ДОНСКОЙ ГОСУДАРСТВЕННЫЙ ТЕХНИЧЕСКИЙ УНИВЕРСИТЕТ

УПРАВЛЕНИЕ ДИСТАНЦИОННОГО ОБУЧЕНИЯ И ПОВЫШЕНИЯ КВАЛИФИКАЦИИ

Кафедра «Иностранных языков»

Методические указания

по развитию грамматических навыков по теме «Модальные глаголы» в устной и письменной речи
по дисциплине

«Английский язык»

Автор
Басенко Г.В.

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Аннотация

Методические указания предназначены для магистрантов всех специальностей. Содержится обзорный грамматический материал по теме «Модальные глаголы», таблицы, тренировочные и коммуникативные упражнения творческого характера на базе научно-технических текстов, ключи для контроля при самостоятельной работе.

Автор

К. филол. наук, старший преподаватель кафедры «Иностранных языков» Басенко Г.В.

Оглавление

ОБЩАЯ ХАРАКТЕРИСТИКА МОДАЛЬНЫХ ГЛАГОЛОВ И ИХ ЭКВИВАЛЕНТОВ

Модальные глаголы и их эквиваленты обозначают не действие, а отношение говорящего/пишущего к действию. Данное действие воспринимается как желательное, необходимое, обязательное, возможное и т.д.

Модальные глаголы:

can, could, may, might, must, shall, should, will, would, ought to, need, dare

Эквиваленты:

be able to, be allowed to, have to, be to

Для модальных глаголов характерно:

1) присоединение смыслового глагола без частицы –**to**, кроме эквивалентов и глагола *ought to* (They **may** be at home. They **ought to** be at home);

2) отсутствие окончания **–s** в 3-м лице единственного числа в Present Simple (I/you/*he/she*/we/they **can** speak English well);

3) образование отрицательной формы путем добавления к модальному глаголу частицы –**not** (She can**not** play golf. You may **not** park your car here);

4) образование вопросительной формы путем вынесения модального глагола на первое место (**Can** I help you? **May** I come in?);

5) отсутствие формы прошедшего времени, кроме глаголов **can (could), may (might)**;

6) отсутствие неличных форм глагола (причастия, инфинитива, герундия).

!*Эквиваленты модальных глаголов* изменяются по временам как смысловые глаголы. (I **was able to** see that film yesterday (Past Simple); I'**ll be able to** go to the exhibition with you next Sunday (Future Simple).

Модальные глаголы (и их эквиваленты) выражения *возможности*:

Глагол	Форма прошедшего времени	Форма будущего времени	Примеры
can мочь, уметь (физическая, умственная возможность)	could	-	Now he can swim very well. He couldn't swim last year.
be able to мочь, быть в состоянии	was/were able to	will be able to	They are (were) able to help us.
may мочь (иметь разрешение)	might	-	May I come in? He might come in though he was late.
be allowed to разрешается, позволяется	was/were allowed to	will be allowed to	We are (were) allowed to use dictionaries in class.

Модальные глаголы (и их эквиваленты) выражения *долженствования*:

Глагол	Форма прошедшего времени	Форма будущего времени	Пример
must должен (моральный долг)	-	**-**	Parents must care for their children.
have to должен (по обстоятельствам)	had to	will have to	We have (had) to be at home at 9 p.m.
be to должен (по графику, плану)	was/were to	will be to	They are (were) to arrive at noon.

should следует (совет), должен (моральная обязанность)	-	-	You should be very attentive.
ought to должен (обязательство, навязчивый совет)	-	-	You ought to see this interesting film.

Модальные глаголы с перфектными формами инфинитива:

Перфектная форма инфинитива	Пример	Перевод
can have V3 (возможность)	He can have written it.	Наверное (возможно), он написал это.
could have V3 (порицание) вопросит.форма (удивление) отрицат.форма (недоверие)	He could have written it. Could he have written it? He couldn't have written it.	Он мог бы это написать. Неужели он это написал? Не может быть, чтобы он это написал.
may have V3 (вероятность)	He may have written it.	Возможно (вероятно), он это написал.
might have V3 (упрек)	He might have written it.	Он мог бы и написать это.
must have V3 (предположение)	He must have written it.	Должно быть, он написал это.
should have V3 (порицание)	He should have written it.	Ему следовало написать это.
needn't have V3 (отсутствие необходимости)	He needn't have written it.	Ему не нужно было это писать.

UNIT I
"TUNNELS"

I. Read the text. State the meanings of the modal verbs highlighted in the following sentences. Translate the sentences:

CHANGES TO ENGINEERING

Engineering in the transport sector **must have** increasingly **become** an area of work for highly-educated, computer-literate professionals. These engineers **have to face** practical challenges in a period of rapid technological advances. The traditional engineering skills **should be** in demand in the transport sector: aerodynamics and mechanics, electrical and electronic, chemical and materials. But the big transport projects **ought to require** engineers with a range of other skills, including project management, business development, teamwork and even aesthetics. A new breed of engineers **has to be trained**, with a more global view of the growth of a complex system over a period of time. A transport system **may be** in use for 20 years or more, during which time developments in technology, materials and ways of thinking will have happened, so design systems have to be flexible.

II. Translate the following sentences with modal verbs and their equivalents paying special attention to their passive forms:

1) Science on the scale that it exists and **is needed** today **can be maintained** only with large amounts of public support.

2) The problem which I am setting before myself **may be indicated** by a comparison.

3) On this point I **cannot** altogether **agree** with him.

4) Those who have patience to read this book to the end **will have to admit** that language is not a personal creation.

5) And it **must not be forgotten** that humans are only one factor in the ecosystem.

6) In order to become proficient in literary composition, we **must acquire** habits of concentration, we **must be able to analyze**, and we **must become** expert in synthesis and develop our intelligence.

7) We **must not neglect** our spontaneous powers, nor **should** we **despise** our intellectual powers.

8) His conscious attention **will have to be devoted** to this process.

9) Automatism is acquired by repetition but this repetition **need not be** of the parrot-like type.

10) It is worth adding that some of the most efficient practitioners at this time **were to be found** in Jesuit school.

III. Read the following texts. Find the modal verbs and their equivalents in them. Translate the sentences paying attention to the active and passive forms of the modals:

TUNNEL PORTALS

Portals and ventilation shafts should be located such that they satisfy environmental and air quality requirements as well as the geometrical configuration of the tunnel. At portals, it may be necessary to extend the dividing wall between traffic travelling in opposite directions to reduce recirculation of pollutants from the exit tunnel into the entry tunnel. If possible, portals should be oriented to avoid drivers being blinded by the rising or setting sun. Special lighting requirements at the portal are needed to address the "black hole" effect. The portal should be located at the point where the depth of the tunnel is suitably covered. It has to depend on the type of construction, the crossing configuration and the geometry of the tunnel. For example, in a cut and cover tunnel, the portal can be as close to the surface as the roof of the tunnel can be placed with sufficient clearance for traffic. On the other hand, in mined tunnels the portal will be placed at a location where there is a sufficient ground cover. In mountain tunnels the portal can be as close to the face of the mountain as practically constructible.

EMERGENCY EGRESS

Emergency egress for persons using the tunnel to a place of refuge should be provided at regular intervals. Throughout the tunnel, functional, clearly-marked escape routes should be provided for use in an emergency. Exits should be clearly marked and the spacing of exits into escape routes should not exceed 1 000 feet (300 m) and should comply with the latest Standard for Road Tunnels, Bridges and other Limited Access Highways. Emergency exits should be provided to safe secure locations.

The emergency egress walkways should be a minimum of 3.6 ft wide and should be protected from oncoming traffic. Signage indicating both direction and distance to the nearest escape door should be mounted above the emergency walkways at reasonable intervals (100 to 150 ft) and be visible in an emergency. The emergency escape routes should be provided adequate level and connected to the emergency power system.

Where tunnels are provided in twin tubes, cross passages to the adjacent tube can be considered a safe haven. The cross passage

should be of at least two-hour fire rating construction and should be equipped with self closing fire rating doors that open in both directions or sliding doors. The cross passages should be located not more than 656 ft (200 m) apart. An emergency walkway at least 3.6 feet (1.12 m) wide should be provided on each side of the cross-passageways.

In long tunnels sometimes breakdown emergency alcoves (local widening) for vehicles are provided. Some European tunnels also provide at intervals an emergency turn-around for vehicles into the adjacent roadway duct which turn-around would normally be closed by doors.

IV. Change these sentences with modals from Active into Passive:

Model: Scientists may discover the origins of the universe. – The origins of the universe may be discovered by scientists.

1) We can find more information about the Hadron Collider at www.lhc.ac.uk.
2) They should discuss your situation at the conference.
3) They may delay the conference.
4) The engineers must use computers very often.
5) They can build a new ring road round the city.

V. Look through the text and choose the appropriate active or passive form of the modal verb "should". Translate the text.

EMERGENCY VENTILATION, LIGHTING AND COMMUNICATION

An emergency ventilation system 1) **should/should be** provided to control smoke and to provide fresh air for the evacuation of passengers and for support to the emergency responders. The emergency ventilation system is often the normal ventilation system operated at higher speeds. Emergency ventilation scenarios 2) **should/should be** developed and the operation of the fans would be based on the location of the fire and the direction of the tunnel evacuation. The fans 3) **should/should be** connected to an emergency power source in case of failure of the primary power.

Emergency tunnel lighting, fire detection, fire lines and hydrants 4) **should/should be** provided. In certain installations fire suppression measures such as foam or deluge system have been used. The risk of fire spreading through power cable ducts 5) **should/should be** eliminated by dividing cable ducts into fireproof sections, placing cables in cast-in ducts using fireproof cables where

applicable and other preventative measures. Vital installations 6) **should/should be** supplied with fire-resistant cables. Materials used 7) **should not /should not be** release toxic or aggressive gases such as chlorine. Water for fire-fighting 8) **should/should be** protected against frost. Fire alarm buttons 9) **should/should be** provided adjacent to every cross-passage. Emergency services 10) **should/should be** approach a tunnel fire in safety.

Emergency telephones 11) **should/should be** provided in the tunnels and connected to the emergency power supply. When such a telephone is used, the location of the caller 12) **should/should be** identified both at the control center and by a warning light visible to rescuing personnel. Telephones 13) **should/should be** provided at cross passage doors and emergency exits. Communication systems 14) **should/should be** give the travelling public the possibility of summoning help and receiving instructions and 15) **should/should be** ensure coordinated rescue. Systems 16) **should/should be** raise the alarm quickly and reliably when unusual operating conditions or emergency situations arise.

Radio coverage for police, fire and other emergency services and staff 17) **should/should be** extend throughout the tunnel. It is necessary for police, fire and emergency services to use their mobile radios within tunnels and cross-passages. Radio systems 18) **should not /should not be** interfere with each other and 19) **should/should be** connected to the emergency power supply to communicate with each other. It is recommended that mobile telephone coverage be provided.

UNIT II
"WATER SUPPLY AND SEWAGE"

I. Read the texts. State the meanings of the modal verbs highlighted in the following sentences. Translate the sentences paying special attention to the passive form of the modals:

QUANTITY OF WATER AND SEWAGE

1) In the design of any waterworks project it is necessary to estimate the amount of water that is required. This involves determining the number of people who will be served and their per capita water consumption, together with an analysis of the factors that **may operate** to affect consumption.

2) It is usual to express water consumption in liters or gallons per capita per day, obtaining this figure by dividing the total number of people in the city into the total daily water consumption. For many purposes the average daily consumption is convenient. It is obtained by dividing the population into the total daily consumption averaged over one year. It **must be realized**, however, that using the total population **may**, in some cases, **result** in serious inaccuracy, since a large proportion of the population **may be served** by privately owned wells. A more accurate figure would be the daily consumption per person served.

CONSUMPTION FOR VARIOUS PURPOSES

1) The water furnished to a city **can be classified** according to its ultimate use or end. The uses are: *Domestic:* This includes water furnished to houses, hotels, etc., for sanitary, culinary, drinking, washing, bathing and other purposes. This also includes air conditioning of residences and irrigation or sprinkling of privately owned gardens and lawns, a practice that **may have** a considerable effect upon total consumption in some parts of the country. The domestic consumption **may be expected** to be 50 percent of the total in the average city; but where the total consumption is small the proportion will be much greater.

2) *Commercial and Industrial:* Water so classified is that furnished to industrial and commercial plants. Its importance will depend upon local conditions, such as the existence of large industries, and whether or not the industries patronize the public waterworks. In cities of 25,000 people commercial consumption **may be expected** to amount to about 15 percent of the total consumption.

3) *Public Use:* Public buildings, such as city halls, jails and schools as well as public service – flushing street and fire protection –

require much water for which, usually, the city is not paid. Such water amounts to 50 to 75 l per capita.

4) *Loss and Waste:* This water is sometimes classified as "uncounted for", although some of the loss and waste **may be accounted** for in the sense that its cause and amount are approximately known. It is apparent that the unaccounted-for water, and also waste by customers, **can be reduced** by careful maintenance of the water system and by universal metering of all water services.

5) The total consumption will be the sum of the foregoing uses and the loss and waste. The average daily per capita consumption **may be taken** to be 670 l. Each city **has to be studied,** particularly with regard to individual and commercial uses and actual or probable loss and waste. Care **must** also **be taken** in considering per capita figures since the figure **may be based** upon persons actually served or upon census population of the city.

II. Read the following text. Find the modal verbs and their equivalents in them. Translate the sentences paying attention to the active and passive forms of the modals:

RELATION TO WATER CONSUMPTION

Sanitary sewage and industrial waste will obviously be derived largely from the water supply. According, an estimate of the amount of such wastes to be expected must be prefaced by a study of water consumption, either under present conditions or at some time in the future. The proportion of the water consumed which will reach, the sewer must be decided upon after careful consideration of local conditions. Water used for steam boilers in industries, air conditioning, and that used to water lawns and gardens may or may not reach the sewers. On the other hand, many industrial plants may have their own supplies but discharge their wastes into the sewers. Although the sewage may vary in individual cities from 70 to 130 percent of the water consumed, designers frequently assume that the average rate of sewage flow, including a moderate allowance for infiltration, equals the average rate of water consumption.

III. Translate the following text paying attention to the modal verbs in active and passive forms:

The first step in any industrialization project should be preparation for plant construction. It is economically desirable to use local materials for this. It is well-known that metals form the most important group of engineering materials. One must know that they

possess necessary mechanical and physical properties. They can be easily fabricated into various forms by a variety of techniques. They are hard, tough, strong and temperature-resistant, a combination of properties not available in any other materials. The properties of metals can be changed by heat treatment so that the fabrication is much easier since the work pieces can have properties quite different from those needed in the final product.

IV. Translate the following sentences from Russian into English:

1) Вам следовало бы принять во внимание все подробности, когда вы обсуждали этот вопрос.

2) Не может быть, чтобы он опоздал на экзамен.

3) У меня много работы. Я должен успеть ее выполнить в срок.

4) Она могла бы сделать эту работу сама.

5) Вероятно, он забыл о нашей встрече.

6) Должно быть, он очень занят и не смог нам перезвонить.

7) Он мог бы сообщить о том, что не придет заранее.

8) Ему не нужно было отменять деловую встречу.

9) К сожалению, у него не было времени позвонить. Он должен был срочно уехать.

10) Должно быть, он очень важный человек.

UNIT III
"CONSTRUCTION MATERIALS"

I. Read the following text. State the meanings of the modal verbs highlighted in the following sentences. Translate the sentences:

FLOOR FOR INSTALLATIONS NEW AREA OF APPLICATION FOR PRECAST CONSTRUCTION

1) For the floor system, the "floor for installations", the installation conduits are laid in the loadbearing structure. In this way, the structural height required for accommodating the installation conduits **can be used** for the loadbearing structure. Furthermore, the span **can be increased** and the total height of the floor **can be reduced.**

2) The loadbearing construction height is 70 cm and **can span** floor bays of 12m x 12m. Here, the weight and building-physical properties correspond to those of a floor of 20cm height; however, the latter **can** only **be spanned** over a maximum of 7m.

3) The target value for the span **should be** less than 8m, as larger spans create solid floors with proportionately larger own weights and become uneconomical. All building-services conduits **can be laid** within the loadbearing construction.

4) The sound insulation behaviour **can be assumed** to equal that of a reinforced-concrete slab of 20cm thickness with false ceiling or that of a conventional floor.

5) The loadbearing construction **can be** rapidly and simply **formed** using individual partly precast parts.

6) There is no need for complex formwork. The precast units **can be loaded** immediately after installation. After concreting, a floor substructure **can be cast** in the area of the continuous upper cord on which large-sized wooden boards **can form** the construction site floor. Upon completion of the interior work, a conventional floor structure or false ceiling panels **can be built** onto this substructure.

II. Look through the text. Use the following modal and notional verbs in the correct form. Translate the text:

EVALUATION OF CONSTRUCTION MATERIALS AND CORROSION PROTECTION SYSTEMS FOR DURABILITY IN TECHNICAL WASTEWATER SYSTEMS

1) The wastewater treatment systems … (be to, design) to resist the physical and chemical actions to which they will be exposed for a targeted service life of approximately 100 years. In specific

cases, additional protective measures for the concrete … (may, require) to reach this objective.

2) The corrosive chemical substances that … (can, damage) technical wastewater systems on the inside, as well as on the outside, depending on the materials used … (can, classify) into organic substances (e.g. aliphatic, aromatic or halogenated hydrocarbons).

3) The spectrum of construction materials and protection systems for technical wastewater systems is highly complex. While the resistances of the various systems to mechanical actions are generally sufficiently well known, the chemical resistances … (can, predict) due to a lack of reliable findings.

4) Cement-bound materials such as, e.g., concretes, … never (can, engineer) to become totally resistant to the aggressive actions of acids; at best, the resistance to such actions … (can, increase). Here it … (must, keep) in mind that in conventional concrete is already durably resistant to the permanent exposure to, for example, communal wastewaters with pH value that is not very low. This resistance … (must, increase).

5) To increase the density of the cement stone structure, not only the aggregate sizes … (should, grade), but the granulometric composition of the binders … (should, adjust) to each other.

6) High acid resistance is a typical characteristic of high performance concrete. To obtain the desired properties reliably, special attention … (must, give) during production to high uniformness of the initial constituents, as well as when weighing in the individual components. Special care … (must, take) to ensure that this concrete does not segregate during placement. This … (can, ensure) by reducing the drop height.

III. Translate the highlighted modal verbs into English. Pay attention to the active and passive forms of the modal verbs. Translate the text:

INFLUENCE OF CEMENT-ADMIXTURE INTERACTION ON THE RHEOLOGY OF MORTAR AND CONCRETE

1) During mass production of concrete elements in a precast plant and during large concrete jobs on construction sites it **… может случится** (happen) that the rheological parameters of concrete change drastically during concrete production when a new cement delivery is used.

2) High yield cement **… может быть определен** (to define) as a cement which generates a yield stress higher than the average yield stress plus the standard deviation within the test series.

3) Particularly SCC, with its high cement content and high admixture dosage **... может находиться под воздействием** (to affect) by cement admixture interaction.

4) The cement is coming from the same plant and the same production line. Various difficulties on construction sites **... могут быть вызваны** (to cause) by cement-admixture interaction.

5) The effect of the distinct cement deliveries in mortar and concrete **... можно увидеть** (to see) that mortar and concrete correlate rather well.

6) The variations in concrete were somewhat lower than in mortar. This **... могло бы иметь отношение** (to relate) to the relatively high admixture dosage in SCC mix and the delayed addition of the admixture to the concrete.

IV. Translate the following sentences paying attention to the Perfect Infinitive with the modal verbs:

1) They may have studied better.
2) They might have studied better.
3) The Pyramids must have been built 5 000 years ago.
4) He could have got an interesting job advertised in the newspaper.
5) It didn't rain yesterday. I needn't have taken an umbrella.
6) He couldn't have forgotten his new idea.
7) The meeting can have started on time.
8) You should have come to the meeting beforehand.
9) Could he have spent so much time in the lab?
10) She must have defended the theses that spring.

V. Change the following expressions of advice into criticism of a past action by changing the form of the Infinitive:

Model: You shouldn't say such things (present). – You shouldn't have said such things (past).

1) He shouldn't speak so long at the conference.
2) She shouldn't lose such a good job.
3) They shouldn't miss classes.
4) We shouldn't send him on a business trip.
5) You shouldn't neglect safety rules at the plant.

VI. Criticize the actions below according to the model (work in pairs):

Model: **-** I forgot to tell you about the conference. – *a)* You should have told me about the conference. *B)* You shouldn't have

forgotten about the conference.

1) I left my papers at home.
2) He wasn't ready for the examination.
3) She didn't take part in the general discussion.
4) I didn't read enough books to finish the idea in the article.
5) Their project suffered several technical setbacks.

VII. Circle the correct perfect forms of the modal verbs:

MICHAEL DELL

How 1) **must he have/could he have** managed to become the youngest CEO of one of the largest American companies? Michael Dell's company – Dell Computer Corporation – now earns more than $50 million on a daily basis! It sells computers all over the world. You may even have a Dell computer at home!

How did he do it? It 2) **mustn't have/can't have** been easy, especially when he'd been told at school that he wouldn't get anywhere in life! He 3) **could have been/can't** have been discouraged, but he wasn't.

He was an average student who was interested in computers like lots of other teenagers. He 4) **must have been/can't have been** a bit different, though, because one day he brought a computer home and started to take it apart. He then reassembled it just to see if he could. At university he started building computers for his fellow students.

He dropped out of college and never looked back. He managed to fulfil his dream of making and selling computers. In 1984 with only $1,000, he started his own company. His parents 5) **needn't have worried/shouldn't have worried** as he went on to become a successful businessman.

UNIT IV
МОДАЛЬНЫЕ ГЛАГОЛЫ "MUST" (MUSTN'T) И "HAVE TO (DON'T HAVE TO")

+	You **must** wear a hard hat. We **have to** clock in.	It is necessary.
-	You **mustn't** smoke.	It is not allowed.
-	We **don't have to** wear hard hats in the office.	It is not necessary.
?	**Must** we clock in?* **Do** we **have to** clock in? (***have to** – обычно в вопросах)	Asking if something is necessary.

I. Read the text "A factory tour" paying attention to the underlined modal verbs. Then complete the company's health and safety rules with 8 of the items in the box:

arrive fire alarm fire extinguishers food and drink hard hat smoke protective clothing temperature warehouse waste material

A FACTORY TOUR

- Good morning, everyone. I'm Alistair Patterson and I'm responsible for health and safety here at the plant. Before we start the tour of the plant, please put on your jackets and the hard hats. Remember that you must always wear a hard hat when you are moving around the plant. Ok, good. Is everyone ready? I'll take you around the main production lines first, then we'll visit the warehouse and we'll finish the tour back here in the main office building…

Now obviously, you mustn't smoke in the production area – in fact, there is no smoking allowed anywhere. Until last year, we had a special smoking area outside the office building, but now the whole plant is a no-smoking zone. As you can see, the main hazard here is the machinery. That's why you should always wear protective clothing. In fact, you can't enter this area if you aren't wearing jackets and hard hats…

Well, here we are in the warehouse. There are a lot of fire hazards in the warehouse, and so this area must be kept clean and tidy at all times. If you are working here, always put all waste material into the bins. There are fire extinguishers on the walls and the fire

exit is on the left. Can you see it? It's quite clearly marked. Please remember, you are not allowed to have any food or drink in the warehouse area. You can only eat or drink in the canteen…

Now, just before we go back into the main office building, can you see the sign on the wall here? This is the main assembly point, where you should come if there is an emergency – a fire, for example. We do regular fire drills and you should come here to this assembly point when you hear the fire alarm. This is the way we check that all employees and visitors are safe. That's why visitors must always sign in when they arrive at the plant and sign out when they leave. We have to know who is on site at all times. Now, are there any questions?

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1) You must always wear a …… when you are moving around the plant.
2) You mustn't ……..anywhere.
3) You can't enter the production area if you aren't wearing …….
4) The ……..must be kept clean and tidy.
5) Always put all ……..into the bins.
6) You can only consume ……in the canteen.
7) You should come to the assembly point when you hear the ……
8) Visitors must sign in when they ……..at the plant.

II. Choose the correct verbs to complete the list of health and safety rules for the workplace.

1) Women *should/must/shouldn't* wear high-heel shoes at work.
2) Stairs *can't/don't have to/must* be clear of obstacles.
3) All exits *don't have to/should/can't* be kept clear.
4) You *have to/can/mustn't* leave any objects on the floor.
5) You *should/mustn't/don't have to* behave correctly at work.
6) You *don't have to/must/shouldn't* tie back your hair if it is long.
7) You *have to/mustn't/can't* wear a protective mask when operating machines.
8) You *can/mustn't/should* smoke.
9) For safety reasons, you *don't have to/can/mustn't* wear a tie when operating machines.
10) When lifting boxes, you *don't have to/should/mustn't* bend

your knees.

III. What rules or guidelines are there in your workplace? Compare with a partner ask follow-up questions.

Model: A: We have to wear white coats in the laboratory.

B: Oh, we don't have to wear any special clothing. Why do you have to wear white coats?

UNIT V
"ARCHITECTURE AND DESIGN"

I. Read the following text. Find the modal verbs and translate them paying attention to the active and passive forms of the modals:

HIGH PERFORMER

It may be grim outside today but a summer of orchestras and proms in the park will soon be upon people. The work of the architect Jason Flanagan at Fosters and BFLS has included the Sage at Gateshead and the Performing Arts Centre for the Welsh College of Music and Drama. But work on a small acoustic project with conductor Mark Stephenson soon turned into something more as they spotted a gap in the market of mobile stages and, working with Arup Acoustics, patented an acoustically lined stage.

To carry out this new project the three sizes of stage should have a lightweight aluminium truss structure that goes up like a pram hood, an inflatable skin completes the shell and acoustic liners flown inside. As well as creating a reflective surface for performers inside to hear themselves, and the rest of the ensemble, the shell should have a peak that projects sound out to an audience of up to 750 without amplification.

II. Look through the text and choose the appropriate form of the modal verbs. Translate the text.

TWO WATERSIDE MUSEUMS

To go in the space of a week from Zaha's Riverside Museum in Glasgow to the new M Shed Museum in Bristol (by Melbourne's LAB architects, and also on the waterfront) 1) **is to/is to be** see two utterly different approaches to the business of making a regional cultural centre. Zaha's big striated zigzag of a building 2) **can/can be** draw from its context to a perhaps surprising extent – there 3) **should /should have** be echoes of the remaining big industrial sheds of Clydeside with their sawtooth roofs, plus the fluid confluence of the rivers Kelvin and Clyde at this point. But it 4) **must/must have** be all-new, making its mark in a distinctly denuded postindustrial setting.

At Bristol's M Shed, given that the architects are also known as icon-builders (think Federation Square in Melbourne) you 5) **might/might be** expect eruptions of fractal geometry. But no. This is a well-mannered, modest bit of re-use of an existing dockside warehouse. One that is not especially remarkable or historic – it dates from the 1950s and is not listed – though it 6) **must/must have**

have a functionalist purity to it.

LAB architects really only 7) **can/can be** get their trademark fractals going in the staircase atria at the two ends of the building, plus they make one large incision to make their slightly forward-leaning entrance façade. Otherwise, you think, it 8) **may/may have** be actually quite a modest little regional museum, the kind of memory-attic that provincial cities used to have. Plus it has interesting things around it like working dockyard cranes, steam engines and historic boats. At Glasgow's Riverside, everything 9) **should/should have** be static.

Despite that, Zaha in Glasgow is all about transport and travel. Two things put you off: the relentlessly pistachio-green interior, which feels like coloured cake icing, and the massively over-cluttered collection of vehicles. It's like one huge traffic jam in there. It 10) **could/could be** edited down by 50 per cent easily. So if you're museum-spotting for architecture, head for Glasgow – it's good if not great Zaha. But if you want a well-balanced and presented display of local material in a relatively understated building in more congenial urban surroundings, then you 11) **should/should have** make for M Shed in Bristol.

III. Look through the text. Use the following modal and notional verbs in the correct form. Translate the text:

LIFESPAN

What is the lifespan of a building, or a building restoration? Despite the fact that much of the population lives in houses that are a century or more old, the answer nearly always **1)** (can, appear) to be 30 years.

The 1863 Temperate House in Kew Gardens **2)** (need) a £28m restoration. Go there today and you'll see the proudly-carved stone inscription marking its re-opening by the Queen - in 1982. That **3)** (could, mark) the completion of the last restoration. There is controversy over Make Architects' proposal to demolish part of Arup Associates' Broadgate complex in the city of London and replace it with something very much bigger. The original Broadgate is only 25 years old. No wonder there are moves afoot to get Richard Rogers' Lloyd's of London building listed. It too is 25 years old.

Some buildings are of course **4)** (should, design) for much longer lifespans - the British Library by Sandy Wilson and Portcullis House by Michael Hopkins both have something like a 250 year design life, and you **5)** (cannot, help) noticing that medieval cathedrals and timber-frame houses last pretty well, too. But in the commercial

sector, 25 to 30 years **6)** (be to, be) the norm. Consider the demountable new building for Garsington Opera by Robin Snell, in June's RIBAJ. Demountable it **7)** (may, be), but not 'temporary'. It will be put up and taken down again every year. And its planned design life is - 30 years.

КЛЮЧИ

EMERGENCY VENTILATION, LIGHTING AND COMMUNICATION

1) should be 2) should be 3) should be 4) should be 5) should be 6) should be 7) should not 8) should be 9) should be 10) should 11) should be 12) should be 13) should be 14) should 15) should 16) should 17) should 18) should not 19) should be.

EVALUATION OF CONSTRUCTION MATERIALS AND CORROSION PROTECTION SYSTEMS FOR DURABILITY IN TECHNICAL WASTEWATER SYSTEMS

1) are to be designed, may be required 2) can damage, can be classified 3) can be predicted 4) can never be engineered, can be increased, must be kept, must be increased 5) should be graded, should be adjusted 6) must be given, must be taken, can be ensured.

INFLUENCE OF CEMENT-ADMIXTURE INTERACTION ON THE RHEOLOGY OF MORTAR AND CONCRETE

1) can happen 2) can be defined 3) can be affected 4) can be caused 5) can be seen 6) might be related.

TWO WATERSIDE MUSEUMS

1) is to 2) can 3) should be 4) must 5) might 6) must 7) can 8) may 9) should 10) could be 11) should.

LIFESPAN

1) can appear 2) needs 3) could have marked 4) should be designed 5) cannot help 6) is to be 7) may.

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