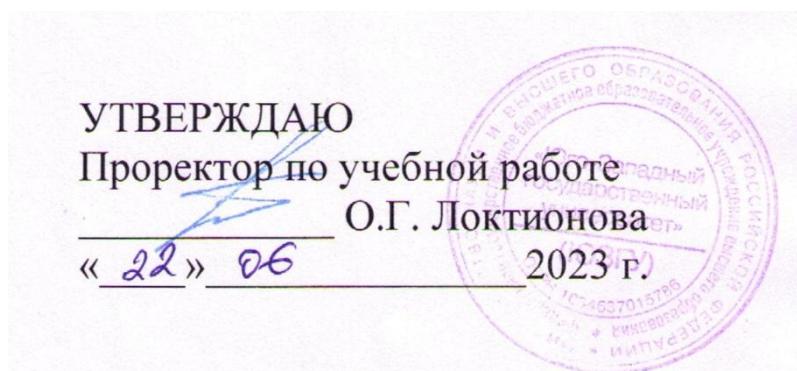


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МИНОБРНАУКИ РОССИИ

Федеральное государственное бюджетное
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«Юго-Западный государственный университет»
(ЮЗГУ)

Кафедра иностранных языков



INTRODUCTION INTO ENGLISH FOR CIVIL AND CONSTRUCTION ENGINEERS AND ARCHITECTS

Методические рекомендации для практических занятий
по дисциплине «Иностранный язык» для обучающихся
на факультете строительства и архитектуры по
направлениям подготовки: 07.03.01, 07.03.04, 08.03.01,
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Содержит методические рекомендации к проведению практических занятий по английскому языку. Цель методических рекомендаций – формирование иноязычной компетентности студентов в сфере профессиональной коммуникации. Используются оригинальные материалы; предложена система упражнений, развивающая навыки чтения, говорения и письма.

Методические рекомендации соответствуют требованиям, предъявляемым госстандартами высшего образования. Предназначены для студентов специальностей 07.03.01, 07.03.04, 08.03.01, 13.03.01, 21.03.02, 08.05.01, 08.05.02, 21.05.04

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ВВЕДЕНИЕ

Изучение иностранного языка является одним из основных элементов системы профессиональной подготовки специалистов в высших учебных заведениях. Владение иностранным языком необходимо, чтобы выпускник вуза мог стать конкурентоспособной личностью на рынке труда. В условиях реализации компетентного подхода в образовании это предполагает профессионально ориентированную направленность обучения путем осуществления тесной связи изучаемого материала с выбранной специальностью обучающегося, с предметами междисциплинарного курса и производственной практикой.

Цель дисциплины – формирование достаточного уровня иноязычной коммуникативной компетенции для эффективной профессиональной деятельности.

Основной целью дисциплины является повышение исходного уровня владения иностранным языком, достигнутого на предыдущей ступени образования, формирование профессионально значимых иноязычных речевых умений у бакалавров, овладение бакалаврами необходимым и достаточным уровнем иноязычной коммуникативной компетенции для решения социально-коммуникативной задач в культурной, научной и профессиональной сферах деятельности, при деловом общении с зарубежными партнерами, а также для дальнейшего самообразования.

Задачами дисциплины являются: овладение лексическим запасом и знаниями о грамматическом строе изучаемого языка, достаточными для осуществления профессиональной деятельности в условиях иноязычной коммуникации; формирование умений и навыков в области иноязычной коммуникации в соответствии с потребностями совместной деятельности; подготовка к решению задач практической деятельности в условиях иноязычной коммуникации.

Процесс изучения дисциплины направлен на формирование компетенции УК-4 – Способен осуществлять деловую коммуникацию в устной и письменной формах на государственном языке Российской Федерации и иностранном(ых) языке(ах).

Содержание практических занятий

Тема 1. Traditional building materials

(Stone, Timber, Brick, Cement and Concrete, their advantages and disadvantages, Trades)

Классические строительные материалы (камень, дерево, кирпич, цемент и бетон, их преимущества и недостатки, строительные профессии). Видовременная система глагола (to be, Present Simple), порядок слов в предложениях. Знакомство, профессии.

Тема 2. Modern building materials

(Steel, Glass and Metals, Plastic, Sustainable Materials).

Современные строительные материалы (сталь, стекло и металл, пластик, экологически чистые материалы). Видовременная система глагола. Рассказ о себе, о строительной отрасли вашего региона, строительные профессии и используемые ими инструменты и материалы.

Тема 3. Design and Planning

(Mapping, Sketch Stage, Working Drawings, AutoCAD, Rendering, Town Planning, Master Plan)

Проектирование и планирование (карты, эскизы, рабочие чертежи, AutoCAD, компьютерная визуализация, градостроительство, генплан. Видовременная система глагола, числительные. Выбор вуза/колледжа, выбор образовательной программы.

Тема 4. Building elements

(Foundation, Walls, Floor, Roofs, Stairs)

Конструктивные элементы (фундамент, стены, перекрытия, крыши, маршевые лестницы). Видовременная система глагола (сослагательное наклонение). Персональные данные, разговор на стройплощадке.

Тема 5. On the building site

(Construction Machinery, Health and Safety)

Строительная площадка (строительная техника, техника безопасности и охрана труда). Сложные предложения. Разговор с поставщиками, телефонный разговор заказчик и поставщика, заказ материалов/оборудования.

Тема 6. House systems

(Plumbing Systems, Electrical Systems, Heating, Ventilation and Air-Conditioning)

Технические системы зданий (водоснабжение и канализация, электрика, отопление, вентиляция и кондиционирование).
Обобщение грамматического материала. Погода и техника безопасности.

ОРГАНИЗАЦИЯ ПРАКТИЧЕСКИХ ЗАНЯТИЙ

Цели и задачи занятий

Основной целью практических занятий является повышение исходного уровня владения иностранным языком, формирование профессионально значимых иноязычных речевых умений, овладение необходимым и достаточным уровнем иноязычной коммуникативной компетенции для решения социально-коммуникативной задач в культурной, научной и профессиональной сферах деятельности, при деловом общении с зарубежными партнерами, а также для дальнейшего самообразования.

Задачи практических занятий:

- развитие коммуникативных умений;
- развитие когнитивных и исследовательских умений;
- развитие информационной культуры;
- расширение кругозора и повышение общей культуры студентов;
- воспитание толерантности и уважения к духовным ценностям разных народов.

Цели и задачи каждого занятия включают:

формирование знаний, умений и навыков, необходимых для осуществления перевода на максимально возможном уровне эквивалентности; формирование и закрепление необходимых коммуникативных навыков, овладение лексикой и грамматикой, позволяющими реализовывать задачи делового межкультурного общения по соответствующим темам в Units 1-6;

Формы заданий, используемые в данных методических рекомендациях:

- закрытая (с выбором одного или нескольких правильных ответов),
- открытая (необходимо вписать правильный ответ),
- на установление правильной последовательности,

- на установление соответствия.

Каждая тема состоит из двух разделов: **Reading** и **Speaking** и включает **гlossарий**. Задания в разделе **Reading** направлены на отработку навыков и умений анализа, понимания и перевода текста, а также направлены на развитие мышления, памяти, рефлексии, на структурирование и систематизацию имеющихся и получаемых знаний.

Задания в разделе **Speaking** содержат упражнения, направленные на отработку навыков устной речи, в том числе профессиональной коммуникации, позволяющих реализовывать задачи делового межкультурного общения по соответствующим темам.

По результатам практических занятий обучаемый должен

Знать общую и распространенную профессионально-ориентированную лексику по изучаемым темам, грамматику, необходимую для адекватного перевода текстов строительной тематики и продуцирования высказываний, участия в дискуссии по темам в Units 1-6.

Уметь осуществлять адекватный перевод текстов, в том числе профессионально ориентированных текстов на максимально возможном уровне эквивалентности, грамотно вести общение на иностранном языке в соответствии с ситуацией.

Владеть необходимыми навыками анализа и перевода иноязычного текста соответствующей тематики, необходимыми коммуникативными навыками, позволяющему реализовывать задачи межкультурного общения, навыками ведения дискуссии.

Необходимое материально-техническое оборудование

Учебная аудитория для проведения занятий семинарского типа, оснащенная учебной мебелью: столы, стулья для обучающихся; стол, стул для преподавателя, доска.

Пример выполнения

Примеры выполнения заданий приведены непосредственно в заданиях в Units 1-6 в разделе Reading.

Задание для проведения текущего контроля успеваемости

Для проведения текущего контроля успеваемости в конце каждой темы предусмотрен тест **Test yourself**.

Шкала оценивания

Форма контроля	Минимальный балл		Максимальный балл	
	балл	примечание	балл	примечание
Тест	1	Правильно выполнено не менее 50 % теста	3	Правильно выполнено не менее 90 % теста
Дискуссия	1	Пассивное участие в дискуссии, допущены грубые лексико-грамматические ошибки, мешающие адекватной реализации коммуникативной задачи.	3	Активное участие в дискуссии, отсутствуют грубые лексико-грамматические ошибки, мешающие адекватной реализации коммуникативной задачи.
Кейс-задача	1	Проблема решена, но допущены грубые лексико-грамматические ошибки, мешающие адекватной реализации коммуникативной задачи.	3	Проблема решена, отсутствуют лексико-грамматические ошибки, мешающие реализации коммуникативной задачи.

Задания для самостоятельной работы по каждой теме.

Задания для самостоятельной внеаудиторной работы для закрепления результатов, достигнутых в ходе практического занятия, определяются по усмотрению преподавателя из числа заданий, представленных ниже в Units 1-6.

ENTRY TEST

1. Vocabulary

1. Complete these conversations with the words in the box.
You do not need all the words.

apartments architect design do glass meet
Poland Polish project

- 1 A: Hello. I'm Atsuko Sato.
B: Hi! I'm Manuel Fernandez. Pleased to _____ you.
- 2 A: Where are you from?
B: I'm from Krakow in _____ .
- 3 A: Are you the plumber?
B: No, I'm not. I'm the _____ .
- 4 A: What do you do, Giraldo?
B: I'm the site manager on this _____ .
- 5 A: What types of construction do you work on?
B: We build _____ .

2. Match 6–10 to a–e to make word pairs.

6 building	a manager
7 site	b block
8 telephone	c control
9 office	d number
10 remote	e site

2. Language

1 Choose the correct answer, a, b or c.

- 1 It's my birthday. I _____ 28 today.
- 2 David _____ in Berlin.
- 3 'Are they here?' 'No, they _____ .'
- 4 _____ climb the scaffolding. It's dangerous.
- 5 Maria is the general manager. _____ is on the building site.

- | | | | |
|---|------------|-----------|----------|
| 1 | a) are | b) am | c) is |
| 2 | a) is work | b) work | c) works |
| 3 | a) are | b) aren't | c) don't |
| 4 | a) Do | b) Not do | c) Don't |
| 5 | a) She | b) He | c) Her |

2 Put these words in the correct order to make questions.

6 your / name / what / is / ?

7 is / the / construction site / this / ?

8 you / do / how / your name / spell / ?

9 Egypt / you / from / are / ?

10 does / where / live / he / ?

3. Skills development

1 Match questions 1–5 to answers a–e.

- | | |
|--|------------------------|
| 1 Are they from France?
near the station. | a) It's in Dover Road, |
| 2 Where is the hospital? | b) Glass and metal. |
| 3 How tall are you? | c) No, it isn't. |
| 4 Is this the site manager's office? | d) 1.76 m. |
| 5 What's it made of? | e) Yes, they are. |

2 Manuela works for a construction company. Gregory Fox is a visitor. Complete their conversation with the phrases in the box.

And you? You're welcome. I'm looking for Pavel.
Pleased to meet you. What's her telephone number?

Manuela: Hi, I'm Manuela de Costa, the team assistant. (6)

Gregory: I'm Gregory Fox, the building inspector.

Manuela: (7) _____

Gregory: (8) _____ Where is he?

Manuela: He's with the site manager in her office.

Gregory: Oh. (9) _____

Manuela: It's 498860.

Gregory: Thanks.

Manuela: (10) _____

4. Reading

1 Read this email and answer the questions.

From: Pierre Lambert
To: All staff
Subject: The new project manager

The new project manager Hiroshi Akita joins the company next week. Hiroshi comes from Japan. He is in charge of the construction of the new bridge. Please welcome him to the company. At the moment he is staying in a hotel, 20 km from the city. He wants to find an apartment in the centre of the city.

1 When does Hiroshi Akita start work?

2 What is he in charge of?

3 Where is he from?

4 Where does Pierre Lambert want the staff to do?

5 Is Hiroshi staying in the city centre?

UNIT 1

READING

TRADITIONAL BUILDING MATERIALS

Building materials can be divided into two main groups: natural and man-made. Stone and timber are natural materials, used by man since ancient times. Man-made materials include bricks, cement, concrete, steel, glass, metal and more modern materials including plastic and synthetics.

1. Read the text and then match the two parts of the sentences.

Stone

Stone walls are one of the oldest construction methods known to mankind. The first stone walls were made laying up stones without any mortar. With this method stones are held together by gravity. These walls are usually larger at the base. In Ireland and north-eastern UK counties this kind of wall was made by farmers to create fences. It was quite a long and labour-intensive method, but with no costs. When cement appeared, the first mortared stone walls were created, where cement paste fills the gaps between the stones. The first cements were made using burnt gypsum or lime, mixed with water.

Concrete includes Portland cement mixed with sand, gravel and water, which makes it resistant to cracking. To make it even more resistant, steel reinforcing bars can be added. Most stone walls today are made using this method, because it is fast and cheap.

1	The first stone walls were made	a	burnt gypsum or lime, mixed with water.
2	When cement appeared	b	to make concrete even more resistant
3	The first cements were created using	c	the first mortared stone walls were created
4	Concrete is Portland cement	d	without any mortar
5	Steel reinforcing bars can be added	e	sand, gravel and water.

Example: 1-d

2 Read the text about timber framing and answer the questions below

Timber

Timber framing and conventional wood framing are two different forms of construction. Timber framed structures use fewer, larger timbers with dimensions from 15 to 30 cm and mortice and tenon or wooden pegs as fastening methods, whereas conventional woodframed buildings have a greater number of timbers with dimensions from 5 to 25 cm, and nails or other mechanical fasteners are used to join the timbers.

Today timber structures are often surrounded in manufactured panels, such as Structural Insulating Panels (SIPs). They are made up of two rigid woodenbased composite materials with a foamed insulating material inside. This method is used because these structures are easier to build and they provide more efficient heat insulation.

Timber-framed construction offers a lot of advantages. It is kind to the environment (when the wood used is taken from sustainable forests) and the frames can be put up quickly. Its design is elegant and simple, and also both practical and adaptable. It can give a house character, both inside and outside. Thanks to its strength, large open spaces can be created, something which is not so easy to obtain with other techniques. It is very versatile, so timber-framed houses can also be clad with stone or brick. This offers two more advantages: the house can blend in with the surrounding area (both urban and rural) and it is very energy-efficient. Timber is also cheaper than other materials.

- 1 Do timber-framed structures use larger or smaller timbers compared to conventional wood framing?
- 2 Which fastening methods do the two different methods use?
- 3 What structures have been recently used? How are they made up?
- 4 What are the advantages of this method?

Example 1. Timber-framed structures use larger timbers compared to conventional wood framing.

3 Read the text and then write a list of the advantages and disadvantages offered by brick.

Brick

Masonry construction is a method that has been used for centuries around the world. It is usually used for walls of buildings, retaining walls and monuments. The most frequent type of masonry is brick, but concrete block is also becoming more and more popular. Brick was one of the first building materials that man used and has been used since the times of the ancient Egyptians because it offers a great number of advantages. First of all, it has an affordable price and it is made of accessible raw material, which has long durability and good insulating properties. It is a strong material and is perfect for load-bearing systems where the loads are compressive. It is the size of a man's hand and therefore simple to use. The appearance of the final work depends on the ability and expertise of the bricklayer. Another advantage of using brick is that, like stone, it offers increased comfort in the heat of the summer and the cold of the winter. Being heat resistant, this material also offers good fire protection.

One of the disadvantages of using this material is that masonry must be built on a firm foundation to prevent settling and cracking, and in the presence of expansive soils the foundation may need to be elaborate. Moreover, this is a heavy material, consequently the structural requirements will have to be increased, especially if the area is subject to earthquakes.

Advantages	Disadvantages
<i>Affordable price</i>	

4 Complete the text with the words from the box.

blocks bricks concrete (x2) ingredient materials mixture walls
--

Cement and concrete

The most common type of cement is Portland cement, which is the

basic (1)_____of concrete and mortar.

It is made of Portland cement clinker (calcium silicates, aluminium and other compounds) and other minor constituents.

Portland cement clinker is produced by heating a mixture of raw (2)_____ up to 1450° C in a kiln.

There are three production stages:

- preparation of the raw mixture,
- production of the clinker,
- preparation of the (3)_____.

Limestone is the main raw material for the production of clinker, followed by sand, shale, iron ore, bauxite, fly ash and slag. About 2% gypsum is also added and then the (4) is pulverised. The resulting powder will react when water is added.

Portland cement is commonly used to produce (5)_____, which is made of gravel, sand, cement and water.

Blocks of cinder concrete, ordinary concrete and hollow tile are known as Concrete Masonry Units (CMU). They are larger than ordinary (6) _____ and used for applications where appearance is not very important, such as in factory walls, garages and industrial buildings. One of the advantages of concrete (7) _____ is that they can be reinforced, grouting the voids, inserting rebar or using grout, so that they are stronger than typical masonry (8) _____.

Example (1)- mixture

4a Read the text Cement and concrete again and choose the best alternative.

- 1 Portland cement is the basic ingredient of concrete/aluminium.
- 2 The main raw material for the production of clinker is brick/limestone.
- 3 Portland cement is used to produce gravel/concrete.
- 4 Concrete Masonry Units are larger than ordinary bricks/stones.
- 5 Concrete blocks can be reinforced/industrial.
- 6 Reinforced concrete blocks are stronger than masonry industries/walls.

Example 1 - concrete

4b Match the words with their definitions.

1	masonry	a mixture of cement, sand, small stones and water
2	brick	b brick work
3	concrete	c white rock often used for making cement
4	mortar	d a mixture of sand, water and cement or lime
5	limestone	e a reddish-brown rectangular block used to build walls and houses

Example 1-b

4c Create four groups. Each group chooses one material from this unit (stone, timber, brick, cement and concrete). Use your own words to describe it to the other groups.

4d Use the information from the texts in this unit to complete the following table.

	Stone	Timber	Brick	Cement and concrete
Advantages				
Disadvantages				

GLOSSARY

bricklayer	to join
to blend in	kiln
cinder concrete	to lay
clad	lime
compound	limestone
concrete	masonry
cracking	mortar
to fasten	mortice
fence	mould
fly ash	nail

foamed	peg
frame	to put up
gap	rebar
gravel	settling
grout	shale
to grout	slag
gypsum	to surround
heat insulation	tenon
hollow tile	timber
iron ore	void

SPEAKING



Ex.1 Match photos A-E to texts 1- 5.

- 1 Hello, I'm Kamal Awwad, from Morocco. I'm a plumber.
_____E_____
- 2 I'm Isabelle Roux, from France. I'm an architect. _____
- 3 Hi. my name's Sergei Berkovitch. I'm from Belarus. I'm a crane operator. _____
- 4 Hi, I'm Karoi Nowacki. I'm from Poland. I'm a roofer. _____
- 5 Hello there. My name's Jun Takahashi. I'm from Japan. I'm a building Inspector. _____

Ex.2 Complete these conversations.

1. Jun: Hi! I'm Jun Takahashi, from the Ministry.
Isabelle: Hi, Mr. Takahashi / (1)_____Isabelle Roux. I'm from (2)_____. I'm the architect on the project.

Jun: Ah, I'm a building (3) _____.

Isabelle: Pleased to (4) _____ you.

2. Karol: Hi! Karol Nowacki.

Sergei: Sergei Berkovitch.

Karol: What do you do, Sergei?

Sergei: I'm a crane (5) _____. And you?

Karol: Me? I'm a(n) (6) _____.

3. Kamal: Hi! My (7) _____ is Kamal Awwad.

Sergei: Hi, Kamal. I'm Sergei.

Kamal: (8) _____ are you from?

Sergei: From Minsk, Belarus.

Kamal: Ah, Minsk. A beautiful city. I come from (9) _____.

4. Kamal: Hello. (10) _____ name's Kamal Awwad.

Karol: Hi, Kamal. I'm Karol Nowacki. And this is Isabelle Roux.

Kamal: Hello. Isabelle.

Isabelle: Pleased to meet you.

Karol: What do you (11) _____. Kamal?

Kamal: I'm a plumber.

Karol: I'm a roofer. And Isabelle designs buildings.

Kamal: She's a(n) (12) _____, isn't she?

Isabelle: Yes, that's right.

Ex.3 Read this text and underline the verbs.

Harun Rashid is 35 years old. He comes from Alexandria, but lives and works in Cairo. Harun is a general contractor. He hires subcontractors to work on building projects. He also organises the material and equipment. Harun has a lot of experience in the construction industry. Harun always works hard. Sometimes he has meetings with clients. Sometimes he visits construction sites. And sometimes he deals with suppliers. He is always busy. But Friday is different. Harun never works on Fridays. Friday is a day off.

Ex.4 Correct the sentences.

1. Harun Rashid is a plumber.
2. He hires clients to work on building projects
3. He has a lot of experience in the tourist industry.
4. He never visits construction sites.

5. He always works on Fridays

Ex.5 Work in pairs and introduce yourselves. Use the model to help you.

A. I'm _____/My name's _____. What's your _____?

B. I'm _____/My name's _____. Where're you from?

A. I'm from _____. And you?

B. I'm from _____.

A. Pleased to meet you.

B. Pleased to meet you, too.

Ex.6 Put the words in 1-6 in the correct order to make questions.

Then match the questions to answers a-f.

1 what / he / do / does / ?

2 can / you / help / I / ?

3 how / spell / you / that / do / ?

4 where / work / you / do / ?

5 what / you / do / do / ?

6 are / the / manager / site / you / ?

a) He's a crane operator.

b) I'm a plumber.

c) On a building site.

d) C-H-E-S-T-E-R-T-O-N-S.

e) I'm looking for Kim.

f) Yes, I am.

Test yourself

1 Complete these words for jobs in the construction industry with a, e, i, o or u.

1 c_rp_nt_r

2 r__f_r

3 _rch_t_ct

4 pl_mb_r

5 b_ld_ng _nsp_ct_r

2 Match the words in the box to these sectors.

apartments bridges factories hospitals office blocks power
plants tunnels

commercial sector: (1) _____, (2) _____

industrial sector: (3) _____, (4) _____

infrastructure sector: (5) _____, (6) _____

residential sector: (7) _____

3 Complete these sentences with the words in the box.

are hires is visits work

1 They always _____ hard on the construction site.

2 My name _____ Kamel Nowacki.

3 She _____ the construction site every Friday.

4 Harun _____ the subcontractors.

5 We _____ the designers of the project.

4 Choose the correct words in italics.

1 *What / Where* are you from?

2 *What / Where* does Ahmed do?

3 *How / What* do you spell your surname?

5 Put these words in the correct order to make questions.

1 where / live / you / do / ?

2 are / on / the / project / this / architect / you / ?

3 what / address / is / your / ?

4 how / spell / 'Karol' / you / do / ?

6 Complete these questions. Use one word in each gap.

1 _____ do you spell your name?

2 _____ you French?

3 _____ do you work?

4 _____ does Paul do?

7 Complete these sentences with the prepositions in the box.

for of with

- 1 The construction industry in the UK consists _____ four sectors.
- 2 The general contractor deals _____ the suppliers.
- 3 The client pays _____ the work.

UNIT 2

READING

MODERN BUILDING MATERIALS

1 Read the text and complete the sentences with words from the text.

Steel

Steel is resistant to corrosion, rusting and general deterioration. It can be used both for exterior as well as internal infrastructure. Compared to conventional concrete buildings, steel buildings offer a longer lifetime and they cause less harm to the environment thanks to the resistance and durability. Because steel buildings are usually pre-fabricated or made in sections and parts that are assembled on the construction site, they are cheaper than conventional buildings.

The quantity of carbon contained in steel determines whether the alloy is hard or soft. Nowadays steel buildings are often appreciated for their design. In fact, the flexibility of this material allows different forms and shapes. More than any other building material, steel has a high strength-to-weight ratio. This means that it is easy and cheap to span large distances elegantly eliminating columns. Thanks to this, it is easier to subdivide and customise office and warehouse space.

- 1 Steel can be used both for the exterior and the interior _____ of a building.
- 2 Steel is _____ to corrosion, rusting and general deterioration.
- 3 Steel buildings have a longer _____ compared to conventional concrete buildings.

- 4 Steel buildings are usually _____ than _____ buildings.
 5 It is easy and cheap to span large _____ elegantly.
 6 By eliminating _____, it is easier to subdivide and customise office and warehouse space.

Example 1- infrastructure

1a Read the text again and match the words to their definitions.

1 rusting	a a composite metal made by mixing other metals together
2 flexibility	b the period of time for which a building is expected to last
3 alloy	c when a metal becomes reddish brown because of air and water
4 deterioration	d to change the appearance or characteristics of something according to someone's taste or needs
5 lifetime	e becoming worse in quality or condition
6 to customise	f being bent easily without breaking

Example 1 - c

2 Read the text and match each paragraph with a heading.

- A** Advantages and disadvantages of different kinds of metals
B Transparent buildings: problems and possible solutions
C An interesting experiment

Glass and metals

1. _____

Glass is a fashionable material in contemporary architecture. Transparent buildings and structures are very popular in contemporary architecture. Structural glass components such as columns and beams are often required, but this material seems structurally unsafe because of its brittleness. For this reason a new construction technique has been developed using:

- very long overlapping glass segments to create glass beams. These are made by bonding the segments adhesively;
- a small stainless steel profile that has been added to the layout of the glass beam to reinforce it.

2 _____

To prove that glass structures can be as safe as reinforced concrete, an experimental transparent pavilion has been designed (with dimensions 9 x 9 x 3.6 m³) that combines a number of innovative ideas. Many different kinds of glass and glass systems have been used. The outermost and the three-layered insulating glass units have been tempered and sometimes laminated and some glass has also been coated with solar control glass to reflect some of the unwanted sunshine outwards. In other cases glass that can be heated electrically and glass panes free of iron oxide have been used to make the inside light more natural.

3 _____

Painted, stainless, hot dip galvanised and weather resistant steel, as well as aluminium, have also been used for supporting structures. Aluminium has some advantages (it is light, resistant to corrosion and easy to work) but also some disadvantages (its thermal expansion and conductivity are high and it has low elastic modulus and fire resistance). Stainless steel also offers some advantages (it has good fire resistance and it is easy to keep) but its high price is a major disadvantage. Both hot dip galvanised and painted steel are not as expensive, but they are difficult to work on site and are not resistant to corrosion.

2a Read the text again and decide if these statements are true (T) or false (F).

- 1 Glass is very popular in contemporary architecture.
- 2 There is no way to create a glass structure that is as safe as reinforced concrete.
- 3 A transparent pavilion has been recently designed as an experiment that uses some innovative ideas.
- 4 There is only one type of glass in this pavilion.
- 5 Glass has also been used for supporting structures.
- 6 Hot dip galvanised steel is not resistant to corrosion.

Example - T

2b Match the words with their definitions.

1 outermost	a a metal made from steel that does not rust
2 stainless steel	b fragility
3 galvanised	c external
4 brittleness	d flat sheet of glass
5 pane	e coated with zinc to protect it from rust

Example - c

3 Read the text and then choose the correct option.**Plastic**

Plastic products offer a number of ecological advantages: they save resources, have a low maintenance cost and can be recycled. Furthermore, they contribute to save energy (plastic foams are used for thermal insulation in many applications). Plastic is also useful for noise protection and insulation.

The main fields of application of these materials are pipes, insulation, wall covering, flooring (both in houses and in public areas) and, quite recently, window frames (made of PVC). PVC stands for Polyvinyl Chloride and it is the plastic which has seen the most rapid growth in recent times in industry. PVC is often used in piping systems because of its good chemical resistance to corrosive fluids. PVC pipes are used for a great number of applications: to drain waste, for natural gas distribution, for electrical and communications wiring, for municipal water.

As it is the newest primary construction material and entirely man-made, plastic is extremely versatile. Improvements made through research have increased its acceptance among designers, contractors and building code officials.

1 Plastic products save... A industry. B materials. C resources.	4 The ... fields of application of these materials are in flooring. A alternative B main
2 Plastic insulation is also	

<p>useful for... protection. A recycled B resources C noise 3 PVC is the plastic whose use has grown more... A recently. B slowly. C primary.</p>	<p>C useful 5 PVC has good ... resistance to corrosive fluids. A physical B public C chemical 6 PVC pipes are used for... gas distribution. A natural B chemical C piping</p>
--	---

Example – 1 - C

3a Read the text again and answer the questions.

- 1 What are the advantages offered by plastic products?
- 2 How can plastic save energy?
- 3 What is plastic insulation useful for?
- 4 What are the main fields of application of plastic?
- 5 What does PVC stand for?
- 6 What are PVC pipes used for?

Example – Plastic products save resources, have a low maintenance cost and can be recycled, they contribute to save energy, they are also useful for noise protection and insulation.

3b Make a list of advantages and disadvantages of each material.

	Steel	Glass Metals	and Plastic
Advantages			
Disadvantages			

4 Read the text and answer the questions below.

Sustainable materials

Due to the rise in global population and prosperity over the last few decades, one of the consequences of this phenomenon has been the increase in volume and variety of the materials used (such as raw materials, food, manufactured products and waste) with a consequent increase in the transport distances. This has created a series of negative effects on the environment, especially different kinds of pollution, leading to an ecological emergency and growing preoccupation about health. This is why the aim of eco-design is to create buildings with low ecological impact, where people can live in a comfortable, healthy way. This is possible by using building materials that are traditionally considered eco-friendly and sustainable: timber from forests that have been certified; quickly renewable plant materials (such as straw or bamboo); some typical traditional materials such as brick, stone, clay and cork; non-toxic, renewable and recyclable materials (natural paints, waxes and varnishes). Waste materials can also be reused as a resource for construction purposes.

- 1 What has happened to population and wealth in the last few decades?
- 2 What has been one of the results of this?
- 3 What is the aim of eco-design?
- 4 Can you name some eco-friendly and sustainable materials you have found in the text?

4a Work in pairs: what is your opinion of modern building materials? Which would you use if you could build your own house? Tell your partner about it using the information given in this unit.

GLOSSARY

alloy	outermost
beam	outwards
brittleness	overlapping
coated	pane
customise	pipe
to drain waste	rust
durability	to span

endurance	stainless steel
hot dip galvanized	straw
iron	strength to weight ratio
layout	window frame

SPEAKING

Ex.1 Choose a role card. Introduce yourself to other students. Use the model below to help you.

Name: Kasia Katolsky
 Job: building inspector
 Typical projects: factories, schools
 From: Katowice, Poland

Name: Thomas Smith
 Job: roofer
 Typical projects: residential projects (houses, apartments)
 From: Toronto, Canada

Name: Park Ji-Wung
 Job: crane operator
 Typical projects: bridges, flyovers From: Seoul, Korea

Name: Mohamed bin Ali
 Job: site manager
 Typical projects: hospitals
 From: Dubai, United Arab Emirates (UAE)

A Hi! I'm _____
 My name's _____

B Hi! I'm Raja Anand. /My name's Raja Anand.

A What do you do?

B I'm a general contractor.

A What types of construction do you work on?

B We build apartment blocks.

A Where are you from?

B I'm from Mumbai, India.

Ex.2 Work in groups. Think about the construction industry in your area. List examples of the following.

- 1 clients
- 2 general contractors
- 3 subcontractors
- 4 residential sector projects
- 5 infrastructure sector projects
- 6 commercial sector projects
- 7 industrial sector projects

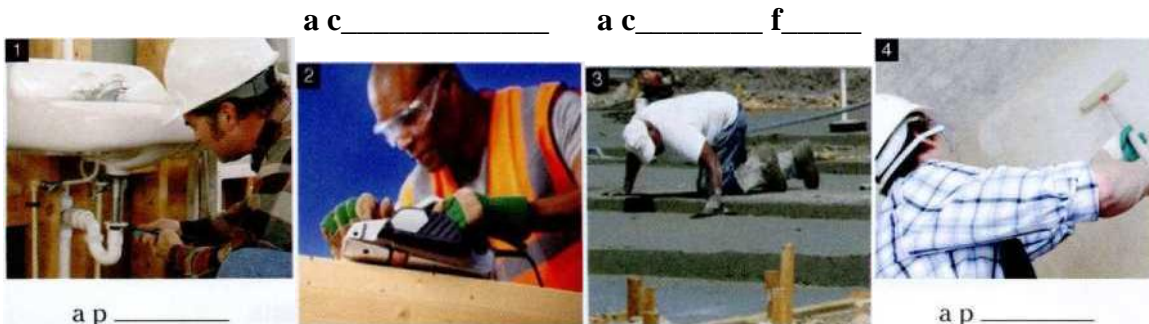
Ex.3 Read this text and underline the trades

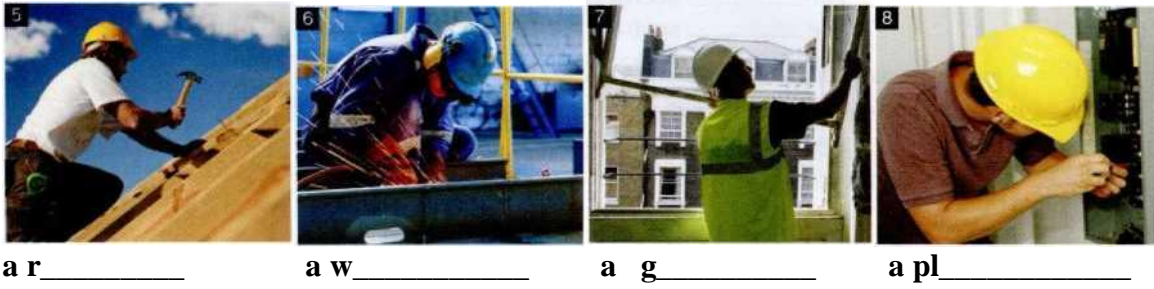
A job in the construction industry?

The construction industry has different trades or crafts. A tradesperson is a specialist and normally has a qualification from a vocational school or other training institute. Plumbers, electricians and roofers are all tradespeople. Other tradespeople on residential housing projects include carpenters, painters and concrete finishers. Tradespeople are often subcontractors and work for a general contractor or a client.

Ex.4 Label tradespeople 1-8 with the words in the box.

carpenter concrete finisher electrician glazier painter plumber roofer welder

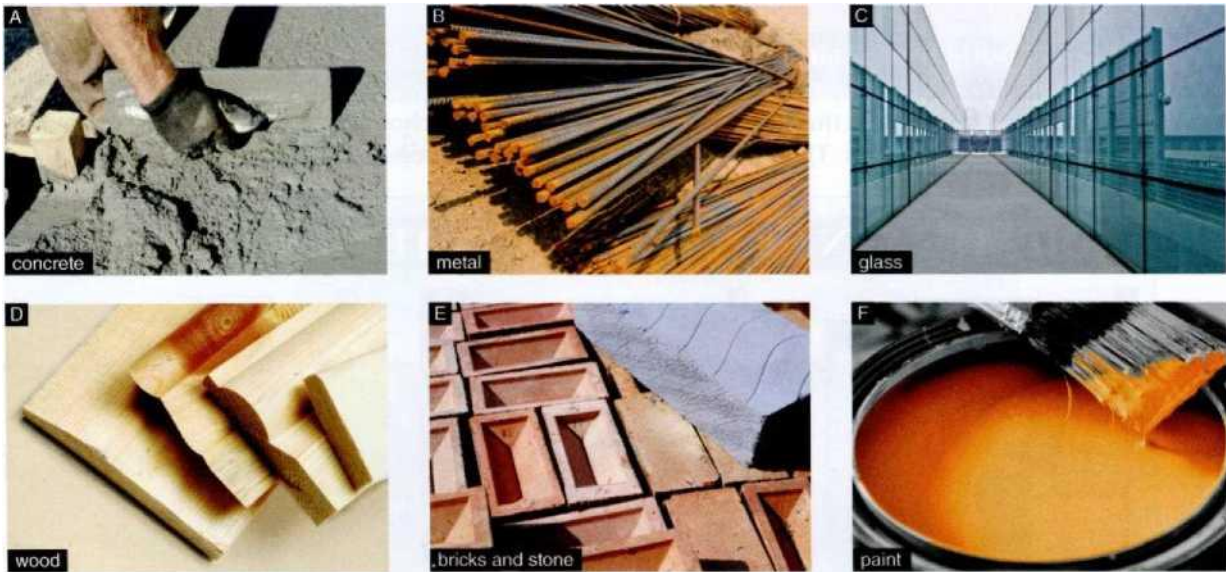




Ex.5 Complete these sentences. Write one word in each gap.

- 1 I'm a bricklayer. I lay _____
- 2 I'm a(n) _____. I do the wiring.
- 3 I'm a(n) _____ technician. I do the heating, ventilation and air conditioning.
- 4 I'm a carpenter. I work with _____ .
- 5 I'm a(n) _____. I install windows.
- 6 I'm a painter. I use _____ to decorate houses.
- 7 I'm a welder. I weld _____.

Ex.6 What materials do these tradespeople use? Match materials A-F to tradespeople 1-6.



- | | | | |
|---|-----------|---|----------------------|
| 1 | carpenter | 4 | bricklayer and mason |
| 2 | glazier | 5 | welder |

3 painter 6 concrete finisher

Test yourself

1 Choose the correct answer, a, b or c.

- 1 A carpenter works with _____.
a) bricks b) glass c) wood
- 2 A _____ installs windows.
a) welder b) glazier c) decorator
- 3 I'm a mason. I work with _____.
a) metal b) wood c) stone
- 4 He's a welder. He welds _____.
a) metal b) glass c) stone
- 5 The _____ does the wiring.
a) plumber b) glazier c) electrician
- 6 Roofers, concrete finishers and painters are all _____.
a) tradesperson b) tradespersons c) tradespeople

2 Write the vocational courses for these trades.

- 1 carpenter: c _____
- 2 bricklayer: m _____ and c _____
- 3 painter: p _____ and d _____
- 4 electrician e _____ w _____
- 5 plumber: r _____ p _____

3 Choose the word that does not belong in each group.

- 1 **Jobs:** architect plumber carpentry electrician welder
- 2 **Commercial sector:** schools apartments hospitals office blocks
- 3 **House features:** bathroom kitchen bridge porch stairs

4 Choose the correct words in italics.

- 1 We are bricks / bricklayers.
- 2 I weld / welder metal.
- 3 I use paint / painter to decorate houses.

5 Find and correct the mistakes in these sentences.

- 1 He work on a construction site.

2 Where live you?

3 Not forget to use the locking pins.

4 The man in the roof is John, the roofer.

UNIT 3

READING

DESIGN AND PLANNING

1 Read the text and fill in the missing sentences from the box.

- because they offer a great amount
- images taken from different elevated positions
- offer cultural information about countries
- specific subjects such as population density
- they explain differences in elevation

Mapping

Maps are a useful method of illustrating a lot of information into a format that people can understand and learn from. Mapping is the job of a mapmaker or cartographer. There are different types of maps that give different types of information:

- Physical maps show landforms, mountains, deserts and lakes. (1) _____ through hypsometric tints or changes in colour. Topographic maps show the shape and elevation of the land through contour lines.
- Political maps (2) _____ (such as their borders and main cities) and some physical characteristics (like oceans, rivers and lakes).
- Thematic maps give information about (3) _____, natural resources, climate, primary imports and exports. Some specialised thematic maps show information that can be useful to analyse different kinds of trends.

In short, maps are very important (4) _____ of information in a very small space.

Photogrammetry is a measurement technology that can determine the three-dimensional coordinates of points of an object using different photographic (5) _____. This kind of technology is used in different fields, such as topographic mapping, engineering, architecture, police investigation, geology and archaeology and also in movie post-production. This measurement technology provides high performance, wide application and accurate measurements, and it is easy and quick to use.

Example – (1) - they explain differences in elevation

1a Read the text again and answer the following questions.

- 1 What do physical maps show and explain?
- 2 What kind of information do political maps offer?
- 3 What kind of information do thematic maps offer?
- 4 Can you explain what photogrammetry is?
- 5 Which fields is it used in?

1b Match the words with their definitions.

1 elevation	a one or two numbers or letters indicating a particular point on a map
2 contour	b something useful that can be used to increase the wealth of a country
3 resource	c tendency, a development of events
4 trend	d the shape or outline of an object
5 coordinate	e height above the sea level

Example – 1-e

2 Read the text and decide if the statements below are true (T) or false (F).

Sketch stage and working drawings

Designing a project involves a number of vital stages: sketch design, design development and working drawing.

During the design development stage all kinds of helpful information are gathered, so that materials and methods proposed for the project can be checked. The working drawing stage is the most demanding, because every project is unique as far as design and assembly of the parts are concerned. At this stage all the architectural drawings, schedules and specifications required for building consent are prepared. Sometimes all this material is also needed to get prices from builders. In some cases, 2D or more commonly 3D formats are used to describe the building. The builders will need working drawings, consisting of plans sections, elevations, details, schedules, specifications and other consultants' documents. During this stage all the architectural drawings are produced using the most recent computer design software, which is very similar to the software used by other consultants. This way all the information can be coordinated easily. It is important to make very precise drawings because they must conform to all the latest building standards, otherwise the council will not give building consent. Another reason is that this will help builders know as much information as possible, thus reducing their guesswork. Engineering graphics are very important for engineers because it is the language with which they think and communicate. Years ago the AutoCAD replaced the old T-square and, more recently, the 3D parametric solid modelling software has been used to learn graphics.

- 1 The first stage when designing a project is sketch design.
- 2 The specifications necessary for obtaining building consent are drawn up during the working drawing phase.
- 3 Builders will never provide a price until they have these documents.
- 4 These documents help builders to work as accurately as possible.
- 5 Building consent to start work on building depends on the accuracy of these drawings.
- 6 AutoCAD is the latest form of software in this field.

Example – 1 - T

2a Find the synonyms of these words in the text.

Step, controlled, cost, technique, papers, newest, essential, estimation

Example – step – stage

3 Read the text and answer the questions below.

AutoCAD

At the beginning of the 1980s Computer-Aided Design (CAD) programs drastically cut the needs of draftsmen. Today students in universities do not learn drafting techniques, they learn computer-aided design instead. But what exactly is CAD and what is it used for? CAD is software which allows the use of computer technology for the development of design and design documentation. It is used to design curves and figures in two-dimensional space or curves, surfaces and solids in 3D objects. CAD has a great number of applications: automotive, shipbuilding and aerospace industries, industrial (in the design of tools and machinery and throughout the engineering process from conceptual design and layout of products) and architectural design (of all types of buildings), prosthetics and also computer animation for special effects in movies, advertising and technical manuals. Moreover, it is used for the creation of photo simulations often required in the preparation of Environmental Impact Reports. The objects and features created are adjustable and modern CAD can also allow rotations in 3D, so that the designed object can be viewed from any angle.

Nowadays CAD systems exist for all the major platforms and no special hardware is required for most CAD software (except for some systems that do graphically and computationally- intensive tasks and require a modern graphics card). The human-machine interface is usually via a computer mouse or a pen and a digitizing or graphics tablet. The advantages of CAD are lower product development costs and a greatly shortened design cycle.

- 1 What does CAD stand for?
- 2 What is it exactly? What is it used for?
- 3 When did a drastic change in design take place?

- 4 What was the consequence of this change?
- 5 Can you name a few CAD applications?
- 6 Is there any need for special hardware if you use CAD?
- 7 Can you explain what the 'human machine interface' is?
- 8 What are the main advantages of this design program?

4 Read the text and reorder the words below to make accurate sentences describing the processes of rendering

Rendering

The process of generating an image from a model by means of computer graphics is known as 'rendering'. It is an engineered program, based on disciplines connected to light physics, visual perception, mathematics and software development. It is a method used by architectural illustrators to create two-dimensional images or animations from a three-dimensional model (prepared scene) thanks to computer programs. These images or animations show the characteristics of a planned architectural design. Scene files contain objects in a special language or data structure (such as geometry, viewpoint, texture, lighting, and shading information) to describe a virtual scene. The data is then passed to a rendering program to be processed.

Rendering software can be used to create life-like images for presentation, marketing and design analysis. It is used in architecture, video games, films and TV visual effects and also in real estate sales for experimenting with building design or to make decisions before a building is created.

There is a wide range of different kinds of Renderers. They may be integrated into modelling and animation packages, standalone, or be free open-source projects.

In the case of 3D graphics pre-rendering is used for creating films, whereas real-time rendering is often used in producing 3D video games.

- 1 is / engineered / illustrators / program / used / by / an / architectural / Rendering
- 2 Architectural / use / illustrators / rendering / animations / create / two-dimensional / to / images or

- 3 for / This / is / used / presentation, / software / and / analysis / marketing / design
- 4 for / It / used / be / design / experimenting / can / building / with
- 5 the / Pre-rendering / used / in / is / industry / film
- 6 the / 3D / production / For / of / video / real-time / rendering / is / games / used

Example – Rendering is an engineered program used by architectural illustrators.

4a Read the text again and decide if the statements below are true (T) or false (F).

- 1 Rendering and computer-generated graphics are the same thing.
- 2 When using rendering illustrators create 3D models from 2D images.
- 3 Rendering is used in the fashion industry.
- 4 The images produced by rendering software are very realistic.
- 5 Rendering software is also used for designing houses before they are built.
- 6 Films are created using real-time rendering techniques.

Example – 1 - F

5 Read the following text about planning. What is it? What do planners typically do?

Town planning

Planning is a balancing act between constructing modern communities and conserving our natural and built heritage to create sustainable places where people can live, work and play. It implies decisions about transport, facilities, the development of new shops, schools, dwellings, parks, etc. It supports our ongoing use of the environment.

Some of the things that planners do include:

- developing and creating affordable housing;
- regenerating socially-deprived areas;
- requalifying historic buildings;

- creating policies for managing the traffic and improving energy efficiency;
- discussing with communities about how to improve their quality of life.

6 Read the text and fill in the blanks with the words from the box.

Agricultural, centre, Renaissance, human, rational, situated, streets, towns

The first stable (1) _____ settlements appeared when agriculture replaced nomadic existence. The first cities were centres for commerce, politics, defence and distribution of (2) _____ surplus. The earliest examples of planned cities in history were in modern-day Iraq and India. In these cities some (3) _____ were paved and there were both commercial and residential streets.

The first examples of cities in the West were in Greece and in Italy. Many European (4) _____ are still based on schemes that date back to the times of the Romans, who put all the streets at right angles, set out in a square grid. During the Middle Ages there was no trace of (5) _____ urban planning in Europe. Cities grew around a fortress or a fortified abbey. Most of them were (6) _____ on high defensible ground and their plans followed the irregularities of elevation contours. They offered protection both to urban city and rural inhabitants during enemy attacks.

Things changed again during the (7) _____.

A great number of important artists created beautiful buildings in many cities which were accurately designed by architects and city planners.

In Florence, for example, radial streets extended outward from a defined (8) _____.

Example – (1) – human

6a Read the text again and decide if the statements below are true (T) or false (F).

- 1 The first cities were centres for commerce, politics and defence.
- 2 The earliest examples of planned cities in history are in the West.
- 3 Many European towns date back to the times of the Romans.
- 4 Urban planning was extremely important during the Middle Ages.
- 5 Cities in Europe grew around a fortress or a fortified abbey during the Middle Ages.
- 6 During the Renaissance radial streets extended outward from a defined centre in Florence.

Example – 1 – T

7 Read the text and answer the questions below

Master Plan

A Master Plan is a document describing how a city is developed and how it can develop in the future. It is written by city planners and experts after examining the land. Here is an example of the aims of a Master Plan:

- to create a structure for the best quality City Centre;
- to create the best possible environment for all users;
- to find key problem areas;
- to treat improvements as priorities;
- to create an attractive area for businesses;
- to develop existing resources. Modern city planning is increasingly concerned with the social and economic aspects of city living.

The process of city planning usually involves a series of surveys and studies, development of a land-use and transportation plan, preparation of a budget, and the approval of a unified Master Plan by various agencies or legislative bodies. City planners have to tackle problems of traffic.

pollution, security, fire and sanitation services, limitations and other regulations, and the problems of funding. In recent years planners have worked closely with community groups who wanted to take part in the planning of their own neighbourhood.

- 1 Who writes a Master Plan?
- 2 What does it include?

- 3 What are its aims?
- 4 What does modern city planning involve?
- 5 What problems do city planners have to tackle?
- 6 How are trends in recent years?

7a Find the synonyms of these words in the text

Specialist, inspecting, structured, suggestions, enhancements,
restrictions

Example – specialist - experts

GLOSSARY

border	hypsometric tint
building consent	ongoing
to conform	open-source
consultant	paved
contour	prosthetics
demanding	real estate
deprived	sanitation
draftsman	schedule
dwelling	shading
to engineer	stand-alone
funding	survey
grid	to tackle
guesswork	

SPEAKING

Numbers

1 one	11 eleven	21 twenty-one
2 two	12 twelve	30 thirty
3 three	13 thirteen	40 forty
4 four	14 fourteen	50 fifty
5 five	15 fifteen	60 sixty
6 six	16 sixteen	70 seventy

7 seven 17 seventeen 80 eighty
 8 eight 18 eighteen 90 ninety
 9 nine 19 nineteen 100 a hundred/one hundred
 10 ten 20 twenty

Ex.1 Say these numbers

56 34 89 63 76 21
 40 16 60 13 30 14

Ex.2 Write these numbers.

1	twenty-four	4	sixty-nine
2	thirty-three	5	seventy-two
3	forty-seven	6	ninety-one

Ex.3 a) Write a number from 1 to 100 on a piece of paper. On the other side, write a calculation for the number.

b) Work in small groups. Read your calculation in 10 to the other students. The first student to answer correctly is the winner.

A: Eight times eight, plus thirty-one, divided by five, plus thirty-eight equals

B: Fifty-eight.

A: Wrong!

C: Fifty-seven.

A: Correct!

Ex.4 Work in pairs.

Student A: Read this email from a vocational school in Calgary, Canada and underline the key information.

Thank you very much for your telephone call. Our school offers five apprenticeship programs which include supervised training, on-the-job training and classroom teaching. The programs take three or four years to complete. The programs are HVAC, carpentry, residential electrician, welding and masonry. All programs include health and safety training, maths and English.

Student B: Read about a training institute in Dubai, United Arab Emirates (UAE) and underline the key information.

The institute is 24 years old and has over 1,000 students. The first year of training is general and includes training on basic tools and equipment, health and safety and algebra. In the second year apprentices specialise in one trade: construction electrician, painting and decorating, concrete specialist, heating, ventilation and air conditioning technician, indoor plumbing, roofing or residential glazing. The training takes three years to complete and includes on-the-job experience.

Ex.5 Compare the two training institutes in 7. What things are the same? What things are different?

Test yourself

1 Write these numbers.

- 1 thirty _____
- 2 twenty-four _____
- 3 thirteen _____
- 4 five hundred _____
- 5 ninety-eight _____

2 Read the text. What do the numbers refer to? Match 1-5 to a-e.

The office block has six floors. Each floor has twenty-two rooms. Each room has two windows and a door, so there are forty-four windows per floor and twenty-two doors. Each window is 1 m 20 by 80 cm. Each room is 32 m².

6	a) number of windows per floor
22	b) number of floors
44	c) m ²
32	d) number of rooms per floor
2	e) windows per room

3 Make the calculations for the office block in 2.

Example: 1 264 (2 windows per room x 22 rooms = 44 windows; 44 windows x 6 floors = 264 windows)

- 1 the total number of windows: 264
- 2 the total number of doors:
- 3 the total number of rooms:
- 4 the total space per floor (m²):

UNIT 4

READING

BUILDING ELEMENTS

1 Read the text and then answer the questions below.

Foundation

The foundations, walls, floor, stairs and roof are some of the building elements that all types of building have in common.

Foundations are structures that transfer weights from walls and columns to the ground. There are two types of foundations: shallow foundations and deep foundations. Shallow foundations are usually embedded a metre into the soil, whereas deep foundations are embedded more in depth. They are recommended in case of very large design loads, a poor soil at shallow depth or site constraints, such as property lines. There are different types of deep foundations and they can be made of timber, steel and reinforced or pretensioned concrete.

Geotechnical engineers design foundations to ensure that they have an adequate load capacity with limited settlement. When designing foundations, it is also important to consider scour (when flowing water removes supporting soil from around a foundation) and frost heave (when water in the ground freezes and forms ice lenses).

- 1 What are foundations? How many types of foundations are there?
- 2 What are the main features of shallow foundations?
- 3 What are the main features of deep foundations?
- 4 What do geotechnical engineers design?
- 5 What must be considered?
- 6 What are scour and heave?

2 Read the text and decide if the sentences below are true (T) or false (F).

Walls

Building walls support the superstructures of building (roofs and ceilings), separate space and give protection against intrusion and the weather. They usually have about three separate components: structural elements, insulation, finish elements or surface.

Walls can be loadbearing or non loadbearing depending on their providing structural support to the building or not. Exterior loadbearing walls carry ceiling, roof or upper floor loads to the foundation. Some bearing walls are inside buildings: they support joists at mid span and transfer loads down to the foundation.

Usually, conventional house walls have an inner wooden framework that may support part of the house, but does not support wall coverings, windows and doors. It contains electrical wiring, plumbing, insulation, and other utilities.

1. Walls can define and protect areas, support the superstructures of buildings and delineate a space.
2. There are two kinds of structural walls.
3. Exterior boundary walls give protection against intrusion and weather.
4. Loadbearing walls can only be exterior walls.
5. Conventional house walls usually contain electrical wiring or plumbing.

Example – 1 – T.

3 Complete the text with the words from the box.

electrical wood surface covering underfloor strength

Floor

Floor structure contributes to the general (1)_____of the building system. It is formed of a steel I-beam frame with a horizontal upper (2) _____to which a number of adjacent composite floor panels is fastened firmly.

Floors consist of a subfloor for support and a floor (3) _____ used to give a good walking surface. In modern buildings the

subfloor often has (4) _____ wiring, plumbing, and may provide other services built in, like (5) _____ heating.

There is a wide variety of floor covering materials: carpet, ceramic tiles, (6) _____ flooring, laminated wood or stone.

Example – (1) - strength

4 Read the text and decide if the statements below are true (T) or false (F).

Roofs

Roofs can be divided in **cut roofs**, where a carpenter measures, cuts and places every length of wood needed for the frame; and **fixed roofs**, made of pre-built and assembled trusses. Trusses are custom-designed by computer so as to adapt to the typical weather conditions of the house. As they generally rest only on outside walls, they leave the inside free to move walls and to accommodate different room sizes.

When the frame of the roof is ready, a waterproof membrane is placed over it and it is held in place by battens (long pieces of wood) that are nailed into the truss and are the supporting system for the tiles. Tiles are then nailed to the wood. The top of the roof is finished off with ridge tiles that cover both sides of the roof's top row of tiles. Then the end of the wood at the bottom of the roof is covered by a fascia. The fascia allows air to flow safely through the membrane. To take away the water from the building, guttering is attached to the fascia. As heat can go straight out of the roof, insulation is also necessary. When designing the roof structure it must be remembered that all the load on the roof has to be transferred to the supporting beams, bearing walls, building foundation and the earth.

1 Trusses are designed to adapt to the typical weather conditions of the house.

2 Battens are long pieces of wood supporting the tiles.

3 The top of the roof is finished off with a waterproof membrane.

4 Then the end of the wood at the bottom of the roof is covered by the guttering.

Example – 1 – T

5 Read the text and say what the stairs in the picture are like.

Stairs

Staircases are powerful design elements and an opportunity for creative expression. They can be **spiral** (twisting around a centre pole with steps radiating out of it), **straight** (they stretch from lower to upper level in one straight run), **circular** (sweeping in a broad curve from one level to another) or they can have other shapes. They can be **wide** or **narrow**, **steep** or **gradual**, **return** (dividing the run, reversing direction 180 degrees at a landing) or **'L' stairs** (making a 90 degree turn at a landing).

Their design is influenced by their function and their style varies according to how their parts are built and combined. Staircases are built according to rules that are important for safety, indicating the heights of risers, depth and width of treads and placement of handrails. The first measurement to take when building a staircase is the distance between the two finished floors. This determines the height of the staircase. Its riser must not exceed 22 cm in residential buildings. The average width is 80 cm, and anyway it should not be less than 60 cm.



5a Think about the stairs in your house or a building you know well. Write a short paragraph answering questions below.

- What kind of stairs are they?
- Would you replace them with another kind of stairs? Why/Why not?
- Do you think this is the best solution? Why/Why not?

GLOSSARY

average	row
batten	run
carpenter	scour
constraint	settlement
electrical wiring	shallow
embedded	span
framework	firmly
guttering	steep
handrail	to stretch
heave	to sweep

I-beam joist landing plumbing ridge tile riser	tile tread truss turn utility waterproof membrane
---	--

SPEAKING

Ex.1 Match questions 1-7 to answers a-g.

1 How old are you?	a) Yes, please.
2 What's your name?	b) It's 265775.
3 Where do you live?	c) It's seven o'clock.
4 Coffee?	d) I'm 33.
5 What's your telephone number?	e) It's John Smith.
6 How tall are you?	f) In Paris.
7 What time is it?	g) I'm 1.78 m.

Ex.2 Complete this form with information about yourself

Name	1. _____
Surname	2. _____
Nickname	3. _____
Address	4. _____
Telephone number	5. _____
Age	6. _____
Height	7. _____

Ex.3 Work in pairs. Practise this conversation.

A: What's your telephone number?

B: It's _____. And yours?

A: It's _____

A: How old are you?

B: I'm _____ And you?

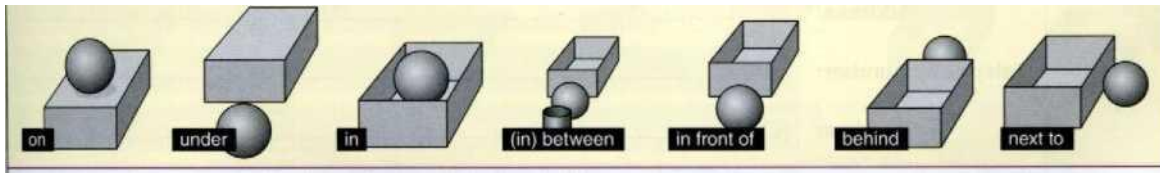
A: I'm _____

A: Where do you live?

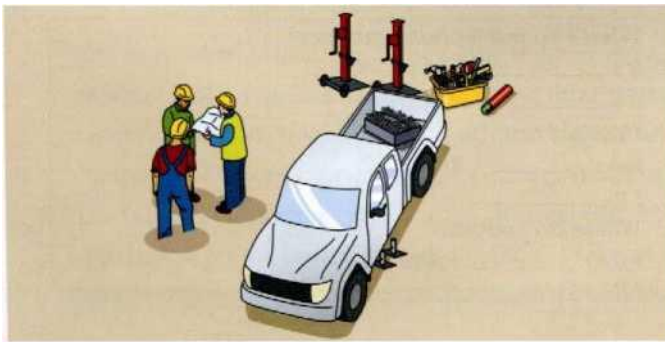
B: In/At _____ And you?

A: I live in/at _____.

We use prepositions of place to say where something is



Ex.4 Write four sentences to show where the objects are in this illustration



Ex.5 Put these words in the correct order to make sentences.

- 1 A: Where's the sand?
B: I / the / on / think / it's / way
A: I hope so.
- 2 A: Where are the base plates?
B: they're / sure / the / in / I'm / truck
A: Ah, OK. That makes sense.
- 3 A: too / the / boom / is / think / high / I
B: Ah, yes, you're right. Use the radio and speak to the operator.
A: OK. Good idea.
- 4 A: I think the concrete is too hard.
B: I don't think so. looks / it / to / me / OK
A: Are you sure?

B: OK, go and ask Jim.

A: Will do.

5 A: Where's your hard hat?

B: Over there. Why?

A: Go and get it. this / you / wear / hard / must / area / a / hat / in / area

B: OK. Here it is.

6 A: We have a problem. hopper / hole / there's / in / a / the

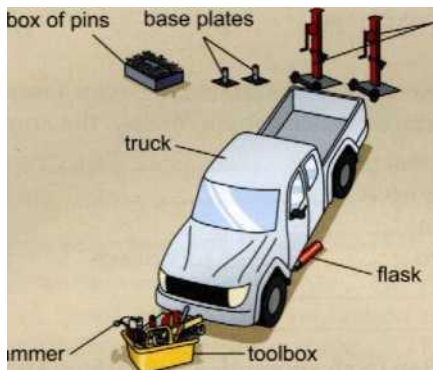
B: John's in the house. He's a welder. Ask him to fix it.

A: Good idea. Thanks.

B: You're welcome.

Test yourself

1 Look at the picture below. Complete the sentences



1 The base plates are ___ the truck.

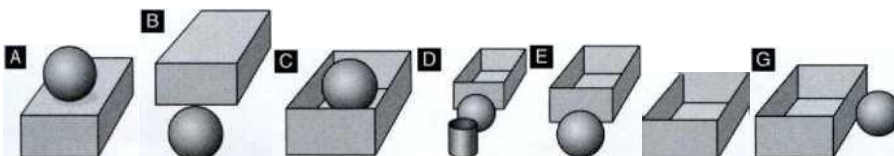
2 The hammer is ___ the toolbox, ___ the truck.

3 The coupling pins and locking pins are ___ a box, ___ the truck.

4 The jacks are ___ the truck.

5 The foreman's flask is ___ the truck.

2 Label these diagrams with the correct prepositions.



3 Work in pairs. You're on a construction site. Take turns to start a conversation using one of the phrases in the box. Then repeat with a new partner.

How do I ...? I think the What does...? Where's the ...? Where are the...?

A: Where's the remote control?

B: I think it's in the truck.

A: OK, thanks.

B: You're welcome.

UNIT 5

READING

ON THE BUILDING SITE

1 Read the text and label the pictures with the words in bold in the text.

Construction machinery

A **tower crane** is used to build tall buildings. Its short arm carries a counterweight of concrete blocks and its long arm carries lifting gear. The operator can sit in a cabin at the top of the tower just below the horizontal boom or control the crane by radio remote control from the ground. The lifting hook is controlled by a system of sheaves.

Digging machines are used for digging trenches for subterranean utility lines, storm sewer, etc. They use a vehicle (such as a front loader) and digging implements (such as a bucket-style backhoe or a rotary digging one). The rotary digging instruments use a rotating structure that is rotated along an elongated path.

A **concrete mixer** (or cement mixer) mixes cement aggregate (such as cement or gravel) and water to form concrete. There are also portable concrete mixers for smaller volume work.



1a Read the text again and answer the questions.

- 1 What is a tower crane used for? How does it work?
- 2 Where can the operator sit?
- 3 What are digging machines used for?
- 4 What do the rotary digging instruments use?
- 5 What does a concrete mixer do?
- 6 What is usually used for smaller volume work?

1b Find the words in the text for the following definitions.

- 1 a person who is employed to operate or control a machine
- 2 a curved device used for catching or holding things
- 3 narrow holes which are dug into the ground
- 4 longer and narrower than is normal
- 5 small enough to be easily carried or moved

Example – 1 – an operator

Health and safety

2 Match the safety signs with their explanations



- 1 danger high voltage
- 2 harmful or irritating substances
- 3 inflammable substances
- 4 mandatory safety helmet
- 5 protective footwear required
- 6 no unauthorised entry
- 7 protective gloves required
- 8 suspended loads
- 9 wear safety harness

Example – 1 – B

2a Read the text and answer the questions below.

The improvement of safety, health and working conditions depends upon governments, managers, supervisors and workers. Construction and maintenance of safety facilities, installation of safety signs, testing of lifting machinery, emergency and evacuation plans must all follow precise safety procedures. The aim of all this is to avoid accidents and ill health by eliminating potential dangers. The materials, equipment and tools on the site should also meet some safety standards.

The main safety measures involve:

Work platforms: every work platform must be provided with safe access and have enough strength to bear the load placed on it. It must also be secured to avoid separation from the supporting structure to which it is attached.

Scaffold stability: scaffolds must be assembled with the vertical members plumb and be secured to a building if their height is over 3 times their minimum base dimension. Their bases must have bearing plates resting on a solid surface and strong enough to support their weight.

Electrical hazards: a scaffold must be grounded if it is situated near a high voltage source.

- 1 What do site safety procedures concern?
- 2 What should also meet some safety standards?
- 3 A hat is the main aim of these measures?
- 4 What must every work platform be provided with? Why must it also be secured?
- 5 How must scaffolds be assembled? What must their bases have?
- 6 When must a scaffold be grounded?

3 Read the text and fill in the chart.

Pollution is the release of chemical, biological, physical or radioactive substances in the environment. Among the main kinds of pollution are:

- **Air pollution:** due to the release of chemicals and particulates (solid particles forming dust) such as nitrogen oxides that create smog and hydrocarbons. Other examples of air pollution are carbon monoxide and sulphur dioxide.
- **Water pollution:** caused by industrial waste, agricultural drainage and sewage.
- **Soil contamination:** the most significant soil contaminants are heavy metals, hydrocarbons, herbicides and pesticides.
- **Radioactive contamination:** caused by accidents in nuclear power stations and by the production and use of nuclear weapons.
- **Noise pollution:** including roadway, aircraft and industrial noise and high-intensity sonars.
- **Light pollution:** including light trespass and overillumination.

- **Visual pollution:** referring to the presence of overhead power lines, motorway billboards or open storage of junk and municipal solid waste.

Type of pollution	<i>Example</i>
Air pollution Water pollution Soil contamination Noise pollution Light pollution Visual pollution Radioactive contamination	

4 Write down a list of the sources of pollution that exist in the area where you live and write a short essay about the possible solutions to these problems

In my area there is a lot of air and water pollution due to the chemicals the farmers use on their fields...

GLOSSARY

backhoe boom front loader gear grounded harness mandatory plumb	safety scaffold sheaf storm sewer subcontractor tower crane trench
--	--

SPEAKING

Ex.1 Underline the correct words or phrases in italics to complete these conversations

- 1 A: I need some three-core cable, please. 2.5 mm. 240 V.
 B: I'm sorry. We're *in stock / out of stock*.

- 2 A: I want to order some timber.
B: Yes, of course. What's your *customer number / order number*, please?
- 3 A: Do you have transport?
B: No, I'm sorry. I don't.
A: No problem. We organise *delivery / pick-up*. Where is the site?
- 4 A: Hello again.
B: Hello. Can I place *an order / change an order*, please? We need three bags of sand, not thirty.
A: No problem at all.

Ex.2 Work in pairs. Practise a telephone conversation between a supplier and a buyer. Use the words and phrases in 1 to help you.

A: I'd like to place an order.

B: Certainly. What's your customer number?

Ex.3 Work in pairs.

Student A Read this list. Check with Student B that the items are in stock. Then ask to borrow the items you need.

Check stock:

- 12m extension cable - 3
- 5A/250 V plug - 3
- 20 mm flexible metal conduit - A1? ИА
- 3G power cable - 3 0 |A4
- 18 mm x 30 m PVC insulating tape - 3 H)llS

You have:

- spare grey paint
- two brushes
- a roller

You need to borrow:

- spray equipment (for painting)

Student B. Read this list. Check with Student A that the items are in stock. Then ask to borrow the items you need.

In stock:

- 12m extension cable - 7
- 15m extension cable - 10
- 5A/250V plug - 30
- 15 mm flexible metal conduit - 10 M
- 25 mm flexible metal conduit - 3C
- 3G power cable - 119 M
- 18 mm x 30 m PVC insulating tape - 10 YC-11S

You have:

- spare red paint
- spray equipment (for painting)

You need to borrow:

- a paint brush

A: Do you have three 12-metre extension cables?

B: Yes, we do. We have seven in stock.

A: What about conduits?

B: Yes, we have conduits. What type?

A: Can I borrow ...?

B: Yes, no problem.

Test yourself

1 Choose the correct answer, a, b, c or d.

1 He _____ the supplier.

- a) is phoning b) is phones c) phoning d) is phoning

2 _____ a key switch?

- a) There is b) Is c) Is there d) Are there

3 The ground is _____ .

- a) not hard enough b) hard not enough c) not enough hard
d) enough hard

4 Felt tape is _____ insulate pipes.

- a) use to b) used to c) used for d) used as

2 Put these words in the correct order to make sentences and questions.

5 soft / the ground / too / is /

6 putting / he / the mats down / is

7 you / do / plugs / a spare box of / have / ?

8 I / your power cable / can / borrow / ?

3 Match 1–8 to a–h to make sentences.

1 GT Jones Ltd supplies a wide	a) delivery of goods to your site.
2 We stock felt and foam tubing	b) of stock.
3 We also stock high	c) number at the top of the order form.
4 At the moment, rollers are out	d) quality steel staircases.
5 All our goods can be made	e) your order.
6 We organize	f) range of building products.
7 Email GT Jones Ltd to place	g) to your specifications.
8 Don't forget to write your customer	h) for insulating pipes.

3 Complete these sentences. Use one word in each gap.

1 'I'd like to _____ an order, please.' 'Yes, certainly. What's your order number?'

2 Sorry, we don't have any felt tape. It's out of _____ .

3 We have a wide _____ of products on our website.

4 We design high quality products, made _____ your specifications.

4 Choose the opposites of these words.

1 dry a) wet b) soft c) liquid

2 coarse a) fine b) wet c) heavy

3 hard a) solid b) soft c) big

4 light a) big b) fine c) heavy

5 liquid a) solid b) wet c) fine

5 Find and correct the mistakes in these requests.

1 Do you a spare box of plugs?

2 I can borrow your roller?

3 Do you has a spare roll of insulating tape?

4 Do Stefan have an extension cable?

7 Complete these sentences. Use is/isn't, too or enough and the adjectives in brackets.

1 I can't move the ladder. It _____ (heavy).

2 The ground _____ (soft) for the truck.

3 This toolbox _____ (big) for my tools. I need a bigger one.

4 Please wait. The paint _____ (dry) yet.

5 That truck _____ (small). We need a bigger one.

UNIT 6**READING****HOUSE SYSTEMS****1 Read the text and answer the questions below.****Plumbing systems**

The plumbing system, consisting of pipes and fixtures, concerns the distribution of tap water and the removal of waterborne waste in a building.

Plumbing installation must follow some regulations to ensure safe, quality construction.

Water systems of ancient times used pipes or channels made of clay, lead or stone. Today water supply systems use high pressure pumps and pipes made of non-toxic materials, such as copper, brass, steel, cast iron and plastic. The domestic hot water supply is provided by means of water heater appliances, or through district heating.

Used water and wastes are carried away by the drainage, waste and vent system.

- 1 What does a plumbing system consist of?
- 2 What materials were used in water systems of ancient times?
- 3 What materials are used in water systems today?

2 Read the text and decide if the statements below are true (T) or false (F).

Electrical Systems

An electrical system includes the electrical service, lighting outlets and hard-wired appliances. The electrical service is usually between 100 and 200 amps. Electrical lines run from the street to a meter box (situated outside the house), then to the electric panel board which contains the switches to control the electricity in each room of the house. It is there that the amps are divided up across circuits to supply the different areas of the house with electricity. Electrical systems must follow a number of safety measures including, for example, circuit breakers, ground fault circuit interrupters and smoke alarms.

If you have specific needs, you can ask your electrician for advanced wiring systems, which may also include modern computer lines to help you work at home.

- 1 An electrical system and an electrical service are the same thing.
- 2 A meter box should not be placed inside the house.
- 3 There is an electric panel board in each room of the house.
- 4 There are many circuits for supplying the different areas of the house with electricity.
- 5 Modern computer lines can be installed by an electrician.

Example – 1 – F

3 Read the text and complete the table. More than one answer is possible

Heating Systems

All climate-control devices or systems have three basic components: a source of warmed or cooled air, a means of distributing the air to the rooms being heated or cooled, and a control used to regulate the system (e.g. thermostat). A variety of technologies are available for heating your house:

- In a **central heating system** a furnace or boiler consumes the fuel (e.g. gas, oil, or electricity) that powers it. As fuel is burned, pipes take hot water to radiators. You get hot water at the same time as heating, depending on how you set the controls.
- **Electric heat pumps** remove heat from outdoor air, ground, surface water or the earth and move heat from one place to another. They can also be used as air conditioners when the weather is warm. The thermostat will also include controls for air conditioning.
- **Radiant skirting board heaters** are long, metal units with electrical elements inside. They are sometimes the only source of heat in a house, or they can be an extra heating device in cooler rooms.
- **Radiant ceiling or floor systems** are installed in floors, ceilings or (occasionally) walls. They warm objects in much the same way as the sun does.
- In **hydronic heating** a boiler warms the circulating water and hot water flows through tubes under the floor or through units that are similar to skirting board heaters. They can also be installed in ceilings. They are sometimes used under concrete in driveways to keep snow and ice from accumulating.
- **Portable space heaters** are either freestanding or attached to a wall and work with electricity, gas or kerosene. Their area cannot be qualified as heated living space.

Your demands	What can you use
1 I want a freestanding heater.	<i>a portable space heater</i>
2 I have a cool room downstairs.	
3 I want to install heating in the ceiling.	

4 I need to move heat from one place to another.	
5 I want to install a radiant element in the floor.	
6 I need an extra heating device.	
7 I want to use my heater as an air conditioner too.	

4 What kind of heating system is used in your home? Work in small groups and discuss the advantages and disadvantages of each system thinking of the costs of installation, maintenance, efficiency.

5 Complete the text with the words from the box.

tank roof common pollution sunlight storing

Solar heating

Solar energy is the electricity produced from the sun's rays and captured by means of solar panels, which are becoming increasingly (1)_____ nowadays. The two types of solar panel systems are solar photovoltaic systems and solar thermal system.

In the **solar photovoltaic systems** the solar thermal panels contain cells whose semiconductors react with (2) _____.

Electricity is produced when sunlight hits them. This kind of technology is still quite expensive and its disadvantage nowadays is the problem of (3)_____ energy.

In the **solar thermal systems** solar energy is used for water heating. The panels are positioned either on the (4) _____ or a wall facing the sun and contain flowing water. When the thermal collectors in the panel are exposed to the sun, they heat the water (stored in a hot water cylinder) that is either pumped or driven by natural convection through it. The storage (5) _____ is mounted immediately above or below the solar collectors on the roof. This system is not very expensive and offers a number of advantages, including being renewable, creating less

environmental (6) _____ reducing costs and maintenance and saving resources. Hot water can be produced for most of the year.

A conventional boiler can be used to make the water hotter, or to provide hot water when solar energy is not available.

Example – (1) – common

5a Read the text again and then match the two parts of the sentences.

1 Solar energy	a we can produce energy using solar panels.
2 Thanks to solar thermal systems and solar photovoltaic systems	b are contained whose semiconductors are able to react with sunlight.
3 The solar thermal panels are usually installed	c when solar energy is not available or to make water hotter.
4 In thermal panels special cells	d next to the solar collectors on the roof, either above or below.
5 Water is heated by	e hot water for most of the year.
6 The storage tank is mounted	f means producing electricity from the sun's rays,
7 Thanks to these panels you can produce	g exposing the thermal collectors in the panel to the sun.
8 Sometimes a conventional boiler is used	h on house roofs.

Example – 1 – f

5b Now answer these questions.

- 1 How can electricity be produced using the sun's energy?
- 2 What do solar thermal panels contain?
- 3 How is electricity created?
- 4 What are the two main disadvantages of this energy?
- 5 What is solar energy also used for?
- 6 What happens when the thermal collectors are exposed to the sun?
- 7 Can you name some of the advantages of this system?
- 8 What can a conventional boiler be used for?

6 Read the text and answer the questions.

Ventilation and air conditioning

Ventilation - the exchange of indoor air with outdoor air - is important to reduce indoor moisture, odours, and other pollutants.

Contaminants such as volatile organic compounds, and radon (that may cause health problems) can accumulate in poorly ventilated homes. Excess moisture needs to be removed before high humidity levels lead to physical damage to the home.

There are three main types of ventilation:

- **Natural ventilation** which is uncontrolled air movement through cracks and small holes (infiltration) and through vents such as doors and windows. The disadvantage of this is that it is uncontrollable.
- **Spot ventilation** which means using localised fans in the rooms where contaminant substances are generated (for example kitchen extractor fans and bath fans).
- **Whole-house ventilation** is a system that works thanks to fan and duct systems to exhaust stale air and supply fresh air to the house. Whole-house ventilation systems are usually classified as exhaust ventilation when the air is forced out of the house, supply ventilation if it is forced inside and balanced ventilation if the same amount of air is forced inside and outside the house.

- 1 Why is ventilation important?
- 2 What happens if too much moisture is not removed from the inside of your home?
- 3 What is the disadvantage of natural ventilation?
- 4 What is spot ventilation?
- 5 How does whole-house ventilation work?

7 Read the text and decide if the statements below are true (T) or false (F).

Passive solar building

One of the latest trends in energy conservation is passive solar building design. This means making windows, walls and floors in such a way that

they are able to collect, store and distribute solar energy (heat) in winter and reject it in summer. This kind of design implies avoiding the use of mechanical and electrical devices. The best way to design a passive solar building is to pay great attention to window placement, glazing type, thermal insulation, thermal mass and shading. In most cases these design techniques are applied to new buildings, but even existing buildings can be adapted.

If emissions decrease, this will help to reduce climate change. Energy conservation makes the replacement of non-renewable resources with renewable energy easier. According to the European Union pledges of 2006 the annual consumption of primary energy in the EU should be reduced by 20% by 2020.

The EU's SAVE Programme is expected to promote energy efficiency and encourage energy-saving behaviour. The European Commission is currently giving financial support to large-scale research projects that will try to understand the factors for effective energy conservation programmes.

1 Mechanical and electrical devices are used in passive solar building design.

2 These techniques can only be applied to new buildings.

3 Thanks to the decrease in emissions, climate change can be reduced.

4 By 2020 yearly consumption of primary energy in the EU should be reduced by 10%.

5 The European Commission is supporting some energy conservation research projects.

Example – 1 – F

7a Find the synonyms of these words in the text.

Tendency, piece of equipment, decrease, facilitate, promise, support, plan

Example – tendency - trend

8 Read the text about bio-architecture and decide if the statements are true (T) or false (F)

Bio-architecture is a new building approach that respects life and earth. Its aim is to create 'healthy' buildings with little ecological impact, creating harmony between buildings and nature. For this reason two basic principles have to be followed:

- using the natural presence of the sun, good thermal insulation and natural ventilation to reduce energy consumption;
- using renewable energy resources (solar, wind, water and geothermal) to achieve energy autonomy.

Bio-architects and designers follow the principles of natural design that rule all nature, so by studying and understanding the regularity and balance that we can find in nature, they try to establish rules that can be applied to architecture. They use special geometric shapes, symmetries, proportions, natural patterns and universal symbols to create pleasant and harmonious spaces. Bio-architects follow simple rules that include:

- designing spaces using natural geometries, shapes and growth patterns in order to create sustainable systems;
- avoiding 'negative' forms such as sharp angles, and creating harmonious spaces;
- using all kinds of biological materials and avoiding steel, aluminium and plastics when possible.

- 1 Sustainable architecture aims at creating harmony between man and nature
- 2 Bio-architecture tries to mirror the balance we find in nature.
- 3 The rules of bio-architecture are very complex.
- 4 Sharp angles are a good example of harmonious spaces.
- 5 Steel and plastics are widely used in bio-architecture.

GLOSSARY

amp	ground fault
appliance	hydronic
brass	lead
cast iron	lighting outlet
circuit breaker	moisture
compound	pledge

driveway	skirting board
to exhaust	stale
fan	tank
fixture	waterborne waste
glazing /	wiring system

SPEAKING

Ex.1 Complete this text about extreme weather and construction sites with the words in the box

cold hot lightning wet wind

Bad weather often causes long delays on construction sites. Building materials behave differently, equipment needs protection and injuries are more common. In (1) _____ weather, paint and concrete dry too fast, sand gets into machines and other equipment, and injuries include dehydration and sunburn. In (2) _____ weather, a big problem is mud. Strong (3) _____ blows things away. (4) _____ can kill. And in (5) _____ weather, workers require special clothing and fingers stick to metal. In extreme weather, accidents are more common. In short, weather is expensive.

Ex.2 Read the text in 3 again and match these word pairs from the text.

1 strong	a) clothing
2 big	b) wind
3 special	c) delays
4 wet	d) problem
5 long	e) weather

Ex.3 Match questions 1-5 to reasons a-e.

- 1 Why can't you work on the roof?
- 2 Why do you need more sheeting?
- 3 Why can't you work outside?
- 4 Why can't you use the crane?
- 5 Why do you need sunglasses?

- a) Because of the sand. We need to cover the machines.
- b) Because it's too cold. We need better clothing.
- c) Because of the sun. It's very bright.
- d) Because of the rain. It's too dangerous for the roofers.
- e) Because it's too windy. It's difficult to handle the loads.

Ex.4 Imagine you work on construction sites all over the world. Give examples of problems different types of weather can cause. Discuss these with a partner.

A: One big problem on building sites is rain.

B: Why?

A: You can't work on the roof in the rain. It's too dangerous. And the ground is too soft for big trucks.

B: And the paint can't dry.

A: Yes, good point.

Ex.5 What type of weather causes the following.

1	dehydration	4	fingers to stick to metal
2	sand to get in machines	5	soft ground
3	sheeting to blow away		

Test yourself

1 Choose the word that does not belong in each group.

1 **Weather:** sunny dehydration raining windy lightning

2 **Food:** biscuits sandwiches noodles cheese coffee

3 **Parts of the arm:** elbow finger foot thumb hand

4 **Waste containers:** biohazard packaging glass tarmac
inert mixed

2 Match 5–8 to a–d to make sentences.

Caution: slippery	a) belt.
You must wear protective	b) surface.
Always use the seat	c) wool.

Dry the cut with some cotton	d) clothing.
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3. Complete Ron's email to his site manager. Explain why you can't work outside, what things you need and what you need to do. Use these notes.

cold: fingers stick to metal – special gloves sunny: too bright – sunglasses windy: sheeting blows away – tie it down snowing: a lot of snow on access roads – clear roads

Hi Bill,

We can't work outside today because of (1)

_____.

We need (2) _____ . We can't drive the trucks (3) _____ .We (4)

_____ .We can't work outside (5)

_____.

We (6) _____ . The trucks can't get to the site. There (7) _____ .We (8)

_____.

Best wishes,

Ron

4 Find and correct the mistakes in these sentences.

1 Where the site manager's office is?

2 I felled off the ladder and sprained my ankle.

3 We can't work on the roof because the rain.

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