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Ярославский государственный университет им. П. Г. Демидова  
Кафедра иностранных языков естественно-научных факультетов

## **Базовый курс грамматики и лексики английского языка**

*Практикум*

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Практикум содержит материал, способствующий развитию и закреплению у студентов знания основ фонетики, лексики и грамматики английского языка. Предусмотрена отработка материала, с помощью которого студенты готовятся к коммуникации межличностного и профессионального характера. Тексты составлены на основе материала, взятого из разных учебных источников, включая сайт университета.

Предназначен в основном для студентов физического факультета, изучающих английский язык.

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# INTRODUCTORY COURSE PHONETICS

## АЛФАВИТ

№ n/n	БУКВА	ТРАНСКРИПЦИЯ	№ n/n	БУКВА	ТРАНСКРИПЦИЯ
1.	A a	[ei]	14.	N n	[en]
2.	B b	[bi:]	15.	O o	[əu]
3.	C c	[si:]	16.	P p	[pi:]
4.	D d	[di:]	17.	Q q	[kju:]
5.	E e	[i:]	18.	R r	[a:(r)]
6.	F f	[ef]	19.	S s	[es]
7.	G g	[dʒi:]	20.	T t	[ti:]
8.	H h	[eitʃ]	21.	U u	[ju:]
9.	I i	[ai]	22.	V v	[vi:]
10.	J j	[dʒei]	23.	W w	[ˈdʌblju:]
11.	K k	[kei]	24.	X x	[eks]
12.	L l	[el]	25.	Y y	[wai]
13.	M m	[em]	26.	Z z	[zed]

## ОСНОВНЫЕ ПРАВИЛА ЧТЕНИЯ ГЛАСНЫХ И СОГЛАСНЫХ

### Чтение гласных

<b>Ударный слог</b>					
в открытом слоге		[ei]	—	take, place, name, cake, state	
в закрытом слоге		[æ]	—	map, sat, stand, happy, apple	
перед r		[a:]	—	car, art, dark, farm, party	
перед re		[eə]	—	care, bare, share, prepare	
Неударный слог		[ə]	—	ago, about, legal, formal	
<b>Буквосочетания</b>					
<b>Аа</b>	ai, ay	[ei]	—	main, chain, day, way, play	
	aw, au	[o:]	—	saw, law, autumn, cause	
	ar после w	[o:]	—	war, warm, warn	
	ar после qu	[o:]	—	quarter, quarrel	
	an + согласная .	[a:]	—	answer, dance, chance	
	a + ss, st, sk	[a:]	—	class, last, ask, task	
	a + ft, th	[a:]	—	after, craft, bath, rather	
	w(h) + a		—	watch, wash, was, what, want	

Ее	<b>Ударный слог</b>		
	в открытом слоге	[i:]	— be, he, me, see, meter, Pete
	в закрытом слоге	[e]	— best, next, left, smell
	перед г	[ɜ:]	— her, term, verse
	перед ге	[iə]	— here, mere, severe
	<b>Неударный слог</b>	[i]	— begin, return, because, between
		[ə]	— mother, father, corner, over
	<b>Буквосочетания</b>		
	ее, ea	[i:]	— green, seem, sea, clean
	ea + d	[e]	— bread, head, already
	<i>Исключения:</i> read [rid], lead [lid]		
	ei + gh	[ei]	— eight, weight
Ii	ew	[ju:][u:]	— few, new, grew, blew
	eu	[e]	— grey, obey
	ее, ea + г	[iə]	— deer, dear, hear, appear
	ear + согласная	[ɜ:]	— learn, earth, early
	<b>Ударный слог</b>		
	в открытом слоге	[ai]	— life, five, fine, tie, time
	<i>Исключения:</i> live [liv], give [giv]		
	в закрытом слоге	[i]	— sit, lift, pick, little
	перед г	[ɜ:]	— bird, girl, first, circle
	перед ге	[aiə]	— fire, tired, admire
	<b>Неударный слог</b>	[i]	— origin, engine
	<b>Буквосочетания</b>		
	i + id, nd	[ai]	— child, find, kind, mind
Oo	<i>Исключения:</i> children [ˈtʃɪldrən], window [ˈwɪndəʊ]		
	i + gh	[ai]	— night, light, right, high
	<b>Ударный слог</b>		
	в открытом слоге	[əʊ]	— close, note, rose, home
	в закрытом слоге	[o]	— stop, long, song, copper
	перед г	[o:]	— form, born, fork, border
	перед ге	[o:]	— store, before, restore
	<b>Неударный слог</b>	[əʊ]	— photo, motto, Negro
	суффиксы ous	[əs]	— famous, various, numerous
	суффиксы or	[ə]	— doctor, tractor, conductor

<b>Оо</b>	<b>Буквосочетания</b>		
	oa	[əu]	— coat, boat, road, roast
	oi, oy	[oi]	— oil, noise, boy, enjoy
	oo+k	[u]	— look, book, took
	oo + l, m, n, d, t	[u:]	— cool, tool, soon, food, root
	oo+r	[o:]	— door, floor
	ou	[au]	— house, mouth, cloud, round
	ou + gh	[o:]	— bought, thought, brought
	ou + r	[o:]	— four, course, your
	o+l+ согласная	[əu]	— old, cold, told, hold
<b>Uu</b>	<b>Ударный слог</b>		
	в открытом слоге	[ju:]	— tube, tune, useful
	в открытом слоге	[u:]	— blue, true, June
	в закрытом слоге	[ʌ]	— cut, but, hurry, hunter
	перед г + согласная	[ɜ:]	— turn, burn, curly, hurt
<b>Yy</b>	перед г + гласная	[(j)uə]	— pure, during, sure
	<b>Неударный слог</b>		
	в открытом слоге	[ə]	— upon, success, difficult
	в закрытом слоге	[ai]	— my, try, type, cycle
	перед г	[i]	— symbol, system
<b>Yy</b>	перед г	[aiə]	— tyre
	перед гласной	[j]	— year, you, young, yet
	<b>Неударный слог</b>		
		[i]	— any, many, very, only

### ***Упражнения на правила чтения гласных***

***Руководствуясь правилами чтения, прочтите следующие слова:***

**a**

1. age, stage, date, face, trace, labour, navy, cradle, change, same
2. bag, bad, man, back, black, act, action, latter, capital, match
3. arch, march, sharp, 'army, part, car, charge, yard, large, art
4. square, spare, 'parents, fare, com'pare, ware, pre'pare, care,

Mary

## e

1. be, he, she, eve, even, scene, 'secret, com'plete, these, 'legal, mete
2. men, yes, set, ac'cept, rent, 'enter, well, bed, 'petty, bed, Ted, Ben
3. 'person, pre'fer, term, serve, 'German, herd, e'merge, 'mercy, con'fer
4. here, 'era, 'period, 'series, mere, in'herent, 'hero, **sphere** [f], inter'fere,

## i/y

1. my, bike, try, fine, nice, Mike, 'library, pro'vide, des'cribe, type
2. fit, city, finish, symbol, thick, thin, dig, bill, myth, 'sympathy
3. first, sir, girl, third, thirty, circle, dirty, firmly, birthday, myrtle
4. fire, wire, en'tire, de'sire, tired, hire, dire, shire, tyre

## o

1. so, no, note, open, stone, vote, social, pro'pose, those, yoke, hope
2. stop, shot, lot, gone, job, doctor, long, strong, box, dog, fog, top
3. 'fortress, north, 'former, sport, 'order, short, ac'cording, horse, or
4. more, shore, 'story, be'fore, 'glory, store, ore, bore, tore, fore

## u

1. use, 'student, duke, 'unit, 'duty, 'music, ac'cuse, tune, 'super, 'pupil
2. 'uncle, just, 'judges, Dutch, 'public, 'upper, dis'cuss, 'struggle, gun, cut
3. oc'cur, hurt, 'further, 'urgent, 'purpose, turn, burst, church, herd, burn
4. cure, 'curing, pure, lure, 'during, 'fury, dure, 'plural, en'dure, 'jury

## *Упражнения на правила чтения гласных диграфов и сочетаний*

1. **ai, ay** = [ei] wait, rain, mail, bail, main, ray, pay, may, bay, lay  
**air** = [eə] hair, air, airplane, chair, pair, fair, lair  
**al + l(k)** = [o:] fall, call, wall, small, ball, tall, talk, chalk, walk, balk

**au, aw** = [o:] ‘autumn, Paul, pause, ‘auto, auk, law, saw, dawn, maw, pawn

**a + ss** = [a:] class, glass, brass, pass

**a + st** = [a:] cast, fast, master, vast, past, last

**a + sk** = [a:] cask, basketball, task, bask, mask, ask

**a + sp, a + ft** = [a:] after, craft, grasp, draft

**a + th** = [a:] father, rather, lather, path, bath

2. **ea** = [i:] cheap, peak, sea, leaf, dean, mean, meat, team, bean

**ee** = [i:] feed, fee, speech, seek, need, feel, deep, meet, bee, keen

**ea + d** = [e] ready, bread, head, dead, ‘meadow, ‘dreadful

**eigh** = [ei] eight, weigh, neigh, freight, weight, ‘eigh’teen, eighty

**ew** = [ju:] few, pew, dew, mew; **1, r, j + ew** = [u:] flew, blew, grew, drew, jew

**ey** = [ei] they, grey, o’bey, ‘diso’bey, con’vey

**eer** = [iə] pio’neer, engi’neer, veer, leer, deer, peer, beer

3. **ia, io** = [aiə] via, trial, dial, lion, liar, diary

**i + ld, nd** = [ai] child, wild, mild, find, mind, bind, kind

**i + gh** = [ai] high, higher, sight, sigh, right, might, light, night

4. **oa** = [əu] boat, coat, soap, load, toast, toad, coal

**oi, oy** = [oi] ap’point, coy, an’noy, toy, boy, oil, boil, toil, spoil

**oo + k** = [u] took, crook, shook, look, rook, nook, book, ‘looking-glass

**oo + 1, m, n** = [u:] spoon, soon, moon, loom, doom, fool, pool, tool, tooth [θ]

**o + ld** = [əu] hold, sold, old, told, fold, bold, folk, toll

**ou** = [au] loud, found, sound, round, pound, a’bout, out, lous

**ow + n** = [au] town, down, brown, ‘powder, cows, vow, bow, how, now, al’low

**o + (m, n, v, th)** = [ʌ] **come, son, some, front, month, mother, brother, other, an’other, love, above, a’mong, ‘company, done, govern, dove**

**our, ower** = [auə] sour, our, hour, tower, shower, power, flowers

5. **u + ll, sh** = [u] pull, bull, full, push, bush, bullet

6. **y + гласн.** = [j] yes, yet, yard, yoke, yell, yeast, year, beyond

## Чтение согласных

<b>Cc</b>	перед е, і, у перед а,	[s]	— face, city, bicycle
	о, и и согласной	[k]	— case, cat, cut, cool, coal,
	<b>Сочетания</b>		
	ch, tch,	[tʃ]	— watch, match, bench, chief
<b>Gg</b>	ck	[k]	— clock, thick, quick
	перед е, і, у переда,	[dʒ]	— page, age, engineer
	о, и	[g]	— gate, got, great, fog
	<b>Сочетание</b>		
<b>Ss</b>	ng	[ŋ]	— bring, sing, ring
	в начале слова	[s]	— say, such, send, stop, speak
	перед глухой согласной	[s]	— rest, best, ask, test
	после глухой согласной	[s]	— books, desks, asks, gets, puts
	после звонких согласных и гласных	[z]	— beds, reads, boys, days, factories
	между гласными	[z]	— rise, these, please
	перед суффиксами -ion, -ure	[ʒ]	— occasion, pleasure, measure
	в суффиксе -ous	[s]	— famous, numerous
<b>Ww</b>	перед гласной	[w]	— wind, was, way
	перед h	[w]	— when, where, what, why, white
	<b>Сочетания</b>		
	who	[h]	— who, whose, whom, whole
	wr	[r]	— write, wrote, wrong

## Буквосочетания

<b>bt</b>	[t]	— debt, doubt, subtle
<b>ght</b>	[t]	— light, night, right
<b>gn</b>	[n]	— sign, design, reign
<b>kn</b>	[n]	— know, knife, knit
<b>ph</b>	[f]	— photo, philosophy



<b>qu</b>		[kw]	— queen, question
<b>sh</b>		[ʃ]	— wish, show, fresh
<b>ss + ion</b>		[ʃn]	— permission
<b>ss</b>		[s]	— passive, possible
<b>th</b>	в начале и в конце знаменательных слов	[θ]	— thin, thick, month, path
	в начале служебных слов, местоимений, наречий и между гласными	[ð]	— the, this, that, those, thus, they, though, gather, bathe, weather

### *Упражнения на правила чтения согласных диграфов и буквосочетаний*

1. **c** = [s] city, face, peace, cell, cite, cyst, scene, science, scent, scythe [θ], certain, cycle, sauce, pence; **c** = [k] cake, cut, club, picnic, coal, clean, screw, coil, cure, decree, crowd, couch, cup, cotton

2. **ch (tch)** = [tʃ] chess, catch, fetch, such, dis'patch, de'tachment, speech, chap, each, bench, match, choice

3. **ck** = [k] back, lack, puck, neck, kick, cock, stick, lock, stock, Nick

4. **g** = [dʒ] page, large, gin, gentleman, gypsy, gym, bridge, charge, gem; **g** = [g] 'gather, grow, gave, game, gold, green, gain, egg, log, gun

5. **s** = [s, z] noise, nose, see, seaman, sitting, please, these, Chi'nese, tens, beds, papers, bays, ties, cast, sense [s], sights, Japa'nese

6. **sh** = [ʃ] shoot, show, shake, sharp, sheep, ship, clash, wash, 'usher, fish, shout, fresh

7. **ng** = [ŋ] long, song, young, king, bring, wing, thing, being, doing, going, having, getting; **ng + 1, r, w** = [ŋg] English, England, angry, hungry, single

8. **nk** = [ŋk] thank, think, conquer, 'conqueror, uncle, links, tank, frankly

9. **th** = [ð] other, mother, father, brother, an'other, rather, this, that, these, those, bathe, lathe, with, further, whether, clothes, gather, thus, then, than, they, them, breathe, weather, youths, paths

10. **wh** = [w] which, when, what, where, why, whip, white, while, wheat

[h] who, whose, whom, whole

11. **wr** = [r] write, wrap, wreck, wrench, wreak, wrist, wretch  
12. **w** + **or** = [w] work, worker, working, word, worse, worst, world, **worth** [θ]  
13. **w(h)** + **a** = [o] was, what, want, watch, swamp, swan, wander, wash  
14. **ture** = [tʃ] lecture, picture, pasture, feature, future  
15. **tion, ssion** = [ʃn] nation, station, national, mention, fiction, solution, session, op'pression, com'mission, dis'cussion, sup'pression, trans'lation, expression, action, tension, ex'pansion, ag'gression  
16. гласн. + **sion** = [3n] in'vasion, oc'casion, ex'plosion, conclusion, in'clusion, provision, con'fusion, col'lision, illusion, di'vision, de'cision  
17. гласн. + **sure** = [ʒ] measure, pleasure, treasure, com'posure, en'closure

### **ЧТЕНИЕ МНОГОСЛОЖНЫХ СЛОВ**

В трехсложных и четырехсложных словах ударение падает на третий от конца слог и гласная в нем читается кратко. Слова, состоящие из пяти слогов и более, имеют два ударения: второстепенное и главное. Главное ударение падает на третий слог от конца, а второстепенное – на пятый слог. И в том и другом слоге гласная читается по правилу закрытого слога (кратко). Например:

- faculty ['fækəlti] (трехсложное слово)  
vicinity [vi'siniti] (четырёхсложное слово)  
possibility [posi'biliti] (пятисложное слово)  
divisibility [di'izi'biliti] (шестисложное слово)  
indivisibility ['indi'izi'biliti] (семисложное слово)

#### **Упражнение на чтение многосложных слов**

navigate, liberate, penetrate, celebrate, educate, operate, indicated, economy, democracy, geography, political, monopoly, biography, ability, history, family, enemy, animal, capital, radical, factory, general, origin, industry, regiment, monument, regular, popular, faculty, company [ʌ]

## PART 1

### LESSON 1

#### THE WAY WE STUDY SCIENCES

##### 1. Remember the words.

way – путь, способ; the way we study sciences – о том, как мы изучаем науки	But all the rest is much the same – Но все остальное почти/во многом то же самое
do – вспомогательный глагол при образовании вопроса и отрицания в настоящем простом времени Present Simple	academic year – учебный год
study (studied, studied) – учить (ся), изучать	begin (began, begun) – начинать
first-year students – первокурсники	as a rule – как правило
as they put it – как говорят	last – длиться
enjoy – получать удовольствие от, нравиться	only – только
know (knew, known) – знать	short – короткий
sciences – естественные науки	long – длинный
humanities – гуманитарные дисциплины	have a rest – отдыхать ( <i>иметь отдых</i> )
world – мир	foreign – иностранный
around us – вокруг нас	check up on our assignment – проверять наше домашнее задание
I am doing (do – did – done) – я занимаюсь чем-то (дословно: <i>делаю</i> )	ask and answer questions – задавать вопросы и отвечать на них
has chosen (choose – chose – chosen) – выбрал (от <i>выбирать</i> )	read (read, read) – читать
different – разный, различный	write (wrote, written) – писать
part – часть	attentive – внимательный
	prepare – готовить
	want – хотеть
	difficult – трудный
	we are given – нам дают
	roommates – соседи по комнате

### **Grammar note**

**Глагол и его основные формы.** В речи глагол выполняет функцию главного члена предложения – сказуемого. Это значит, что с помощью своей формы он должен показывать, в каком отношении к моменту речи находится данное высказывание: а) предшествует ему (прошлое), б) совпадает с ним (настоящее), в) следует за ним (будущее). Такую функцию выполняют только две личные формы глагола: первая и вторая. Они называются личными, потому что их можно употребить сразу после подлежащего, кроме обозначения будущего времени. Если это первая форма глагола, совпадающая со словарной единицей, то действие относится к настоящему: I **want** to learn English. – Я **хочу** выучить английский. Вторая форма глагола образуется с помощью прибавления окончания **-ed** к первой форме так называемых **правильных** глаголов: We **wanted** to study sciences. Она показывает, что действие имело место в прошлом: Мы **хотели** изучать естественные науки. Для обозначения будущего времени перед смысловым глаголом ставится вспомогательный глагол **will**: I **will be** a scientist. – Я **буду** ученым.

Глагол **be** имеет разные личные формы в своем спряжении в настоящем времени: **I am; you are; he is, she is, it is; we are; you are; they are.** В прошедшем времени он имеет две формы **was** с местоимениями единственного числа, кроме **you**; **were** с местоимениями множественного числа, включая местоимение “ты” – **you**.

Кроме двух личных форм глагола, имеются еще неличные формы, соответственно 3-я и 4-я. В отличие от первых двух, они, во-первых, не могут стоять сразу после подлежащего в функции сказуемого. Им нужен посредник, вспомогательный личный глагол, который связывает неличную форму с подлежащим и должен показать время, наклонение и залог действия, обозначаемого смысловым глаголом. Эту функцию выполняют два глагола: **be, have – быть, иметь.** В тексте данного урока употребляются, в основном, глаголы-сказуемые в своей 1-й форме, то есть в настоящем времени Present Simple. Но вам встретится и сказуемое **has chosen**, в котором вспомогательный глагол **has** в своей пер-

вой форме показывает, что действие, совершенное в прошлом (**выбрал**), имеет результат в настоящем и переводится глаголом совершенного вида.

В английской грамматике форма типа **has chosen** называется «настоящим совершенным видом». **Неправильный** глагол **choose** употреблен здесь в своей 3-й форме – страдательном причастии **chosen**, соответствующем русскому «выбранный». Дословный перевод данного сказуемого – **имеет выбранной** – заменяется в русском языке простой личной формой «выбрал».

**Правильные** глаголы (а их подавляющее большинство) отличаются от неправильных тем, что образуют свои 2-ю и 3-ю формы с помощью **-ed**: **want – wanted – wanted**. Но и здесь есть свои правила, которые следует запомнить. Это – правила правописания и произношения. Например, правило об изменении конечной **y** на **i**, если перед ней стоит согласная: **study – studied – studied**. Но: **enjoy – enjoyed – enjoyed**.

Последняя форма глагола, 4-я, образуется одинаково и у правильных, и у неправильных глаголов – с помощью окончания **- ing**. Если данная форма выполняет функцию смысловой части сказуемого, то она вводится в него с помощью вспомогательного глагола **be** в соответствующем времени, лице и числе. Поскольку спряжение данного глагола отличается от спряжения других глаголов, то необходимо запомнить его спряжение вместе с местоимениями: **be – was, were – been – being**.

## 2. Read and translate the text.

My friend Andrey and I study at Yaroslavl State University. We are first-year students, or *freshmen*, as they put it in America. We enjoy sciences. Do you know that all disciplines are divided into sciences and humanities? Sciences study the natural world around us. Humanities learn the human culture. At school my friend and I enjoyed mathematics and physics. They are sciences. Now I am a student of the physics faculty. I am doing physics. Andrey has chosen the mathematics faculty. He is doing mathematics. Our faculties are located in different parts of the city, even on different sides of the Volga River. But all the rest is much the same.

The academic year begins, as a rule, on the first of September and ends in June. It lasts ten months: September, October, November, December, January, February, March, April, May and June. The academic year has two terms: the autumn term and the spring term. The autumn term begins in September and ends in December. It lasts four months or eighteen weeks. The spring term begins in the second week of February and ends, as a rule, in June. Each term ends with examinations, or *exams*. They take place in January and in June, sometimes in July.

We have two holidays a year: winter holidays and summer holidays. The winter holidays are short. They last only two weeks. The summer holidays are long. They last two months. During the holidays we do not study, we have a rest.

We go to the university on week-days: Monday, Tuesday, Wednesday, Thursday, Friday, and Saturday. We do not go there on Sundays. On Sundays we have a rest.

My classes begin at eight-thirty, or at half past eight, in the morning and end at about two or four in the afternoon. As for Andrey, his classes begin at nine and end at about the same time. I take a full course of physics and some parts of mathematics. Andrey takes a full course of mathematics and some parts of physics. Also, all students learn some foreign language: English, German or French. Students of physics learn only English. We have one English lesson a week. **At the lesson we check up on our assignment, ask and answer questions,** read English texts and translate them into Russian. We listen to English speech and learn to understand it. We also write English.

At the end of each lesson we are given our assignment. I am very attentive in class and always prepare my assignments because I want to know English well. It is not difficult for me: I work at this language regularly. I prepare my assignments together with Andrey. We are not from Yaroslavl. We live in the hall of residence (British) / in the dorms (American). We are roommates.

### **3. Translate into Russian.**

To check up on the results of the experiment, to do assignments, to do electricity and magnetism, to learn the new words, to choose a profession, to prepare exercises, in summer and in autumn,

in the morning and in the afternoon, to answer a difficult question, to have a short rest, to have a long lesson.

#### **4. Translate into English.**

Выбрал естественные науки; регулярно слушаю английскую речь; мы с другом; очень внимателен; в конце урока; в конце недели, месяца; длится около семнадцати недель; живем в общежитии; на разных берегах; то же самое; один раз в неделю, два раза в месяц, три раза в год.

#### **5. Answer the questions.**

1. Where do you study? 2. What science are you doing now? 3. When does the autumn term begin? 4. When does the spring term begin? 5. When do the summer holidays begin? 6. When do examinations take place? 7. How long do holidays last? 8. What do you do during the English class? 9. Do you speak English or Russian in class? 10. Do you work at your English regularly? 11. Does your friend live with his parents or in the hall of residence / dorms? 12. At what time do you come to the university? 13. How long does the academic year last?

#### **6. Translate the following into English using the model.**

a) When do you prepare your assignments? 1. Когда вы читаете специальные тексты? 2. Когда вы занимаетесь английским? 3. Во сколько вы приходите в университет? 4. Когда вы отдыхаете?

b) Where does he study? 1. Где учится ваш друг? 2. Где он живет? 3. Где живет ваша сестра? 4. Где она занимается английским? 5. Где они готовят домашнее задание? 6. Куда вы ходите по воскресеньям? 7. Куда я прихожу утром?

#### **7. Translate the following into English.**

1. Мой друг учится говорить и писать по-английски. 2. Я хочу понимать вас, когда вы говорите по-английски. 3. На уроках мы много переводим с английского. 4. Мои занятия заканчиваются в 13.35. 5. Я регулярно занимаюсь этой наукой. 6. Я хожу в университет каждый будний день. 7. У нас английский один раз в неделю. 8. По вечерам я отдыхаю. 9. Экзамены бывают, как правило, в конце семестра, а не в начале. 10. Студенты в каникулы

- не учатся. 11. Я всегда внимателен на лекциях (at the lectures).  
12. Он не живет в общежитии.

### 8. Ask Yes/No questions using the model.

We study at the university. – Do you study at the university?

The teacher does not know you. – Doesn't the teacher know me?

1. The academic year has two terms. 2. The examinations take place two times a year. 3. Students do not study on Sundays. 4. He speaks on various topics. 5. Classes begin at half past eight. 6. She works at her English regularly. 7. They ask each other questions.

### 9. Correct the statements using the model.

The boy is a worker. – He is not a worker. He is a second-year student.

1. The girls are at home (in the university). 2. These students are in our classroom (in their classroom). 3. Winter holidays are long (short). 4. The student wants to translate this text (to learn this text). 5. Nick is a first-year student (a second-year student). 6. Jane works at the factory (at an office). 7. The students may take their books (lap-tops)

### 10. Make the following statements negative. Use *don't*, *doesn't* for A, D; *isn't*, *aren't* – for B; *no* – for C.

- A. 1. I have a family. 2. She has good books. 3. He has a sister. 4. They have a new laboratory. 5. We have an English class today. 6. You have to take one more exam.

- B. 1. He is a good sportsman. 2. They are brothers. 3. We are friends. 4. She is a scout. 5. Your teacher is at the faculty.

- C. 1. There is a bag on the chair. 2. There are a lot of students in the lab. 3. There is a lamp on the desk. 4. There are twenty new words in the text.

- D. 1. He works at a research institute. 2. I speak English very well. 3. Those foreign students understand Russian. 4. My brother helps me with my assignment.

**Grammar note.** Глагол **have** употребляется как обычный знаменательный глагол в научном и официальном стиле. В разговорной речи в британском варианте появляется форма **have got**, в которой **have** выступает уже как вспомогательный глагол, т. е.



играет свою строевую роль при образовании вопросительных и отрицательных предложений:

**11. Translate into English using the following models for each sentence.**

I have got (I've got) a younger brother. – Have you got a younger brother? – I haven't got a younger brother.

В американском варианте английского языка утвердительное, вопросительное и отрицательное предложения о наличии у меня брата выглядят следующим образом:

I have a brother. – Do you have a brother? – I don't / do not have a brother, то есть глагол **have** ведет себя здесь как обычный знаменательный глагол типа study. Существует и третий вариант употребления глагола **have**. Перед отрицанием дополнения, выраженного существительным без какого-либо определения, после **have** ставится отрицательное местоимение **no** – «никакой»: I have no brother.

У этих машин нет блока питания. – These machines *don't have* power. These machines *haven't got any* power. These machines *have no* power.

1. У меня нет никаких идей (ideas). 2. У них совсем нет мест (room) в общежитии. 3. У студентов теперь нет учебников. 4. У вас нет зачета (pass). 5. На нашем факультете нет библиотеки (library). 6. У этой группы нет экзамена по английскому языку. 7. У меня совсем нет времени (time).

**12. Express distrust (недоверие) according to the model.**

Linguistics is a science. – Is it?

1. The students are always ready for the lesson. 2. I am your teacher. 3. This girl is a beauty (красавица). 4. The computers are absolutely new. 5. It is easy. 6. We are busy on Sunday. 7. Rostov is older (старше) than Yaroslavl.

**SPEAK about the way you study sciences. Make up 15–17 simple sentences.**

## **LESSON TWO**

### **MY ROUTINE**

#### **1. Remember the words.**

early – рано, ранний	kitchen – кухня
get up – вставать (от сна)	breakfast – завтрак
seldom – редко	porridge – каша
do one's morning exercises – де- лать зарядку	listen to – слушать что-либо
open – открывать	over the radio/the television – по радио / по телевизору
window – окно	It does not take me long – мне не нужно много времени
switch on – включать	I leave home for – я уйду в
bathroom – ванная	as – как, так как, тогда как
wash – умываться	far from – далеко от
clean – чистить	go – идти, ехать, вообще передвигаться
teeth (tooth) – зубы (зуб)	breaks – перерывы
quarter – четверть	dining-hall – столовая (в кол- леджах, университетах)
walk – ходить пешком	stay – проживать, оставаться
every – каждый	не на долгое время
I am never late – я никогда не опазываю	after – после, после того как
in time / on time (Amer.) – во время	
between – между	

#### **2. Read and translate the text.**

My week-days begin early. I always get up at seven o'clock. Every day I do morning exercises. For that I open the window and switch on some music. After the morning exercises I go to the bathroom and clean my teeth, take a shower and do some other procedures. Then I dress myself and go to the kitchen to have breakfast. At breakfast I usually have some porridge, a cup of tea with sugar, and a ham sandwich.

It does not take me long to have breakfast and at half past seven I leave home for the university. As I live far from it, I go there by bus. It usually takes me half an hour to get there. I seldom walk in **the morning** as I have no time to do it.

I am never late. I always come to my classes in time. We have short breaks between them and a long lunch break after the second or the third period: it depends on the faculty. I usually have lunch in the dining-hall.

As a rule, we have four lectures or seminars or practical classes a day, sometimes three of them. So I leave the university at different hours. I very often walk home after a busy day: I like it very much. When I come home, I have dinner and a short rest: I have to do my homework. It usually takes me about two hours. I go to bed at eleven o'clock. Before that I can take a walk, watch TV or just have a nice time on the Internet.

### **3. Translate the following into Russian.**

a) to have breakfast (lunch, dinner); to leave the university for home; to walk home; to have a short rest; a five minutes break; between classes; between the windows; to do exercises to music; over the radio; over the phone; to switch on the light; to go by bus (tram, trolleybus); a busy day; an hour and a half; half an hour; not far from my house; early in the morning.

b) 1. I like to watch TV. 2. He is busy with his research today. 3. I live far from the universities but near the centre of the city. 4. I go to the library very seldom. 5. It takes my friend some minutes to learn the latest news.

### **4. Translate into English.**

пятиминутный перерыв, по радио, идти домой, немного отдохнуть, под музыку, ехать автобусом, полтора часа, рано утром, в течение года, раз в неделю.

### **5. Answer the questions.**

1. At what time do you get up? 2. Do you always do your morning exercises? 3. Who makes your breakfast for you? 4. How do you get to the university? 5. How long does it take you to get there? 6. Do you attend all the classes? 7. Do you remember to take everything for your classes? 8. What do you do during the break? 9. Why do you sometimes stay in the university after classes? 10. What do you do in the evening? 11. At what time do you go to bed?

## **6. Make up sentences according to the model.**

It takes me one hour / an hour to do my assignment. (to do morning exercises, to learn the latest news, to get to the university, to have dinner, to prepare for the classes, to have a walk, to translate my home reading)

## **7. Make the sentences of exercise 6 interrogative (вопросительными) and negative (отрицательными) using the following expressions.**

How long does it take you ...? – It does not take me ...

## **8. Translate the following into English using Present Simple in A and Present Progressive in B.**

**A.** 1. Наша мама встает рано по будням. 2. Из дома я ухожу в половине восьмого. 3. Мне не нравится ездить автобусом. 4. Я всегда прихожу в университет вовремя. 5. Она никогда не опаздывает. 6. Ему нравится ходить пешком. 7. Я часто обедаю у нас в столовой. 8. Ему нравится обедать дома. 9. Я ухожу, когда заканчиваются все мои занятия. 10. Я не люблю смотреть телевизор. 11. Как правило, мы ужинаем в семь часов. 12. Во время ужина мы не включаем ни радио, ни телевизор. 13. Я не ложусь в одиннадцать, я ложусь в двенадцать. 14. В столовой сейчас много народу. 15. Раз в неделю я занимаюсь в спортивной секции. 16. Домашнее задание я готовлю вечером. 17. Сколько времени у тебя уходит на перевод домашнего чтения? 18. Домой я добираюсь трамваем или иду пешком.

**B.** 1. Она уже встает. 2. Я выхожу из дома. 3. Мы едем автобусом.

4. Я как раз (just) вхожу в наше здание. 5. Что ты сейчас делаешь? 6. А где остальные (the other) студенты? – Они обедают в столовой. 7. Я как раз смотрю телевизор. 8. Уже поздно. Я иду спать. 9. Она занята. Она делает уроки. 10. Чем он сейчас занимается? Думаю, что он ждет троллейбус на остановке, а может быть (and maybe), все еще (still) идет на остановку.

## **SPEAK about your routine in the form a) of a story and b) of a dialogue.**

## LESSON 3

### A. ABOUT P.G. DEMIDOV YAROSLAVL STATE UNIVERSITY

#### 1. Answer the questions.

1. What do you know about the university you are studying at now? 2. Why was it given the name of Demidov?

#### 2. Remember the words.

lyceum [lai'si:əm] – лицей  
(в России до революции  
1917 года – привилегиро-  
ванное среднее или высшее  
учебное заведение, предна-  
значавшееся главным образом  
для подготовки чиновников)  
councillor ['kaunsələ] – совет-  
ник, член совета  
bachelor ['bætʃələ] – бакалавр  
(Bachelor of Arts – облада-  
тель степени бакалавра по  
одной из гуманитарных наук  
в университетах; Bachelor  
of Science – бакалавр в обла-  
сти одной из математических  
или естественных наук)  
master – магистр

post-graduate [pəʊst 'grædʒuət]  
– аспирант (в России), студент  
магистратуры (в Европе)  
graduate – выпускник универ-  
ситета, аспирантский (в Аме-  
рике)  
Law [lo:] – н. закон; право  
(the Law Faculty – юридиче-  
ский факультет)  
Mathematics [mæθi'mætiks]  
Psychology [sai'kolədʒi]  
Philology [fi'lələdʒi]  
social ['səʊəl]  
facilities [fə'silitiz] – удобства  
dorms (сокр.) – студенческое  
общежитие (-я) (в Америке)  
gym (разг.сокр. от gymnasium)  
[dʒim] – спортивный зал

#### 3. Read and translate the text.

Yaroslavl State University is one of the youngest and at the same time one of the oldest universities in Russia. The history of Yaroslavl State University begins in 1803. The emperor of Russia Alexander I founded the School of Higher Sciences on the money of the famous landlord, scientist-naturalist and the Councillor of State P. G. Demidov. It was later transformed into the Demidov Law Lyceum. In 1918 the Yaroslavl State University was established. Six years later it stopped its activity because of the money problems. But in 1970 began to work again. In 25 years it was given the name of Pavel Grigoriyevich

Demidov. Today P.G. Demidov Yaroslavl State University is one of the best higher educational institutions with more than 7000 students. It has about 70 bachelor's and master's programmes. Students can continue education at a post-graduate school for a candidate's and doctor's degree. In its structure the university has ten faculties: the Law Faculty, the Mathematics Faculty, the Physics Faculty, the Economics Faculty, the History Faculty, the Faculty of Information and Computer Science, the Faculty of Social and Political Sciences, the Psychology Faculty, the Biology and Ecology Faculty, the Faculty of Philology and Communication. Also the University College offers academic programmes in secondary professional education. The teaching process is provided by a professional team of lecturers and instructors, most of them have the degree of candidates and doctors of science. The rector of Yaroslavl State University is Professor Alexander Ilyich Rusakov. Research works are carried out in many fields of science. Students and instructors participate in different scientific conferences and workshops. The university takes part in international exchange projects and has long-term partnerships with higher educational institutions of the USA, Finland, France, England. Demidov Yaroslavl State University provides students with a great variety of facilities, such as libraries, well-equipped laboratories and rooms with Internet access, dorms, gyms.

**4. Consult the dictionary: make nouns of the following verbs. Translate them. Remember to add suffixes -tion, -al, -ment, -sion.**

transform

establish

found

continue

participate

provide

**Grammar note**

**Степени сравнения прилагательных и наречий (Comparatives)**

1. Односложные *прилагательные*: добавляется **-(e)r** для образования сравнительной степени и **-(e)st** для образования превосходной:

*small – smaller – the smallest.*

**Note 1:** у односложных прилагательных, оканчивающихся на гласную + согласную, эта согласная удваивается: *hot – hotter – hottest*.

2. Большинство двусложных и многосложные прилагательные образуют сравнительную степень с помощью **more** (более), а превосходную – с помощью **most** (наиболее):

*sociable – more sociable – the most sociable*.

**Note 2: 1)** в двусложных прилагательных, оканчивающихся на согласную + у, -у заменяется на **-i** и добавляется **-er/-est**: *easy-easier -the easiest*.

2) прилагательные *clever, cruel, friendly, gentle, narrow, quiet, shallow, simple, stupid* образуют сравнительную и превосходную степени сравнения как с **-er/-est**, так и при помощи **more/most**: *friendly – friendlier/more friendly – friendliest/ most friendly*.

### **Наречия**

1. К наречиям, совпадающим по форме с прилагательными (*hard, fast, early, late, high, low, deep, long, near, straight*), добавляется **-er/-est**: *fast – faster – fastest*.

2. К другим наречиям (e.g. *quickly, slowly, easily*) добавляется **more/most**.

**Note 3:** артикль **the** у наречий превосходной степени не употребляется.

### **Исключения**

*good/well – better – best*

*much – more – most*

*far – farther (по расстоянию)/further (по времени) – farthest /furthest*

*bad/badly – worse – worst*

*little – less – least*

*near – nearer – nearest*

**Note 4:** *elder/eldest* употребляется для описания людей из одной семьи.

*Her elder/eldest sister is an architect.*

*near – nearer – nearest* (ближайший, самый близкий по времени)/ **next** (следующий по порядку)

late – **later** (более поздний по времени) / **latter** (последний из двух по порядку) – **latest** (последний по времени)/**last** (самый последний по порядку)

**5. Answer the questions on the text.**

1. Why is the university called the oldest and the youngest institution at the same time?
2. What did Demidov do?
3. How many faculties does the university have?
4. What faculty are you studying at?
5. What facilities does the university provide you with?

**6. Find the superlatives (превосходная степень) of the following words in the text:**

old  
young  
good  
many

**7. Find the comparatives (сравнительная степень) of the following words in the text:**

Much  
High  
Late

**8. Make the comparatives or the superlatives of the following adjectives and adverbs.**

1. Moscow is one of (large) cities in the world.
2. The Kremlin is (beautiful) part of Moscow.
3. This boy is (fat) than that one.
4. My brother is (tall) than my sister.
5. Where does your (old) brother live?
6. We heard (late) news over the radio.
7. Did you read his (late) novel?
8. This box is (heavy) of all.
9. Your test paper is (bad) than mine.
10. June is (good) month of the year.
11. Whose translation is (good)?
12. Our teacher lives in (far) part of the city.
13. Which is (high) mountain in Russia?
14. Your hands are (big) than mine.
15. This street is (noisy).
16. Peter is (small) of the family.
17. She will get (thin) when she gets (old).
18. Your dress is (fashionable) of all.
19. She did the work (well) than my brother.
20. My grandfather is



two years (old) than my grandmother. 21. His watch is 5 minutes (fast) than yours. 22. Where is (near) bus stop?

**SPEAK about Demidov State University. Make up 15-17 simple sentences.**

## ***B. THE MATHEMATICS AND THE PHYSICS FACULTIES***

**1. Answer the question:** What have you learned about your faculty at the freshmen's meeting?

### **2. Remember the words.**

direction – направление  
specialism – специализация, специальность  
qualification [kwolɪfɪ'keɪʃn] – квалификация, подготовленность  
quality ['kwɒləti] – качество  
applied [ə'plaɪd] – прикладной  
guaranteed [gæ'rən'ti:d] – гарантированный  
achievements [ə'tʃɪvmənts] – достижения  
abroad [ə'bro:d] – за границей  
departments [di'pɑ:tmənts] – кафедры  
finite groups ['faɪnaɪt gru:ps] – конечные группы (группы, содержащие конечное число элементов (это число называется её «порядком»))  
increase [ɪn'kri:s] – увеличиваться, возрастать, повышаться  
high-energy physics – физика частиц высоких энергий

dean [di:n] – декан  
Radio Engineering [ˈreɪdɪəʊ ɛndʒɪ'nɪrɪŋ] – радиотехника  
opportunity [ɒpə'tju:nɪti] – возможность, перспектива  
ability [ə'bɪləti] – способность  
skill – умение, навык  
research [ri'sɜ:tʃ] – исследование, изучение, научно-исследовательская работа  
magazine [mægə'zi:n] – периодическое издание, журнал  
journal ['dʒɜ:nəl] – специализированный журнал, посвященный одному конкретному предмету исследования  
variation inequalities [vəri'eɪnɪ'kwɒltɪz] – вариационные неравенства (универсальная форма записи различных задач нелинейного анализа)  
quantum field theory [ˈkwɒ:ntəm] – квантовая теория поля

elliptic systems of differential equations [i'liptik 'sistimz əv dɪfə'renʃl i'kweiʒnz] – эллиптические системы дифференциальных уравнений (класс дифференциальных уравнений в частных производных, описывающих стационарные процессы)

freshman – новичок, первокурсник  
the Club for the Lighthearted and Quick-witted [laɪt'ha:tɪd] [kwɪk'wɪtɪd] – КВН (Клуб веселых и находчивых)

### 3. Read and translate the text.

#### **The Mathematics and the Physics Faculties**

The Mathematics and Physics Faculties were opened in 1976 after the division of the Physics and Mathematics Faculty.

**The Mathematics Faculty** trains bachelors and masters in the following directions: Applied Mathematics and Information Science, Mathematics and Computer Sciences and specialists in a specialism Computer Security. A high quality of graduates' education is guaranteed by a high qualification of teachers and scientists. They are known for their achievements not only in Russia, but also abroad. The faculty's departments do research on fundamental problems of mathematics, such as finite groups; elliptic systems of differential equations; variation inequalities; self-oscillation processes. Scientific and research conferences are regularly held. International cooperation is realized in the form of teaching single students and post-graduate students and teaching and research work of teachers abroad. Pavel Nikolaevich Nesterov is the dean of the faculty.

**The Physics Faculty** trains bachelors and masters in the following directions: Physics, Radiophysics, Electronics and Nanoelectronics, Information and Communication Technologies and Systems, Radio Engineering. The faculty trains candidates and doctors of science in several specialties. The faculty's graduates get a multi-discipline education and have good job opportunities because they have the ability to do interesting creative tasks and the skills of working in the team. The graduates can work at the plants, in organizations and companies in the areas of radiophysics, electronics and nanoelectronics, engineering

in medical and biological practice, information technologies and in other areas. Traditionally the Physics Faculty successfully develops both fundamental and applied researches of the international level. Every year the number of articles in foreign and national magazines and journals increases. The faculty's departments specialize in the research area of high-energy physics, elementary particles theory, quantum field theory, astrophysics, solid-state theory. A wide range of research is provided by close creative cooperation with a number of leading research institutes and higher education institutions. Professor Sergey Borisovich Moskovsky is the dean of the faculty.

**4. Consult the dictionary: make the verbs of the following nouns. Translate them.**

achievements

cooperation

research

organizations

oscillation

qualification

**5. Answer the questions on the text.**

1. What do you know about the traditions of the Physics and Mathematics faculties? (ask your curator); (freshman party, student's spring, physicist's day, the Club for the Lighthearted and Quick-witted).

2. Which directions and specialisms do the Physics and Mathematics faculties prepare students in?

3. Who are the deans of the Physics and Mathematics faculties?

4. What areas do the students and the workers of the Physics and Mathematics faculties do research in?

***Grammar note***

*Possessive Case (притяжательный падеж)*

1. Притяжательный падеж обозначает принадлежность одного предмета к другому.

2. В большинстве случаев притяжательный падеж употребляется с одушевленными существительными (но также может употребляться с неодушевленными существительными, если это

- названия общественных организаций, фирм, учреждений:  
government's decision;

- географические или территориальные единицы: London's theatres;

- конкретный период времени: the last year's journey; two weeks' holiday).

3. Существительные образует притяжательный падеж при помощи окончания -s, перед которым ставится апостроф ('): the girl's voice (голос девочки).

4. Окончание притяжательного падежа читается как [s] после глухих согласных звуков, как [z] после звонких согласных и гласных и как [iz] после s, ss, sh, ch, tch, x: cat's [kæts], dog's [dogz], actress's ['æktɹɪsɪz].

5. Существительные во множественном числе с окончанием -s требуют только апострофа:

the Andersons' house.

6. К существительным-исключениям во множественном числе прибавляется -'s: women's beauty secrets.

7. В случае словосочетания или группы существительных -'s употребляется с последним словом: Sue and Tom's car (но Shelly's and Byron's poems, так как нет общего определителя), my elder brother's son.

## **6. Find the examples of the Possessive Case in the texts.**

### **7. Use the Possessive Case in the following sentences.**

1. The room of my friend. 2. The questions of my son. 3. The wife of my brother. 4. The table of our teacher. 5. The poems of Pushkin. 6. The voice of this girl. 7. The new club of the freshmen. 8. The letter of Pete. 9. The car of my parents. 10. The life of this woman. 11. The handbags of these women. 12. The flat of my sister is large. 13. The children of my brother are at home. 14. The room of the boys is large. 15. The name of this girl is Jane. 16. The work of these students is interesting.

### ***Grammar note***

#### *Passive Voice (страдательный залог)*

1. Страдательный залог употребляется для того, чтобы показать, что действие происходит над объектом (сам объект пассивен).

2. Страдательный залог образуется при помощи глагола *to be* (в нужном времени) и 3-й формы смыслового глагола.

<i>Tense form</i>	<i>Active</i>	<i>Passive</i>
<b>Present Simple</b>	Mary makes tea.	Tea is made by Mary.
<b>Present Continuous</b>	I am making tea.	Tea is being made (by me).
<b>Past Simple</b>	Mary made some cakes.	Some cakes were made by Mary.
<b>Past Continuous</b>	Mary was making tea.	Tea was being made by Mary.
<b>Present Perfect Simple</b>	Mary has made tea and coffee.	Tea and coffee have been made by Mary.
<b>Past Perfect Simple</b>	Mary had made tea.	Tea had been made by Mary..
<b>Future Simple</b>	Mary will make tea.	Tea will be made by Mary.
<b>Future Perfect Simple</b>	Mary will have made tea.	Tea will have been made by Mary.
<b>Infinitive</b>	Mary has to make tea.	Tea has to be made by Mary.
<b>Modal Verbs</b>	Mary may make tea.	Tea may be made by Mary.

3. Изменение действительного залога в страдательный происходит по следующей схеме:

а) **ПРЯМОЕ** дополнение в действительном залоге становится подлежащим в страдательном залоге;

б) форма смыслового глагола изменяется на форму страдательного залога;

в) подлежащее в действительном залоге становится дополнением, указывающим на исполнителя действия, и употребляется с предлогом **by** или опускается.

**8. Find the examples of the Passive Voice in the texts. Identify the Tense forms.**

### **9. Choose the correct form of the verb.**

1. The porter will (bring, be brought) your luggage to your room.
2. Your luggage will (bring, be brought) up in the lift.
3. You may (leave, be left) your hat and coat in the cloak-room downstairs.
4. They can (leave, be left) the key with the clerk downstairs.
5. From the station they will (take, be taken) straight to the hotel.
6. Tomorrow he will (take, be taken) them to the Russian Museum.
7. At the station they will (meet, be met) by a man from the travel bureau.
8. She will (meet, be met) them in the hall upstairs.

### **10. Put the verbs in the brackets in the Passive Voice (mind the Tense form).**

1. The new theatre (to open) last month.
2. A cure for cancer (not to find) yet.
3. The article (to translate) into Russian now, it (to publish) in a few days.
4. Normally the passengers (to show) how to use life jackets after the take-off.
5. I (to ask) a lot of questions about my education background at a job interview.
6. The glass mirror (to invent) by the Romans.
7. People always (to impress) by the beauty of the night city.
8. Finally salad, beefsteak and tea (to serve).
9. **April Fool's Day (to mark) for the last few years in Russia too.**
10. He (to bring up) by his parents to be a distinct man.
11. Bread (to eat) every day.
12. The letter (to receive) yesterday.
13. Nick (to send) to Moscow next week.
14. I (to give) a very interesting book at the library last Friday.
15. St. Petersburg (to found) in 1703.
16. At the last competition the first prize (to win) by our team.
17. **The question (to settle) as soon as they arrived.**
18. **Your report must (to divide) into two chapters.**
19. The book (to discuss) at the next conference.
20. **The composition must (to hand) in on Wednesday.**
21. Yesterday he (to tell) to prepare a speech.
22. The article (to publish) last week, if I am not mistaken.
23. The lectures (to attend) by all of us.
24. The rule explained by the teacher at the last lesson (to understand) by all of us.
14. I hope the invitation (to accept) by everybody.

**SPEAK about the faculty you are studying at now. Make up 10 simple sentences, using the information from the text. Add 5 more sentences about the traditions of your faculty to your story.**

## **LESSON 4**

### **FAMOUS SCIENTISTS**

*A. MIKHAIL LOMONOSOV*

#### **1. Answer the question.**

1. Who said about M. Lomonosov: “Lomonosov was a great man. He created the first university, ..., he was our first university”?

#### **2. Remember the words.**

to enter – поступать в  
the Slavic-Greek-Latin Academy – Славяно-греко латинская академия  
stained glass – цветное, витражное стекло  
mineralogy [ˈmɪnəˈrælədʒi] – минералогия, наука о минералах, ископаемых неорганических веществах  
meteorology [ˈmi:tɪəˈrælədʒi] – метеорология, наука об атмосфере и происходящих в ней процессах  
the law of conservation of matter and motion – закон сохранения материи и движения  
to regard – рассматривать  
substance [ˈsʌbstəns] – вещество  
to argue [ˈɑːɡjuː] – утверждать, доказывать

to observe [əbˈzɜːv] – наблюдать  
transit – прохождение планеты (через меридиан)  
Venus [ˈviːnəs] – Венера  
to conclude – делать вывод  
guess [ɡes] – предположение  
vertical currents – вертикальные потоки  
to point to – указать на  
aurora [oːˈrɔːrə] – полярное сияние  
to estimate – оценить, подсчитать  
height [haɪt] – высота  
epoch [ˈiːpɒk] – эпоха  
corpuscular theory [koːˈpʌskjʊlə] – корпускулярная теория (частиц)  
introduce – вводить  
thermometer [θəˈmɒmɪtə] – термометр  
formula [ˈfoːmjʊlə] – (pl. formulae [ˈfoːmjʊliː])

#### **3. Read and translate the text.**

The great scientist and poet, M. Lomonosov, began his working life when he was still a boy. The son of a fisherman, he often went with his father to the White Sea and to the Arctic Ocean and learned

much about nature and the life of his country. He did not go to school, but he learned to read at an early age and soon knew by heart the few books that he had.

At the age of 19 he left his home and went on foot to Moscow, where he entered the Slavic-Greek-Latin Academy.

There was no other higher school in Moscow at that time, his first years of study were difficult, but he worked hard and made great progress. He continued his studies in St. Petersburg and later on in foreign countries.

When Lomonosov came back, he taught chemistry and other subjects at the Academy of Sciences. He founded the first chemical laboratory in Russia, and made in it over 4,000 (four thousand) experiments on the production of stained glass.

Lomonosov's other scientific interests were electricity, light, mineralogy, meteorology, and astronomy. He formulated the main principles of one of the basic laws of physics – the law of conservation of matter and motion. Mikhail Lomonosov was the first to make the main statements of the kinetic theory of gases. Lomonosov believed that all bodies are composed of tiny moving particles – atoms and molecules, which when heated move faster, and cooled – more slowly. When most scientists regarded heat as material substance, he argued that heat was in fact a form of motion – the result of the motion of the molecules. He observed the transit of Venus in 1761 and concluded that Venus had an atmosphere “similar to, or perhaps greater than that of the earth.” He expressed the correct guess about the vertical currents in the atmosphere, correctly pointed to the electrical nature of auroras and estimated their height. In the epoch of the corpuscular theory of light, he openly supported the wave theory, and developed an original theory of colours.

Lomonosov wrote poetry that had a great effect on the development of the Russian literary language. He also wrote the first Russian grammar. He translated a course in physics from German into Russian and introduced into the Russian scientific language such terms as thermometer, formula, atmosphere and some others.

He devoted his whole life to the development of Russian science, and all that he did, he did for his people and for his country.



**4. Consult the dictionary: make the adjectives of the following nouns. Translate them. Remember to add suffixes –al, -ial**

nature  
experiment  
electricity  
substance  
transition

***Grammar note***

**Learn by heart.**

### ***IRREGULAR VERBS***

<i>Infinitive</i>	<i>Past Indefinite</i>	<i>Past Participle (Participle II)</i>	<i>Translation</i>
be	was, were	been	быть, находиться
bear	bore	born	рожать
become	became	become	становиться
begin	began	begun	начинать(ся)
blow	blew	blown	дуть
break	broke	broken	разбивать(ся)
bring	brought	brought	приносить
build	built	built	строить
buy	bought	bought	покупать
catch	caught	caught	ловить, хватать
choose	chose	chosen	выбирать
come	came	come	приходить
cost	cost	cost	стоить
cut	cut	cut	резать, рубить
do	did	done	делать
draw	drew	drawn	рисовать
drink	drank	drunk	пить
drive	drove	driven	ехать, вести автомобиль
eat	ate[et]	eaten	есть
fall	fell	fallen	падать
feed	fed	fed	кормить
feel	felt	felt	чувствовать
fight	fought	fought	бороться, драться
find	found	found	находить
fly	flew	flown	летать
forget	forgot	forgotten	забывать
freeze	froze	frozen	замерзать
get	got	got	получать, добираться

<i>Infinitive</i>	<i>Past Indefinite</i>	<i>Past Participle (Participle II)</i>	<i>Translation</i>
give	gave	given	давать
go	went	gone	идти
grow	grew	grown	расти
have	had	had	иметь
hear	heard	heard	слышать
hide	hid	hidden	прятать(ся)
hit	hit	hit	ударять
hold	held	held	держать
keep	kept	kept	хранить
know	knew	known	знать
lead	led	led	вести
learn	learnt/learned	learnt/learned	учить, узнавать
leave	left	left	оставлять
lend	lent	lent	одолжить
let	let	let	позволять
lie	lay	lain	лежать
lose	lost	lost	терять
make	made	made	делать
mean	meant	meant	означать
meet	met	met	встречать(ся)
pay	paid	paid	платить
put	put	put	класть, ставить
read [ri:d]	read [red]	read [red]	читать
ride	rode	ridden	ехать верхом
ring	rang	rung	звонить
rise	rose	risen	подниматься
run	ran	run	бежать
say	said [sed]	said [sed]	сказать
see	saw [si:]	seen	видеть
sell	sold	sold	продавать
send	sent	sent	посылать
set	set	set	ставить; заходить (о солнце)
shake	shook	shaken	трясти
shine	shone	shone	светить
shoot	shot	shot	стрелять
show	showed	shown	показывать
sing	sang	sung	петь
sit	sat	sat	сидеть
sleep	slept	slept	спать
smell	smelt	smelt	нюхать; пахнуть

<i>Infinitive</i>	<i>Past Indefinite</i>	<i>Past Participle (Participle II)</i>	<i>Translation</i>
speak	spoke	spoken	говорить
spend	spent	spent	проводить
stand	stood	stood	стоять
steal	stole	stolen	красть
strike	struck	struck	ударять
swim	swam	swum	плавать
take	took	taken	брать
teach	taught [to:t]	taught [to:t]	обучать
tell	told	told	сказать (кому-л.)
think	thought [θo:t]	thought [θo:t]	думать
throw	threw	thrown	бросать
understand	understood	understood	понимать
upset	upset	upset	опрокинуть; перевернуть
wake	woke	woken	просыпаться
wear	wore	worn	носить (об одежде)
weep	wept	wept	плакать
win	won [w^ʌn]	won [w^ʌn]	побеждать, выигрывать
write	wrote	written	писать

### 5. Put the following verbs in the Past Indefinite Tense.

to know, to be, to do, to write, to have, to give, to teach, to found, to learn, to leave.

### 6. Put the verbs in the brackets in the Past Indefinite Tense

1. Lomonosov (to be) a great poet and (to do) much for the progress of the Russian language. 2. In his Grammar he (to teach) how to write Russian. 3. He (to give) much time to experiments in chemistry and physics. 4. These experiments (to have) a great effect on the development of Russian science, which (to make) considerable progress at his time. 5. There (to be) no chemical laboratories in Russia before Lomonosov. 6. Lomonosov (to know) the nature and the life of his country. 7. He (to write) the first Russian grammar. 8. He (to do) all for his country.

### 7. Translate the following sentences into Russian, paying attention to the use of the prepositions (предлоги).

1. Lomonosov had so few books when he was a boy that he soon knew them by heart. 2. His desire for knowledge was so great that he

went on foot to Moscow. 3. He lectured on chemistry at the Academy of sciences. 4. He translated a course in physics from German into Russian 5. His experiments on the production of glass had a great effect on the development of glass industry in Russia.

### 8. Answer the questions on the text.

1. When did Lomonosov leave his home? 2. Where did he study? 3. What did he teach at the Academy of Sciences? 4. Was there any other higher school in Moscow at that time? 5. Did Lomonosov continue his studies later on? 6. Did he know foreign languages? 7. What did he translate? 8. What discovery in astronomy did Lomonosov make? 9. Did Lomonosov support the corpuscular or the wave theory? 10. How do the tiny moving particles behave when they are heated and cooled?

## B. ISAAC NEWTON

**1. Answer the question: What associations do you have when you hear the name of Isaac Newton?**

### 2. Remember the words.

saac ['aizək] – Исаак	differential calculus – дифферен-
prominent – выдающийся, зна-	циальное исчисление (раздел
менитый	математического анализа, в ко-
ability – способность	тором изучаются понятия про-
weak – слабый	изводной и дифференциала).
slow-witted – несмышленный	infinitesimal calculus – исчис-
to have pity on somebody – жа-	ление бесконечно малых, т. е.
леть кого-то	историческое название мате-
skilful – умелый, искусный	матического анализа, изучаю-
tutor – наставник	щего разделы: производные,
Descartes [dei'ka:t] – Декарт	интегралы и производные ряды
(французский философ, мате-	investigation – исследование
матик, физик, создатель ана-	the law of universal gravitation
литической геометрии)	– закон всемирного тяготения
to display – проявлять	solution – решение

extremely odd – чрезвычайно странный  
 reserved – замкнутый  
 secretive – скрытный  
 plague [pleɪɡ] – чума  
 binominal theorem [baɪˈnɒmɪnəlˈ θiərəm] – бином Ньютона (формула для разложения на отдельные слагаемые целой неотрицательной степени суммы двух переменных)  
 integral calculus [ˈɪntɪgrəl] **ин**-тегральное исчисление (раздел математического анализа, в котором изучаются понятия интеграла, свойства и методы исчислений)  
 foundation – основание  
 Principia (лат. Philosophiæ Naturalis Principia Mathematica) – Математические начала натуральной философии (фундаментальный труд Ньютона, в котором он сформулировал закон всемирного тяготения и три закона движения)

Halley [ˈhæli] – Галлей (Королевский астроном, который предсказал возвращение кометы (сейчас известной как комета Галлея), что стало подтверждением теории тяготения Ньютона)  
 equation – уравнение  
 momentum – импульс (векторная физическая величина, характеризующая меру механического движения тела; импульс равен произведению массы на скорость)  
 inertia [ɪˈnɜːʃə] – инерция (явление сохранения скорости, если внешние воздействия на него отсутствуют)  
 acceleration – ускорение  
 to apply – применять  
 craftsman – мастер, умелец  
 reflect – отражать  
 concave mirror – вогнутое зеркало  
 lens [lenz] – линза

### 3. Read and translate the text.

The outstanding genius of the 17th century and one of the most prominent scientists of the all time, Isaac Newton, the man of powerful mathematical ability, was born into a family of a farmer in 1642, the year Galileo died. The early days of Isaac's life were rather unhappy. The child was so weak and slow-witted that his grandmother had pity on him and didn't send him to school till the boy was twelve. Newton was extremely skilful in making models, mechanical toys. His first "tutor" in science and the man who impressed Isaac most

by his great charm and popularity was Descartes, who died when Newton was eight years old. After school he entered Cambridge University where later on he lectured on mathematics for more than 30 years. At the University Newton displayed an extraordinary mathematical and scientific ability. Newton had an extremely odd character, very reserved and even secretive. He never married. He was very self-critical and also criticized other people. During the plague of 1660–1665 in England Newton left Cambridge and spend 18 months at his home in the country. In this short time he made practically all of his great discoveries. He discovered the binomial theorem, laid the foundation of **what is now differential, and integral calculus** (developed the infinitesimal calculus together with Leibniz), performed experiments on light and colour, formulated the laws of motion and started the chain of investigations which led to the formulation of the law of universal gravitation. In 1684, Halley, Newton's friend, offered a prize for the solution of the celestial body motion problem. And Newton was able to solve it. Most of what students do on the mathematical side of physics can be found in Newton's Principia. The equations of motion, the basic idea of dynamics, ideas of momentum, of inertia, of mass and of acceleration were applied by Newton to large bodies like the Earth and the Moon to explain the structure and the motion of the universe. Newton was not only a scientist. He was also a very skilled craftsman. He made the first reflecting telescope, with a concave mirror, not a lens. Like most great men, he was an all-round man.

**4. Consult the dictionary: form the adverbs out of the following adjectives. Translate them. Do not forget to add suffixes -ly; -lly**

prominent  
powerful  
unhappy  
universal  
basic  
great

**5. Answer the questions on the text.**

1. When was Newton born? 2. Where did he study? 3. Who was Newton's tutor? 4. How can you characterize Newton's personality?

5. Why did Newton spend 18 months at home in 1660–1665?  
4. What discoveries did he make during this short period of time?  
6. What can students find in Newton's Principia? 7. Who was Newton's friend? 8. What was his telescope like?

**6. Fill in the gaps.**

1. After school he... Cambridge University. 2. Newton... an extraordinary mathematical and scientific ... . 3. Newton .... the law of universal ... . 4. Newton... 18 months at his home in the country. 5. Newton made the first ... telescope with a ... . 6. He... an ..... man.

**7. Translate the words in the brackets.**

1. Volta (родился) in Italy, in 1745. For some years he (был) a teacher of (физики). Later on he became professor of (естественных наук) at the University. 2. Russian (ученый) Yablochkov (работал) in the field of electrical engineering in the second (половине) of the 19th (столетия), 3. M. Lomonosov's (открытие) of the atmosphere on Venus (положило) the beginning for research into the (физические) properties of (планет) of the solar system.

**SPEAK about one of the scientists mentioned. Make up 15-17 sentences. Use the texts given.**

## PART II

### LESSON 1

#### A. NUMERALS

##### *Grammar note*

##### NUMERALS (числительные)

<i>Числа (numbers)</i>	<i>Количественные (Cardinal)</i>	<i>Порядковые (Ordinal)</i>
1	one	first
2	two	second
3	three	third
4	four	fourth
5	five	fifth
6	six	sixth
7	seven	seventh
8	eight	eighth
9	nine	ninth
10	ten	tenth
11	eleven	eleventh
12	twelve	twelfth
13	thirteen	thirteenth
14	fourteen	fourteenth
20	twenty	twentieth
21	twenty-one	twenty first
32	thirty-two	thirty second

При чтении чисел после «hundred» произносится «and»:

563 – five hundred and sixty three, 1,450 – fourteen hundred and fifty

40 – forty, 50 – fifty 100 – a hundred, 300 – three hundred

1,000 – a thousand, 5,000 – five thousand 1,000,000 – a million,

10,000,000 – ten million

##### **Даты:**

1147 — eleven forty seven 1493 — fourteen ninety three

1992 — nineteen ninety two

1900 — nineteen hundred, 1905 - nineteen “o” [əu] five,

2000 — two thousand.

##### **Полные даты:**

On January 17, 1992 = on the seventeenth of January, nineteen ninety-two



**Номера телефонов/автомобилей:**

123-45-67 = one-two-three-four-five-six-seven

**Математические операции:**

x — times / multiplied by

: — divided by

= — equals/is equal to/is/makes

Например:  $3 \times 3 = 9$  Three times three equals nine.

$12:4 = 3$  Twelve divided by four makes three.

**Дроби (Fractional Numerals)****Простые (fractions)**

$1/2$  a (one) half

$2/5$  two fifths

$1/3$  one third

$2\ 3/7$  two and three sevenths

$2/3$  kilometre two thirds of a kilometer

24  $1/8$  twenty-four and one eighth tons

**Десятичные (decimal)**

0.2 — o [əu] point two / zero ['zi:rəu] point two / nought [no:t] point two

0.002 — point oo two ['point'dʌbləu'tu:] 1.15 — one point one five 64.598 — sixty-four point five nine eight

0.25 nought point two five of a ton

12.75 one two (twelve) point seven five tons

**Степень (power)**

$10^4$  — ten to the fourth power

$31^{-5}$  — thirty-one to the minus fifth power

**1. Consult the dictionary: translate the following words. Identify the parts of speech (noun (сущ.), verb (гл.), adjective (прил.), adverb (нар.)) they belong to.**

Sum — summarize, product — production, equal — equally — to equate — equality, rational — rationalize — irrational, quantity — quantitative, difference — to differ — to differentiate — differential, base — baseless.

**2. Solve the problems and read them.**

$52-7=$

$36+63=$

$36:9=$

$78-10=$

$2^3 \times 3^4=$

$54 \times 8=$

$5.3+7.2=$

$42:7=$

## B. UNITS OF MEASUREMENT

**1. Read the following tables. Convert the corresponding units of measurement (e. g. 1 metre is 100 centimetres). Convert the corresponding units of SI and the British-American system (e. g. 1 metre is 3.28 feet).**

### *SI*

<i>Length</i>	<i>1 kilometre (km)</i>	<i>metre (m)</i>	<i>centimetre (cm)</i>
Area	1 km <sup>2</sup>	square metre (m <sup>2</sup> )	cm <sup>2</sup>
Volume	—	1 cubic metre (m <sup>3</sup> )	cm <sup>3</sup>
Velocity	1 kilometre per hour (km/h)	metre per second (m/sec)	—
Mass	ton	kilogram (kg)	gram (gr)
Density	—	1 kilogram per cubic metre (kg/m <sup>3</sup> )	gr/cm <sup>3</sup>

### *American-British system*

<i>Length</i>	<i>1 mile (m)</i>	<i>yard (yd)</i>	<i>foot (ft) (pl. feet)</i>	<i>inch (in)</i>
Area		1 square yard (sq.yd.)	square foot (sq.ft.)	square inch (sq.in.)
Volume		1 cubic yard (yd <sup>3</sup> )	cubic foot (ft <sup>3</sup> )	cubic inch (in <sup>3</sup> )
Velocity	1 knot (kt)	mile per hour (mph)	foot per second (fps)	
Mass	1 ton	hundredweight (cwt)	pound (lb)	ounce (oz)
Density			pound per cubic foot (lb/ ft <sup>3</sup> )	ounce per cubic inch (oz/in <sup>3</sup> )

### *Temperature*

Degree Fahrenheit (°F) [ˈfærənhaɪt]	Degree Celsius (°C) [ˈsɛlsiəs]
-------------------------------------	--------------------------------

## 2. Remember the words.

unit of measurement

[ˈmɛʒəmənt] – единица измерения

length – длина

area – площадь

volume – объем

velocity – скорость

density – плотность

yard – ярд

foot (pl. feet) – фут (футы)

inch – дюйм

knot [not] – узел

mile – миля

hundredweight – английский/

американский центнер

pound [paund] – фунт

ounce [auns] – унция

Fahrenheit – градус Фаренгейта

Celsius – градус Цельсия

ton [tʌn] – тонна

to be derived from – заимствован из

to be interrelated – быть взаимосвязанными

widespread – широко распространенный

followed by – за которым следует, с последующим

observation – наблюдение

phenomenon (pl. phenomena) – явление

towards [təˈwo:dz] – к, по отношению (направлению) к

to link – связывать

to enter smth. (something) – входить, проникать

to indicate precisely – точно указать

to reproduce given conditions – воспроизвести заданные условия

to obtain a desired result – получить желаемый результат

definite magnitude – определенная величина

to define – определять

quantity – количество

to be related to – связаны с therefore [ˈðeəfo:] – поэтому

imperial [imˈpiəriəl] – имперская

customary – обычный (зд.

Американская система мер)

The International system of Units (SI) – Международная система единиц (СИ)

extension – расширение

possess – обладать

relationship – отношение

complicated – сложный

to convert – преобразовывать, переводить

conversion – преобразование

by shift – сдвигом

equator [ikˈweɪtə] – экватор

ampere [ˈæmpɪə] – ампер

mole – моль

### **3. Read and translate the text.**

Real science has various recognized steps. It always begins with observation followed by classification and measurement. Classification has become the first step towards understanding of a new phenomenon. The process of putting known and unknown phenomena in order is measurement, which links science with mathematics. Only by measurement new knowledge enters science. By measurement it is possible to indicate precisely what has to be done to reproduce given conditions and obtain a desired result.

A unit of measurement is a definite magnitude of a physical quantity, defined by law and used as a standard for measurement. For example, length is a physical quantity. The metre is a unit of length. When we say 10 metres we mean 10 times the definite length called metre.

Much of physics deals with measurements of physical quantities such as length, time, velocity, area, volume, mass, density, temperature and energy. Many of these quantities are interrelated. For example, velocity is length divided by time. Density is mass divided by volume. Volume is a length times a second length, times a third length. Most of the physical quantities are related to length, time and mass, therefore all the systems of physical units are derived from these three fundamental units.

There are several systems of measurement in use today. The imperial system or the British Imperial was derived from the English units. The English units are the historical units of measurements used in England up to 1824. The US customary system is also developed from them. That is why the British Imperial and the US customary systems are interrelated and sometimes we may say the British-American system. The International System of Units (SI) is the extension and the modern form of the metric system (MKS system – metre, kilogram, second). It is the most widespread system of measurement now. Most of the nations of the world use SI. The value of the International System of Units is that its various units possess simple and logical relationships among themselves, while the British system (the f. p. s. — foot-pound-second) is a very complicated one. For example, in the British system 1 mile is equal to 1,760 yards; 1 yard is

equal to 3 feet, and 1 foot is equal to 12 inches. In the English system converting one unit into another is a hard and monotonous job, while in SI conversions of one unit to another can be carried out by shifts of a decimal point (comma in Russian writing).

The standard metre of the world was originally defined in terms of the distance from the north pole to the equator. This distance is close to 10,000 kilometres or  $10^7$ (ten to the seventh power) metres. How is the standard metre defined now?

The square metre ( $m^2$ ) is a unit of area while the cubic metre ( $m^3$ ) is a unit used to measure volume.

The seven basic units in SI Units are: the metre (m), kilogram (kg), second (s), ampere (a), Kelvin (K), mole (mol), and candela (cd).

**4. Consult the dictionary: translate the following adjectives and nouns. Remember that prefixes (префиксы) in-, il-, im-, ir- have the negative meaning (applicable — *применимый*; inapplicable — *неприменимый*).**

inaccurate, incomplete, incompleteness, inconvenient, inaccuracy, indivisible, indivisibility, inexperience, inexperienced.

#### **5. Choose the appropriate word.**

1. Unit is a (quality /quantity) adopted as a standard of measurement. 2. Foot is a unit of (area / length) in the English system of measurement. 3. Inch is (more/less ) than foot is 4. There are 12 (yards /inches) in 1 foot. 5. Velocity is length (multiplied / divided) by time. 6. The second is a unit for measuring time in (SI Units/ all the systems). 7. (Dimension / division) is a mathematical operation. 8. The square metre is an SI unit of (area/ volume). 9. 11,500 cubic feet is the measure of (area/ volume / mass).

#### **6. Answer the questions.**

1. What are the recognized steps in the real science? 2. Why are classification and measurement so important? 3. What is a unit? 4. What are the three fundamental units? 5. What systems of measurement are used nowadays? 6. Why is SI Units widespread? 7. What are the units of length in SI and the British system? 8. How was the metre originally defined? 9. How is the metre defined now? 10. What are seven basic units in SI Units?

## 7. Read and translate the following.

- a) In the British system: 1 mile=1,760 yd, 1yd=3 ft, 1ft=12 in.
- b) In SI: 1 km=1000 m, 1m=100 cm, 1 cm=10 mm.
- c) Do you know that 1 in=25.3995 mm, 1ft=30.479 cm, 1yd=0.9144 m, 1 mile=1.6093 km?

**SPEAK about units of measurement. Make up 15-17 sentences. Use the text given.**

## LESSON 2 HOW COMPUTERS WORK

### *Grammar note*

**Еще о неличных формах глагола.** Как 3-я, так и 4-я формы глагола могут самостоятельно выполнять в предложении функцию одного из его второстепенных членов. Так, 4-я форма глагола **want – wanting** – функционирует в данном тексте как определение («нуждающимися») по отношению к слову *machines*, а слово *failing* – 4-я форма глагола *fail*, т. е. «терпеть неудачу», «отказывать» в смысле «прекращать действовать, работать» – является частью предложного словосочетания **without failing** «без перебоев» или даже частью слова «безотказно», которые выполняют в предложении роль обстоятельства образа действия.

### *Vocabulary*

#### **1. Remember the words:**

have changed – форма совершенного вида от глагола **change – менять, изменять (ся)**  
imagine – воображать  
take care of – заботиться о  
guide – управлять, направлять  
plane – самолет

without failing – без перебоев, безотказно  
in order to – для того, чтобы  
why – зачем, почему  
mean (meant, meant) – значить, означать  
count – считать  
calculate – вычислять

connect – соединять  
 complex – сложный, трудный  
 wanting – действительное при-  
 частие  
 настоящего времени от глаго-  
 ла want «хотеть, нуждаться»  
 team – команда, бригада  
 make (made, made) здесь: «за-  
 ставлять» – модальный гла-  
 гол, после него инфинитив  
 употребляется без частицы to  
 addition – сложение  
 subtraction – вычитание  
 multiplication – умножение  
 division – деление  
 integration – интегрирование  
 achieve – достигать; are  
 achieved – форма страдатель-  
 ного/возвратного залога на-  
 стоящего времени

therefore – поэтому  
 consist in – состоять в, заклю-  
 чаться в том, чтобы  
 instantaneously – мгновенно  
 evolve – развиваться(ся)  
 directly – непосредственно,  
 прямо  
 desk calculating machine – (на-  
 столный) арифмометр  
 complicated – сложный, труд-  
 ный для понимания  
 множественного числа – «до-  
 стигаются», «получаются»  
 sequence – последовательность  
 speed – здесь: глагол «уско-  
 рять»  
 necessitate – делать необходи-  
 мым, неизбежно влечь  
 за собой  
 tool – инструмент

## 2. Read and translate the text.

### *HOW COMPUTERS WORK*

#### *TEXT A*

Computers have changed the world so much that we cannot imagine it without them. They take care of our time and money, guide planes and rockets, connect people in different parts of the world with each other and do a lot of other things. As a result, computers have become complex machines wanting teams of people whose profession is to make computers work without failing.

But what does the word “work” mean in the case of computers? How do they work? What do they do? In order to answer these questions, we should ask first **what** computers you mean. There are three types of them: the digital computer, which manipulates information coded as binary numbers; the analog computer which is the analog

of known physical phenomena; and the hybrid computer which has characteristics of both digital and analog computers.

It is the digital computers that we are discussing here. And our question is about them. The answer is easy: because they can count, or calculate, very quickly, more quickly and correctly than people. Their work, therefore, consists in calculating. They are calculating machines. They are simply electrical machines which do arithmetic instantaneously. They have evolved directly from desk calculating machines and use no more complicated operations than addition and subtraction.

All other operations, such as multiplication, division, integration, etc. are achieved by the use of special sequences of additions or subtractions.

In principle there is no more to the digital computer than to the desk calculator or the car milometer. However, in practice, the use of electricity to speed computation has necessitated the use of new mathematical concepts and tools. The most basic of these tools is the binary system of arithmetic.

**3. Write out (выпишите) all the verb (глагольные) forms from the text and give their definitions (определения). Use them in your own sentences.**

**4. Answer the following questions.**

1. How have computers changed the world?
2. What can you say about a computer and a modern watch (на-  
ручные часы)?
3. What can you say about a computer and telephone service?
4. What can you say about a computer and calculating?
5. What can you say about a computer and banking service?
6. Have you got a computer at home? Do you like it? When do  
you use it?

What kind of computer is it? Have you got one computer or more than one?

7. Is it effective to use computers in medical research? And in medical service?

8. What is the difference between a computer and a desk calculator?



9. What operations do computers use? What helps them perform (выполнять) their calculations instantaneously?  
 10. What is the most basic tool of modern computation?

**5. Fill in the gaps with the right words from the text.**

1. We cannot imagine the world ... computers. 2. They take care ... our time ... money. 3. They are analogs ... known physical ...  
 4. They have evolved directly ... .. calculating machines. 5. All other operations ... achieved ... the use ... special sequences ... additions ... subtractions. 6. The ... basic ... these tools is the binary ... .. counting.

**6. Use the questions of exercise 2 as a plan and retell text A.**

**TEXT B**

*Vocabulary*

**1. Remember the words:**

decimal – десятичный	thumb – большой палец
that is, i.e. – то есть	на руке number – насчитывать
power – в математике: степень	look – выглядеть
tens – десятки	rather – весьма, довольно
hundreds – сотни	(-таки)
thousands – тысячи	strange – странный
etc. – etcetera – и т. д., и так далее	at first – сначала
accidental – случайный	for example – например
early man – первый, древний человек	nought – ничто; в математике: нуль
convenient – удобный (в отличие от comfortable, имеющего физическое значение, данное слово значит «удобный для совершения какого-то действия»)	represent – представлять
finger – палец на руке	representation – представление
	far easier – гораздо легче, проще
	so – поэтому
	fortunately – к счастью
	found – вторая форма от find – находить, найти, обнаруживать

toe – палец на ноге	set – установленный
joint – сустав, соединение	inner – внутренний
since – с (какого-то времени); поскольку	workings – действия at all – во- все, совсем
invention – изобретение	lead (led, led) – вести, руководить
accept – принимать	naturally – естественно
proceed – протекать, происхо- дить	must – модальный глагол дол- женствования
judg(e)ment – суждение, мнение	capable of – способный к
furthermore – более того, кро- ме того	provide – предоставлять
assumption – допущение	upon = on
underlie – лежать в основе	human – человеческий
have to – эквивалент глагола	development – достижение
in advance – заранее	substitute – заменитель
emphasize – усиливать (в речи)	beings – существа
therefore – поэтому	aid – помощник
any – любой	activities – деятельность
exactly – точно	supernatural – сверхъесте- ственный
devise – придумывать, изо- бретать	qualities – качества
order – приказ	in themselves – сами по себе
specify – уточнять, конкрети- зировать	control – управлять

## 2. Read and translate the text.

In everyday life we use the decimal system of counting; that is, we count in tens and powers of tens such as hundreds, thousands, millions, etc.

This is not accidental; early man found it convenient to count using his fingers and thumbs, which number ten. Some civilizations counted in twenties (using toes) and others in threes (using finger-joints).

Since the Arabic invention of the ten symbols, 0, 1, 2 ... 9 all civilizations have accepted the decimal system.

In the binary system only two symbols – 0 and 1 – are used. Counting proceeds just as for decimals but the results look rather strange at first: for example, 0 (nought), 1 (one), 10 (two), 11 (three), 100 (four), 100101 (thirty-seven).

Electrical representation of numbers is far easier in binary since each number can be represented by a sequence of “on” or “off” signals (i.e., “1”, or “0”). So digital computers are always designed to work with binary arithmetic.

Fortunately, it is not necessary for potential users of digital computers to know exactly how computers work. Modified forms of algebra have been devised for writing instructions and these “codes” or “programming languages” are easy to learn.

Expert programmers have written “compilers” which translate such codes into machine instructions. Machine instructions are a series of orders to the machine instructing it to add or subtract specified numbers in a set sequence and to print the final results.

In this way it is possible for you to use a computer without having any detailed knowledge of its inner workings at all.

This leads, naturally, on to a discussion of the limitations of computers. It must be clearly understood that computers cannot “think”. They are capable only of providing information upon which human judgments can be made. Furthermore the basic assumptions underlying all calculations also have to be specified in advance by human judgment.

It must be emphasized, therefore, that computers or any modern technological development, are not substitutes for human beings but aids for their activities. They have no supernatural qualities in themselves and are only as effective as the humans who control them.

**SPEAK about the way computer has evolved and works.**

## LESSON 3

### 1. Read the text and entitle (озаглавьте) it.

### 2. Remember the words.

numbers – числа, цифры	a whole-number (integer) [həʊl];
numerals – числительные	[ˈɪntɪdʒə] – целое число
point – точка	a <b>prime</b> – <b>простое число</b> (натуральное число, имеющее два делителя – единицу и самого себя)
comma – запятая	a <b>composite</b> – составное число (натуральное число, большее одного, которое является произведением двух натуральных чисел, больших 1)
a numeration system – система счисления, система представления чисел	a <b>fraction</b> (rational number) – дробь (рациональное число – число, представленное обыкновенной дробью)
digits – [ˈdɪdʒɪt] – однозначное число, разряд	a <b>numerator</b> – числитель
<b>Hindu-Arabic system</b> – <b>Арабская</b> система счисления	a <b>denominator</b> – знаменатель
a <b>place-value system</b> – <b>разрядная</b> система счисления (система счисления, в которой значение каждого числового знака (цифры) в записи числа зависит от его позиции (разряда))	<b>proper fractions</b> – правильные дроби
<b>billion</b> – миллиард	<b>improper fractions</b> – неправильные дроби
<b>even numbers</b> – четные числа	<b>mixed fractions</b> – смешанные дроби
<b>odd numbers</b> – нечетные числа	<b>equivalent fractions</b> – эквивалентные дроби
<b>an equation</b> – уравнение	<b>reducing</b> – приведение дроби к несократимому виду
<b>an equal sign</b> – знак равенства	<b>decimal fractions</b> – десятичные дроби
<b>arithmetic</b> [əˈrɪθmətɪk] – <b>арифметика</b>	<b>value</b> – величина, значение
<b>addition</b> – сложение	<b>to deal with</b> – иметь дело с
<b>subtraction</b> – вычитание	
<b>multiplication</b> – умножение	
<b>division</b> – деление	
a <b>product</b> – произведение	
<b>factors</b> – множители	

### 3. Translate the text.

We cannot live a day without numerals. Numbers and numerals are everywhere. The number names are zero, one, two, three, four and so on. The numerals are 0, 1, 2, 3, 4 and so on. In a numeration system numerals are used to represent numbers. The numbers used in the numeration system are called digits. In the Hindu-Arabic system we use only ten digits: 0, 1, 2, 3, 4, 5, 6, 7, 8, 9 to represent any number. We use the same ten digits over and over again in a place-value system. A comma separates each group or period. To read 529,248,650,396 you must say: five hundred twenty-nine billion, two hundred forty-eight million, six hundred fifty thousand, three hundred ninety-six. In the numeration system there are even and odd numbers. The set of even numbers is 0,2,4,6,... and the set of odd numbers is 1,3,5,7,.... An equation is a mathematical sentence that has an equal sign (=) between them. For example,  $3+4=5+2$ , or  $3-1=6-4$ . The + is a plus sign. The - is a minus sign. We say three plus six equals five, or three minus one is equal to two. In the equation  $3+5=8$  eight is the sum. We add three and five and we get eight. There are four basic operations of arithmetic: addition, subtraction, multiplication and division. The result of multiplication is called a product, and the numbers that are multiplied are called factors. When you write  $6 \times 3 = 18$  it means that you write number 18 as a product of two whole-number factors. A whole number is called a prime number, or just a prime if: it is greater than one and its only factors are 1 and itself. Any whole number other than 0 or 1 which is not a prime number is called a composite number, or just a composite. In arithmetic students deal with fractions. Every fraction has a numerator and a denominator. The denominator tells you the number of parts of equal size into which some quantity is divided. The numerator tells you how many of these parts are to be taken. Fractions with values less than 1, like two thirds are called proper fractions. Fractions which name a number equal to or greater than 1, are called improper fractions. There are numerals like one and one second, which name a whole number and a fractional number. Such numerals are called mixed fractions. Fractions which represent the same fractional number like one second and two fourths are called equivalent fractions. The process of bringing a fractional

number to lower terms is called reducing a fraction. The mathematical concepts and principles are valid in the case of rational numbers (fractions) as well as integers (whole numbers). In a numeral 587.9 where 9 is separated from 587 by a point. The numeral 587 names a whole number. The sign (.) is called a decimal point. All digits to the left of the decimal point represent whole numbers. All digits to the right of the decimal point represent fractional parts. This is called a decimal fraction.

#### **4. Complete the following sentences.**

1. We cannot live a day without ... 2. In a numeration system numerals are used to ... 3. An equation is a mathematical sentence that has ... 4. There is a set of ... numbers 0, 2, 4 and a set of ... numbers 1, 2, 3. 5. The numerator tells you ... 6. Fractions representing values less than one are ...

#### **5. Answer the questions.**

1. How many prime numbers are there between 1 and 100? 2. What number can be divided by 5? 3. Could you name the fraction, which numerator and denominator are divided by two? 4. What is the product of  $12 \times 3$ ? 5. What is the base of the Hindu-Arabic system? 6. Could you speak about four basic operations? 7. What does denominator show?

#### **6. Translate the following sentences.**

1. Вы умеете пользоваться этой системой исчисления? 2. Дайте пример смешанной дроби. 3. Результат умножения называется произведением. 4. Запятая отделяет периоды. 5. Сложите 35 и 260 и назовите сумму. 6. Какое это уравнение? 7. На что указывает числитель?

**SPEAK about numerals. Make up 15-17 sentences. Use the text given.**

## Оглавление

INTRODUCTORY COURSE.....	3
PART I.....	11
LESSON 1.....	11
LESSON 2.....	18
LESSON 3.....	21
LESSON 4.....	31
PART II.....	40
LESSON 1.....	40
LESSON 2.....	46
LESSON 3.....	52

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