BUILDING MATERIALS

l. Read the words and guess their meaning.

Material, metal, gypsum, cement, interior, natural, granite, column, facade, decoration, crystalline, to press, block, modern, electric, corrosion, aluminium, plastics, combination, crane, physical, chemical, mechanical, inertness, cellulose, protein, insulation.

2. Find English equivalents.

мрамор	rocks
естественные камни	stone
железо	timber
камень	lime
известь	sand
смола	clay
бетон	concrete
песок	marble
чугун	brick
сталь	iron
глина	cast iron
кирпич	steel
лесоматериал, строевой лес	glass
стекло	resin

3. Translate the following words and word combinations.

1) Sandstone; fire-resistance (resistance - сопротивление, противодействие); ferroconcrete, pipeline (pipe - труба).

2) Bearing structure (to bear - нести нагрузку); mechanical strength (strength - прочность); sound insulation (sound - звук); heat insulation (heat-тепло); electric and heat conductivity (conductivity-проводимость); corrosion resistance; light weight (weight - вес); long span roof (span - двускатная); dome roof (dome - купол); crane jib (jib -стрела); compressed member (to compress - сжимать, member-элемент); to take on a high polish, (polish - полировка); to face rough wall (rough - неоштукатуренная).

4. Learn the following words.

to divide - разделять	to use - использовать
to bind - связывать, скреплять	to refer - относиться

to burn - гореть
to decay - гнить
to belong - принадлежать
to cut - резать
to shape - придавать форму
to face - облицовывать
to fasten - соединять
to include -включать
to apply - применить
main - основной
artificial - искусственный
cheap - дешевый
easy –легко
masonry - каменная кладка
unit - элемент, узел, блок
disadvantage - недостаток
property - свойство
compactness - плотность
porosity - пористость
hard - твёрдый
durable - прочный, долговечный
step - ступенька
purpose - цель
mortar - строительный раствор
ferrous metal - черный металл
alloy - сплав
framework - каркас
kind - вид, тип
derivative - производное
reinforcement -арматура

5. Read the text and find the answers to the questions.

1) What groups are all building materials divided into?
2) What building materials are mentioned in the text?

Building Materials

All building materials are divided into three main groups:

Main building materials such as rocks and artificial stones, timber and metals; Binding materials such as lime, gypsum and cement; Secondary building materials which are used for the interior parts of the buildings.

We use main building materials for bearing structures. Binding materials are used for making artificial stones and for binding together masonry units. For interior finish of the building we use secondary materials.

Natural building materials are stone, sand, lime and timber. Cement, clay products and concrete are examples of artificial building materials.

Timber is reffered to the group of the main building materials. It is the most ancient structural material It Is light, cheap and easy to work. But wood has certain disadvantages; it burns and decays.

Stone belongs to one of the oldest building materials used by man. It has many properties, such as mechanical strength, compactness, porosity, sound and heat insulation and fire-resistance. The stones which are usually used for masonry work are granite, sandstone and marble. Granite is very hard, strong and durable. It is used for foundations, columns, steps and for entire facades. Its colour may be gray, yellow, pink or deep red. Sandstone is

comparatively easy to cut and shape. It is often used for facing rough walls and for interior decorations. Marble is a crystalline stone chiefly used for decorative purposes. It takes on a high polish.

Bricks were known many thousands of years ago. They are the examples of artificial building materials. Brick is made by pressing clay, into blocks and burning them to hardness. Bricks are hard and easily fastened together with the help of mortar. They are produced in a great variety for widely different purposes.

Metals are divided into ferrous metals and non-ferrous metals. Ferrous metals include iron, steel and its alloys. Cast iron is the cheapest of the ferrous metals. It is chiefly used in building for compressed members of construction. Steel is used for framework of buildings, and as reinforcement in modern ferroconcrete structures. Non-ferrous metals have the following characteristics: high electric and heal conductivity, high corrosion resistance, light weight. The oldest and the best known light metal is aluminium. It is used in lift bridges, long span roofs, dome roofs, crane jibs, and in other structures.

Glass and plastics are widely used nowadays in construction of different kinds of buildings. Glass has excellent combination of physical, chemical, and mechanical properties. The outstanding property of glass is its chemical inertness. Glass is used for constructing doors, walls, roofs, pipelines, etc. Plastics is the name for various derivatives of resin cellulose, and protein. Nowadays plastics can be applied to almost every branch of building.

6. Read the text once more and find the equivalents to the following Russian word combinations.

Основные строительные материалы; вяжущие строительные материалы; второстепенные строительные материалы; внутренние част здания, несущие конструкции; изготовление искусственных камней; элементы каменной кладки; внутренняя отделка; примеры искусственных строительных материалов; старейший строительный материал; некоторые недостатки; механическая прочность; огнестойкость; сравнительно легко режется и обрабатывается; для облицовки неоштукатуренных стен; кристаллический камень; легко соединяются вместе с помощью раствора; цветные металлы; самый дешевый черный металл; конструкции, работающие на сжатие; каркас здания; современные железобетонные конструкции; устойчивость против коррозии; подъёмный мост; выдающееся свойство стекла; производные смолы, целлюлозы и протеина.

7. Complete the following sentences.

1) All building materials are divided into three main groups: … 2)They are also divided into two groups: … 3) Natural building materials are ... 4) Cement, clay products and concrete are ... 5) Wood has certain disadvantages: ... 6) Stone has many properties, such as... 7) The stones which are usually used for masonry work are ... 8) Brick is made by pressing clay into blocks and... 9) Metals are divided into two groups: …10) Ferrous metals include... 11) Non-ferrous metals have the following characteristics: ... 12) Glass has excellent combination of... 13) Plastics is the name for various derivatives of...

8. Compose as many sentences as possible.

Main building materials	are used	for interior finish of the building.
Binding materials		for bearing structures
Secondary building materials		for binding together masonry units.
Granite	is used	for framework of buildings.
Sandstone		for facing rough walls, for decorative purposes.
Cast iron		for constructing doors, walls, roofs, windows.
Steel		in lift bridges, long span roofs, crane jibs.
Aluminium		for compressed members of construction.
Glass		For basements, columns, steps.

9. Translate the following sentences using “is (are) reffered to” or “belong(s) to”.

1) Искусственные и естественные камни относятся к группе основных строительных материалов. 2) Металл также относится к этой груше. 3) Известь, гипс и цемент относятся к группе вяжущих материалов, 4) Кирпич относится к искусственным строительным материалам. 5) Песок относится к естественным строительным материалам. 6) Дерево и камень относятся к старейшим строительным материалам. 7) Сталь относится к черным металлам. 8) Стекло и пластмасса относятся к материалам, которые сейчас широко используются в строительстве.

10. Agree or disagree with your partner, begin your phrase with "That's right" or "That's wrong".

1) We use main building materials for bearing structures.
2) Concrete and cement are natural building materials.
3) Timber is the newest structural material.
4) The stones which are used for masonry work are granite, marble and sandstone.
5) Granite is hard, strong and durable.
6) Marble doesn't take on a high polish.
7) Bricks are easily fastened together with the help of mortar.
8) Cast iron is the cheapest of the ferrous metals.
9) Steel is reffered to the group of non-ferrous metals.
10) Aluminium is used in long span roofs and dome roofs.
11) Nowadays we don't use glass and plastics in construction of buildings.

11. Listen to the sentence repeat it and add your own information.

1) All building materials are divided into three main groups.
2) Binding materials are used for making artificial stones.
3) Timber is light, cheap and easy to work.
4) Timber has certain disadvantages.
5) Stone has many properties.
6) Sandstone is comparatively easy to cut and shape.
7) Marble is a crystalline stone.
8) Brick is made by pressing clay into blocks.
9) Metals are reffered to the group of main building materials.
10) Steel is used for framework of buildings.
11) The best known light metal is aluminium.
12) Glass has excellent combination of physical, chemical and mechanical properties.

12. Work in pairs.

1) *Ask your friend* what groups all building materials are divided into.
   where main building materials are used.
   what main building materials he (she) knows.
2) *Ask your friend* what two groups all building materials are divided into.
   what natural building materials he (she) knows.
   what artificial building materials he (she) knows.
3) *Ask your friend* what group of building materials stone belongs to

what properties stone has.
what stones are usually used for masonry work.

4) *Ask your friend* what group of building materials-sandstone is reffered to.
whether sandstone is easy to cut and shape.
where sandstone is used.

5) *Ask your friend* what group of building materials granite belongs to.
what properties granite has.
where granite is used.

6) *Ask your friend* what group of building materials marble is reffered to.
whether marble takes on a high polish.

7) *Ask your friend* what group of building materials timber belongs to.
what properties timber has.
what disadvantages timber has.

8) *Ask your friend* what group of building materials metals belong to.
what groups metals are divided into.
what metals ferrous metals include.

9) *Ask your friend* what group of metals steel is reffered to.
where steel is used.
what other ferrous metals he (she) knows.

10) *Ask your friend* what group of metals cast iron belongs to.
where cast iron is used.

11) *Ask your friend* what groups metals are divided into.
what properties non-ferrous metals have.
what metal is the best known light metal.

17) *Ask your friend* what metal is the oldest and best known light metal.
what group of metals aluminium belongs to.
where it is used.

13) *Ask your friend* what example of artificial building materials he (she) knows.
how brick is made,
whether bricks are produced in great variety

14) *Ask your friend* what materials are widely used nowadays in construction of different kinds of buildings.
what properties glass has.

where glass is used.

15) *Ask your friend* whether plastics is widely used in construction.
what plastics is.
where it can be applied to.

13. What material is spoken about? What else can you say about this material?

1) They are used for making artificial stones. These are.
2) They are used for bearing structures. These are...
3) It is light, cheap and easy to work. That is...
4) It is characteristic of such properties as mechanical strength, compactness, porosity, sound and heat insulation and fire-resistance. That is…
5) It is a crystalline stone chiefly used for decorative purposes. That is
6) It is made by pressing clay into blocks and burning them to hardness. That is...
7) It is often used for facing rough walls. That is...
8) Its colour may be gray, yellow, pink or deep red. That is
9) They have me following characteristics: high electric and heat conductivity, high corrosion resistance, light weight. These are...
10) It is the cheapest of the ferrous metals. That is...
11) It is used as reinforcement in modern ferroconcrete structures. That is…
12) It is the oldest and best known light metal. That is...
13) It's outstanding property is chemical inertness. That is...
14) It is used for framework of buildings. That is...
15) It is the name for various derivatives of resin, cellulose and protein. That is...
16) It is chiefly used in building for compressed members of construction. That is...
17) It has certain disadvantages: it burns and decays. That is...

14. Speak on the classification of building materials.

15. Speak on one of the building materials and its properties. (timber, metals, stones, glass, etc.)

16. Study the dialogues, memorize them and perform them in pairs.

Dialogues

1

- What are the three materials most widely used in construction?
- I'm quite sure they are lime, gypsum and cement. Right?
- Right! Now tell me for what purpose these materials are used?
- They are used for the purpose of binding together masonry units.
- What kind of masonry units do you mean?
- I mean stone and brick. Don't you agree with me?
- Are those three materials used as constituents of wall plaster?
- They are, yes. All of them are used as constituents of wall plaster.

2

- What is lime? Do you know?
- It's a white substance obtained by burning limestone.
- Is it used in making cement and mortar?
- Right. It's used in making cement end mortar.

3

- What do you know about cement?
- It's a powder which, mixed with water, becomes hard like stone.
- Suppose we mix cement with sand and stones?
- If we mix cement with sand and stones, we get concrete.

4

- Why isn't ordinary brick always satisfactory in building practice?
- Because of its high volume weight and high thermal conductivity.
- What other kinds of bricks are there?
- Don't you know? They are light-weight bricks, hollow or porous bricks.
- Do light-weight bricks differ from ordinary clay bricks?
- Of course, they do! They have a lower volume weight and lower thermal conductivity.
- So that means that they are more economical than ordinary bricks.
- Yes, they are far more economical than ordinary bricks!

5

- Aluminium alloys of very high strength are obtainable, aren't they?
- They are, but such alloys are not generally used in structural engineering.
- Is corrosion from sea air or industrial pollution a problem?
- No, corrosion from sea air or industrial pollution is no longer a problem.
- So that means that painting is not necessary?
- You are right. Painting is not necessary at all.

17. Study the texts. Which of these texts contain the most interesting information for you? Compose short dialogues using the information of these texts.

SAND HOUSES

The first residents have moved into houses literally built of sand in Turkmenia which has a greater part of its territory covered by the Karakum Desert (one of the largest in the world).

Turkmenian specialists have designed a technology for the production of "cell" concretes from sand which, looking like cheap light blocks, are quite suitable for housing construction. The sand is also used for façade finishing. Marble-like slabs can also be made from it with the help of an original technology.

Notes

literally - буквально
«cell» concrete – ячеистый бетон
slab – плита

POLYMER REPLACEMENT FOR TIMBER

Diabase plastic is a new building material which will help to reduce the consumption of timber. Timber is, unfortunately, still being used tor, mine roofing. Diabase plastic is much more durable and has shown greater resistance to moisture and fire than wood, say Alma-Ata scientists. Diabase, the raw material, on which this new timber substitute is based, was discovered in the rock to the north of Lake Balkhash.

Notes

diabase — диабаз (мин.)
to reduce the consumption - уменьшать потребление
raw material — сырье
substitute - заменитель
to discover – обнаруживать

PLASTER FROM ASH

A new building material, bulged volcanic ash, can be used as a kind of "packing" to protect houses from the northern cold. The technology for its production was developed by Magadan scientists.

Possessing fine heat-insulating properties, the ash does not weigh much. Therefore, its use as a heat-insulating plaster combined

with traditional materials makes it possible to reduce the thickness of the outside walls of a building by 30 - 40 per cent. As a result, materials consumption is considerably reduced. A commercial installation producing the new material is now in operation in the environs of Magadan.

Notes

bulged volcanic ash - вспученный вулканический пепел
to pack - упаковывать
weigh - весить
installation - установка
environs – окрестности

DURABLE TIMBER

Latvian specialists have increased the service life of timber from five to six times by using a vacuum to remove the air from the pores of the timber and substituting an aqueous antiseptic solution. The new installation can treat logs and sawn timber up to 9.5 m long, which become resistant to moisture, fungus and mould. Other preparations can make the wood fire-resistant. As well as becoming resistant, soft deciduous woods acquire the properties of valuable species following special treatment.

Notes

to increase – увеличивать
to remove - удалять
pore - пора
aqueous solution - водный раствор
to treat - обрабатывать
log - бревно
to saw - пилить
fungus - гриб
mould - плесень
soft deciduous wood - мягкая, лиственная древесина
to acquire - приобретать
valuable species - ценная порода

POLISH ON MARBLE

Quality artificial marble is a major building material. Under the conventional technology it is made from mortar and fragments of noble stones, followed by grinding and polishing. These labour-consuming operations considerably add to the cost of such marble plates. A new process developed at the Krasnodar Polytechnical Institute is most likely to make them cheaper. It was found there that artificial marble plates could be formed on sheets of well polished glass.

Notes

conventional - обычный, общепринятый
fragment - осколок, кусок
grinding - шлифовка
labour-consuming - трудоемкий
cost - цена
plate - плитка
sheet - лист

18. Render the following in English:

ТРОСТНИК

Крыши дворцов тростником не крыли. Это было «привилегией» хижин бедных крестьян и батраков, особенно в мекленбургских краях. Тростник был не только дешев, но и имелся в изобилии, часто неподалеку от дома. В нынешнее время тростник «вошел в цену» и не только как долговечный, отвечающий местному колориту и красивый кровельный материал, но и как исходное сырье для садоводства, сельского хозяйства, строительства. Если его измельчить и смешать с бетоном, то полученные панели пригодны для ненесущих стен и перегородок домов.

Notes

тростник – reed
крестьянин - peasant
иметься в изобилии - to be in abundance
измельчать - to cut very small

ИСКУССТВЕННЫЙ МРАМОР

Сегодня лишь немногие мастера владеют секретами известного с 17 века производства искусственного мрамора.

Для получения этого декоративного материала гипс обрабатывают путем многократного шпаклевания и шлифовки его

поверхности. Благодаря последующей полировке природными камнями исходный материал становится гладким и блестящим, так что непрофессионалу его даже трудно отличить от подлинного мрамора.

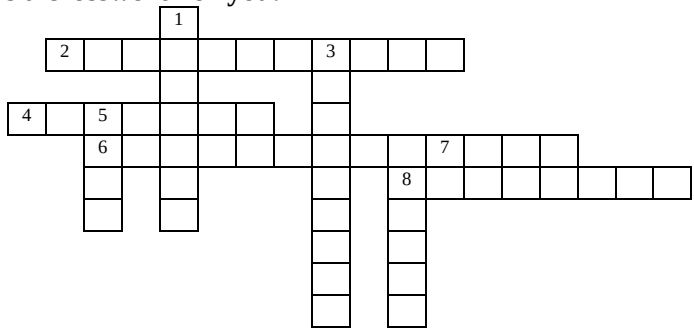
Notes

многократный-repeated
шпаклевание-puttying
шлифовка – polishing
гладкий – smooth

19. How many type of building materials can you find in these letters? The words may appear in any direction in the grid. One of them is done for you: TIMBER. Can you find 9 others?

M	U	S	P	Y	G	E	A	S	T
O	N	M	A	N	A	I	K	E	L
D	H	L	B	T	E	L	I	T	C
F	C	A	R	M	Y	T	U	E	G
V	R	G	I	R	O	N	M	R	I
R	E	L	C	L	A	E	P	C	A
H	B	A	K	G	N	E	V	N	Y
E	M	O	F	T	I	D	O	O	L
B	I	G	Y	M	A	T	E	C	T
G	T	C	R	H	S	S	A	L	G

20. Here is a crossword for you.



1. One of three main groups of building materials.
3. The property of glass.
5. A ferrous metal.
6. The material with the help of which bricks are fastened together.

Across

2. Fill in the blank: Plastics is the name for various ...of resin, cellulose and protein.
3. A person who builds.
6. The use of steel.
7. The property of stone.

21. Be attentive reading the text! You are to do a crossword using its information.

Properties of Building stone.

Among the materials commonly used in building and construction are various kinds of stone. Of many kinds of stone used in building there are several distinct classes which have different properties.

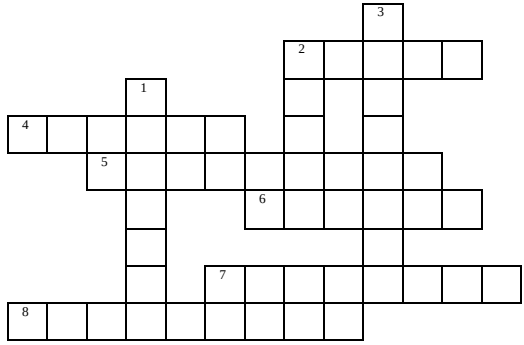
Sandstone and slate (сланец) are comparatively easy to cut and shape, but do not take a high polish. Sandstone is easily quarried (добывать из карьера) and cut into shape for building purposes. The irregular blocks which come from the quarries are dressed either by hand or machinery. Sand rock has various colours depending upon the presence of minute quantities of iron and other mineral matter in it. It is often used in than slabs to form facings of rough walls, or carved into various shapes for interior decorations. Slate is used for roofing arid for blackboards. For both of these uses it is unsurpassed (непревзойденный).

Granite is very hard with gleaming crystals of beautiful colourings in its texture. Examination of a piece of granite shows that it is made up of several different kinds of minerals, which are usually in crystalline form. The glassy granular particles (частицы) which do not have the appearance of crystals in granite are quartz. The white, gray, or salmon coloured crystals are feldspar (полевой шпат). Granite is variously coloured and takes on a high polish. Because of its structure and hardness granite is difficult to work and is correspondingly expensive. Its crushing strength (прочность на сжатие, раздавливание) is so great that it is often used in foundations for the heaviest structures.

Marble is heavy and hard. It is capable of taking on a high polish

Marble is used largely for ornamentation in buildings.

Limestone is one of the most useful stones. It is used in the preparation of building materials, as lime and cement. It is used also for other purpose, as smelting of iron and certain other metals from their ores. Great quantities are moreover used as ballast on railroads and making highways.



Down

1. This material is has gleaming crystals of beautiful colourings in its structure.
2. This material is unsurprised for roofing and blackboards.
3. The property of granite.

Across

2. Fill in the blank: Sandstone is often used in thin … to form facing of rough walls.
4. Give the English equivalent for «кварц».
5. This material is comparatively easy to cut and shape.
6. Fill in the blank: The colours of sandstone ... upon the presence of minute quantities of iron and other mineral matter in it.
7. The white, gray, or salmon coloured crystals in granite. The material used in preparation of lime and cement.

CONCRETE

1. Read the words and guess their meaning.
Monolithic, to form, gravel, crystal, process, characteristic, proportion, economical, class, adequate, dam, arch, gas, product, to produce, position, type, column, foundation, universal, system, to granulate, aviation, decade, cylindrical.

2. Find Russian equivalents.

important	огнестойкий
strong	долговечный
hard	важный
durable	искусственный
fire-resistant	строительный
wet	мокрый, влажный
structural	твёрдый
artificial	прочный
light	тяжёлый
heavy	подходящий, соответствующий, годный
suitable	изготовленный заранее, сборный
prefabricated	легкий
acid-proof	кислотоупорный

3. Learn the following words.

to imagine - представить себе
to mix - смешивать
to pour - лить, вливать
to hold (held) - держать
to stick (stuck) - липнуть
to introduce - вводить
to compose - состоять из
to contain - содержать в себе
to foam - пениться
to replace - заменять
innovation - нововведение
structure - здание, конструкция
quality - качество, свойство
aggregate - заполнитель
grading гранулометрический состав
amount - количество
resistance - сопротивление
beam - балка
setting - схватывание
void - пустота
compound - соединение
pavement - дорожное покрытие |
sodium - натрий
potassium - калий

4. Learn the following word combination.
plain concrete - неармированный бетон
reinforced concrete железобетон
dense concrete - тяжелый бетон
light-weight concrete -легкий бетон
cellular concrete - ячеистый бетон
gas concrete - разе
foam concrete - пенобетон
in-situ concrete—монолитный бетон
precast concrete - сборный бетон
alkali-slag concrete - щелочной шлакобетон
prestressed concrete - предварительно напряженный бетон
silica concrete - кремнеземистый бетон
compressive strength - прочность на сжатие
tensile strength - сопротивление разрыву
compressive stress - сжимающее напряжение
tensile stress - растягивающее напряжение
blast-furnace slag - доменный шлак

5. Read the text and in a few words express the main idea of it.

Concrete

Concrete is one of the most important building materials. It is difficult to imagine modern structure without concrete. Concrete is the very building material, which led to great structural innovations. The most important quality of concrete is its property to be formed into large and strong monolithic units of any desired shape.

Concrete is a mixture of cement, sand, gravel and water. It is mixed and poured into forms that hold it in place until it hardens. The crystals forming in the process of making concrete stick together in a very hard artificial stone.

The characteristics of concrete depend upon the quality of the materials used, grading of the aggregates, proportioning and amount of water. The most important requirements for concrete are: it should be hard, strong, durable, fire-resistant and economical.

Concrete can be divided into two classes: plain concrete and reinforced concrete where it is necessary to introduce steel.

Reinforced concrete is a combination of two of the strongest structural

materials: concrete and steel. Concrete has an adequate compressive strength, but its tensile strength is low. On the other hand, steel has a high tensile strength. Suitable combination of these two materials provides resistance to both compressive and tensile stresses.

Plain concrete can be used for almost all building purposes. Reinforced concrete is used in building bridges, arches, dams, for structures under water, for foundations, columns, beams, etc. The use of concrete and reinforced concrete is almost universal.

There is a broad division of concrete types into: 1) Dense concretes, which are composed of heavy aggregates and, 2) Light-weight concretes, which are composed of light aggregates.

There are cellular concretes made by using materials, which foam or form gas during the mixing of the concrete. These give a product of very light weight, because after setting it contains a large number of small voids.

Concrete can be made on a construction site and poured into position as a wet mix, or it may be used as the material for making prefabricated units in a factory. That is why there is another classification into "in-situ" (or cast-in-place) concrete and precast concrete.

Builders also produce alkali-slag concrete and silica concrete. In alkali-slag concrete cement is replaced by a mixture of granulated blast-furnace slags and sodium and potassium compounds. This material is used for irrigation systems, roads, pavements and other structures. Silica concrete is light, fire-resistant and acid-proof. It contains no cement. Silica concrete is widely used in under water constructions.

6. Read the text once more and find the equivalents to the following Russian word combinations.

Трудно представить, большие и прочные монолитные блоки, очень твердый искусственный камень, гранулометрический состав заполнителя, количество воды, самые важные требования, достаточная прочность на сжатие, высокая прочность на разрыв, сжимающее и растягивающее напряжения, тяжёлый заполнитель, легкий заполнитель, большое количество маленьких пустот, строительная площадка, сборные элементы, измельченный доменный шлак, натрий-калиевые соединения, оросительные системы, подводные сооружения.

7. Find the definitions to the following English terms.

Reinforced concrete
Dense concrete
Light-weight concrete

Gas concrete	In-situ concrete
Concrete made by using materials, which form gas during the mixing of the concrete.	Aklali-slag concrete
Concrete composed of light-weight aggregates.	Concrete made by using materials, which foam during the mixing of the concrete.
Concrete composed of heavy aggregates.	Concrete made on a construction site and poured into position as wet mix.
The combination of concrete and steel.	Concrete used as the material for making prefabricated units in a factory.
Foam concrete	Concrete in which cement is replaced by a mixture of granulated blast-furnace slags and
Precast concrete	sodium and potassium compound

8. Completes the following sentences.

1) Concrete is the very building material which led to … 2) The most important quality of concrete is ... 3) Concrete is a mixture of... 4) The characteristics of concrete depend upon ... 5) The most important requirements for concrete are ... 6) Concrete can be divided into two classes ... 7) Concrete has an adequate compressive strength, but ... 8)Suitable combination of concrete and steel provides resistance to ... 9)Reinforced concrete is used in building ... 10) There are cellular concretes made by using materials which ... II) These give a product of very tight weight, because after setting it ... 12) Alkali-slag concrete is used for... 13) Silica concrete is widely used in...

9. Read the text and gnawer the following questions.

1) What reinforcement has prestressed concrete?
2) Is prestressed concrete a new material?
3) What advantages has prestressed concrete?
4) Where is it used?

ordinary - обычный, простой
to be subject to - подвергаться
cracking - образование трещин, растрескивание
to enable давать возможность

Prestressed Concrete

There are two kinds of reinforced concrete: with ordinary reinforcement and concrete with prestressed reinforcement. Prestressed concrete is not a new material. Its successful use has been developed rapidly during the last two decades.

In prestressed concrete steel if used as a means of producing a suitable compressive stress in the concrete. Prestressed concrete it not subject to cracking. It enables lighter construction than ordinary reinforced work. Less steel is required than in ordinary reinforced concrete.

Prestressed concrete is used for beams, columns, pipes, cylindrical water-towers, etc.

10. Read the text once more and retell the contents in your own words.

11. Agree or disagree with your partner, begin your phrase with "That's right" or "That's wrong".

1) Concrete is a natural building material.
2) The most important quality of concrete is its property to be formed into large and strong monolithic units.
3) The characteristics of concrete depend upon the quality of the materials used, grading of the aggregates, proportioning and amount of water.
4) There is only one type of concrete used in construction.
5) Concrete has an adequate tensile strength.
6) Suitable combination of concrete and steel in reinforced concrete provides resistance to both compressive and tensile stresses.
7) Prestressed concrete enables lighter construction than ordinary reinforced work.
8) Dense concretes are composed of light aggregates.
9) Cellular concretes arc very heavy.
10) In-situ concrete is made on a construction site and poured into position as a wet mix.
11) Alkali-slag concrete and silica concrete contain no cement.

12. Read the sentences and add your own information.

1) Concrete is one of the most important building materials.
2) It is a mixture of cement, sand, gravel and water.
3) Concrete can be divided into two classes.
4) Reinforced concrete is a combination of concrete and steel.
5) There are two kinds of reinforced concrete.

6) The use of concrete and reinforced concrete is almost universal.
7) There is a broad division of concrete types into dense concretes and light-weight concretes.
8) Gas concrete and foam concrete are reffered to cellular concretes.
9) Concrete may be used as the material for making prefabricated units in a factory.
10) In alkali-slag concrete cement is replaced by a mixture of granulated, blast-furnace slags and sodium and potassium compounds.
11) Silica concrete is light, fire-resistant and acid-proof.

13. Look through the text and give it a title.

Plain concrete dates from very early days. It was used by the Egyptians, Romans and Greeks in the construction of bridges, roads, town walls. Romans used it even in under-water structures, some of which have survived till our time. A large part of the Great Chinese Wall (the 3 century before our era) was also built of concrete.

The concrete remains of the foundations of buildings built several thousand years ago have been found in Mexico. As cement was not known in those times, concrete was made of clay and later of gypsum and lime. Nowadays concrete is made in up-to-date machinery with very careful regulation of the proportion of the mix.

Concrete is made by binding together particles of sand and gravel, stone or broken brick. The binding agent used is a paste of cement and water, in suitable proportions. When water is added to the cement, hydration takes place. This causes the whole mixture to set and harden, forming a solid mass.

The idea of strengthening concrete by a network of small iron rods was developed in the 19 century, and reinforced concrete was introduced into engineering practice. The first results of the tests of the reinforced concrete beams were published in 1887. The first reinforced concrete skyscraper in the world was built in 1902-03 in Cincinnati, Ohio. The 16-storey structure demonstrated for the first time the safety and economy of reinforced concrete frames for high-rise construction, and was a vital stimulus for using reinforced concrete in fireproof construction. Since that time the development of reinforced concrete work has made great progress.

Reinforced concrete structures and elements are widely used both for residential houses and Industrial building».

Notes.

to survive-уцелеть
remains - остатки
hydration - гидратация
to cause -быть причиной,

заставлять
solid - твердый, прочный
network - сеть, сетка
skyscraper - небоскреб
safety - безопасность

14. Read the text and answer the given questions.
1) Is plain concrete a new material?
2) What was concrete made of, when cement was not known?
3) How is concrete made?
4) What building demonstrated for the first time the safety and economy reinforced concrete frames for high-rise construction?

15. Give a short summery of the text using the models.
1) The text is about...
2) The first part of the text is devoted to ...
3) Further, the author describes...
4) It is pointed out that...
5) The author tells that...
6) The text also discusses…
7) The text ends saying that...

16. Answer the questions:
1) What is concrete?
2) Plain concrete dates from very early days, doesn't it?
3) What is the most important quality of concrete?
4) What are the most important requirements for concrete?
5) What types of concrete are used in construction?
6) What is reinforced concrete?
7) When was reinforced concrete introduced into engineering practice?
8) What advantage has reinforced concrete?
9) What can plain concrete be used for?
10) What aggregates are dense concretes composed of?
11) Does cellular concrete contain a large number of small voids?
12) What is gas concrete?
13) Where is in-situ concrete made?
14) What is cement replaced by in alkali-slag concrete?
15) What is it used for?
16) What properties has silica concrete?

17. Reed the statements and ask what is not clear to you.

1) Concrete was made of clay and later of gypsum and lime. (Why? When?)
2) The first reinforced concrete skyscraper was built. (When? Where? How many?)
3) It is difficult to imagine modern structure without concrete. (Why? What?)
4) Many types of concrete are used in construction. (What?)
5) The use of concrete and reinforced concrete is almost universal. (Where? What?)
6) There are two kinds of reinforced concrete. (What? Where?)
7) Prestressed concrete is not subject to cracking. (Why? What? Where?)
8) Then is a broad division of concrete types into dense and light-weight concretes. (What?)
9) Some concretes are made by using materials which foam (What?)
10) Cellular concretes has very light weight. (Why? What?)

18. What would you reply if I tell you:

1) Concrete is an artificial kind of stone, much cheaper than brick or natural stone and much stronger than they are.

Oh, yea, you are quite right…
Sorry, but you are wrong…
How economical…
What properties…
Where...

2) Plain concrete dates from very early days and was used by the Romans and Greeks in the construction of rotate.

I fully agree with you…
I disagree…
How interesting…
Where else...
It seems to me...

3) Reinforced concrete is an excellent building material, used for various purposes. It is strong, fire-resistant and durable when well made.

I am of the same opinion...
I am sorry, but you are mistaken...
As far as I known...
For what purpose...
I'd like to say some words about…

4) In 1921 the first large hydroelectric power station in the country was built, the main building was a reinforced frame structure.

You are absolutely right…
I'm sorry but..
It seems to me...
How interesting...
Where... (on the river Volkhov)

5) Prestressed concrete enables heaver construction than ordinary reinforced work.

You are quite right...
I can't agree with you...
As far as I know...
On the contrary...
What advantages...

6) Prestressed concrete is used only for beams.

Oh, yes, you are right…
Sorry, but you are wrong...
I think...
To my mind...

7) There are various methods of producing light-weight concretes.

Of course...
I'm sorry, but...
What…
It seems to me...

8) Silica concrete contains no cement.

It goes without saying that…
Sorry, but you are mistaken...
Frankly speaking...
Where...
What properties...

19. What material is spoken about? What else can you say about if?

1) It is a mixture of cement, sand, gravel and water. That is...
2) It is the combination of two of the strongest structural materials, concrete and steel, That is...
3) The most important quality of this material is its property to be formed into large and strong monolithic units of any desired shape. That is...
4) These concretes are composed of heavy aggregates. They are...
5) These concretes are composed of light aggregates. They are...
6) These concretes contain a large number of small voids. They are…
7) These concretes are made by using materials which foam or form gas during

the mixing of the concrete. These are...
8) This concrete is made on a construction site and poured into position as a wet mix. It is...
9) This concrete if used as the material for making prefabricated units in a factory. It is …
10) In this concrete cement is replaced by a mixture of granulated blast-furnace slags and sodium and potassium compounds. It is…
11) This concrete is light, fire-resistant and acid-proof. It is...
12) This concrete is made by using materials which foam during the mixing of the concrete. It is...
13) This concrete is made by using materials which form gas during the mixing of the concrete. It is...
14) This concrete is not subject to cracking. It is...
15) This concrete is used for irrigation systems, roads, pavements, etc. It is…

20. Speak on concrete, its components, properties, use.

21. Speak on concrete classifications.

22. Read the dialogues in pairs and then speak about the information presented in them.

Dialogues

1

- May concrete be considered an artificial conglomerate stone?
- Certainly, it may! Why not?
- You know how it's made, don't you?
- Sure, I do. It's made by uniting cement and water into a paste.
- What about sand? Isn't sand used?
- Of course, sand is used! How can you make concrete without sand?

2

- Concrete has great compressive strength, doesn't it?
- Quite true, it has enormous compressive strength!
- Does it have great ability to withstand tension?
- Tension, you say? It has very little ability to withstand tension.

3

- What two kinds of reinforced concrete do you know?
- Concrete with ordinary reinforcement and with prestressed reinforcement.

- How are ordinary concrete structures reinforced?
- They are reinforced by introducing steel rods in stretched zones of concrete elements.
- What are reinforced concrete structures and elements widely used for?
- They are widely used for residential houses and industrial buildings.

23. Compose your own dialogues on concrete.

24. Working in pairs, discuss the information presented in the texts. Use the vocabulary given below.

GLASS CONCRETE

Central Asian scientists have developed a new building material - glass concrete. It has successfully undergone tests for durability, elasticity, and frost resistance. It can also withstand acids.

Specialists replaced cement in concrete with glass, and the concrete became much stronger. Corrosion and demolition resistance paved the way for the use of glass concrete in building hydroengineering facilities, especially in the zones with much saline lands.

The new material is produced at the plant of precast ferroconcrete in Uzbekistan.

Notes

to undergo tests - выдержать испытание
to withstand acids - противостоять кислотам
demolition - разрушение
hydroengineering facilities - гидротехнические сооружения
saline-солончак

ECONOMICAL CONCRETE

Mass production of floor and roof slabs using a new kind of concrete has started at the plant of reinforced concrete parts in Yaroslavl, a city north of Moscow. Compared with slabs made of heavy concrete, the mass of the new slabs has been reduced by 25-30 per cent and metal consumption has been cut. The production of outside wall slabs has also started. Their use will lessen the need for cement by 15 per cent reduce labour expenditures.

Notes

to compare - сравнивать
to lessen -уменьшать
to cut -снимать

labour expenditure - затраты труда

CLOTHING FOR CONCRETE

Turkmen scientists have developed a new polymer. Impregnated with it concrete does not perish in an aggressive medium and becomes 50- 100 per cent more durable. The impregnating of the concrete is completely mechanized.

to impregnate - пропитывать
to perish - терять свои свойства
medium – среда

25. Render the following in Enghish:

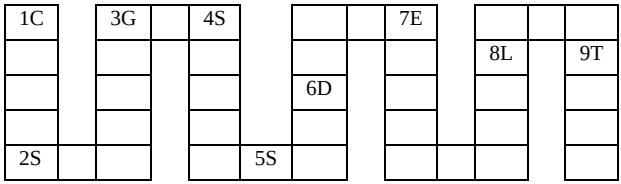
О ПОЛЬЗЕ БИТОГО СТЕКЛА

В Англии давно используют битое стекло (а также фарфор, фаянс и керамику). Осколки добавляют в бетон, асфальт и цемент. Дорожные покрытия с такой добавкой очень долговечны. А бетонные панели служат прекрасным звуковым барьером вдоль грохочущих трасс. Словом, достоинств битого стекла не перечтешь. Но вот беда! - его стало не хватать. Тогда изобрели машину для производства осколков: берете сервиз, помешаете его в специальный бункер, нажимаете кнопку и - раз! - получаете отличную порцию аккуратно упакованных осколков.

Notes

битый - broken
фарфор - china
фаянс - faience
керамика - ceramics
асфальт - asphalt
хватать - to be enough
сервиз - set
бункер - bunker
нажимать кнопку - to press the button
порция - portion

26. Here is chainword for you! The first and the last letters of each word are given. What are these 9 words?


1C
3G
4S
7E
8L
9T
6D
2S
5S

PARTS OF A BUILDING

1. Read the words and guess their meaning.

Contact, cylinder, diameter, excavation, stability, to proportion, isolated, column, natural, insolation, structure, function

2. Find Russian equivalents.

dwelling	перекрытие
foundation	стена
framework	фундамент
wall	комната
crack	этаж
to cloth	трещина
roof	купол
to resist	покрывать
floor	каркас, остов
room	крыша
shape	жилище
dome	сопротивляться, противостоять
storey	земля
ground	форма

3. Translate the following words paying attention to their components.

Outside, inside, topmost, to enclose, sometimes, basement.

4. Learn the following words and word combinations.

to dig(dug, dug) - рыть, копать
to erect - сооружать, воздвигать
to protect - защищать, охранять
to intent - предназначать
to impose - налагать
to keep from(kept, kept) - удерживать
to guard - защищать
to prevent - предохранять
to cause - вызывать, быть причиной
to rest - опираться
to set(set, set) - устанавливать
solid-монолитный,сплошной
to support - поддерживать
hollow - пустотелый, полый
to cover - покрывать
settlement - осадка, оседание
to tie - связывать
vault - свод
exposure- выставление(на солнце, под дождь...)
isolated spread footing - отдельный пирамидальный фундамент
combined footing - сборный

фундамент
mat footing - сплошной фундамент
"caisson" footing - кессонный фундамент
pitched roof- крыша со скатами
flat roof - плоская крыша

5. Read the text and render it in Russian.

Parts of a Building

The construction of a building begins with the excavation, dug for the basement. Then the foundation walls below ground level are constructed. After this the framework is erected and clothed with various finishing materials and protected by several coats of paint.

The part upon which the stability of the structure depends is the framework. It is intended for safety carrying the loads imposed The floors, walls, roofs, and other parts of the building must be carefully designed and proportioned.

Here are the main parts of a building and their functions. Foundations are to keep the walls and floors from contact with the soil, to guard them against the action of frost, to prevent from settlement which causes cracks in walls and uneven floors.

The more common types of foundation structures are: isolated spread footings (one to each column); combined footings (one to two columns); and mat foundations (all columns resting upon a heavy slab). These forms may sometimes rest directly on the bearing soil or they may rest on the piles. Sometimes the columns are set on large cylinder of plain concrete, from 4 to 8 ft. in diameter. This form is called "caisson" foundation.

Walls are built to enclose areas and support the weight of floors and roofs. An outside wall rests directly on the foundation wall forming a bearing unit for the upper floors and the roof Inside walls serve as partitions for several rooms inside the dwelling. They may or may not support other parts of the structure. The walls may be solid and hollow. The materials used for the wall construction are brick, stone, concrete and other natural or artificial materials.

Floors divide the building into stories. They may be of timber or may be constructed of fire-resisting materials.

A roof is the topmost part of a building It covers the building and protects it from exposure to the weather A roof must be strong enough to resist winds and support snow loads, and serve as insulations to prevent transmission of heat Roofs tie the walls and give strength to the structure Shapes of roofs may be flat, pitched, of domes and vaults.

6. Read the text once more and find the equivalents to the following Russian word combinations.

Рытье котлована, фундаментные стены, ниже уровня земли, различные отделочные материалы, несколько слоев краски, устойчивость здания, приложенная нагрузка, тщательно спроектированы и соразмерены, предохраняют от осадки, трещины в стенах, наиболее распространенные виды фундамента, сборный фундамент, огородить площадь, вес перекрытий и крыш, внутренние стены, несущая конструкция, верхние перекрытия, служат перегородками, монолитные стены, делят здания на этажи, огнеупорные материалы, самая верхняя часть здания, предохранять от теплоотдачи, придавать прочность зданию, формы крыш.

7. Find the definitions to the following English terms.

Framework	They divide the building into stones.
Foundations	It covers the building and protects it from exposure to the weather.
Walls	They are to keep the walls and floors from contact with the soil.
Floors	They are built to enclose areas and support the weight of floors and roofs.
Roof	The part upon which the stability of the structure depends.

8. Complete the following sentences.

1) The construction of a building begins with ... 2) The framework is erected and clothed with ... 3) Framework is intended for... 4)The main parts of a building are ... 5) The more common types of foundation structure are ... 6) Foundations may rest directly on ... 7) An outside wall rests directly on ... 8) Inside walls serve as ... 9) The materials used for the wall construction can be ... 10) Floors may be of... 11) Shapes of roofs may be ...

9. Answer the following questions.

1) What does the construction of a building begin with?
2) What is constructed then?
3) What part does the stability of the structure depend upon?
4) What is the framework intended for?
5) What are the main parts of a building?

6) What is the function of foundations?
7) What are the more common types of foundation structure?
8) What may these forms rest on?
9) What are walls built for?
10) What wall forms a bearing unit for the upper floors and the roof?
11) What do inside walls serve as?
12) May walls be hollow?
13) What divide the building into stories?
14) What materials are used for the floor construction?
15) What Is the function of roofs?
16) What shapes of roofs do you know?