurry.

3. Fill in the gapped sentences with the following word combinations:

revision, eco-friendly, learning styles, access to information, go online, power consumption

1. Understanding your own preferred can help you study more effectively.
2. There will be significant growth in both gas and nuclear..... in the next 10 years.
3. I'll just and look up the university address.
4. is becoming easier nowadays due to the use of computer technologies.
5. I know I haven't done enough for tomorrow's exam.
6. homes are good for the environment and the future of our planet.

4. Translate from English into Russian:

1. rely on myself
2. cost-reduced version
3. cramming
4. battery lifetime
5. charge/recharge cycles
6. turn vision into reality
7. run on batteries
8. come up with inventions

5. Put the words in the sentences into the order:

1. was / the television / The entire / Neil Amstrong / watching / on the day / on / landed / world / the moon
2. in 1990 / new / was introduced / A / approach / pollution control / in European Union / of integrated
3. in its / decided / UK enterprise / cars / German factory / and / Ford / to its / to manufacture / deliver them / for sale
4. comfortable / when / Output / is improved / conditions / are made / more / for workers
5. Apple i-Book / in April / Western Europe / and they're planning / was announced / to ship it / The new / to
6. the new / held / Personal / to launch / a special party / They / Communications Computer
7. Remarkable innovations / transportation / products and services / have resulted in / and / communications / new / in manufacturing
8. have / a wide range of / computers / applications / Currently / for businesses
9. and / weather patterns / send it / Satellites / on / collect data / back to earth
10. laptops / These / the time / batteries / most of / run on / will
11. with / the world / The children / to go / our machines / are going / online / of

6. Correct the sentences.

1. The exam was easy than we expected.
2. I'd like to have the more reliable car.
3. It's becoming more hard and more hard to find a job.
4. "The more difficult thing about English is the prepositions" students usually say
5. I can remember the days when the better computer was the biggest computer.
6. San Francisco is one of the expensivest cities in the USA.
7. The aerospace industry is largest user of titanium.
8. Bosses today are more young and more close in age to the workers they supervise.

7. Match the words in two columns and make sentences with these word combinations:

to take	for examinations
to revise	goals
to make	money and support
to learn	interest
to set	in good time
to give	a talk
to work	progress
to plan	by heart
to express	part in
to receive	in groups

MODULE 2

FROM STUDENTS LIFE TO ENGINEERING CAREER

Lead in

«What do Neil Armstrong, Jimmy Carter, and Alfred Hitchcock have in common? Though they eventually chose very different careers - one as an astronaut, one as a president, and one as a filmmaker - they all started with an engineering education.»

Raymond Landis, dean of engineering and technology at California State University – LA



1. Do you know any other famous people who had/ have engineering education?
2. What makes it special in comparison with other kinds of education (humanitarian, economic, etc.)?
3. What do you expect to get from engineering education?
4. Do you think that extracurricular activities can help you develop professional skills?

YOU ARE GOING TO READ, SPEAK AND WRITE ABOUT

- types of engineers
- engineering
- Engineering Students' Societies
- events

YOU WILL PRACTICE

- questions
- phrasal verbs
- pronunciation
- word building
- topical vocabulary
- listening, reading and writing
- working in groups
- project work

YOU WILL KNOW HOW TO

- read abbreviations
- ask for and express opinions
- design a leaflet

UNIT 4

ENGINEERING STUDENTS' SOCIETIES

All work and no play makes Jack a dull boy.
English proverb

For a start

1. Are there any students' clubs/ societies at your university?
2. Do you belong to any? If not, would you like to? Why/ why not?
3. What is the purpose of creating professional societies for students?

Activity 4.1**Students' engineering societies**

For most disciplines in engineering there exists a professional society with a student chapter. With guidance from faculty, students organize the chapter's activities such as industry plant tours and inviting speakers to campus. These societies provide a valuable link to the professional world.

Read what members say about the advantages of belonging to a students' engineering society and see if you have come up with the same ideas.

1. Before you read match the words in column A with their definitions in column B:

A	B
confident individual	everyday troubles and events
daily hassles and happenings	feeling of participation
hands-on experience	have better knowledge or experience
provide valuable contacts	practical knowledge/ skills
sense of involvement (with)	supply important connections
get better acquainted (with)	sure of oneself person



"What you get from participating in student organizations is based on what you put into it. Not only can you develop invaluable friendships, but you also build your communication, leadership and team skills, which in turn makes you a more confident individual. From my experience, the things that I have learned from being involved with student organizations are just as, if not more, important than schoolwork. Student organizations represent real life - the daily hassles and happenings that you would deal with in the working world." (Kristin Shuda, a co-president of the college's Polygon Engineering Council in University of Wisconsin, USA)



"Among the many advantages of belonging to a professional society, I place hands-on experience, teambuilding skills and skills in interpersonal relations among the top. Professional societies also provide valuable contacts and job opportunities that would be hard to come by anywhere else". (Neel Vasavada, a member of the American Society of Mechanical Engineers)



“One of the greatest benefits of belonging to an engineering society is in the friendships and sense of involvement with the college that it generates. I have also been able to get better acquainted with the faculty, which I think is a big plus. If I had not gotten involved with ASCE, I surely would know less people, have less understanding of the profession and would not have gained the leadership, social and organization skills that I have developed.” (Jeremy Tomesh, American Society of Civil Engineers (ASCE) student chapter leader)

(adapted from <http://www.engr.wisc.edu/alumni/perspective/26.2/societies.html>)

2. Read the extract again and divide the advantages into the following three columns. Can you add some other advantages?

Professional skills	Social skills	Other

Activity 4.2
Vocabulary
Word building

Not only can you develop invaluable friendships...

1. What do the following prefixes in bold mean? Add some more words to each category.

e.g. re- means “again”

1. **re**play/ **re**charge
2. **in**valuable/ **il**logical/ **im**possible/ **ir**regular/ **un**usual/ **dis**advantage
3. **inter**personal/ **inter**active
4. **sub**marine/ **sub**way
5. **over**crowded/ **over**estimate
6. **under**weight/ **under**estimate
7. **post**graduate

2. What parts of speech (noun or adjective) do the suffixes in bold indicate?

1. organization**ion** / leadership**ship**/ involvement**ment**
2. learner**er**/ teacher**er**/ doctor**or**
3. personal**al**/ active**ive**/ daily**ly**/ powerful**ful**

3. Make as many words as you can by combining different parts of the box:

dis	communicate	ive	ion
un	friend	al	ship
in	profession	ly	ment
re	effect	ful	er/ or
	invent		ism
	success		
	help		
	revise		
	achieve		
	construct		
	appoint		
	visible		
	employ		
	mechanic		
	develop		

4. Choose at least six words you formed and write a sentence for each to illustrate the meaning.

Activity 4.3
Events



Culture corner

The University of Alberta (U of A) is one of the largest universities in Canada. Founded in 1908 it currently enrolls over 36,000 students. The main campus covers 50 city blocks with over 90 buildings.

The Engineering Students' Society hosts a number of events throughout the year.

1. Before reading think what these abbreviations stand for:

e. g. APEGGA - Association of Professional Engineers, Geologists and Geophysicists of Alberta

UAEC -

ESS -

BBQ -

2. Read about the events and match the titles to the paragraphs:

Country Crusade..... charity events
 National Engineering &
 Geoscience Week.....
 Geer Weeksoft skills
 seminars..... The University
 of Alberta Engineering
 Competition..... GEER 101

Culture corner

GEER 101, General Engineering Entrance Requirement, is a week-long event that takes place during the second week of classes every fall. Its purpose is to show first-years that there's more to a degree than a GPA (grade point average - средний балл)
 101 (обозначение учебного курса нижнего уровня)
 e.g. *History 101* — *начальный курс истории.*

I _____

Dating back to the early 1940's, is a celebration of all things engineering. Held annually in the second week of the winter semester at the University of Alberta, it includes a series of competitions and parties, with engineering disciplines fighting to become the winner. Some of the events are:

- Toboggan Races
- Battle of the Bands & Dance Troupe
- Design Competition
- Movie Night
- Technical Display
- Floor Hockey



II _____

..... is one of the most popular social events at the University of Alberta. Twice a year, the Engineering Students' Society buses out a few hundred engineering students out to mystery small town Alberta to relax and party with the locals.

III _____



Throughout September,..... brings out first year engineering students to meet one another on a more social setting. The ESS hosts a free BBQ, a pool tournament, and other social events to help ease the transition for first year engineering students.

IV _____

..... is an annual competition at the University of Alberta. UAEC consists of various design and presentation events to challenge students to apply their skills to the solution of engineering problems. Participants and winners of UAEC move on to compete in the Western Engineering Competition.

V _____

In the spring, the Engineering Students' Society celebrates....., a series of events organized by the Association of Professional Engineers, Geologists and Geophysicists of Alberta . It is meant to promote the profession of engineering to the general public. A number of events are held throughout the week, including design competitions, a pancake breakfast, and a speech contest.



VI _____

Throughout the year, the ESS works with APEGGA to organize professional events for the students. At the technical mixers, professionals from the engineering industry come to meet with students in a social setting.

At the....., a speaker will come in to present to students on different topics, such as networking, interviewing skills, and financial management.



VII _____

The ESS is involved in a number of.....:

Engineering Head Shave to raise money for the Alberta Cancer Foundation.

International Pi Throw to raise money for Habitat for Humanity.

(adapted from http://www.mece.ualberta.ca/~mececlub/Engg_Week.html)

3. Discuss with your partner:



1. What events would you like to take part in?
2. What events do you have at your university?
3. What other events would you like to have?

Activity 4.4 Abbreviations

1. While reading articles very often you can come across different abbreviations. Divide the following abbreviations into three categories:

AC	alternating current
BSc/ BS(AmE)	Bachelor of Science
CAD	computer aided design
CIS	Commonwealth of Independent States
CPU	central processing unit
dpi	dot per inch
EM	electronic mail
EU	European Union
FEANI	European Federation of National Engineering Associations (Fédération Européenne d'Associations Nationales d'Ingénieurs)
IE	Information Engineering
ISO/OSI	International Standards Organization/ Open System Interconnection
MS-DOS	Microsoft disk operating system
PC	personal computer
PDF	Portable Document File
QC	quality control
RAEE	Russian Association for Engineering Education
SAE	Society of Automotive Engineers
TQM	Total Quality Management
URL	Uniform Resource Locator

engineering	information technology	other

2. Add at least one more abbreviation to each category.

Activity 4.5

Every university has its traditions. Read about University of Alberta's tradition of celebrating Steve Drake Day. (from *The Bridge Engineering Newspaper*, a monthly newspaper for Engineering Students published by The Engineering Students' Society.)

1. Before reading match the words in column A with their definitions in column B:

A	B
take everything in stride	cheerful
on his own terms	clothes, style of dress
bleak and dreary	declare
mini-putt	play mini-golf
garb	on his conditions
decree	take it easy
uplifting	depressing and uninteresting

Steve Drake was an electrical engineer at the University of Alberta many years ago. As the legend goes, he took many years to get his degree because he didn't want to rush things. He **took everything in stride**, didn't ever stress out about anything, and did his degree **on his own terms**. He is the reason they have the 7-year rule at the University of Alberta (that you have to graduate in 7 years or less). He wore a Hawaiian shirt for every day of his long and well-known degree, brightening every class he chose to attend with his presence, spreading cheer and hope inside these **bleak and dreary** halls. Legend goes that he loved **to mini-putt** and so was often found not only dressed in such festive Polynesian **garb**, but also carrying a putter. Thus, in honor of his final graduation after many years (by some reports as many as ten) the electrical engineering club **decreed** a day in his honor: Steve Drake Day. It is the first Friday of February, and the best day of the year.

On this day, mini putt holes are set up at every engineering club, festive drinks are served, and the garb is colorful and **uplifting**.

2. Are there any traditions in your university connected with famous people? If not, could you offer such a tradition?

Activity 4.6**Grammar review
Questions**

In questions which we can answer either with *yes* or *no* we put an auxiliary verb before the subject.

"Do you belong to any students' society?" "No, but I'd like to."

"Is Mathematics your favourite subject?" "No, I prefer History."

"Did you take part in sports competitions last year?" "Yes, and we won Students Football Cup."

To ask for more information we use question words like *what*, *why*, *where*, *when* and *how*. We put the question word before the auxiliary verb.

What events do you have at your university?

How many clubs are there at your university?

If *who* or *what* is the subject of the sentence, the word order is the same as in a statement.

Who is the head of your students' society?

What happens when you fail an exam?

1. Correct the grammatical mistakes in these sentences.

e.g. What means *GEER 101*?

What does GEER 101 mean?

1. How much it cost?
2. Why you didn't pass the exam?
3. When it must be finished?
4. Did you took part in the design competition last week?
5. Is coming your friend tomorrow?

2. Complete the questions. Each slash (/) indicates one or more missing words.

1. / like and dislike most about your studies?
2. How / times a year / go on holiday?
3. / have children?
4. / much / earn?
5. / many students / there at your university?

Activity 4.7 Listening

Steve Drake: The Man behind the Legend



1. You are going to hear an interview with Steve Drake. Before listening think about the questions you would like to ask him. Write at least five questions.
2. Listen to the interview and see if your questions are similar to those of the interviewer.
3. Listen to the interview again and mark the following statements as true or false. Correct the false ones.
 1. Steve Drake graduated from the University of Alberta 20 years ago.
 2. Steve liked it when professors joined students on Friday nights.
 3. Steve used to like white dress shirts with long sleeves when he was a student.
 4. Once Steve failed an exam.
 5. He shaved his head just for fun.
 6. He believes that engineers have invented more useful than damaging things.
 7. Steve encourages students to come up with ideas and test them.

4. Read the extract from the interview and fill in the particles in phrasal verbs. Listen again and check.

down	out	over	up
------	-----	------	----

SD: *Oh, had to be the Fridays in the Club room, it was great we could come in (1st to 4th, and 5th years) and hang Actually anyone from anywhere could show*

I remember we had some arts students come one time to ask for help in math, you know simple stuff like derivatives. Open the fridge, get a bottle of beer and just listen to what's happening, or the music on the stereo. When a really great song came we could turn the music.

Also, I really liked the popcorn days. The club had a couple of popcorn machines so we would just make tubs of popcorn for everyone, this might have also helped in selling beer, but I'm not sure.

It was great when the Professors would turn for Fridays. Back then Professors would sit and drink a beer with you. They were great, and during Engineering Week you had to have a Professor on your boat race team, so they were pretty good at it.

I want to make it clear that we did not run around in a drunken haze, and almost all students would refrain from drinking during classes. I don't remember ever seeing anyone drunk and passed during a weekday or on those Fridays.

Activity 4.8
Grammar Review
Phrasal verbs

Use the following phrasal verbs in the correct to replace the words in italics.

save up	hang out	come over	pass out	come up	turn up	look	up
---------	----------	-----------	----------	---------	---------	------------	----

1. I used to *spend a lot of time* with my friends when I was at college.
2. I went to meet Frank but he never *arrived*.
3. Do you want to *visit me* on Friday evening?
4. The same problems *appear* every time.
5. I nearly *became unconscious* when I saw all the blood.
6. *Find* the word in your dictionary.
7. If you want a new bike you'll have to start *saving money*.

Activity 4.9
Project work

Imagine you are the members of ESS Executive (a group of students responsible for managing the society's work). You have to develop a plan of events for the students of your university.

You may surf the following university websites to see the examples of events.

<http://cses.carleton.ca/events/social/>

<http://engsoc.queensu.ca/events>

1. Work in small groups, describe possible events and discuss with your partners which of them could be included in the Calendar for the next academic year. Use expressions from the Functional language box to help you.

Functional language
Making suggestions

We could offer...
 Why don't we... ?
 How about... ?
 What about... ?

Giving opinions

I think we should...
 I feel that we have to consider...
 I'm sure/ convinced/ positive that...

Agreeing

Yes, that's right.
 I think I agree with you.
 Exactly.
 Good/ Excellent idea.

Disagreeing

I'm not sure I agree.
 I really don't agree.

month week	September	October	November	December	January	February	March	April	May



2. Choose one or two of the events and design a leaflet. You can use the following website to learn how to write leaflets:

http://www.bbc.co.uk/schools/ks2bitesize/english/revision_bites/leaflets2.shtml

(or see Writing file p 53)



3. Create your class wiki, upload there your leaflet. Have a look at your classmates' leaflets and comment on them.

UNIT 5

THE SCOPE OF ENGINEERING

For a start

1 Engineering has been called “invisible profession” or the “stealth profession” because most people have no clue what engineers do. A 1998 poll in the USA indicated 61% of adults felt “not very well” or “not at all well” informed about engineering.

Being a student in engineering do you know what engineers do?

What areas of our society do they work in?

The pictures below refer to some of the areas. Can you name them?



2. In the table there is a list of areas of society. What types of engineers work in each area?

Tick all the types of engineers who work in each area.

Types of engineers Areas of society	aerospace	agricultural	biomedical	chemical	civil	computer	electrical	environmental	mechanical	nuclear
Agriculture		√		√				√	√	
Communications										
Computers										
Construction										
Energy										
Entertainment										
Environment										
Machines										
Medicine										
Space										
Transportation										

Which areas of society are represented in the pictures on page 36?

Activity 5.1

What types of engineers are involved in the following activities?

1. Develop diagnostic machines, artificial organs and prosthetic devices.
2. Design vehicles – cars, trucks, heavy equipment, buses, aircraft.
3. Work up ways to reduce energy consumption .
4. Construct the wings, landing gear, etc. Design, analyze, model, simulate, and test satellites, missiles, and rockets.
5. Create irrigation systems, tractors and buildings, experiment with food processing and farming techniques.

6. Discover and manufacture better plastics, paints, fuels, fibers, medicines, fertilizers, semiconductors, paper, and all other kinds of chemicals.
7. Make sure pollutants are removed from various streams released to the air and water.
8. Use computer technologies and advanced materials to design structures that meet the needs of a growing population.
9. Engineer structural supports for human colonies in space or on the moon.
10. Apply the laws of physics governing electricity, magnetism, and light to develop products and services for the benefit of humankind.



Activity 5.2
Vocabulary Focus

- | | |
|---------------|----------------|
| 1. artificial | a. gear |
| 2. prosthetic | b. processing |
| 3. heavy | c. the needs |
| 4. energy | d. devices |
| 5. landing | e. organs |
| 6. irrigation | f. consumption |
| 7. food | g. systems |
| 8. meet | h. equipment |

1. Match the words to form expressions from the text and translate the expressions into Russian:

Activity 5.3
Pronunciation

Put the words from the boxes in the correct columns according to the pronunciation of the letters in bold:
A.

Truck, equipment, ruduce, consumption, construct, simulate, technique, manufacture, feuel, semiconductor, pollutant, computer, sucture, population, support, poduct, huankind.

as in cl <u>u</u> b	as in <u>u</u> se	as in q <u>u</u> ick	as in s <u>u</u> ccess	as in cheq <u>u</u> e

B.

Diagnostic, machine, artificial, prosthetic, devices, design, vehicle, satellite, missile, irrigation, experiment, plastic, fiber, medicine, fertilizer, chemical, various, material, engineer, physics, electricity, magnetism, service, diagram, benefit.

as in <u>f</u> ine	as in <u>d</u> ialogue	as in <u>h</u> it

Activity 5.4 Underline the verbs used to describe engineering activities. What other verbs can be used?

Activity 5.5
Each One Teach One Make up your own sentences about tasks and activities of engineers. Don't name the type of engineer, let the other students guess it.

Activity 5.6
Internet use



Use www.engineergirl.org/CMS/careers/2986.aspx internet site to prepare a short report about the type of engineer which appeals to you.



Find at least five words which you think are important to learn and teach them to the other students in your group. Present your report to the other students in the group.

Activity 5.7
Definitions

1. Can you define the term "engineering"?

Engineering is ...

2. Read the definitions of engineering given by professionals and choose the one which is the closest to yours.

"Engineering is the application of math and science to create something of value from our natural resources"

(Internet <http://www.discoverengineering.org/aboutengineers.asp>)

"Engineering is the art of deliberately modifying the physical world for the use and conveniences of mankind"

(paraphrased from charter for ICE (Institute of Civil Engineers), 1828)

"Engineering is not merely knowing and being knowledgeable, like a walking encyclopedia; engineering is not merely analysis... Engineers operate at the interface between science and society..."

(Dean Gordon Brown; Massachusetts Institute of Technology (1962))

"Engineering is the art or science of making practical."

(Samuel C. Florman)

"Engineering is the science of economy, of conserving the energy, kinetic and potential, provided and stored up by nature for the use of man. It is the business of engineering to utilize this energy to the best advantage, so that there may be the least possible waste."

(Willard A. Smith)

Activity 5.8
Top 10

In his book *Studying Engineering*, Raymond Landis, dean of engineering and technology at California State University – Los Angeles, lists the following "top 10" rewards and opportunities that an engineering career offers.



(Adapted from www.gulfnews.com)

Read quickly the paragraphs and match them to the right headings given below.

Creative Thinking	Potential to Benefit Society
Intellectual Development	Financial Security
Professional Environment	Challenging Work
Job Satisfaction	Variety of Career Opportunities
Technological and Scientific Discovery	Prestige

1.

Studies show that, by far, the No. 1 cause of unhappiness among people in the United States is job dissatisfaction. Thus, it is important to find a career that provides you with enjoyment and reward. After all, you might spend 40 or so years working eight hours or more a day, five days a week, 50 weeks a year. Do you want to dislike every minute of that time, or would you rather do something that you enjoy? For numerous reasons, some of which are listed below, engineering provides a satisfying field of work.

2.

What do Neil Armstrong, Jimmy Carter, and Alfred Hitchcock have in common? Though they eventually chose very different careers - one as an astronaut, one as a president, and one as a filmmaker - they all started with an engineering education.

An engineering degree offers a wide range of career possibilities. Within the practice of engineering, there is an enormous variety of job functions.

- If you are imaginative and creative, design engineering may be for you.
- If you like laboratories and conducting experiments, you might consider test engineering.
- If you like to organize and expedite projects, look into being a development engineer.
- If you are persuasive and like working with people, consider a career in sales or field service engineering.



The analytical skills and technological expertise you develop as an engineering student can also be used in many other fields. The majority of today's college graduates will have more than one career during their work life, and engineering can provide a strong foundation for almost any one of them.

3.

In the engineering work world, there is no shortage of problems to solve. Any engineering manager will tell you that he or she has a huge backlog of problems that need to be solved. Generally, "real world" engineering problems are quite different from most of the problems you will solve in school. In school, most problems have a single, correct answer. When you get into the engineering work world, virtually all problems will be open-ended. There will be no single answer to a problem, no answer in the back of the book, no professor to tell you that you are right or wrong. You will be required to devise a solution and persuade others that your solution is the best one.

4.

An engineering education will "exercise" your brain, developing your ability to think logically and to solve problems. These are skills that will be valuable throughout your life—and not only when you are solving engineering problems. For example, your problem-solving skills can help you undertake tasks such as planning a vacation, finding a job, organizing a fund-raiser, purchasing a house, or writing a book.

5.

Depending upon your value system, you may not view all things that engineers do as benefiting people. For example, engineers design military equipment like missiles, tanks, bombs, artillery, and fighter airplanes. Engineers are also involved in the production of pesticides, cigarettes, liquor and asbestos.

As an engineer, however, you can choose to work on projects that clearly are of use to society, such as cleaning up the environment, developing prosthetic aids for disabled persons, developing clean and efficient transportation systems, finding new sources of energy, and increasing the standard of living in underdeveloped countries.

6.

While money should not be your only reason for choosing a career in engineering, if you decide to become an engineer you will be well paid. Engineering graduates receive the highest starting salary of any discipline.



7.

Engineers play a primary role in maintaining our standard of living, ensuring a strong national security, and protecting public safety. Furthermore, most people know that engineering requires hard work and strong technical skills. As a member of such a respected profession, you will receive a high amount of prestige.

8.

As an engineer, you will be treated with respect and have a certain amount of freedom in choosing your work. You will also be in a position to influence what happens at your company.

You will have the opportunity to learn and grow through both on-the-job training and formal training. You will learn from experienced engineers in your organization and will be offered seminars and short courses to increase your knowledge.

As a professional, you will receive liberal benefits, which will typically include a retirement plan, life insurance, health insurance, sick leave, paid vacation, holidays, and savings or profit-sharing plans.

9.

Do you know what a laser is or how a computer works? Do you know why split-level houses experience more damage in earthquakes? An engineering education can help you understand how these, and many other things in the world, work.

Furthermore, an understanding of technology will provide you with a better understanding of many issues facing our society. For example: Should we have stopped building nuclear reactors? What will we use for energy when oil runs out? Is it technically feasible to develop a "Star Wars" defense system that will protect us against nuclear attack? Can we produce enough food to eliminate world hunger?

10.

Engineering is by its very nature an inventive profession. When practicing engineers develop solutions to open-ended, real-world problems, they must employ conscious and subconscious mental processing.

Because we are in a time of rapid social and technological changes, the need for engineers to be creative is greater now than ever before. Only through creativity can we cope with and adapt to these changes. If you like to question, explore, invent, discover, and create, then engineering could be the ideal profession for you.

(Source: adapted from Landis R. Studying Engineering. Discovery Press, 1995)

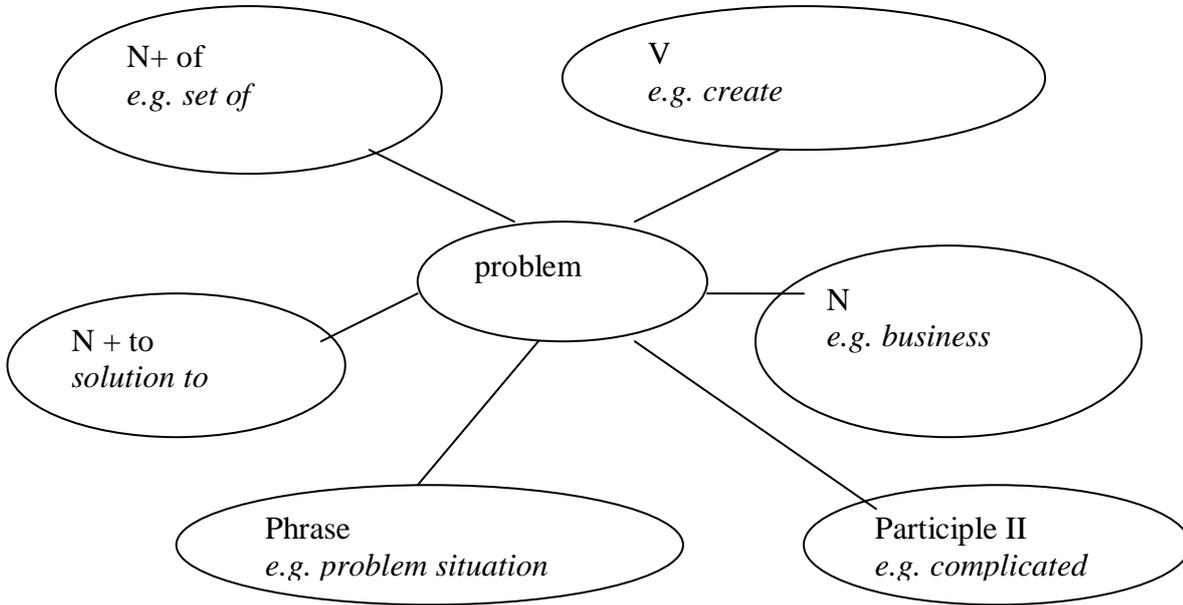
Activity 5.9

Vocabulary focus

1. Match the following words/expressions in English with their Russian equivalents:

1. conduct experiment	a. инженер по техническому обслуживанию в процессе эксплуатации
2. to organize and expedite projects	b. выполнить задание
3. analytical skills	c. слаборазвитые страны
4. technological expertise	d. инженер конструктор играть главную роль в чем-то
5. provide a strong foundation	e. защищать общественную безопасность
6. "exercise" your brain	f. развивать умственные способности
7. undertake tasks	g. нетрудоспособный
8. disabled person	h. инженер проектировщик
9. standard of living	i. ставить опыт
10. underdeveloped countries	j. обучение по месту работы
11. play a primary role in	k. аналитические способности
12. ensure a strong national security	l. дать прочные знания
13. protect public safety	m. специалист по испытаниям
14. on-the-job training	n. обеспечивать национальную безопасность
15. design engineer	o. организовывать и продвигать проекты
16. test engineer	p. уровень жизни
17. development engineer	q. играть главную роль в чем-то
18. field service engineer	r. технологическая компетенция

2. The diagram below shows some collocations with *problem*. Find all the collocations with this word from the text and fill them in the diagram.



3. Create similar diagrams for the following words: *career, job, project*. Use a dictionary to help you.

4. List all the professional benefits from the paragraph 8, give Russian equivalents. Fill them in the gaps in the following sentences:

1. Employees are entitled to four weeks' annually.
2. I have never realised that if I had an accident and survived, my would pay me nothing.
3. A store boss was sacked for taking 60 weeks in just two years.
4. The place is closed for the Christmas
5. Buying a house has taken all their
6. In your experience, what are the problems and what are the when women and men work together?
7. Since my firm gives us, which involves an annual check-up, I know I am in good health.

Culture corner

In *British English* the word **holiday** is used to mean a time of rest from work or school, or a period of time when you travel to another place for pleasure. *Americans* use **vacation** for this meaning, and to refer to a period when universities are closed. In both *American* and *British English* **holiday** is used to mean a day fixed by law on which people do not have to go to work or school. In *British English* **vacation** is used to refer to a period when universities are closed.

Activity 5.10
Extension

Discuss the following questions:

Why have you chosen engineering profession?

Which of the benefits listed in Studying Engineering by Landis R. is the most important to you?

What other considerations did you take into account while making your choice?

Functional language
Asking for and expressing opinions

I think ...	What do you think of ... (career opportunities/ ...)?
I believe ...	How do you feel about ... (developing problem-solving skills/ the idea of benefiting society/ ...)?
In my opinion, ...	What's your opinion of ... (professional benefits/ ...)?
In my view, ...	
It seems to me that ...	
From my point of view, ...	
As far as I'm concerned, ...	
If you ask me, ... (informal)	

Progress monitoring

In this unit you came across the following words and expressions. Tick those which you understand and can

translate into Russian.

Types of engineers

aerospace	computer
agricultural	electrical
biomedical	environmental
chemical	mechanical
civil	nuclear.

Verbs

develop	model	discover
design	simulate	manufacture
work up	reduce	benefit
construct	create	engineer
analyze	experiment with	apply.

Nouns

truck	population	irrigation
equipment	support	fiber
technique	product	fertilizer
fuel	humankind	physics
semiconductor	machine	electricity
pollutant	vehicle	magnetism
structure	satellite	service
benefit	missile	diagram

Phrases

artificial organs heavy equipment energy consumption irrigation systems food processing meet the need conduct experiment expedite projects analytical skills technological expertise "exercise" your brain undertake tasks underdeveloped countries play a primary role in on-the-job training design engineer test engineer development engineer field service engineer	job satisfaction career opportunities challenging work intellectual development financial security professional environment creative thinking liberal benefits a retirement plan life insurance health insurance sick leave paid vacation profit-sharing plans a huge backlog of problems "real world" engineering problems open-ended problems devise a solution disabled person standard of living
--	---

UNIT 6**REVISION****1. Ask different types of questions (at least 5) to the following sentences:**

- A long time ago I read an article in a popular electronics magazine and the title was “Micro Chips - Mega Death”.
- Twice a year, the Engineering Students' Society takes a few hundred engineering students out to mystery small town Alberta to relax and party with the locals.
- Engineers are the coolest people around because we invent so many things for people and we want to make the world a better place.

2. There are mistakes in phrasal verbs. Correct them.

1. There are job vacancies from time to time. I'll let you know if something makes up.
2. I'll just spend up the train times in the timetable.
3. You'll probably find Dave at the swimming pool – he often reads out there.
4. Why don't you hide over to our place one evening?
5. I think the poor guy took out. It looks like he's had a lot to drink.
6. Steve slept up late for the meeting, as usual.
7. It took me ages to play up for the new Porsche.

3. Underline the two words which have the same sound.

truck structure simulate

device irrigation design

construct equipment technique

chemical fiber plastic

fuel support pollutant

service satellite missile

reduce consumption humankind

diagnostic material vehicle

4. Fill in the gapped sentences with the following words.

fuel pollutants benefit satellite fiber applied manufactures
equipment

1. This firm cars.
2. Scientific discoveries are often to industrial processes.
3. It's an expensive investment but it will the company in the long run.
4. Nylon is a man-made
5. Petrol is no longer a cheap
6. The broadcast came from America by
7. are constantly being released into the atmosphere.
8. The university bought several new pieces of for the chemistry lab.

5. Match types of engineers with the words and expressions you associate with them. More than one variant is possible.

aerospace agricultural biomedical chemical civil electrical environmental mechanical	cars, trucks, heavy equipment, buses, aircraft computer technologies diagnostic machines, artificial organs electricity, magnetism, and light irrigation systems, tractors and farming techniques plastics, paints, fuels, fibers, medicines, fertilizers, semiconductors pollutants satellites, missiles, and rockets design structures
---	---

6. Match the words in the columns to make word combinations. Use them in sentences of your own:

career challenging creative energy financial health professional sick	insurance opportunities consumption security work environment leave thinking
--	---

7. Choose the correct option.

1. It's extremely difficult for one teacher to solve/meet the needs of 16 students in a class when each has his own learning style.
2. Is it really necessary to conduct/research experiments on animals?
3. Dr Johnson decided to understand/undertake the task of writing a Business English dictionary.
4. Scientists can also play/make a role in improving energy efficiency in their laboratories.
5. European governments are working together to decide/devise a solution to the problem of nuclear waste.
6. Standards/Structures of living in European countries have improved over the last century.

GRAMMAR REFERENCE

Present Simple and Present Continuous

Present Simple

Form

+ I/ You/ We/ They **work**.

He/ She/ It **works**.

- I/ You/ We/ They **don't work**.

He/ She/ It **doesn't work**.

? **Do** I/ you/ we/ they **work**?

Does he/ she/ it **work**?

Present Continuous

Form

+ **I am going**.

He/ She/ It **is going**.

You/ We/ They **are going**.

- **I am not going**.

He/ She/ It **is not going**.

You/ We/ They **are not going**.

? **Am** I **going**?

Is he/ she/ it **going**?

Are you/ we/ they **going**?

Past Simple

Form

+ I/ You/ We/ They **worked**.

He/ She/ It **worked**.

- I/ You/ He/ She/ It/ We/ They **didn't work**.

? **Did** I/ you/ he/ she/ it/ we/ they **work**?

Degrees of Comparison

		Comparative	Superlative
Short adjectives	cheap small big	cheaper (than) smaller (than) bigger (than)	the cheapest the smallest the biggest
Adjectives that end in --y	funny early heavy	funnier (than) earlier (than) heavier (than)	the funniest the earliest the heaviest
Adjectives with two syllables or more	careful boring expensive	more careful (than) more boring (than) more expensive (than)	the most careful the most boring the most expensive
Irregular adjectives	good bad far	better (than) worse (than) further/ farther (than)	the best the worst the furthest/ farthest

WRITING FILE**Guide to presentation**

1. Make a plan of your talk. This should include at least three sections:
 - introduction
 - development
 - conclusion
2. Write detailed notes of what you will say:
 - key points and key words
 - the action points you will stress
3. Prepare visual aids
4. Practice your presentation :
 - use simple and clear language
 - don't read from your notes

Look at these expressions. In which part of a presentation would you expect them to be used?

1. On this next slide you can see ...
2. To conclude, I want to tell you about ...
3. I'll be happy to answer questions at the end of the presentation.
4. Let's have a look at some statistics/ figures.
5. My name is ... and I'm a ...
6. Finally, a few words about ...
7. This brings me to the next point ...
8. Thanks very much for listening to my talk.
9. My main aim today is to tell you .../ I'm here today to tell you ...

Sample report

Date: 12 April 2008

Report on: location of new assembly plant

Introduction

The purpose of this report is to assess the suitability of locating the new assembly plant in Hamburg, north Germany, and recommend a suitable site.

Findings

Hamburg has excellent transport links by sea, road and air. It is one of Europe's busiest ports, Germany's two main motorways pass through the city and it has a fast-growing international airport. It is also a gateway to Scandinavia and central Europe with a fast rail link to Berlin.

The region has an educated and skilled workforce with a strong engineering tradition. It will be possible to source many components locally.

Recommendation

It is suggested that the fast-developing business park north west of the city would be an ideal site because it is next to the motorway and 10 minutes from both the harbour and rail terminal. We recommend that the site should be studied in more detail immediately.

Amanda Jones

Research and Development Manager

Leaflets

Leaflets come in all shapes and sizes, but they all have to tell the user as much as possible in a small space.

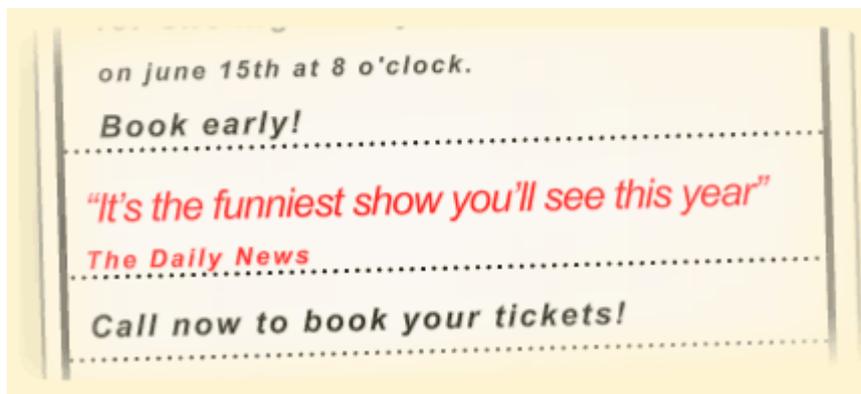
- **The heading.** Leaflets should have a clear, bold heading that catches the reader's attention and makes them want to read more.



- **The message.** You need to get as many facts as possible onto a leaflet – it needs to tell the reader everything they need to know and persuade them to do something, for example visit a restaurant or buy something.



- **Features.** Most leaflets have short messages that stand out and tell the reader what's special about the thing the leaflet is advertising. These could be prices, reviews or special offers.



- **A call to action.** This is a clear message telling the reader what to do next, for example, **Buy it now!** or **Call this number now for more details!**



- **Contact details.** If a leaflet is advertising an event or a shop, for example, it must tell people where to go (an address), and how to get in touch (telephone numbers, website details and e-mail addresses).



- **The design.** Leaflets have to catch the reader's attention, so they need to be bright and engaging.



(adapted from http://www.bbc.co.uk/schools/ks2bitesize/english/revision_bites/leaflets2.shtml)

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**Наталья Викторовна Патяева
Екатерина Борисовна Михайлова**

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Полиграфический центр ННГАСУ, 603950, Н.Новгород, ул. Ильинская, 65