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Институт общественных наук и международных отношений

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INTRODUCTION TO ENVIRONMENTAL DISCOURSE

Учебное пособие по дисциплине «Аналитическое чтение»
для студентов направления подготовки 45.04.01 Филология

Симферополь
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Составленное учебно-методическое пособие предназначено для студентов вузов, которые изучают английский язык как основной иностранный. Его главной целью является формирование прочных знаний студентов в процессе усвоения профессионально ориентированных дисциплин, важной составляющей которых является аналитическое чтение.

Данные материалы могут быть полезными для всех, кто изучает и преподаёт английский язык как в высших учебных заведениях.

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ПРЕДИСЛОВИЕ INTRODUCTION

Профессиональная деятельность выпускников магистратуры направления подготовки 45.04.01 Филология связана с решением научно-исследовательских, педагогических, прикладных и проектно-организационных задач в таких областях, как образование и наука, средства массовой информации, сфера перевода, а также сфера устной и письменной коммуникации.

Подготовка к решению столь разнообразных по своему характеру задач, требует наличия широкого кругозора и особого профессионально-ориентированного мышления, способностей мыслить критически и аналитически с учетом специфики сферы деятельности, работать с информацией и принимать решения на основе фактов; самостоятельно обучаться и развиваться; уметь работать в команде и общаться с коллегами.

Одним из направлений совершенствования профессиональной подготовки в таком контексте становится диверсификация содержания образования, формирование навыков ознакомления и работы с разными видами дискурсов, отражающими взаимосвязь политических, социальных и экономических процессов и явлений.

Гуманитарный характер, направленность на формирование межкультурной компетенции позволяют в качестве оптимального вектора диверсификации содержания обучения магистров-филологов выбрать глобальные проблемы. Одним из основных вызовов современности является изменение климата. Непредсказуемость погодных условий, повышение уровня моря, увеличивающее риск природных катастроф, рассматриваются как последствия изменения климата, имеют глобальный характер и беспрецедентные масштабы.

В основу учебного пособия легли материалы ВОЗ, ООН и других международных организаций, которые знакомят студентов с основными международными документами. При отборе текстов целью было освещение разных точек зрения на решение данных проблем с тем, чтобы у студентов было сформировано наиболее полное и адекватное представление об этих социально значимых явлениях. При составлении глав и подразделов мы руководствовались необходимостью собрать о предмете изучения достаточно данных для выяснения его сущности. В связи с этим были отобраны разные виды текстов (печатные тексты, иллюстрации, графики, таблицы, плакаты, мультимедийные тексты), которые позволяют формировать необходимые в современной медиа среде навыки работы с текстом. Предложенные в пособии упражнения соответствуют разным уровням понимания текста: общее понимание текста, поиск и извлечение информации, обобщение и интерпретация, рефлексия и самооценка. Освоению новой лексики способствует выполнение тренировочных упражнений с опорой на тексты и прилагающийся глоссарий.

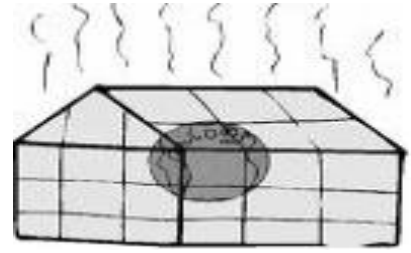
Особое внимание в пособии уделяется медиа текстам. В конце каждого подраздела имеются задания для работы с мультимедийными материалами.

Ознакомление с экологическим дискурсом 1) позволит лучше понимать особенности экологической терминологии, что необходимо для обеспечения качественного перевода, анализа научных текстов и статей по экологии; 2) будет способствовать развитию навыков критического мышления, необходимых для оценки и интерпретации аргументов и данных, связанных с экологическими проблемами; формированию экологической культуры в целом; 3) позволит быть готовым к участию в дискуссиях и дебатах по вопросам охраны окружающей среды, повышать уровень осведомленности о глобальных экологических проблемах; 4) позволит анализировать взаимосвязи между экологическим дискурсом и социальными, политическими и экономическими процессами, влияющими на состояние окружающей среды.

В преподавании дисциплины «Аналитическое чтение» для студентов направления подготовки 45.04.01 Филология данное учебно-методическое пособие может использоваться в аудиторной, самостоятельной и индивидуальной работе студентов.

UNIT 1. GLOBAL CLIMATE CHANGE

CHAPTER 1. MAN-MADE CLIMATE CHANGE?



For the first time in human history, people think **THEY** are changing the Earth's climate by emitting so-called greenhouse gases into the atmosphere. They believe that the main cause is the dramatic increase in the use of fossil fuels (coal, oil and natural gas) since the Industrial Revolution.

1 A. Look at the questions about the history of climate change. Answer them if you can, making guesses where you are not sure.

- a) Is the Earth's climate always changing?
- b) What happened during the period called Ice Age?
- c) How did the climate shifts influence people's lives in the past?
- d) Can we characterize the situation today as a man-made climate change?

1 B. Read the text and prove your answers. Were you right in all your suggestions?

Past climate change

The Earth's climate is always changing. Only 20,000 years ago, much of Northern Europe **was covered** in an enormous **glacier** that was up to three kilometres thick! The Alps and the Pyrenees mountains were covered with smaller **ice caps**. Sudden **climate shifts** happened quite frequently during the Ice Age, and made the ice **expand** or **contract**. In the cold climate **south of** the ice-covered areas, small groups of people hunted **reindeer**, wild horses, and bison.

People living in the Ice Age **left behind** stone tools and fantastic cave paintings but their way of life **was about to** disappear. Over thousands of years, the Earth's orbit around the sun changed, summers became warmer and the ice began **to melt**. The Ice Age ended around 10,000 years ago. Since then, the climate in Northern Hemisphere has been warmer and far more stable. Over the last 10,000 years the climate has been milder and people have **developed agriculture, cities, and civilization** – which would have been far more difficult during the Ice Age. We will always **be at risk of** unexpected and unpleasant climate changes **resulting from natural causes**. For example, around 400 years ago Europe experienced a relatively cold period called the Little Ice Age (but not as cold as a real ice age). What is different about the situation today is that we **risk rapid changes** in climate caused by people. Because of our increasing emissions of CO₂ and other greenhouse gases, we expect that **over the next hundred years** we will see the fastest warming of the Earth since the end of the Ice Age.

1 C. Fill in the words from the list, then make sentences using the completed phrases.

from, rapid, agriculture, shifts, ice, natural

..... caps, climate, develop, causes, risk
..... changes

1 D. Fill in the prepositions from the list, then make sentences using the completed phrases.

over, of, behind, in, at, about to, in

south the ice-covered areas, covered, leave, was
disappear, be ... risk of, result....., the next hundred years

1 E. Give explanations to the words in bold and make up sentences with them.

2 A. Look at the following questions, answer them if you can, making guesses where you are not sure.

a) Which of the factors mentioned below do you think contribute to the greenhouse effect:

- a. rotting vegetation;
- b. water vapour;
- c. respiration of animals and people;
- d. photosynthesis;
- e. exhaust fumes?

b) Can the green house effect be viewed as a natural phenomenon? Why?

c) What would the modern world be like in case we didn't have the green house effect?

- a. It would be a perfect place to live.
- b. It would be completely uninhabitable.

2 B. Read the text and check your answers.

Global climate change

Man-made climate change **occurs** because we emit greenhouse gases into the atmosphere. These emissions come from many sources, including factories and agriculture that **supply us with** food and other material goods, power plants which **provide us with** electricity and cars and planes that take us where we need to go.

Greenhouse gases **affect** the Earth's climate by increasing the greenhouse effect. This is a **natural phenomenon** where **water vapour, carbon dioxide** and other gases in the atmosphere allow sunlight to pass reach the Earth's surface, but then absorb much of the reflected heat from the Earth that otherwise would have escaped to **outer space**. Without the natural greenhouse effect, the average temperature would be about minus 18°C, and the Earth would be **uninhabitable**. Emitting greenhouse gases in large amounts **increases** the concentration of these gases in the atmosphere. This increases the greenhouse effect so that more heat **is**

trapped by the atmosphere. This increases the temperature of the atmosphere and changes the Earth's climate.

Where do emissions come from?

Of all the greenhouse gases we emit, CO is the **greatest contributor** to the man-made **increase in** the greenhouse effect. Not only do we emit huge amounts of CO, but it also takes a very long time to disappear from the atmosphere after it has been emitted. Since the Industrial Revolution, people have emitted large amounts of CO through the consumption of fossil fuels such as coal, oil, gasoline, and natural gas.

Although most emissions of CO₂ come from natural sources, such as **rotting vegetation**, it is the emissions from human activity that **tip the scales** and **create the imbalance that** leads to global warming. This is because nature's own emissions are part of a cycle **whereby** carbon **rotates** between the atmosphere, the oceans and land-based vegetation. For example, both rotting trees and **the respiration of** animals and people emit CO₂, while living plants and trees absorb equivalent amounts of CO₂ through photosynthesis.

2 C. Fill in the words from the list, and then make sentences using the completed phrases

contributor, water, increase, phenomenon, affect, dioxide, scales, create, respiration, rotting

..... the Earth's climate, natural, vapour, carbon, in the greenhouse effect, vegetation, tip the, the imbalance, the greatest to, the of animals and people

2 D. Fill in the prepositions from the list, then make sentences using the completed phrases.

to, by, with, between, with

supply us, provide us, escaped outer space, trapped, rotates the atmosphere, the oceans and land-based vegetation

2 E. Give explanations to the words in bold and make up sentences with them.

2 F. Complete the table:

Verb	Noun
emit	
increase	
	contribution
adapt	
	development

Working with Media: Media text analysis

Find information on the Industrial Revolution in a) Great Britain; b) Russia.

Analysing the Internet sources think about the following questions: 1) Who has created the message? 2) What creative techniques are used to attract your attention? 3) How might different people understand this message differently than me? 4) What values, lifestyles and points of view are represented in, or omitted from the message? 5) Why is the message being sent?

Compare your answers with your group mates' points of view.

CHAPTER 2. WHAT WILL A WARMER WORLD BE LIKE?

1 A. Read the text and find the answers to the following questions:

- What is the future climate determined by? Why?
- Why is it necessary to limit the emissions of green house gases?
- Why are the scientists still uncertain about future forecasts for climate changes?

Climate change

A warmer global climate will definitely mean more than just more **sweat**! It may, for example, change **wind and rain patterns** and it may **lead to** rising sea levels. These changes will affect plant and animal life as well as human health – not to mention our homes, agriculture, businesses and economies.

The future climate will **be determined partly by** how much greenhouse gases we emit, which is **in turn** determined by future population size, fossil fuel consumption, etc. The Intergovernmental Panel on Climate Change (IPCC) has **identified** how much we can expect the climate to change. If nothing we do not take action to limit emissions of greenhouse gases, the IPCC says that by 2100 we can expect:

- **the mean surface temperature** to increase by 1.4–5.8 °C compared to 1990
- the sea-level to rise between 9 and 88 cm
- 5–20% more rain and snow
- more extreme weather, such as **cloudbursts** and **heat waves**, which in turn will cause **flooding, landslides, drought**, and forest fires, and
- wind and ocean currents to change direction, which can cause local climate changes.

The reason that scientists do not know whether the temperature will increase by a little more than one degree or up to six degrees is that, first, they do not know how much we will emit in the future, and second, it is still uncertain how **sensitive**



the climate on Earth is to emissions of greenhouse gases. **Moreover**, the above figures are **averages for the entire planet**. This means that some places may become much warmer, while others may change little, or even become cooler. But the degree of climate change a particular country faces has little to do with how much it has emitted. Greenhouse gases are well mixed with the other gases in the air. After they are emitted, they do not stay in the same place, but rather **spread out throughout** the atmosphere. Once they are there, they stay a long time. This is why it is not true that the biggest emitters will suffer the biggest climate changes. The most **serious consequences** of an increased greenhouse effect are just as likely to show up in places far away from where the emissions originated.

1 B. Fill in the words from the list, then make sentences using the completed phrases.

surface, affect, levels, patterns, size, planet, action, currents, consumption, gases

wind and rain, rising sea, plant and animal life, population, fossil fuel, take, the mean temperature, wind and ocean, greenhouse, the entire

1 C. Fill in the prepositions from the list, then make sentences using the completed phrases.

by, by, as as, for, out, to, in

lead, well, be determined, turn, averages, spread throughout the atmosphere, increase

1 D. Give explanations to the words in bold and make up sentences with them.

2 A. Read the texts and give answers to the following questions:

a) How can climate changes influence the living conditions of animals and plants?

b) What danger do northern and alpine species face as a result of global warming?

c) What changes in the animal and plant life have taken place over the last thirty years in Europe?

Animals and plants must find new places to live

Changes in climate also affect **the living conditions of** animals and plants – both for **individual species** and for **entire ecosystems**. Many species will not **thrive** if their **habitats** become drier, colder, wetter, or warmer. Some will migrate to new habitats, others may **die out**. The most **vulnerable** species are those that are **specially adapted** to particular areas. A warmer climate will cause species and ecosystems to move towards the poles and up the mountains. Species that already live in northern or

alpine regions are particularly **vulnerable**, since their habitats will **be encroached upon** and they will have no place to go: species that live in the mountains cannot move higher up once they reach the top. In the polar regions, the sea ice will **melt** earlier in the spring and form later in the fall, with serious consequences for species that live on or around the sea ice (for example, the polar bear and some seal species).

Observations have shown that the warming over the last 30 years has already affected animal and plant life in Europe. For example, some bird and butterfly species have **expanded** their habitats; a study of the spring growth of several plant species shows that **budding** and **flowering** started 2–5 days earlier **per decade** over the last 50 years; the spring migration of birds and egg laying has started 2–5 days earlier for each decade; and species that are specially adapted to **a particular climate** have moved an average of 6 km toward the poles, or 6 meters higher **in altitude**, per decade. **A crucial factor for** how animal and plant life will **survive** is how fast the warming actually occurs – since the longer time they have **to adapt**, the greater the chance that they will be successful. **Rapid global warming** and sudden climate changes give the species less time than if the changes occur slowly and **gradually**.

2 B. Fill in the words from the list, then make sentences using the completed phrases.

laying, species, entire, conditions, particular, regions, habitat

the living of, individual , ecosystems, areas, alpine....., expand one's, egg

2 C. Fill in the prepositions from the list, and then make sentences using the completed phrases.

upon, out, to, to, for, towards, in, per
migrate , die, specially adapted ..., move, be encroached,
.....altitude, ...decade, a crucial factor ...

2 D. Match the antonyms:

thrive	warm
cold	wet
melt	die out
dry	form

Working with Media:

Examine the graphs in Appendix A. Write your summaries on them using the following recommendations:

1. The first sentence should explain what the charts show.
2. The detailed information should go after the description of the main trends or findings.
3. Use a range of language to describe the charts accurately.
Discuss human impact on climate in the past and today.

CHAPTER 3. HOW DOES CLIMATE AFFECT PEOPLE?

Widespread flooding across Europe

During 2023, one third of the European river network saw river flows exceeding the 'high' flood threshold, and 16% exceeding the 'severe' flood threshold. Record or near-record high river flows were seen in major river basins, including the Loire, Rhine and Danube, due to a series of storms between October and December. According to preliminary estimates from the International Disaster Database (EM-DAT), flooding in 2023 affected an estimated 1.6 million people in Europe and caused around 81% of the year's economic losses due to climate impacts on the continent.

1 A. Read the information about floods in Europe and find answers to the following questions:

- a) In which parts of Europe have floods become a serious problem?
- b) What are the rescue teams mostly concerned about? What do they usually do to hold the water back and save people's lives?
- c) What are people recommended to do when floods are expected?
- d) Why can the impacts of flooding be felt for a long time?
- e) What should people do to avoid severe financial problems after flooding?
- f) Which parts of Europe are expected to have more intense and frequent floods as a result of continued global warming?
- g) What should be done to adapt to the new climatic conditions?

What's it like?

July 2002: Soldiers, police, fire fighters and volunteers **hoist** sandbags to build **dams** in Prague (the capital of the Czech Republic), and the German city Dresden. The water is rising dangerously in the Vltava River in Czechoslovakia and **downstream** in Germany's Elbe after heavy rains. The Danube and several **tributaries** are also **swelling over their banks**. Hundreds of thousands of people must be evacuated from their homes before they are flooded.

Meanwhile the debate **rages** in newspapers, TV and radio: Is this a sign of man-made climate change? No one can know for sure if this particular event can **be ascribed to** human emissions of CO and other greenhouse gases because we have always had floods and extreme weather. But when the world becomes warmer, warn experts, some extreme weather events like this will become more **commonplace**.

Packing up

The rescue team **care little about** the causes of the flood; they are more **concerned about coping with** it. In some places the water is **rising by** one meter per hour, so they have to hurry! Trucks with sand bags are driven into the cities. Sheets of iron several meters high are also being used **to hold the water back**. Water pumps are being set up **to pump the water** back into the river. In the museums, the basements **are being emptied of** valuable artwork before they are flooded. Military helicopters transport patients to safer hospitals. In both large and small cities along the rivers, people are packing their bags and cars and trying **to secure their homes** as

well as they can before they **escape from** the rising water. Some go to relatives and friends. Others are gathered in large tent camps to wait for the water levels **to drop again**. In one village, people **are clinging to** their rooftops. They waited too long to evacuate. Some are trying to save themselves using a raft, but the raft **capsizes**. Meanwhile, the rescue team has a difficult job where the flooding is worst. **Radio and TV signals as well as electricity are lost** in large areas; roads and bridges are washed away by the water and boats must be used instead for transportation. In some places, it is dangerous to cross the river even in a boat.

The authorities **recommend that** people save food and water, since many stores must **remain closed**. Boats and barges that had come loose from their moorings **must be blown up** so they do not destroy bridges **further downstream**.

Europe's major rivers have always overflowed from time to time. But the water levels of the Vltava and Elbe rivers reached record heights in 2002. In some places, the water level **increased by** over ten meters. **Flood related accidents** killed twelve people in Germany and nine in Czechoslovakia. The material damages were **in the order of billions of Euros**.

Underinsured

The impacts of such an event can **be felt** for a long time. It takes time before people can **move back to** their homes and even though the river has returned to normal levels, there is still water in the walls, floors and ground. People cannot move back into the buildings until they can be sure that the electricity and walls in the ground floor are **undamaged**. Farmers living along the river complain that the water has **washed away** soil and crops. And as the water **dries up**, another **problem presents itself**: Many flood victims did not **carry insurance** and thus cannot afford to repair their homes and businesses. This was **the case for many** in eastern Germany, and the German government promised federal aid to help **those in need**. Scenes like this – the flood of summer 2002 – may become more common in the future. With continued global warming, we can expect more intense and more frequent floods in large rivers such as the Vltava, Elbe, Rhine, and Danube and their **tributaries** because of the increased rainfall that is expected **over large parts of Europe** (although in the far south it may become even drier). Continual flooding can cause billions of Euros worth of damage. To adapt, it may be necessary to move residential and business areas, change agricultural practices and build new canals, dams and **drainage systems**. In addition, **irreplaceable cultural heritage** in the form of historical buildings are at risk when the water **rages through** the city streets. If you look at a map of Europe, you can see that many of Europe's capitals and major cities **lie alongside** large rivers.

1 B. Using the word map describe a) what happened to rivers during the floods; b) actions taken by rescue teams; c) what people had to do or should have done.

Water	Rescue works	People's behaviour
downstream in the river	to hoist sandbags	to secure homes
tributaries	to build dams	to escape from the rising

		water
to swell over the banks	to evacuate smb	to cling to the rooftops
to rise by one meter	to care about	to capsize (about rafts)
to drop (about water levels)	to be concerned about	to save food and water
to increase (about water levels)	to cope with smth	to move back to homes
to wash away soil and crops	to hold the water back	to feel the impact of
to rage through the city streets	to pump the water	to carry insurance
to dry up (about water)	to empty smth	to repair homes and businesses
	to blow up smth	those in need
	flood related accidents	

1 C. Fill in the words from the list, then make sentences using the completed phrases.

commonplace, water, related, heritage, escape, hoist, fire, secure, rages, systems, carry, extreme

..... fighters, sandbags to build dams, the debate, weather, become more, to hold the back, one's home, from the rising water, flood accidents, insurance, drainage, irreplaceable cultural

1 D. Fill in the prepositions from the list, then make sentences using the completed phrases.

of, of, of, up, for, over, over, in, by, with, to

swelling their banks, be ascribed , concerned about coping , rising one meter per hour, being emptied valuable artwork, in the order billions of Euros, the impacts , as the water dries , the case many, those need, large parts of Europe

Droughts and monsoons in India

“It doesn't look like a normal monsoon rainfall ahead. There is an enhanced probability of below-normal rainfall over western, southern, south central and northern parts of India,” said according to Akshay Deoras, climate scientist at the University of Reading, the United Kingdom.

A drought year is when the monsoon seasonal deficiency stands at -10 per cent to the long term average of 1971 to 2020. In the last 123 years, there have been 14

instances or years when the monsoonal deficiency threshold has been over -10 per cent. Of these 14 drought years, 10 were El Nino years as well. El Nino and La Nina are the warm phase and cool phases of a recurring climate pattern across the tropical Pacific Ocean called the El Nino-Southern Oscillation. La Nina's three-year run ended in 2023 and El Nino announced its arrival.

2 A. Read the texts and find at least one way in which the situation in India is similar to the situation in Europe. What are the main things which surprise or shock you about the living conditions in India?

History. Waiting for the rain in India

January 2003: The state of Andhra Pradesh in India faces drought for **the fourth year in a row**. "We used to be able **to rely on** the rains", says peasant Middi Muthialappa.

With help from his wife Sumkama and four children, he grows peanuts. For the last few years, the rains have been completely unpredictable.

"Last year all the rain came at once, and it flooded. After that, everything was dry, and the peanut plants **wilted away**." So far, no one knows whether the peasants and farmers in Andhra Pradesh can **place the blame on** permanent climate changes or simply **random variations in** the weather. But **the signs point toward** more unpredictable rainfall in large areas of India in the future. This will create problems for the country's 680 million peasants and farmers – only a small minority of whom have **access to irrigation** (water in canals or pipes) to keep their crops alive. Most depend on the rain.

We are sitting in a small house made of mud – a material that is **well suited for keeping out** the blazing heat. A dim light bulb swings from the ceiling. Some villagers own large farms and can afford bicycles, cars, and TVs. The Muthialappa family has only ten decare of farmland, which is roughly equivalent to one and a half soccer fields. The income from the small crops **does not leave them with any money to spare**.

The parents, Middi and Sumkama, never learned to read or write. Their eldest son who is 15 attended school but **dropped out** after the fifth grade and now helps his father in the fields. Their 13-year-old daughter does not attend school either; she helps her mother in the home. "I have to stand in line for several hours by the water pump in the village to get water," she says. "In the summer there is drought and then the line gets even longer."

Her 11-year-old little brother and 8-year-old little sister both attend school. But after school they must help at home. Middi's elderly father is sick and stays inside all day.

"He needs medicine and the children need food," despairs Sumkama. "But we do not have enough money."

The poor are the hardest hit

If climate change does not happen too quickly, it may actually **have a positive effect** on the economy and society in some parts of the world. For example, a warmer

climate may **improve crop yields** in Northern Europe. In other areas, however, climate change may lead to drought and **starvation**. Thus, a new climate will **generate both winners and losers**. The IPCC has **assessed the likely impacts of** climate change in various regions of the world and concludes that the losers will far **outnumber** the winners.

In the examples showing the effect of a flood in Europe and a drought in India, we saw that the population in both places **were hit hard**. Even though **the impacts of** the weather in these two areas were **entirely different**, they both had **serious consequences** for society and human life. But is it fair to say that they were equally hard hit?

2 B. Read the text again and give answers to the following questions.

- a) Why are rains so important in India?
- b) What were the consequences of the last year floods?
- c) How much is the Muthialappa's life different from the life of their neighbours?
- d) Do all the Indians have equal educational opportunities? Why? / Why not?
- e) Do you agree with the statement that the impacts of the weather in Europe and India had equally serious consequences? Why / Why not?

2 C. Fill in the words from the list, and then make sentences using the completed phrases.

crop, consequences, different, irrigation, unpredictable, roughly, likely, variations, both

completely , random in the weather, access to , equivalent, improve yields, generate winners and losers, assess the impacts of, entirely, have serious ...

2 D. Fill in the prepositions from the list, then make sentences using the completed phrases.

on, on, on, from, away, for, toward, out, out, in

for the fourth year ... a row, to rely, with help smb, wilt, place the blame, the signs point, keep the blazing heat, drop, have a positive effect, suit ...

2 E. Give explanations to the words in bold and make up sentences with them.

3 A. Read the text and innumerate the ways the climate change will affect human health. Which factor seems to be critical for settling the problems caused by the global warming?

And what about human health?

Climate change also affects human health. **Heat waves** will occur more frequently and will be more **intense**. These will lead to more frequent **heat stroke**

and deaths among elderly and sick people. Several thousand people are reported to have died in France as a result of the intense heat wave in summer 2003. In areas that **receive more frequent and more powerful extreme weather events**, storms and strong rain will take more human lives. At the same time, the milder winters will mean that fewer people will freeze to death. A warmer climate is also more favourable to **the spread of diseases** that are transferred by **mosquito, mites, ticks, snails, crustaceans** and other animals.

Disease organisms include viruses, bacteria, fungi and various parasitic worms. **Dengue fever, yellow fever, malaria and schistosomiasis (bilharzia)** are examples of such diseases. While the first three are spread by the mosquito, the last is spread by a freshwater snail. Today, malaria is **especially prevalent** in Africa. The disease kills between one and three million people every year and most victims are children. In addition to climate conditions, poverty is an important factor for the spread of malaria. Rich countries are generally able **to exterminate** malaria-bearing mosquitoes, even where the climate is favourable to them.

3 B. Fill in the words from the list, then make sentences using the completed phrases.

weather, spread, waves, snail, malaria-bearing, heat,

heat, stroke, extreme events, the of diseases, freshwater , to exterminate mosquitoes

3 C. Fill in the prepositions from the list, and then make sentences using the completed phrases.

by, in, for, between..... and, to, to

favourable ..., transferred ... mosquito, prevalent ... Africa, the disease kills one three million people, in addition ... , important factor

3 D. Give explanations to the words in bold and make up sentences with them.

Working with Media: Watching

A Watch the 1st part of the documentary called The Man-made Global Warming Hoax (see on CD or at <http://www.youtube.com/watch?v=QC2vrtx-ozk>).

Think about the following questions: 1) Who has created the message? 2) What creative techniques are used to attract your attention? 3) How might different people understand this message differently than me? 4) What values, lifestyles and points of view are represented in, or omitted from the message? 5) Why is the message being sent? **Compare your answers to your group mates' points of view.**

B Choose one of the other 9 parts of the documentary. Watch it, make a plan of it, and be ready to dwell upon it in class.

CHAPTER 4. HOW CAN WE HINDER THE MAN-MADE CLIMATE CHANGE?

1 A. Read the text and find answers to the following questions.

- a) Why is it so important to reduce the consumption of fossil fuels?
- b) Who will be able to enjoy the efforts taken today?
- c) Which alternative energy sources do you know? What are their advantages?
- d) Why is the usage of 1) *nuclear power*/ 2) *hydrogen* considered to be controversial?
- e) What are the possible ways of reducing emissions of other green house gases different from CO₂?

Burning less fossil fuels

People can **slow down** and **eventually** stop the climate change we have already started. But the climate system reacts slowly. The gases we have already emitted will **keep affecting** the climate **for many years to come** – even if we work hard **to limit** our emissions. Reducing emissions will slow down **the rate of** climate change, but the climate will keep changing as long as we live. Our children and grandchildren, however, will be able **to fully enjoy** our efforts we make today to limit emissions.

The most important thing we can do to hinder climate change is to burn less fossil fuel so that we emit less CO₂.

Technological improvements and lifestyle changes can reduce the amount of energy we use on transportation, heating, cooling, lighting, appliances that run on electricity, industrial production and so on. Using sources of energy **other than** fossil fuels can reduce emissions of greenhouse gases **considerably**. **Alternative energy sources** include **renewable** sources such as wind power, solar power, hydroelectric power, biomass burning (**as long as** new trees and vegetation are planted to compensate) and nuclear power, although this is **controversial** for other reasons.

Technological innovation may give us new energy sources that will **replace** fossil fuels in the future. For example, cars may run on hydrogen instead of gasoline. Hydrogen engines do not emit CO₂ but to produce hydrogen we need lots of energy. If this energy comes from coal, oil or gas then we could **end up with** CO₂ emissions just as big as if cars were still running on gasoline.

Reduce emissions of other greenhouse gases

We can also reduce emissions of greenhouse gases from sources other than fossil fuels.

- By stopping **deforestation**, we can avoid the release of CO₂ to the atmosphere. Today deforestation is especially prevalent in tropical regions where forests are cut down to make **grazing lands** or raise crops.

- **Rubbish dumps (land fills)** release the powerful greenhouse gas methane (CH₄) from rotting organic waste. By capturing this gas and using it as fuel, we get both heat and reduced emissions of greenhouse gases.

- Agriculture **contributes to** emissions of CO₂, methane and nitrous oxide (N₂O). More environmentally sound farming methods can reduce these emissions.

• Many types of industrial manufacturing release greenhouse gases, especially those that contain fluorine. These emissions can be reduced using new production methods.

1 B. Read the text again and fill in the chart with necessary information.

Steps that should be taken	Advantages	Possible disadvantages
1. Burning less fossil fuels	will slow down the rate of climate change	we won't be able to enjoy the effect immediately
2.		
3.		
4.		

1 C. Fill in the words from the list, then make sentences using the completed phrases.

emissions, grazing, affecting, come, alternative, efforts

will keep the climate, for many years to, reducing, to fully enjoy one's,energy sources, lands

1 D. Fill in the prepositions from the list, then make sentences using the completed phrases.

to, of, with, down

slow, the rate, end up CO₂ emissions, contributes emissions

1 E. Give explanations to the words in bold and make up sentences with them.

2 A. Read the text and dwell upon the steps that you have already taken or are ready to take. Do you think it is possible to slow down CO₂ emissions through voluntary efforts? Why do you think many people still do not make attempts to cut down their CO₂ emissions?

What CAN YOU do?

If you would like to help reduce climate change, you can cut down your CO emissions in your everyday life. Here are some examples:

Travel

Cars and buses that run on petrol or diesel emit CO₂. If you live only a short distance from school or work, you will emit less CO₂ compared to if you drive long distances every day. Emissions will be even less if you **opt for** the train or bus rather than your car. And if you ride your bike or walk, you will not emit any CO₂ at all. If

you do have to drive, you will emit less if you drive a vehicle that uses the least amount of petrol per kilometre. You can also **share rides with** other people going in the same direction. The most polluting way to travel is by aeroplane, you emit far less CO₂ if you travel long distances by train.

Electricity

If you save electricity, you reduce **the need for** energy from power plants that use coal, oil or natural gas. Even if you live somewhere where much of the electricity comes from hydroelectric power, windmills or nuclear reactors, saving electricity reduces emissions of greenhouse gases. This is because **the power grid** connects power plants and consumers in many countries.

When all of the consumers use less electricity, there is less need for power plants fired by coal, oil and natural gas. You can save electricity by, for example, replacing normal light bulbs with long-life light bulbs and turn off the lights every time you leave a room. You can also save electricity by completely turning off electric appliances – such as televisions, computers, and stereos – when you are not using them instead of leaving them **in the stand-by mode**.

Goods and services

Most of the goods and services we buy contribute to the emission of greenhouse gases. The richer we are, the more goods and services we tend to consume – and thus the more we emit. But some activities emit a lot, while others emit little. So **there are a large number of choices you can make** if you want to contribute to reducing emissions. For example, you can choose goods that are locally produced, which reduces the emissions associated with transportation.

2 B. Fill in the words from the list, then make sentences using the completed phrases.

long-life, grid, locally, appliances

the power, light bulbs, electric, produced

2 C. Fill in the prepositions from the list, then make sentences using the completed phrases.

with, by, to, with, for, for

opt ..., share rides ... smb, the need smth, in the stand- ... mode, contribute ... , associated transportation

2 D. Give explanations to the words in bold and make up sentences with them.

3 A. Read the text below and make notes using the table.

<i>Incentives</i>	<i>Effects</i>
1. Taxes	a) make people use less fossil fuels b) tempt businesses to move their production to other countries
2. Emission permits	

What can governments do?



Despite efforts to reduce emissions of greenhouse gases, emissions are still increasing in most places (read more about increasing emissions here). **It is unlikely that** the increase in emissions of greenhouse gases will slow down **through voluntary efforts of concerned individuals** and businesses alone. Since households (both families and single persons) and private companies are responsible for **the bulk of emissions**, governments in many countries, including the European Union,

are attempting **to create incentives** for them to reduce their emissions.

The instruments they use include the following:

Taxes

If you have to pay taxes to emit greenhouse gases, it **makes economic sense to avoid** emitting them in the first place. Some European countries have therefore introduced special taxes on the fossil fuels that cause emissions of CO₂. This means that prices of petrol, heating oil and other fossil fuels are high which gives people an incentive to use less. As long as there are only a few countries that have these taxes, businesses which use a lot of energy will **be tempted to** move their production elsewhere. This is why countries with carbon taxes often **exempt industries**, which are **in strong competition with** foreign firms from having to pay these taxes.

Emission permits

The government can set a limit for how much greenhouse gases can be emitted within the country. It can then **issue permits** (also called “allowances” or “quotas”) to emit greenhouse gases. An emissions permit is a certificate that gives **the holder** the right to emit certain amounts of greenhouse gases to the atmosphere. The government can decide whether or not those who are given permits should be allowed to sell them to others. This kind of “emissions trading” **ensures that** emissions reductions are as inexpensive as possible for business and industry. Businesses that would have to invest a lot of money in reducing emissions can buy extra permits instead. Companies that can reduce their emissions at a reasonable cost can do so, and then **sell their permits for a profit**. A system of permits and emissions trading can also **be limited to** certain industries.

Laws and regulations

Laws and rules:

Governments can **make laws**, which require industry to reduce their emissions of greenhouse gases. Governments regulate which products can be sold. For example, they can **forbid the sale of** electric appliances that use more electricity than necessary and cars that use too much petrol. In cold countries, the government can introduce regulations for **insulating buildings** to minimize the amount of energy used for heating. Governments can also forbid activities in industry and agriculture that **generate** particularly high emissions or require the use of special equipment to reduce emissions. For example, owners of rubbish dumps or manure tanks can be

required to **capture the methane** that is generated. Coal and gas-fired power plants can be made to use the heat generated in the electricity production process.

Subsidies

Governments can **create incentives for** businesses and households to invest in equipment that reduces emissions. In countries where homes need heating in the winter, governments can **subsidise the cost of adding insulation** or help people to invest in heating elements that run on bio fuels. In some countries certain types of vehicles, such as electric cars, may be exempted from registration fees or from paying at **toll booths**.

Research

By funding research, the government can stimulate technological innovations which reduce emissions of greenhouse gases – such as windmills, CO₂ capturing, or cars that run on hydrogen.

The disadvantage of many of these is that they cost money – for the government, the firms, or for households. Some are relatively inexpensive **to implement**, others are very **costly**. The question is whether we believe that **the benefit, in terms of a reduced danger of climate change, is worth the cost**.

3 B. Fill in the words from the list, then make sentences using the completed phrases.

economic, industries, relatively, buildings, taxes, individuals, issue, booths, heating, create, set, sale

concerned, incentives, pay, make sense, oil, exempt,a limit, permits, forbid the of smth, insulate, toll, inexpensive

3 C. Fill in the prepositions from the list, then make sentences using the completed phrases.

of, inof, on, from, in, with, for

taxes the fossil fuels, be in strong competition , terms, the bulk ... emissions, the first place, create incentives, exempt smb / smth smth

3 D. Discuss the effect of each incentive. Which of them do you think are essential? Why?

3 E. Give explanations to the words in bold and make up sentences with them.

4 A. Before reading the texts think of the possible answers to the following questions.

a) Do you think that countries with 1) developing / 2) market / 3) underdeveloped economies should be given the greatest burden of responsibility for the Climate Change?

b) Which of the countries has the highest emission rates in the world? 1) the USA/ 2) Russia/ 3) European countries

c) Which countries are the targets for new international negotiations concerning CO emissions? 1) the USA and Russia/ 2) the USA and developed countries/ 3) the USA and developing countries

4 B. Read the texts to confirm your answers. Take notes using the table.

Agreement / Organization	Aims
1. The Climate Convention 1992	
2. The Kyoto Protocol 1997	
3. IPCC	

International Co-operation

Because the climate issue **affects the entire world**, international cooperation is needed to find **truly effective solutions**. Thus, since the end of the 1980s, international negotiations have been taking place to agree on how to limit emissions. At present, there are two important international agreements, which aim **to combat** man-made climate change.

- ***The Climate Convention 1992*** (the United Nations' Framework Convention on Climate Change (UNFCCC), also known as "the Climate Convention") was signed by most of the countries in the world. The UNFCCC says that every country should work to combat dangerous climate changes and gave the developed countries **the greatest burden of responsibility**. The UNFCCC **forms the basis for** further cooperation and **the signatories** meet every year to discuss new steps to take to fight climate change.

- ***The Kyoto Protocol 1997*** is a follow up to the UNFCCC. It **sets targets for** emissions reductions for each of the developed countries for the period 2008–2012. More than one hundred countries have signed this agreement, but the country responsible for **the highest emissions rate** – the United States – **has withdrawn its support**. **To fulfil the requirements of** the Kyoto Protocol, governments of each country must **take actions to** reduce their greenhouse gas emissions. Examples of these actions are described on the previous page "What can the government do?"

The Kyoto Protocol will probably **make only a slight difference**, partly because several countries with economies in transition – particularly Russia – have already reduced their emissions dramatically from 1990 levels for economic reasons. But soon negotiations for new **commitments for** the period after 2012 will begin. If agreement is reached **on even stricter targets** after 2012, and if the United States and developing countries eventually **take on commitments**, the agreement can become more effective. So even though the Kyoto Protocol is perhaps only **a small step for** the Earth's climate, it may be a necessary first step on the road to more effective international climate co-operation.

- ***Paris Agreement, 2015***. The most significant global climate agreement to date, the Paris Agreement requires all countries to set emissions-reduction pledges. Governments set targets, known as nationally determined contributions (NDCs), with

the goals of preventing the global average temperature from rising 2°C (3.6°F) above preindustrial levels and pursuing efforts to keep it below 1.5°C (2.7°F). It also aims to reach global net-zero emissions, where the amount of greenhouse gases emitted equals the amount removed from the atmosphere, in the second half of the century. (This is also known as being climate neutral or carbon neutral.) The United States, the world's second-largest emitter, was the only country to withdraw from the accord, a move by former President Donald Trump that took effect in November 2020. However, President Joe Biden reentered the United States into the agreement during his first months in office. Three countries have not formally approved the agreement: Iran, Libya, and Yemen.

- **The Intergovernmental Panel on Climate Change (IPCC)** is an international scientific organization made up of both scientists and government representatives. Its task is **to assess and summarize** the most **recent developments** in our knowledge about climate change.

Firstly, scientists **assess our state of knowledge** about climate change. Government representatives from countries all over the world then work with the scientists **to simplify and condense** the material so that it is useful to **policymakers**. This means that all countries in the world should **have a shared understanding of** the climate system based on our **most up to date scientific understanding**. The IPCC's reports form the basis for negotiations on international agreements such as the UNFCCC (the United Nations Framework Convention on Climate Change) and the Kyoto Protocol. Roughly, every five years the IPCC **releases an assessment report** with contributions from several different working groups. To date, the most recent is the Third Assessment Report (TAR), which was published in 2001. **TAR puts a great deal of emphasis on** explaining how certain each of its conclusions is, and whether scientists agree or disagree with them.

The IPCC concludes that global average surface temperatures have increased by 0.6 C over the last hundred years and that it is "likely" that people have caused most of the warming over the last 50 years by emitting greenhouse gases. They conclude that we are now more certain than ever that human activity **contributes significantly** to global warming.

4 C. Fill in the words from the list, then make sentences using the completed phrases.

difference, solutions, man-made, state, entire, burden, requirements, report, withdraw, recent

affect the world, truly effective, to combat climate change, the greatest of responsibility, one's support, fulfil the of, make a slight, the most developments, assess one's of knowledge, release an assessment

4 D. Fill in the prepositions from the list, then make sentences using the completed phrases.

for, for, of, of, with, to, on, on, on

to agree ..., Convention ... Climate Change, the basis further cooperation, set targets, take ... commitments, have a shared understanding ..., agree or disagree smb, put a great deal ... emphasis on, contributes significantly ...

CHAPTER 5. FUTURE EMISSIONS?

1 A. Read the text and find the main reason for the variety of scenarios.

Future emissions and climate change

Our future climate will **be determined partly by** the amounts of greenhouse gases we emit. Levels of greenhouse gases emitted are determined by future **developments in** our economy, technological development and population growth. Population size, wealth, fossil fuel consumption and energy efficiency all **have tremendous influences** on how large our greenhouse gas emissions will be.



Driving forces

1. **Population size.** Each person has a pattern of consumption – the food we eat, the cars we drive, etc. – and this **results in** emissions of greenhouse gases. The more people who live on the Earth, the greater the emissions. The emissions increase the most if the population growth is in the rich areas of the world.

2. **Wealth.** The wealthier we are, the more we consume and the bigger our emissions are.

3. **Consumption of fossil fuels.** Fossil fuels emit greenhouse gases when they are burnt, while **renewable sources of energy**, such as wind energy or solar power, do not **give off** such emissions. The kind of fossil fuels we burn also matters. Coal gives off more CO₂ than natural gas.

4. **Energy efficiency.** New technologies allow us to use energy more effectively. In the future, we are likely to need less energy to produce goods or services. Today a car uses between about a half to one litre of petrol to drive 10 kilometres. In the past cars needed more fuel than that. In the future, we expect engines to become even more fuel-efficient.

Scenarios

We cannot **know for sure** how these **driving forces for** climate change will look in the future – but we can guess. Scientists at IPCC have constructed four very different pictures of the future, or scenarios as they are also called, to represent **changes in** population size, wealth, use of energy sources and energy technology up to the year 2100. All four scenarios describe a possible future world:

A1B – a rich world

A world with very **rapid economic growth**, low population growth and the rapid introduction and application of new and more effective technology.

A2 – a heterogeneous world

A world with **a large gap between** the rich and the poor, high rates of population growth, slow economic development, slow distribution of new technology with energy **needs being met** largely through fossil fuel resources.

B1 – a sustainable world

A world of rapid changes where concern for the environment will stimulate development of new technologies **to avoid using** fossil fuel resources. Where new technology **is spread** quickly and **efforts are made to** close the gap between rich and poor and create a more **environmentally sound economy**.

B2 – a technologically imbalanced world

A world **with emphasis on local solutions for** economic, social, and environmental sustainability where technology develops rapidly in some areas while other areas are forced **to make do with** outdated technology. For each of these very different future scenarios, scientists have **estimated** what the emissions of greenhouse gases would be. These emissions figures are then entered into climate models to calculate how the concentrations of greenhouse gases, temperature, sea level, and climate will be changed in each of the scenarios. These scenarios are what the IPCC have used to **come up with** the figure of a temperature increase between 1.4 and 5.8°C by the year 2100. **To ensure that** all reasonable future developments **have been taken into account**, they have used about 40 variations of the four scenarios – where they made smaller changes in the demographics, economic growth or energy consumption **estimates** and used different economic models. The reason for the large difference between the highest and lowest temperature estimates is partly that there is some uncertainty about how exactly the climate system works, and partly that we cannot know precisely **what the future holds** in terms of social developments and emissions patterns. The IPCC says that for every emission scenario there is a 40% chance that the temperature change will be greater than indicated, but only a 5% likelihood that it will be less. These scenarios do not take into account the possibility of countries implementing new, **comprehensive measures** for reducing emissions of greenhouse gases. If that happens, then both the emissions and warming can be reduced.

1 B. Fill in the words from the list, then make sentences using the completed phrases.

sound, consumption, efficiency, rapid, pattern, comprehensive, sustainability

a of consumption, energy, economic growth, environmentally economy, solutions for environmental, energy estimates, measures

1 C. Fill in the prepositions from the list, then make sentences using the completed phrases.

for, for, on, in, in, off, in, between, by, with, into

be determined ..., developments, have influence, result emissions, give emissions, knowsure, driving forces, changes population size, a large gap the rich and the poor, to make do outdated technology, take account

Working with Media: Create your presentation

Choose one of the topics (or think of your own one): 1) More facts about the history of climate change. 2) If CO₂ theory does not explain the climate change, should we reduce CO₂ emissions? 3) How much has the climate in Crimea / Russia changed? 4) What should be done to reduce the negative effects of the climate change?

Follow the structure: 1) *Introduction slides overview the topic and explain why this topic is important, and what your expertise is.* 2) *Introduction slides are followed by body slides that explain the central idea or evidence of your presentation.* 3) *Body slides are followed by at least one conclusion slide, which often recommends an action or a statement about this topic.*

TRANSLATION SECTION

TEXT 1.

1 A) What do you know about geoengineering? How does geoengineering fit into the modern state of environmental issues?

2) What is the genre and style of the text?

3) Analyse the structural components (headings, subheadings, paragraphs) of the text paying attention to the thematic formation.

4) What do you know about the author and his/her intentions?

5) Characterize the cohesive content organization of the text.

6) Translate the text from English into Russian or from Russian into English.

Geoengineering to save the planet: The controversial Plan B that could become inevitable

As the world fails to cut carbon emissions, support is growing for once-radical ideas

When environment writer Jeff Goodell wrote about geoengineering a decade ago, it was a risky, fringe idea. But as the earth speeds toward a climate change tipping point, as predicted by the International Panel on Climate Change in October, Goodell, the author of *How to Cool the Planet: Geoengineering and the Audacious Quest to Fix Earth's Climate* says it may be our best "Plan B."

"When I wrote my book 10 years ago there was still a lot of hope that we ... who are most responsible for climate change would kind of get our act together," he told Day 6 host Brent Bambury.

"The last decade has sort of proven that not to be true."

Climate scientists, activists and government leaders are talking about global warming yet again as the United Nations Climate Change Conference in Katowice, Poland, which began on Dec. 3, wrapped up on Friday.

Sometimes known as "planet hacking," geoengineering refers to a variety of methods that can manually manipulate the Earth's temperature.

The mainstream approach, Goodell says, would be to fill the stratosphere with sulfur dioxide particles, a substance released during volcano eruptions, that would have the effect of reflecting the sun's rays away from the planet like a giant parasol.

While the sci-fi-esque approach has its risks and critics, Goodell says that certain techniques, combined with the continued decline of fossil fuel use, could be what's needed to "take the edge off" the warming planet.

"Depending on how it's done, [for example] the amount of particulates you put up there, you can kind of create a thermostat for the climate, to a degree," he said.

Who controls the thermostat?

Geoengineering isn't a new idea, and it's starting to pick up steam.

The concept was featured in science journal Nature's August 2018 cover story. Harvard University even has a research team dedicated to geoengineering.

"We now have convincing science linking many of the weather extremes we are experiencing to climate change," University of California San Diego climate sciences professor Veerabhadran Ramanathan told Day 6.

He says that as science suggests we're moving more rapidly toward greater warming, drastic intervention is needed. While he's skeptical of how geoengineering would play out, he acknowledges it could be an emergency option.

"The key thing is which nation, or who, is going to hold the thermostat of the planet," he said. The drastic measures would require global cooperation — which could lead to conflict, warns Ramanathan — and who holds the key is sure to be debated.

But, Goodell worries that if action to reduce rising global temperatures isn't taken soon, it may not be up to governments or agencies to decide who geoengineers the planet, and how.

"I don't know that we will come to a decision in the sense that it will be decided in any kind of democratic or even perhaps rational way," he said.

"It may be decided by a lone actor. It may be decided by a group of individuals. It may be decided by a nation state."

'I wish I were wrong'

Aside from the possible political implications, geoengineering won't solve climate change — especially if there isn't a drastic reduction in carbon emissions, Goodell says.

"That's sort of a nightmare scenario ... because then we are continuing to load up the atmosphere with carbon, with all the consequences of that," he said.

Sulfate particles also have a limited lifespan, meaning that the geoengineering process would have to be continuous, according to Goodall.

Without reducing fossil fuel use, then, "we're creating what amounts to a kind of Sword of Damocles," he said, adding if we stopped geoengineering suddenly, it could result in a period of rapid rewarming.

"It's not a kind of diet pill for our fossil fuel consumption habits, but it is something that might buy us some time."

According to Ramanathan, blowing particles into the stratosphere will also reduce rainfall — a particularly problematic outcome for tropical regions.

While Goodell acknowledges that fossil fuel use is on the decline, he worries that geoengineering is quickly becoming a Hail Mary solution.

"I wish I were wrong, and I wish that that wasn't true," he said. "But even 10 years ago it was pretty apparent that geoengineering has a lot of political and technological appeal."

"That's why I took the plunge and wrote the book."

(From Geoengineering to save the planet: The controversial Plan B that could become inevitable)

TEXT 2.

1) What is the genre and style of the text?

2) Analyse the structural components (headings, subheadings, paragraphs) of the text paying attention to the thematic formation.

3) What do you know about the author and his/her intentions?

4) Characterize the cohesive content organization of the text.

5) Translate the text from Russian into English.

Геоинженерия и интерактивная геоинженерная карта

Что такое геоинженерия и нужна ли она вообще?

Геоинженерия (климатическая инженерия) — преднамеренное крупномасштабное воздействие на окружающую среду с целью снижения нежелательных антропогенных изменений климата. Впервые термин "климатическая инженерия" был использован Ч. Маркетти (C. Marchetti) в 1976 году, который предложил захоронить углекислый газ в глубинах океана.

Климатическая инженерия имеет два главных направления: солнечная инженерия и снижение углекислого газа в атмосфере.

Методы солнечной инженерии:

Охлаждение атмосферы за счет уменьшения количества поступающей солнечной энергии путем распыления в атмосфере аэрозолей. Идея такая: введенный в атмосферу аэрозоль распространяется и воздействует на большие области планеты, отражая солнечный свет и снижая температуру воздуха.

Размещение на орбитальных космических станциях огромных направленных зеркал (пока для человечества это что-то из области фантастики).

Трансформация облаков с помощью распыления в атмосфере морской воды.

Окрашивание крыш в светлый цвет, чтобы отражать солнечное излучение и посадка растений, которые имеют высокую отражающую способность.

Геоинженерные методы снижения CO₂ в атмосфере:

Увеличение объема поглощения CO₂ деревьями, почвой или другими поглотителями углерода.

Разработка технологий улавливания и хранения углерода (УХУ), которые позволяют вылавливать CO₂ и хранить его под землей, чтобы он не способствовал изменению климата (многие специалисты критикуют этот метод, так как до реализации нужно решить слишком много экологических, технических и финансовых вопросов).

*Интерактивная геоинженерная карта (источник:
<https://map.geoengineeringmonitor.org/>)*

Геоинженерная карта включает в себя данные о более 1700 экспериментах, которые проводились и проводятся по всему миру. Нанесенные на карту проекты — это исследования, связанные с изменением погоды, улавливанием углерода и управлением энергией солнечного излучения.

Эта карта создана ETC Group и Фондом Генриха Бёлля. Она составлена на основе карты "Эксперименты в области систем Земли", опубликованной в 2012 году. Карта указывает на «тревожное расширение геоинженерных исследований и экспериментов», что говорит о том, что создатели карты не поддерживают использование геоинженерии в качестве метода борьбы с изменением климата. Однако она представляет собой попытку пролить свет на состояние геоинженерии в мире, показать масштабы исследований и экспериментов.

Полного отчета о проектах геоинженерии не существует, поэтому карта, возможно, показывает не все проекты. Тем не менее, она, скорее всего, является наиболее полным собранием данных по исследованиям, экспериментам и разработкам в области геоинженерии.

На интерактивной карте различные типы геоинженерных проектов обозначены цветом по категории: поглощение парниковых газов — синим, управление солнечной радиацией — желтым, изменение погоды — красным и другие — зеленым. На боковой панели карты есть кнопки, которые позволяют фильтровать проекты по типу, и где также можно выбрать интересующий вас период. Данные доступны с 2000 по 2023 гг.

Нажмите на маркер проекта и посмотрите на его описание, цели и текущий статус, а также узнайте спонсоров. Кроме того, можно подробнее узнать о применяющихся геоинженерных технологиях.

Откуда данные для карты?

У многих геоинженерных проектов, особенно текущих и планируемых, есть свои сайты. Планируемые инициативы часто активно рекламируются, так как ищут финансирование для исследований. В некоторых случаях сайты конкретных проектов остаются и после их завершения; как правило, это исследовательские проекты, финансируемые государством, например, общеевропейский MiReCOL. Информацию о завершенных исследовательских проектах часто можно найти в специальных базах данных, например, CORDIS.

Однако промышленные исследовательские проекты обычно менее прозрачны, а некоторые из них могут вообще не публиковаться. Сайты других проектов прекращают свою деятельность после завершения проекта; это часто

происходит в тех случаях, когда компания была создана специально для коммерциализации геоинженерной технологии и не добилась успеха, как, например, компания AGG Biofuel.

Научные источники используются в основном для проектов, находящихся под академическим контролем. В последние годы расширился спектр научных журналов, посвященных тематике геоинженерии. Среди них International Journal of Coal Geology (проект СЕРАС, Бразилия), National Science Review Китайской академии наук (проект ONCE, Китай), American Chemical Society (проект sCS2, США) и многие другие.

Другой источник информации для новых и реализуемых проектов – это информационные бюллетени ассоциаций и институтов, занимающихся или интересующихся вопросами геоинженерии. Например, Global CCS Institute и UK Carbon Capture and Storage Research Centre (UKCCSRC) предоставляют информацию о проектах, технологиях и разработках в области УХУ, а International Biochar Initiative и Australia New Zealand Biochar Industry Group (ANZBIG) – о проблемах биоуглерода.

Вопрос об этичности проведения геоинженерных исследований и применение технологий остается открытым, и о нем до сих пор идут споры. Различные международные договоры (например, конвенция ООН о биологическом разнообразии, решение о введении моратория на реализацию масштабных геоинженерных проектов, которая была принята в 2010 г.) могут ограничить некоторые эксперименты по геоинженерии в реальном мире, хотя неясно, как это будет работать на практике. Технические риски и неопределенности, связанные с геоинженерией, огромны, поэтому, по мнению специалистов, необходимо системное регулирование климатической инженерии. Даже если некоторые методы могут быть проверены на малых масштабах или в лабораторных условиях, то более серьезные испытания должны проводиться с использованием глобальных моделей Земной системы (ESM).

(From Геоинженерия и интерактивная геоинженерная карта)

TEXT 3

- 1) *What is the genre and style of the text?*
- 2) *Analyse the structural components (headings, subheadings, paragraphs) of the text paying attention to the thematic formation.*
- 3) *What do you know about the author and his/her intentions?*
- 4) *Characterize the cohesive content organization of the text.*
- 5) *Translate the text from Russian into English.*

Россия может стать примером по подходам к адаптации и развитию стратегии решения климатических проблем. В течение нескольких лет в нашей стране планомерно формируются нормативное регулирование, национальные цели по снижению выбросов парниковых газов и климатическая инфраструктура.

Части климатической стратегии Российской Федерации сегодня находят отражение в различных нормативно-правовых актах федерального и регионального уровней. основополагающими являются такие документы, как Климатическая доктрина РФ, комплекс национальных проектов, Стратегия социально-экономического развития Российской Федерации с низким уровнем выбросов парниковых газов до 2050 года, Энергетическая стратегия РФ до 2035 года, госпрограмма «Развитие энергетики», комплексный план повышения энергоэффективности экономики РФ. В этих документах определены задачи в области устойчивого развития, энергоперехода, сокращения выбросов углекислого газа, модернизации системы утилизации отходов и внедрения возобновляемых источников энергии (ВИЭ).

В качестве целевого ориентира установлено, что Россия должна достичь углеродной нейтральности или баланса между выбросами парниковых газов от всех источников и их абсорбцией поглотителями, присутствующими в окружающей среде в результате природных и антропогенных процессов, к 2060 году.

Для стимулирования деятельности по сокращению энерго-экологических рисков, снижению углеродоемкости производимых товаров, энергии, работ и услуг, увеличения генерации на основе ВИЭ, масштабной электрификации и цифровизации транспорта и технологических процессов в отраслях, внедрения технологий захвата, хранения и переработки углекислого газа, вводится ценовое регулирование парниковых газов.

В электроэнергетике в период 2031–2050 годов прогнозируется изменение структуры генерации с переходом к низкоуглеродным источникам генерации: ВИЭ, ГЭС, атомной и парогазовой, снижение выбросов в угольной генерации. В углеродоемких отраслях промышленности ожидается внедрение технологий с низким уровнем выбросов парниковых газов и высокой энергоэффективностью. Рост поглощающей способности лесов в период 2020–2050 годов должен увеличиться более чем в два раза — с 535 миллионов тонн эквивалента CO₂ до 1,2 миллиарда тонн.

В результате эти меры должны привести к увеличению доли постиндустриальных отраслей, то есть высокотехнологичной промышленности, информационных технологий и связи, исследований и разработок, на 11,8 процентного пункта к 2050 году по сравнению с 2020 годом. Доля традиционных отраслей, а именно добычи полезных ископаемых, сельского хозяйства, низко- и среднетехнологичной промышленности, в структуре валового внутреннего продукта будет снижаться и упадет на 9,4 процентного пункта за аналогичный период. Ожидается, что энергетический экспорт будет ежегодно падать на 2,1% с 2030 года, а неэнергетический — расти на 4,4% в год.

В перечень поручений президента Российской Федерации Владимира Путина от 3 февраля 2022 года (Пр-740, п.1 г) включен «вопрос об определении критериев отнесения инвестиционных проектов к числу проектов, отвечающих требованиям концепции экологической, социальной и корпоративной ответственности (ESG), а также о предоставлении мер государственной

поддержки участников таких проектов». Одновременно Минэкономразвития России заявило о готовности разработать национальный стандарт в дополнение к уже принятым в России документам для поддержки «зеленых» проектов.

(From Российская климатическая политика в условиях изменения геополитической обстановки)

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UNIT 1 GLOSSARY

Chapter 1

affect v – have an effect upon; "Will the new rules affect me?"

be about to – *infinitive* – be just going to (do smth.).

be at risk of – be threatened by uncertainties (such as failure, loss, etc.).

carbon dioxide – a chemical compound composed of one carbon and two oxygen atoms. It is often referred to by its formula CO₂. It is present in the Earth's atmosphere at a low concentration and acts as a greenhouse gas. In its solid state, it is called dry ice. It is a major component of the carbon cycle.

climate shifts n pl – transformation: a qualitative change of climate.

contract n – an agreement that is legally binding, especially one that is written; a specific job or work order, often temporary or of fixed duration and usually governed by a written agreement; an agreement which the law will enforce in some way.

cover v – place one substance or thing over or in front of (another); hide or protect something in this way; lie or extend over; occupy the surface of something.

create the imbalance – cause the lack of balance or state of disequilibrium; "a hormonal imbalance."

develop v – (about agriculture, cities, and civilization) v - grow, progress, unfold, or evolve through a process of evolution, natural growth, differentiation, or a conducive environment; "A flower developed on the branch"; "The country developed into a mighty superpower."

expand v – **1** become larger in size or volume or quantity; "his business expanded rapidly". **2** make bigger or wider in size, volume, or quantity; "expand the house by adding another wing".

glacier n – a large, slow moving river of ice, formed from compacted layers of snow, that slowly deforms and flows in response to gravity.

ice cap n – an alpine glacier that covers the peak of a mountain.

increase n – **1** the amount by which something increases; "they proposed an increase of 15 percent in the fare". **2** the act of increasing something; "he gave me an increase in salary".

increase v – **1** become bigger or greater in amount; "The amount of work increased". **2** make bigger or more; "The boss finally increased her salary"; "The university increased the number of students it admitted".

leave behind v – **1** depart and not take along; "He left behind all his possessions when he moved to Europe". **2** be survived by after one's death; "He left six children"; "At her death, she left behind her husband and 11 cats". **3** leave unchanged or undisturbed or refrain from taking; "leave it as is"; "leave the young fawn alone"; "leave the flowers that you see in the park behind".

melt v – **1** reduce or cause to be reduced from a solid to a liquid state, usually by

natural phenomenon n – thing that is known to exist by the senses.

occur (about changes) v – happen: come to pass; "What is happening?"; "The meeting took place off without an incidence"; "Nothing occurred that seemed important".

outer space – everything outside the Earth's atmosphere that is not an object like a rock or a planet or a sun.

over (the next hundred years) prep – throughout a period of time; "stay over the weekend".

provide smb. with smth. v – 1 supply: give somebody something useful or necessary; "We provided the room with an electrical heater". 2 give what is desired or needed, especially support, food or sustenance; "The hostess provided lunch for all the guests."

rapid adj – quick, moving, happening, with great speed.

reindeer n – caribou: Arctic deer with large antlers in both sexes; called 'reindeer' in Eurasia and 'caribou' in North America.

respiration n – the process of inhaling and exhaling; breathing, breath; any similar process, in organisms that lack lungs, that exchanges gases with its environment; the process by which cells obtain chemical energy by the consumption of oxygen and the release of carbon dioxide.

result (from natural causes) v – come about or follow as a consequence; "nothing will result from this meeting".

risk v – expose to a chance of loss or damage; "We risked losing a lot of money in this venture"; "Why risk your life?"; "She laid her job on the line when she told the boss that he was wrong".

rotate v – to turn around a centre point, or axis, like a wheel turns on a bicycle.

rotting n – decomposition, rot, putrefaction ((biology) the process of decay caused by bacterial or fungal action).

south of adv – 1 a location in the southern part of a country, region, or city. 2 situated in or facing or moving toward or coming from the south; "the south entrance".

supply smb. with smth. v – provide, ply, cater (give what is desired or needed, especially support, food or sustenance) "*The hostess provided lunch for all the guests.*"

the greatest contributor to – the most important subscriber: someone who contributes (or promises to contribute) a sum of money.

the scales n – simple balance or instrument for weighing.

tip v – cause to tilt "*tip the screen upward*".

trap v – place in a confining or embarrassing position; "He was trapped in a difficult situation" catch in or as if in a trap; "The men trap foxes."

uninhabitable adj – not fit for habitation.

vapour n – vapor a visible suspension in the air of particles of some substance.

vegetation n – flora, botany (all the plant life in a particular region or period) "*Pleistocene vegetation*"; "*the flora of southern California*"; "*the botany of China*".

whereby adv – by what; by which: "*He devised a plan whereby he might escape.*"

Chapter 2.

adapt v – adjust, conform (adapt or conform oneself to new or different conditions) "*We must adjust to the bad economic situation*".

adapted adj – altered (changed in order to improve or made more fit for a particular purpose) *"seeds precisely adapted to the area"; "instructions altered to suit the children's different ages"*.

alpine adj – relating to the Alps and their inhabitants *"Alpine countries, Switzerland, Italy, France, and Germany"*.

averages for n pl – average (an intermediate scale value regarded as normal or usual) *"he is about average in height"; "the snowfall this month is below average"*.

budding n – reproduction of some unicellular organisms (such as yeasts) by growth and specialization followed by the separation by constriction of a part of the parent.

cloudbursts n – downpour, cloudburst, deluge, waterspout, torrent, soaker (a heavy rain).

conditions n – 1 the prevailing context that influences the performance or the outcome of a process *"there were wide variations in the conditions of observation"* 2 the set of circumstances that affect someone's welfare *"hazardous working conditions"; "harsh living conditions"*.

consequences n pl – consequence, effect, outcome, result, event, issue, upshot (a phenomenon that follows and is caused by some previous phenomenon) *"the magnetic effect was greater when the rod was lengthwise"; "his decision had depressing consequences for business"; "he acted very wise after the event"*.

crucial adj – important (of extreme importance; vital to the resolution of a crisis) *"a crucial moment in his career"; "a crucial election"; "a crucial issue for women"*.

decade n – decennium (a period of 10 years).

determine v – 1 find, find out, ascertain (establish after a calculation, investigation, experiment, survey, or study) *"find the product of two numbers"; "The physicist who found the elusive particle won the Nobel Prize"*. 2 shape, mold, influence, regulate (shape or influence; give direction to) *"experience often determines ability"; "mold public opinion"*. 3 set (fix conclusively or authoritatively) *"set the rules"*.

die v – de cease, perish, go, exit, pass away, expire, pass, kick the bucket, cash in one's chips, buy the farm, conk, give-up the ghost, drop dead, pop off, choke, croak, snuff it (pass from physical life and lose all bodily attributes and functions necessary to sustain life) *"She died from cancer"; "The children perished in the fire"; "The patient went peacefully"; "The old guy kicked the bucket at the age of 102"*.

drops of rain"; "please mark the individual pages"; "they went their individual ways".

drought n – a shortage of rainfall *"farmers most affected by the drought hope that there may yet be sufficient rain early in the growing season"*.

ecosystem n – a system formed by the interaction of a community of organisms with their physical environment.

encroach v – infringe, impinge (advance beyond the usual limit) *"This impinges on my rights as an individual"; "This matter entrenches on other domains"*.

entire adj – full, total (constituting the full quantity or extent; complete) *"an entire town devastated by an earthquake"; "gave full attention"; "a total failure"*.

expand v – boom, thrive, flourish, (grow vigorously) *"The deer population in this town is thriving"; "business is booming"*.

factor n – anything that contributes causally to a result *"a number of factors determined the outcome"*.

flood v – become filled to overflowing *"Our basement flooded during the heavy rains"*.

flowering n – blossoming, florescence, inflorescence, efflorescence (the time and process of budding and unfolding of blossoms).

gradually adv – bit by bit, step by step (in a gradual manner) *"the snake moved gradually toward its victim"*.

habitat n – home ground (the type of environment in which an organism or group normally lives or occurs) *"a marine habitat"; "he felt safe on his home grounds"*.

heat wave n – a wave of unusually hot weather.

identify v – **1** place (recognize as being; establish the identity of someone or something) *"She identified the man on the 'wanted' poster"*. **2** name, give the name or identifying characteristics of; refer to by name or some other identifying characteristic property: *"Many senators were named in connection with the scandal"; "The almanac identifies the auspicious months"*. **3** consider (oneself) as similar to somebody else: *"He identified with the refugees"*.

in turn adv – successively in proper order or sequence *"talked to each child in turn"; "the stable became in turn a chapel and then a movie theater"*.

individual adj – single (being or characteristic of a single thing or person) *"individual"*

landslide n v – landslide, landslip (a slide of a large mass of dirt and rock down a mountain or cliff).

lead v – tend to or result in *"This remark lead to further arguments among the guests"*.

mean adj – average, approximating the statistical norm or average or expected value *"the average income in New England is below that of the nation"; "of average height for his age"; "the mean annual rainfall"*.

melt v – run, melt down (reduce or cause to be reduced from a solid to a liquid state, usually by heating) *"melt butter"; "melt down gold"; "The wax melted in the sun"*.

partly adv – partially, in part; in some degree; not wholly *"I felt partly to blame"; "He was partially paralyzed"*.

patterns n – radiation pattern, radiation diagram, pattern (graphical representation (in polar or Cartesian coordinates) of the spatial distribution of radiation from an antenna as a function of angle).

per prep – for each *"for each pound", "for each decade"*.

precipitation n – **1** the quantity of water falling to earth at a specific place within a specified period of time *"the storm brought several inches of precipitation"*. **2** downfall, the falling to earth of any form of water (rain or snow or hail or sleet or mist).

rapid adj – **1** done or occurring in a brief period of time *"a rapid rise through the ranks"*. **2** speedy (characterized by speed; moving with or capable of moving with high speed) *"a rapid movement"; "a speedy car"; "a speedy errand boy"*.

reason n – ground (a rational motive for a belief or action) *"the reason that war was declared"; "the grounds for their declaration"*.

sensitive adj – 1 responsive to physical stimuli *"a mimosa's leaves are sensitive to touch"; "a sensitive voltmeter"; "sensitive skin"; "sensitive to light"* 2 being susceptible to the attitudes, feelings, or circumstances of others *"sensitive to the local community and its needs"*. 3 sensible, (able to feel or perceive) *"even amoeba are sensible creatures"; "the more sensible parts of the skin"* 4 sore, raw, tender (hurting) *"the tender spot on his jaw"*.

species n – ((biology) taxonomic group whose members can interbreed).

spread v – diffuse, spread out, fan out (move outward) *"The soldiers fanned out"*.

surface n – the outer boundary of an artifact or a material layer constituting or resembling such a boundary *"there is a special cleaner for these surfaces"; "the cloth had a pattern of red dots on a white surface"*.

survive v – last, live, live on, go, endure, hold up, hold out (continue to live through hardship or adversity) *"We went without water and food for 3 days"; "These superstitions survive in the backwaters of America"; "The race car driver lived through several very serious accidents"; "how long can a person last without food and water?"*

sweat n – 1 perspiration (salty fluid secreted by sweat glands) *"sweat poured off his brow"*. 2 condensation of moisture on a cold surface) *"the cold glasses were streaked with sweat"*.

thrive v – boom, flourish, expand (grow vigorously) *"The deer population in this town is thriving"; "business is booming"*.

throughout adv – end-to-end (from first to last) *"the play was excellent end-to-end"*.

vulnerable adj – capable of being wounded or hurt *"vulnerable parts of the body"*.

Chapter 3.

alongside adv – aboard (side by side) *"anchored close aboard another ship"*.

ascribe v – impute, ascribe, assign, attribute (attribute or credit to) *"We attributed this quotation to Shakespeare"; "People impute great cleverness to cats"*.

assess v – measure, evaluate, value, appraise, value (evaluate or estimate the nature, quality, ability, extent, or significance of) *"I will have the family jewels appraised by a professional"; "access all the factors when taking a risk"*.

blame n – 1 incrimination, inculpation (an accusation that you are responsible for some lapse or misdeed) *"his incrimination was based on my testimony"; "the police laid the blame on the driver"*. 2 rap (a reproach for some lapse or misdeed) *"he took the blame for it"; "it was a bum rap"*.

blow up v – explode, detonate, set off (cause to burst with a violent release of energy) *"We exploded the nuclear bomb"*.

capsize v – turtle, turn turtle (overturn accidentally) *"Don't rock the boat or it will capsize!"*

care v – give care (provide care for) *"The nurse was caring for the wounded"*.

carry v – pack, take (have with oneself; have on one's person) *"She always takes an umbrella"; "I always carry money"; "She packs a gun when she goes into the mountains"*.

case v – 1 instance, example (an occurrence of something) *"it was a case of bad judgment"; "another instance occurred yesterday"; "but there is always the famous"*

example of the Smiths". 2 event (a special set of circumstances) "in that event, the first possibility is excluded"; "it may rain in which case the picnic will be canceled".

cling v – hold close, hold tight, clutch (hold firmly, usually with one's hands) *"She clutched my arm when she got scared".*

commonplace adj – 1 completely ordinary and unremarkable *"air travel has now become commonplace"; "commonplace everyday activities". 2* banal, hackneyed, old-hat, shopworn, stock, threadbare, timeworn, tired, trite, well-worn (repeated too often; overfamiliar through overuse) *"bromidic sermons"; "his remarks were trite and commonplace"; "hackneyed phrases"; "a stock answer"; "repeating threadbare jokes"; "parroting some timeworn axiom"; "the trite metaphor 'hard as nails'".*

concern v – 1 refer, pertain, relate, come to, bear on, touch, touch on, have-to do with (be relevant to) *"There were lots of questions referring to her talk"; "My remark pertained to your earlier comments". 2* interest, occupy, worry (be on the mind of) *"I worry about the second Germanic consonant shift".*

cope v – get by, make out, make do, contend, grapple, deal, manage (come to terms with) *"We got by on just a gallon of gas"; "They made do on half a loaf of bread every day".*

crop n – 1 harvest (the yield from plants in a single growing season) 2 a cultivated plant that is grown commercially on a large scale.

crustacean n – any mainly aquatic arthropod usually having a segmented body and chitinous exoskeleton.

dam n – dike, dyke (a barrier constructed to contain the flow of water or to keep out the sea).

dengue n – dengue fever, dandy fever, breakbone fever (an infectious disease of the tropics transmitted by mosquitoes and characterized by rash and aching head and joints).

downstream adj – in the direction of a stream's current.

drainage n – drain (emptying something accomplished by allowing liquid to run out of it).

drop (about the water levels) v – 1 let fall to the ground *"Don't drop the dishes". 2* to fall vertically *"the bombs are dropping on enemy targets".*

drop out v – leave school or an educational program prematurely *"Many students drop out because they are not prepared for our challenging program".*

dry up (about water) v – exsiccate, dehydrate, desiccate (lose water or moisture) *"In the desert, you get dehydrated very quickly".*

effect n – consequence, outcome, result, event, issue, upshot (a phenomenon that follows and is caused by some previous phenomenon) *"the magnetic effect was greater when the rod was lengthwise"; "his decision had depressing consequences for business"; "he acted very wise after the event".*

empty v – 1 make void or empty of contents *"Empty the box"; "The alarm emptied the building". 2* discharge (become empty or void of its content) *"The room emptied". 3* vacate, abandon (leave behind empty; move out of) *"You must vacate your office by tonight". 4* remove *"Empty the water".*

entirely adv – wholly, completely, totally, all, altogether, whole (to a complete degree or to the full or entire extent ('whole' is often used informally for 'wholly'))

"he was wholly convinced"; "entirely satisfied with the meal"; "it was completely different from what we expected"; "was completely at fault"; "a totally new situation"; "the directions were all wrong"; "it was not altogether her fault"; "an altogether new approach"; "a whole new idea".

escape v – shake, shake off, throw off (get rid of) *"I couldn't shake the car that was following me".*

exterminate v – 1 kill off (kill en masse; kill on a large scale; kill many) *"Hitler wanted to exterminate the Jews, Gypsies, Communists, and homosexuals of Europe"*
2 uproot, eradicate, extirpate, root out (destroy completely, as if down to the roots) *"the vestiges of political democracy were soon uprooted" "root out corruption".*

feel v – 1 experience (undergo an emotional sensation or be in a particular state of mind) *"She felt resentful"; "He felt regret".* 2 come to believe on the basis of emotion, intuitions, or indefinite grounds *"I feel that he doesn't like me"; "I find him to be obnoxious"; "I found the movie rather entertaining".*

flavivirus n – animal viruses belonging to the family Flaviviridae.

generate v – bring forth (bring into existence) *"The new manager generated a lot of problems"; "The computer bug generated chaos in the office"; "The computer generated this image"; "The earthquake generated a tsunami".*

hard adj – knockout, severe (very strong or vigorous) *"strong winds"; "a hard left to the chin"; "a knockout punch"; "a severe blow".*

heat wave n – wave (a persistent and widespread unusual weather condition (especially of unusual temperatures)) *"a heat wave".*

heritage n – 1 practices that are handed down from the past by tradition *"a heritage of freedom"* 2 inheritance (any attribute or immaterial possession that is inherited from ancestors) *"my only inheritance was my mother's blessing"; "the world's heritage of knowledge".*

hit v – 1 cause to move by striking *"hit a ball".* 2 strike, impinge on, run into, collide with (hit against; come into sudden contact with) *"The car hit a tree"; "He struck the table with his elbow"* 3 deal a blow to, either with the hand or with an instrument *"He hit her hard in the face".*

hoist v – 1 lift, wind (raise or haul up with or as if with mechanical help) *"hoist the bicycle onto the roof of the car. 2 run up (raise) "hoist the flags"; "hoist a sail".*

hold back v – restrain, keep, keep back- (keep under control; keep in check) *"suppress a smile"; "Keep your temper"; "keep your cool".*

impact n – wallop (a forceful consequence; a strong effect) *"the book had an important impact on my thinking"; "the book packs a wallop".*

impact n – wallop (a forceful consequence; a strong effect) *"the book had an important impact on my thinking"; "the book packs a wallop".*

improve v – better, amend, ameliorate, meliorate (to make better) *"The editor improved the manuscript with his changes".*

increase v – 1 become bigger or greater in amount *"The amount of work increased"* 2 make bigger or more *"The boss finally increased her salary"; "The university increased the number of students it admitted".*

intense adj – 1 possessing or displaying a distinctive feature to a heightened degree *"intense heat"; "intense anxiety"; "intense desire"; "intense emotion"; "the skunk's*

intense acrid odor"; *"intense pain"*; *"enemy fire was intense"*. 2 acute (extremely sharp or intense) *"acute pain"*; *"felt acute annoyance"*; *"intense itching and burning"*. 3 vivid ((of color) having the highest saturation) *"vivid green"*; *"intense blue"*.

irreplaceable adj – unreplaceable (impossible to replace) *"irreplaceable antiques"*.

irrigation n – supplying dry land with water by means of ditches etc.

keep v – prevent (stop (someone or something) from doing something or being in a certain state) *"We must prevent the cancer from spreading"*; *"His snoring kept me from falling asleep"*; *"Keep the child from eating the marbles"*.

lie v – 1 be located or situated somewhere; occupy a certain position. 2 be lying, be prostrate; be in a horizontal position *"The sick man lay in bed all day"*; *"the books are lying on the shelf"*.

likely adj – potential (expected to become or be; in prospect) *"potential clients"*.

lose v – fail to keep or to maintain; cease to have, either physically or in an abstract sense.

mite n – any of numerous very small to minute arachnids often infesting animals or plants or stored foods.

mosquito n – two-winged insect whose female has a long proboscis to pierce the skin and suck the blood of humans and animals.

move back v – withdraw, retreat, pull away, draw back, recede, pull back, retire (pull back or move away or backward) *"The enemy withdrew"*; *"The limo pulled away from the curb"*.

need n – indigence, penury, pauperism, pauperization (a state of extreme poverty or destitution) *"their indigence appalled him"*; *"a general state of need exists among the homeless"*.

order n – order of magnitude (a degree in a continuum of size or quantity) *"it was on the order of a mile"*; *"an explosion of a low order of magnitude"*.

outnumber v – be larger in number.

point toward smth. v – orient (be oriented) *"The weather vane points North"*; *"the dancers toes pointed outward"*.

positive adj – plus (involving advantage or good) *"a plus (or positive) factor"*.

presents itself (about a problem) v – 1 show, demo, exhibit, present, demonstrate (give an exhibition of to an interested audience) *"She shows her dogs frequently"*; *"We will demo the new software in Washington"*. 2 represent, lay out (bring forward and present to the mind) *"We presented the arguments to him"*; *"We cannot represent this knowledge to our formal reason"*. 3 stage, represent (perform (a play), especially on a stage) *"we are going to stage 'Othello'"*.

prevalent adj – prevailing, predominant, dominant, rife (most frequent or common) *"prevailing winds"*.

pump v – 1 operate like a pump; move up and down, like a handle or a pedal *"pump the gas pedal"* 2 draw or pour with a pump.

rage through the city streets (about water) v – ramp, storm (behave violently, as if in state of a great anger).

random adj – lacking any definite plan or order or purpose; governed by or depending on chance *"a random choice"*; *"bombs fell at random"*; *"random movements"*.

recommend v – 1 urge, advocate (push for something) *"The travel agent recommended strongly that we not travel on Thanksgiving Day"* 2 commend (express a good opinion of) 3 make attractive or acceptable *"Honesty recommends any person"*.

related to adj – being connected either logically or causally or by shared characteristics *"painting and the related arts"; "school-related activities"; "related to micelle formation is the...ability of detergent actives to congregate at oil-water interfaces"*.

rely on v – 1 depend on, depend upon, rely upon (put trust in with confidence) *"she is someone you can really rely on when times get rough"; "you can rely on his discretion"* 2 depend on (be dependent on, as for support or maintenance) *"elderly parents often depend on their adult children"*.

rise v – lift, arise, move up, go up, come up, uprise (move upward) *"The fog lifted"; "The smoke arose from the forest fire"; "The mist uprose from the meadows"*.

row n – a continuous chronological succession without an interruption *"they won the championship three years in a row"*.

schistosomiasis (bilharzia) n – bilharzia, bilharziasis (an infestation with or a resulting infection caused by a parasite of the genus *Schistosoma*; common in the tropics and Far East; symptoms depend on the part of the body infected).

secure v – fasten, fix (cause to be firmly attached) *"fasten the lock onto the door"; "she fixed her gaze on the man"*.

snail n – freshwater or marine or terrestrial gastropod mollusk usually having an external enclosing spiral shell.

spare v – 1 save (refrain from harming). 2 save or relieve from an experience or action *"I'll spare you from having to apologize formally"*.

spread n – 1 spreading (process or result of distributing or extending over a wide expanse of space). 2 spreading (act of extending over a wider scope or expanse of space or time).

starvation n – famishment (a state of extreme hunger resulting from lack of essential nutrients over a prolonged period).

swell v – 1 well (come up, as of a liquid) *"Tears well in her eyes"; "the currents well up"*. 2 cause to become swollen *"The water swells the wood"*.

tributary n – feeder, confluent, affluent (a branch that flows into the main stream).

undamaged adj – not harmed or spoiled; sound.

underinsured n – opposite of **insured**, insured person (a person whose interests are protected by an insurance policy; a person who contracts for an insurance policy that indemnifies him against loss of property or life or health etc.).

variation n – the act of changing or altering something slightly but noticeably from the norm or standard *"who is responsible for these variations in taxation?"*

wash away v – 1 eliminate *"wash away all the differences"*. 2 wash, wash out, wash off (remove by the application of water or other liquid and soap or some other cleaning agent) *"he washed the dirt from his coat"; "The nurse washed away the blood"; "Can you wash away the spots on the windows?"; "he managed to wash out the stains"*.

well-suited adj – 1 suitable (meant or adapted for an occasion or use) *"a tractor suitable (or fit) for heavy duty"*; *"not an appropriate (or fit) time for flippancy"* 2 outfitted or supplied with clothing *"recruits suited in green"*.

wilt (away) v – 1 lose strength *"My opponent was wilting"*. 2 droop (become limp) *"The flowers wilted"*.

yellow fever n – yellow jack, black vomit (caused by a flavivirus transmitted by a mosquito).

yield n – output (production of a certain amount).

Chapter 4

affect v – impact, bear upon, bear on, touch on, touch (have an effect upon) *"Will the new rules affect me?"*

affect v – influence, have an effect on *"The cold climate affected his health"*.

agreement n pl – the statement (oral or written) of an exchange of promises; *"they had an agreement that they would not interfere in each other's business"*; *"there was an understanding between management and the workers"*.

alternative adj – alternate, substitute (serving or used in place of another) *"an alternative plan"*

as long as conj – 1 so long as (on condition that) *"You can go where you like so long as you get back before dark."* 2 while *"You shall never enter this house as long as I live in it."*

assess v – to give or charge with (as with penalties in sports); to determine the value of; to impose or subject to (taxation and legal).

assessment n – judgment: the act of judging or assessing a person or situation or event; *"they criticized my judgment of the contestants"*.

basis n – base (the most important or necessary part of something) *"the basis of this drink is orange juice"*.

be worth adj – having a certain value (money or ability); of equal value to *"It's not worth more than two pounds"*.

benefit n – advantage, profit, help *"Did you get much benefit from your holiday?"*

booth n – cubicle, stall, kiosk (small area set off by walls for special use).

bulk n – 1 majority (the property resulting from being or relating to the greater in number of two parts; the main part) *"the majority of his customers prefer it"*; *"the bulk of the work is finished"*. 2 mass, volume (the property of something that is great in magnitude) *"it is cheaper to buy it in bulk"*; *"he received a mass of correspondence"*; *"the volume of exports"*. 3 the property possessed by a large mass.

burden n – load, encumbrance, incumbrance, onus (an onerous or difficult concern) *"the burden of responsibility"*; *"that's a load off my mind"*.

capture v – get, catch (succeed in catching or seizing, especially after a chase) *"We finally got the suspect"*; *"Did you catch the thief?"*

combat v – battle (battle or contend against in or as if in a battle) *"The Kurds are combating Iraqi troops in Northern Iraq"*; *"We must combat the prejudices against other races"*; *"they battled over the budget"*.

commitment n – an engagement by contract involving financial obligation *"his business commitments took him to London"*.

competition n – 1 a business relation in which two parties compete to gain customers) *"business competition can be fiendish at times"*. 2 contest (an occasion on which a winner is selected from among two or more contestants). 3 contention, rivalry (the act of competing as for profit or a prize) *"the teams were in fierce contention for first place"*.

concerned adj – interested (involved in or affected by or having a claim to or share in) *"a memorandum to those concerned"*; *"an enterprise in which three men are concerned"*; *"factors concerned in the rise and fall of epidemics"*; *"the interested parties met to discuss the business"*.

condense v – digest: make more concise; *"condense the contents of a book into a summary"*.

considerably adv – well, substantially (to a great extent or degree) *"I'm afraid the film was well over budget"*; *"painting the room white made it seem considerably (or substantially) larger"*; *"the house has fallen considerably in value"*; *"the price went up substantially"*.

contribute v – lend, impart, bestow, add, bring (bestow a quality on) *"Her presence lends a certain cachet to the company"*; *"The music added a lot to the play"*; *"She brings a special atmosphere to our meetings"*; *"This adds a light note to the program"*.

contribute v – to give something, that is part of a larger whole.

controversial adj – marked by or capable of arousing controversy *"the issue of the death penalty is highly controversial"*; *"Rushdie's controversial book"*; *"a controversial decision on affirmative action"*.

costly adj – 1 dearly-won (entailing great loss or sacrifice) *"a dearly-won victory"*. 2 dear, high-priced, pricey, pricy (having a high price) *"costly jewelry"*; *"high-priced merchandise"*; *"much too dear for my pocketbook"*; *"a pricey restaurant"*.

create v – bring into existence *"The company was created 25 years ago"*; *"He created a new movement in painting"*.

deforestation n – 1 the state of being clear of trees. 2 disforestation (the removal of trees).

effective adj – 1 efficient (able to accomplish a purpose; functioning effectively) *"people who will do nothing unless they get something out of it for themselves are often highly effective persons..."-G.B.Shaw*; *"effective personnel"*; *"an efficient secretary"*; *"the efficient cause of the revolution"*. 2 works well as a means or remedy *"an effective reprimand"*; *"a lotion that is effective in cases of prickly heat"*.

effort n – attempt, effort, endeavor, endeavour, try (earnest and conscientious activity intended to do or accomplish something) *"made an effort to cover all the reading material"*; *"wished him luck in his endeavor"*; *"she gave it a good try"*.

emphasis n – 1 special importance or significance; *"the red light gave the central figure increased emphasis"*. 2 vehemence: intensity or forcefulness of expression; *"the vehemence of his denial"*; *"his emphasis on civil rights"* special and significant stress by means of position or repetition. 3 stress: the relative prominence of a syllable or musical note (especially with regard to stress or pitch); *"he put the stress on the wrong syllable"*.

end up (with smth.) v – finish up, land up, fetch up, wind up, finish (finally be or do something) *"He ended up marrying his high school sweetheart"; "he wound up being unemployed and living at home again".*

enjoy v - have benefit from *"enjoy privileges".*

ensure v – guarantee, insure, assure, secure (make certain of) *"This nest egg will ensure a nice retirement for us"; "Preparation will guarantee success!"*

entire adj – full, total (constituting the full quantity or extent; complete) *"an entire town devastated by an earthquake"; "gave full attention"; "a total failure".*

eventually adv – finally (after an unspecified period of time or an especially long delay).

exempt v – 1 relieve, free (grant relief or an exemption from a rule or requirement to) *"She exempted me from the exam"* 2 excuse, relieve, let off (grant exemption or release to) *"Please excuse me from this class".*

forbid v – prohibit, interdict, proscribe, veto, disallow, nix (command against) *"I forbid you to call me late at night"; "Mother vetoed the trip to the chocolate store"; "Dad nixed our plans".*

fulfil v – satisfy, fulfill, live up to (meet the requirements or expectations of).

fully adv – to the full, full (to the greatest degree or extent; completely or entirely; ('full' in this sense is used as a combining form)) *"fully grown"; "he didn't fully understand"; "knew full well"; "full-grown"; "full-fledged".*

generate v – bring forth (bring into existence) *"The new manager generated a lot of problems"; "The computer bug generated chaos in the office"; "The computer generated this image"; "The earthquake generated a tsunami".*

grazing lands n – pasture, pastureland, grazing land, lea, ley (a field covered with grass or herbage and suitable for grazing by livestock).

holder n – 1 a person who holds something *"they held two hostages"; "he holds the trophy"; "she holds a United States passport".* 2 bearer (the person who is in possession of a check or note or bond or document of title that is endorsed to him or to whoever holds it) *"the bond was marked 'payable to bearer'".*

implement v – 1 apply in a manner consistent with its purpose or design *"implement a procedure".* 2 enforce, apply (ensure observance of laws and rules) *"Apply the rules to everyone".* 3 follow through, follow up, follow out, carry out, put through, go through (pursue to a conclusion or bring to a successful issue) *"Did he go through with the treatment?"; "He implemented a new economic plan"; "She followed up his recommendations with a written proposal".*

incentive n – 1 inducement, motivator (a positive motivational influence) 2 bonus, (an additional payment (or other remuneration) to employees as a means of increasing output).

individual n – 1 person, someone, somebody, mortal, soul (a human being) *"there was too much for one person to do".* 2 individual (a single organism).

industry n – 1 the people or companies engaged in a particular kind of commercial enterprise) *"each industry has its own trade publications".* 2 industry, manufacture (the organized action of making of goods and services for sale) *"American industry is making increased use of computers to control production".*

insulate v – protect from heat, cold, or noise by surrounding with insulating material)
"We had his bedroom insulated before winter came".

issue v – 1 bring out an official document (such as a warrant).

law n – legal document setting forth rules governing a particular kind of activity
"there is a law against kidnapping".

limit (emissions) v – restrict, restrain, trammel, bound, confine, throttle (place limits on (extent or access)) *"restrict the use of this parking lot"; "limit the time you can spend with your friends".*

make sense v – add up (be reasonable or logical or comprehensible).

opt for smth. v – choose, prefer, select as an alternative over another *"I always choose the fish over the meat courses in this restaurant"; "She opted for the job on the East coast".*

other than adv – differently, otherwise (in another and different manner) *"very soon you will know differently"; "she thought otherwise"; "there is no way out other than the fire escape".*

permit n – license, licence (a legal document giving official permission to do something).

policymaker n – a politician (from Greek "polis") is an individual who is involved in influencing public decision making through the influence of politics.

power grid n – power system, grid (a system of high tension cables by which electrical power is distributed throughout a region).

profit n – gain (the advantageous quality of being beneficial).

rate n – 1 a magnitude or frequency relative to a time unit) *"they traveled at a rate of 55 miles per hour"; "the rate of change was faster than expected".* 2 the relative speed of progress or change *"he lived at a fast pace"; "he works at a great rate"; "the pace of events accelerated".*

rate v – pace (the relative speed of progress or change) *"he lived at a fast pace"; "he works at a great rate"; "the pace of events accelerated".*

recent developments n pl – in a recent event that has some relevance for the present situation; *"recent developments in Iraq"; "what a revolting developmen*

release v – exhaust, discharge, expel, eject (eliminate (a substance)) *"combustion products are exhausted in the engine"; "the plant releases a gas".*

release v – publish: prepare and issue for public distribution or sale; *"publish a magazine or newspaper".*

renewable sources adj – 1 that can be renewed or extended *"a renewable lease"; "renewable subscriptions".* 2 capable of being renewed; replaceable *"renewable energy such as solar energy is theoretically inexhaustible"*

report n – a written document describing the findings of some individual or group; *"this accords with the recent study by Hill and Dale".*

ride n – drive (a journey in a vehicle (usually an automobile)) *"he took the family for a drive in his new car".*

rubbish dumps (land fills) n pl – dump, garbage dump, trash dump, rubbish dump, wasteyard, waste-yard, dumpsite (a piece of land where waste materials are dumped).

set v – 1 put, place, pose, position, lay (put into a certain place or abstract location) *"Put your things here"; "Set the tray down"; "Set the dogs on the scent of the missing*

children"; *"Place emphasis on a certain point"*. 2 determine (fix conclusively or authoritatively) *"set the rules"*.

share v – 1 have in common *"Our children share a love of music"*; *"The two countries share a long border"*. 2 use jointly or in common.

signatory n – signer (someone who signs and is bound by a document).

significantly adv – in a significant way; *"the two groups differed significantly"*.

simplify v – make simpler or easier or reduce in complexity or extent; *"We had to simplify the instructions"*; *"this move will simplify our lives"*.

slow down v – 1 decelerate, slow, slow up, retard (lose velocity; move more slowly) *"The car decelerated"*. 2 slow, slow up (cause to proceed more slowly) *"The illness slowed him down"*. 3 decelerate (reduce the speed of) *"He slowed down the car"*.

solution n – 1 answer, result, resolution, solvent (a statement that solves a problem or explains how to solve the problem) *"they were trying to find a peaceful solution"*; *"the answers were in the back of the book"*; *"he computed the result to four decimal places"*. 2 a method for solving a problem *"the easy solution is to look it up in the handbook"*.

stand-by mode v – a particular functioning condition or arrangement *"switched from keyboard to voice mode"*.

state n – the way something is with respect to its main attributes; *"the current state of knowledge"*; *"his state of health"*; *"in a weak financial state"*.

step n – measure (any maneuver made as part of progress toward a goal) *"the situation called for strong measures"*; *"the police took steps to reduce crime"*.

subsidise v – 1 subsidize (secure the assistance of by granting a subsidy, as of nations or military forces) 2 support through subsidies *"The arts in Europe are heavily subsidized"*.

summarize v – sum up: give a summary (of); *"he summed up his results"*; *"I will now summarize"* be a summary of; *"The abstract summarizes the main ideas in the paper"*.

target n – aim, object, objective (the goal intended to be attained (and which is believed to be attainable)) *"the sole object of her trip was to see her children"*.

tempt v – 1 allure (dispose or incline or entice to) *"We were tempted by the delicious-looking food"*. 2 entice, lure (provoke someone to do something through (often false or exaggerated) promises or persuasion) *"He lured me into temptation"*. 3 invite (give rise to a desire by being attractive or inviting) *"the window displays tempted the shoppers"*.

terms n pl – condition, term ((usually plural) conditions offered or agreed to) *"the contract set out the conditions of the lease"*; *"the terms of the treaty were generous"*.

toll n – a fee levied for the use of roads or bridges (used for maintenance).

understanding n – the cognitive condition of someone who understands; *"he has virtually no understanding of social cause and effect"*.

unlikely adj – 1 improbable (not likely to be true or to occur or to have occurred) *"legislation on the question is highly unlikely"*; *"an improbable event"*. 2 has little chance of being the case or coming about *"an unlikely story"*; *"an unlikely candidate for reelection"*; *"a butcher is unlikely to preach vegetarianism"*. 3 improbable, unbelievable, unconvincing (having a probability too low to inspire belief).

up to date adj – **1** reflecting the latest information or changes; "an up-to-date issue of the magazine". **2** in accord with the most fashionable ideas or style; "wears only the latest style"; "the last thing in swimwear"; "cutting-edge technology"; "a with-it boutique".

voluntary adj – **1** of your own free will or design; done by choice; not forced or compelled "man is a voluntary agent"; "participation was voluntary"; "voluntary manslaughter"; "voluntary generosity in times of disaster"; "voluntary social workers"; "a voluntary confession". **2** controlled by individual volition "voluntary motions"; "voluntary muscles".

withdraw v – recall, call in, call back (cause to be returned) "recall the defective auto tires"; "The manufacturer tried to call back the spoilt yoghurt".

Chapter 5

avoid v – stay clear from; keep away from; keep out of the way of someone or something; "Her former friends now avoid her".

change in n – the result of alteration or modification; "there were marked changes in the lining of the lungs"; "there had been no change in the mountains".

come up with – to invent, create, or think of.

comprehensive adj – including all or everything; "comprehensive coverage"; "a comprehensive history of the revolution"; "a comprehensive survey".

determine v – shape or influence; give direction to; "experience often determines ability"; "mold public opinion".

driving force – **1** a terminology used in thermodynamics expressing the availability of energy to 'drive' a process such as mechanical work or chemical. **2** an influence that causes change. **3** a driving or energizing force, especially one involved in a process of social or psychological change.

economic growth n – steady growth in the productive capacity of the economy (and so a growth of national income).

effort n – attempt: earnest and conscientious activity intended to do or accomplish something; "made an effort to cover all the reading material".

ensure v – guarantee: make certain of; "This nest egg will ensure a nice retirement for us"; "Preparation will guarantee success

environmentally sound economy – refers to those principles, methods and procedures involved in addressing the protection, management and enhancement of the ecosystem.

estimate n – **1** an approximate calculation of quantity or degree or worth; "an estimate of what it would cost"; "a rough idea how long it would take". **2** a judgment of the qualities of something or somebody; "many factors are involved in any estimate of human life"; "in my estimation the boy is innocent".

for sure adv – surely: definitely or positively ('sure' is sometimes used informally for 'surely'); "the results are surely encouraging".

gap n – **1** a conspicuous disparity or difference as between two figures; "gap between income and outgo"; "the spread between lending and borrowing costs". **2** opening: an open or empty space in or between things; "there was a small opening between the

trees"; "the explosion made a gap in the wall". **3** a narrow opening; "he opened the window a crack".

give off v – **1** have as a by-product; "The big cities gave off so many wonderful American qualities". **2** emit: give off, send forth, or discharge; as of light, heat, or radiation, vapor, etc.; "The ozone layer blocks some harmful rays which the sun emits".

influence n – a power to affect persons or events especially power based on prestige etc; "used her parents' influence to get the job".

local adj – relating to or applicable to or concerned with the administration of a city or town or district rather than a larger area; "local taxes".

make do v – cope: come to terms with; "We got by on just a gallon of gas"; "They made do on half a loaf of bread every day".

need n – **1** a condition requiring relief; "she satisfied his need for affection"; "God has no need of men to accomplish His work"; "there is a demand for jobs". **2** anything that is necessary but lacking; "he had sufficient means to meet his simple needs"; "I tried to supply his wants".

partly adv – partially: in part; in some degree; not wholly; "I felt partly to blame"; "He was partially paralyzed".

rapid adj – **1** done or occurring in a brief period of time; "a rapid rise through the ranks". **2** a part of a river where the current is very fast. **3** characterized by speed; moving with or capable of moving with high speed; "a rapid movement"; "a speedy car"; "a speedy errand boy".

renewable adj – **1** that can be renewed or extended; "a renewable lease"; "renewable subscriptions". **2** capable of being renewed; replaceable; "renewable energy such as solar energy is theoretically inexhaustible".

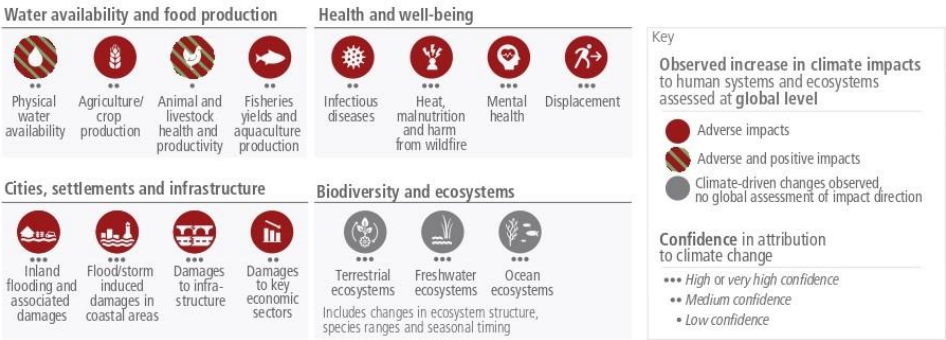
result v – issue or terminate (in a specified way, state, etc.); end; "result in tragedy".

solution n – **1** a statement that solves a problem or explains how to solve the problem; "they were trying to find a peaceful solution"; "the answers were in the back of the book"; "he computed the result to four decimal places". **2** a method for solving a problem; "the easy solution is to look it up in the handbook".

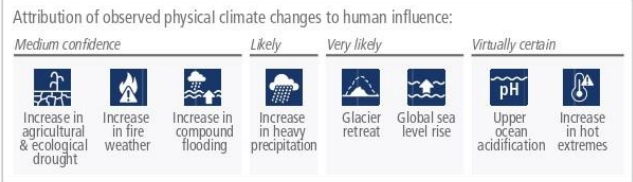
spread v – **1** distribute or disperse widely; "The invaders spread their language all over the country". **2** process or result of distributing or extending over a wide expanse of space. **3** become distributed or widespread; "the infection spread"; "Optimism spread among the population".

Adverse impacts from human-caused climate change will continue to intensify

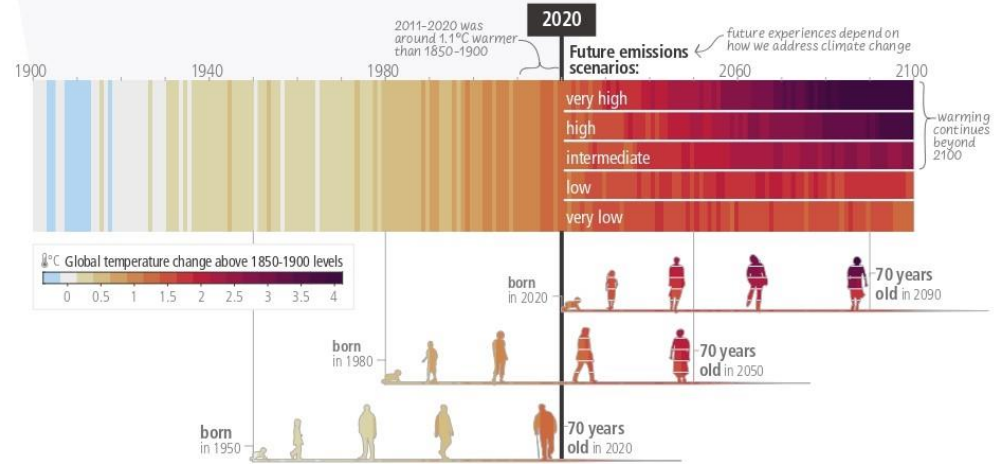
a) Observed widespread and substantial impacts and related losses and damages attributed to climate change



b) Impacts are driven by changes in multiple physical climate conditions, which are increasingly attributed to human influence



c) The extent to which current and future generations will experience a hotter and different world depends on choices now and in the near term



TESTS

GLOBAL CLIMATE CHANGE

Test 1 (Chapter 1)

Task 1

Complete the following phrases:

1. Since 10,000 years ago climate in Northern Hemisphere has been.....

.....

2. The emissions of greenhouse gases come from many sources, including.....

.....

3. The greenhouse effect is a natural phenomenon where.....

.....

4. Most emissions of CO₂ come from natural sources, such as.....

.....

Task 2. Fill in the gaps with

a) the words given: water, dioxide, natural, phenomenon, develop, tip, caps, contributor ice.....,agriculture,causes, natural....., carbon.....,the scales, the greatest,vapour

b) the prepositions given: behind, to, by, of, over, with, at

supply, escapeouter space, trapped....., souththe ice-covered areas, leave....., berisk of,the next hundred years

Task 3. Match the definitions to the following words:

1) melt	A become bigger or greater in number, size etc.
2) risk	B dissolve, become soft or liquid
3) increase	C not fit for habitation
4) provide	D have an effect upon
5) uninhabitable	E happen, come to pass
6) affect	F be just going to do smth
7) occur	G give sbm smth useful or necessary
8) be about to do smth.	H expose to a chance of loss or damage

1 _ 2 _ 3 _ 4 _ 5 _ 6 _ 7 _ 8 _

GLOBAL CLIMATE CHANGE

Test 2 (Chapter 2).

Task 1

Complete the following phrases:

1. A warmer global climate will definitely mean more than just more sweat! It may, for example,

.....
.....
.....

2. According to IPCC, if we do not take action to limit emissions of greenhouse gases by 2100, we can expect.....
.....

3. The reason that scientists do not know whether the temperature will increase by a little more than one degree or up to six degrees is that 1st).....
.....2nd).....
.....

4. The most vulnerable species are those that are specially adapted to particular areas. For example, alpine species.....
.....polar species.....

Task 2. Fill in the gaps with: a) the words given: habitat, patterns, consumption, action, currents, species, size, entire

wind and rain....., population....., take....., fossil fuel....., wind and ocean....., individual.....,ecosystems, expand one's

b) the prepositions given: by, by, in, per, upon, to, to, towards

lead....., be determined....., increase.....,turn, migrate....., move....., be encroached....., decade

Task 3. Match the definitions to the following words:

1) cloudburst	A a slide of a large mass of dirt and rock down a mountain or cliff
2) drought	B be reduced from a solid to a liquid state, usually by heating
3) flood	C the quantity of water falling to earth at a specific place within a specified period of time
4) landslide	D continue to live through hardship
5) precipitation	E of extreme importance, vital
6) crucial	F anything that contributes to a result
7) survive	G become filled to overflowing
8) melt	H a shortage of rainfall
9) factor	I a heavy rain

1 _ 2 _ 3 _ 4 _ 5 _ 6 _ 7 _ 8 _ 9 _

GLOBAL CLIMATE CHANGE

Test 3 (Chapter 3).

Task 1. Complete the following phrases:

1. Flooding cannot be directly ascribed to human emissions of CO and other greenhouse gases because.....
.....
.....
2. The rescue teams are always concerned about.....
.....
.....
3. Under extreme weather conditions authorities recommend that people.....
.....
.....
4. The impacts of flooding can be felt for a long time, because *(give at least 3 reasons)*.....
.....
.....
5. To adapt to continual flooding it may be necessary to *(use the verbs move, change and build)*.....
.....
.....
6. Climate change affects human health in many ways, for example *(give at least 3 examples)*.....
.....
.....

Task 2. Fill in the gaps with: a) the words given: crop, water, hoist, extreme, consequences, fire, unpredictable

.....fighters,weather, to hold theback,
.....sandbags, completely....., improveyields, have serious

b) the prepositions given: by, to, away, to, to, of, of, in

favourable....., prevalentAfrica, in addition....., wilt....., be ascribed....., riseone meter, be emptiedartwork, in the orderbillions of Euros

Task 3. Match the definitions to the following words:

1) ascribe	A prevailing, most frequent
2) commonplace	B extreme hunger
3) downstream	C harvest, yield from plants in a single growing season
4) escape	D be larger in number
5) prevalent	E in the direction of a stream's current
6) starvation	F result, consequence, outcome
7) effect	G get rid of, shake off
8) crop	H ordinary, unremarkable
9) outnumber	I attribute, assign, credit to

1 _ 2 _ 3 _ 4 _ 5 _ 6 _ 7 _ 8 _ 9 _

GLOBAL CLIMATE CHANGE

Test 4 (Chapters 4 and 5).

Task 1. Complete the following phrases.

1. People will slow down the climate change if
.....
.....
.....
.....
2. If you would like to help reduce the climate change, you can
.....
.....
.....
.....
3. The instruments the governments use to create incentives for businesses and individuals include.....
.....
.....
.....
4. There are two important international agreements, which aim to combat man-made climate change:.....
.....
.....
.....
5. The driving forces of man-made climate change are.....
.....
.....

Task 2. Fill in the gaps with: a) the words given: *burden, locally, concerned, economic, report, sound, long-life, comprehensive, enjoy, affecting*

will keepthe climate, to fullyone's efforts,light bulbs,
.....produced,individuals, makesense, the greatest
..... of responsibility, release an assessment, environmentally
.....economy,measures

b) the prepositions given: *to, into, on, on, for, with, with, by, by, down*

slow, contributeemissions, share rides, in the stand-..... mode, taxes
the fossil fuels, create incentives, Convention Climate Change, agree or disagree
smb, be determined, take account

Task 3. Match the definitions to the following words:

1) affect	A full, total
2) combat	B attempt
3) entire	C guarantee
4) signatory	D influence, have an effect on
5) comprehensive	E battle
6) effort	F signer
7) ensure	G calculation
8) estimate	H aim, objective
9) renewable	I including everything
10) target	J that can be renewed

1 _ 2 _ 3 _ 4 _ 5 _ 6 _ 7 _ 8 _ 9 _ 10 _

UNIT 2. PROTECTION OF THE HUMAN ENVIRONMENT FROM SOLAR RADIATION

CHAPTER 1. THE SUN AND UV RADIATION

1 A. Watch the film “Radiation from the Sun and the Earth” (on the CD or at NASA Earth Observatory <http://www.youtube.com/watch?v=nNzDXXUiqRs>) and explain what the Sun radiation is.

1 B. Using the chart below give the descriptions of beneficial and harmful effects of sunlight. For meanings of new words consult the glossary.

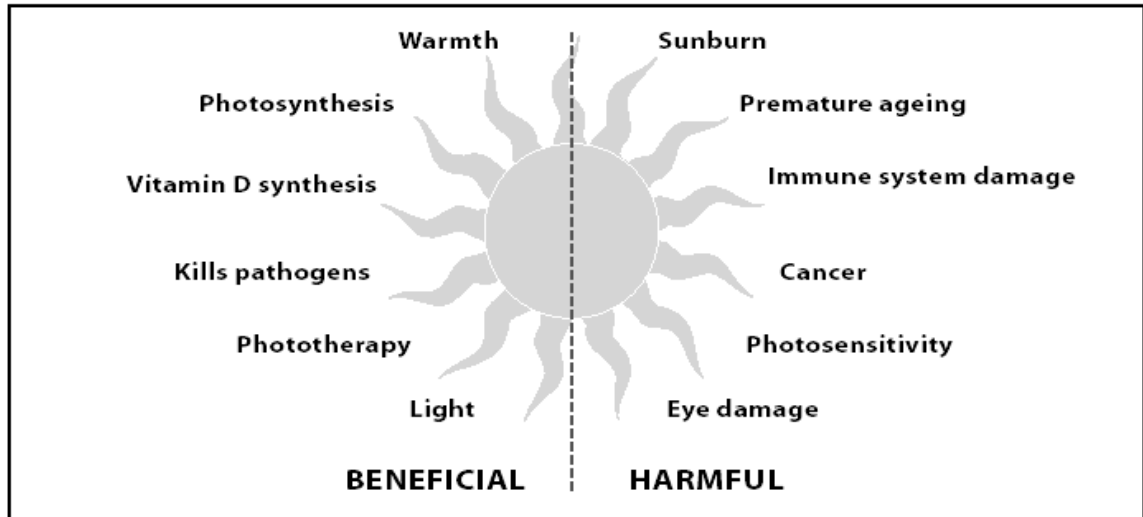


Figure 1: Beneficial and harmful effects of sunlight. Adapted from National Safety Council, The Sun Safety Activity Guide.

2 A. Read the article and confirm your answers.

The sun has beneficial and harmful effects

The sun is essential for life on Earth. It supports life through photosynthesis in plants, and by providing warmth and light. In addition, sunlight is critical to human physical and psychological well-being.

The sun has rays that we cannot see or feel called UV radiation

The sun emits light and warmth but also UV radiation. UV radiation cannot be seen or felt – UV radiation levels are independent of temperature and can still be high even when it is cloudy.

UV radiation levels vary depending on several factors

- Time of day – the higher the sun in the sky, the higher the UV radiation level. The sun is at its highest at around noon.
- Time of year – UV radiation levels are generally highest during the summer months.
- Geographic location – the sun’s rays are strongest at the equator, where the sun is most directly overhead. The closer the equator, the higher the UV radiation levels.
- Altitude – UV radiation levels increase with altitude because there is less atmosphere to absorb the damaging rays.

Clouds – heavy cloud cover usually reduces UV radiation levels.

- Environment – UV rays are reflected off surfaces such as snow, water, sand, and concrete. This indirect UV radiation can significantly add to a person’s overall exposure.

2 B. Give answers to the following questions.

- a) Which of beneficial effects cannot be found in the chart?
b) What is UV radiation?

2 C. Using the list of factors describe

- a) the most dangerous situation; b) the least dangerous situation in terms of time and place.

2 D. Fill in the words from the list, then make sentences using the completed phrases.

exposure, altitude, vary, reduce, significantly, emit

to light and warmth, UV radiation levels, increase with, to UV radiation levels, person's overall, to add

2 E. Fill in the prepositions from the list, then make sentences using the completed phrases.

overhead, through, to, to, of, on, at, for, in,

to be essential, to support life photosynthesis, addition, critical human physical and psychological well-being, independent, to depend, to be its highest (about the sun), directly, to add ...

3 A. Discuss these questions:

- a) Why is sunlight critical to human health and well-being?
b) Which factors influence UV radiation levels? In what ways?

3 B. Dwell upon the influence of indirect UV radiation using the information from the text and the picture from Appendix A.

Examples 1) As we know heavy cloud cover usually reduces UV radiation levels, while over 90% of UV can penetrate through light cloud.

2) As clean snow reflects up to 80% of sun burning UV this indirect UV can significantly add to a person's overall exposure. **or** Snow reflects up to 80% of sun burning UV which significantly adds to a person's overall exposure.

3 C. Fill in the words from the list, and then make sentences using the completed phrases.

by, UV, workers, increase, half, by, intense, penetrate

..... light cloud, increase 4 %, in latitude, reduce UV 50%, indoor, exposure, at a meter depth, as as

a)



b)



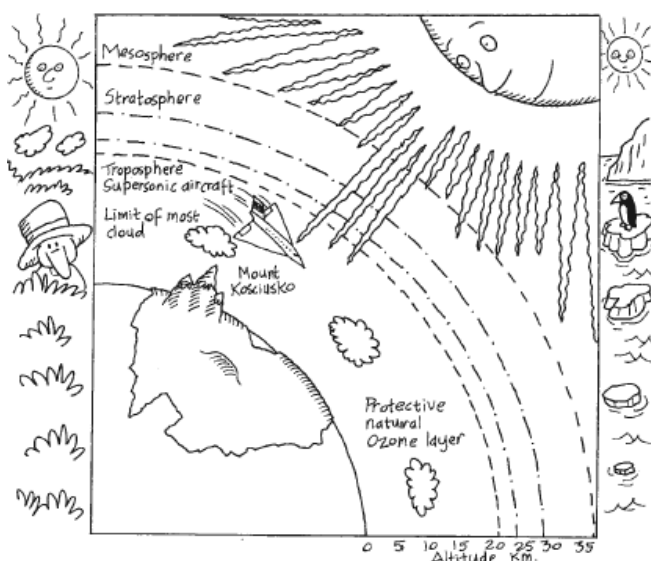
4 B. Fill in the words from the list, then make sentences using the completed phrases.

potential, adverse, Earth's, midday, indicate, along with, the level, range

to describeof UV radiation, at the surface, designed tothe potential, the potential for health effects, thefor damage to the skin and eye, the values of the indexfrom zero upward, to be reportedthe weather forecast, around

5 A. What are ozone and the ozone layer (for definitions consult the glossary)? What other layers does the Earth's atmosphere have?

Ozone—the Earth's sunscreen



B. Restore omitted parts of the text, making use of the following words.

UV radiation, chlorofluorocarbons, protected, countries, a shield, sensitive to, found, ozone, plankton, ozone-depleting, health effects, agreement, destroy, reversed, negative

The ozone layer blocks out most harmful rays from the sun

The Earth is mostly 1)from UV radiation by the ozone layer. Ozone is a naturally occurring gas 2)..... in the Earth's atmosphere. The ozone layer acts like 3).....that protects against the harmful effects of 4).....on

human beings. Man-made chemicals – such as the 5)..... (CFCs) used in aerosol sprays, refrigerators, and air conditioners – rise into the atmosphere, where they are broken down. This releases chlorine, which depletes some of the protective 6)..... layer. With the thinning of the ozone layer, increased levels of UV radiation on Earth are expected, and have been measured in some 7).....

Some possible outcomes of ozone depletion are:

- an increase in UV radiation-related adverse 8).....such as sunburn and skin cancer;
- a possible drop in the production of 9)....., which provides the basis for the ocean's food chains;
- lower production of important food crops around the world. Many plants are 10).....high levels of UV radiation.

The good news about ozone depletion is that most countries have now entered into an 11)....., the Montreal Protocol, to severely restrict the use of chemicals, which 12).....ozone. Actions taken as a result of the Montreal Protocol have decreased the levels of 13).....substances in the atmosphere. This means that concentrations of chlorine in the stratosphere will decrease in years and decades to come. The bad news is that it will not be until the end of the 21st century that most ozone depletion will be 14)..... Furthermore, atmospheric changes associated with the greenhouse effect may also have a 15).....impact on ozone levels.

5 C. Read the article again and give answers to the following questions:

- What is the main reason for ozone depletion?
- What are the possible outcomes of ozone depletion?
- Do you know if Ukraine has entered the Montreal Protocol yet?
- Do you believe it is possible for everyone to make his(her) personal contribution to the solution of the problem?

5 D. Fill in the words from the list, then make sentences using the completed phrases.

like, from, in, in, against, into, with

to be protected UV radiation, found the Earth's atmosphere, protects the harmful effects, to acta shield, an increaseadverse health effects, associated, rise the atmosphere

**Working with Media: Making a Power Point Presentation vs Glogging
Summarising the contents of Chapter 1 choose one of the tasks:**

- as a group leader in a summer camp make a presentation for teenagers from a northern country;
- write a post in your blog to tell your friends the most interesting facts that you have learnt;
- if you found the information useless, write a post in your blog or make a glog explaining why. Share your media products with the group.

CHAPTER 2. HEALTH RISKS OF UV RADIATION EXPOSURE

1 A. Read the paragraph and give answers to the following questions:

- To what extent is exposure to sunlight important for the production of vitamin D by the human body?
- Is it problematic for Northern Europeans to maintain a sufficient level of vitamin D because of low UV indexes?
- Which problems can you face as a result of prolonged UV exposure?

Some UV radiation is necessary – too much is harmful

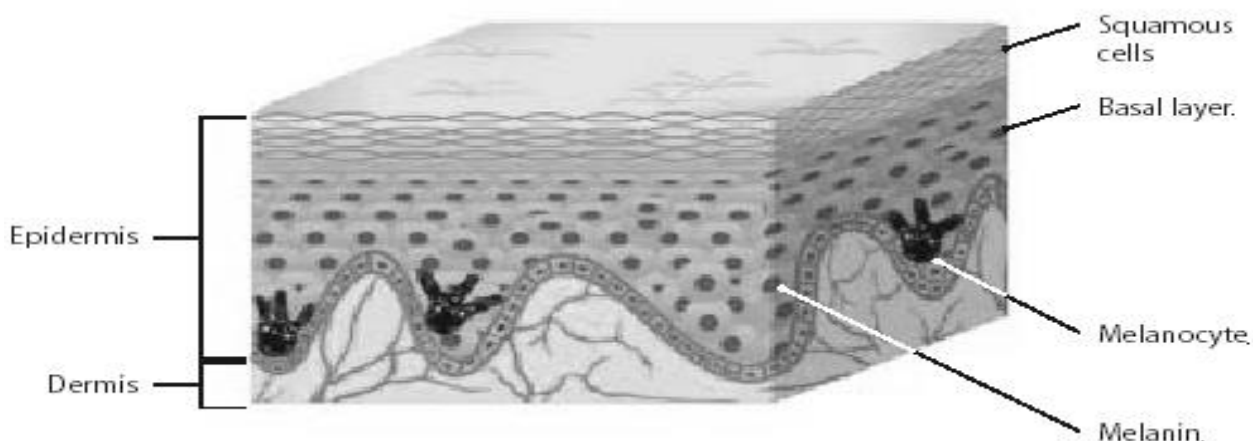
Exposure to sunlight enables the body to produce vitamin D, which plays a **crucial** role in skeletal development, immune function, and blood cell formation. Ten to fifteen minutes daily exposure of face, forearms, and hands to normal Northern European summer sun is **sufficient** to maintain vitamin D levels. Vitamin D **deficiency** may be a problem for some people, e.g. those with heavily pigmented skin who live in high-latitude areas where UV radiation levels are relatively low, or the **housebound** elderly. While some sunlight is beneficial and its light and warmth enhances people's general feeling of **wellbeing**, prolonged exposure to UV radiation can cause serious health damage. We know that UV radiation is responsible for sunburn. **Furthermore**, sun exposure can cause skin cancer, skin ageing, and eye inflammation, and **contributes** to cataract development. There is also **mounting evidence** that exposure to UV radiation may weaken the immune system.

1 B. Fill in the words from the list, then make sentences using the completed phrases.

maintain, evidence, sunburn, deficiency, crucial, areas, exposure, produce, housebound, immune, health, development

to enable the body tovitamin D, to play a role in, function, daily to the sun, sufficient to vitamin D levels, vitamin D, high-latitude, the elderly, cause serious damage, responsible for, to contribute to cataract, mounting

2 A. Give the description of the human skin structure, making use of the scheme and the glossary. Answer the questions below.



- What are the two layers of the skin?
- Which layer is on top closest to the surface of the skin?
- What is the deepest layer of the skin called?

Identify the following:

- Epidermis
- Dermis
- Melanocytes
- Melanin
- Basal cells
- Squamous cells

2 B. Read the texts below and answer the questions:

- a) What is suntan? Can it be viewed as a shield from UV radiation? Why/ Why not?
- b) Why are sunburns considered to be so dangerous?
- c) What are the most visible signs of premature aging?

Suntan

The skin produces the dark-coloured pigment melanin as a shield against damage from UV radiation. There is no such thing as a healthy tan – any colour change from our natural skin colour is a sign of damage and offers little protection against further damage.

Sunburn

High doses of UV radiation kill most of the cells in the upper skin layer, and cells that are not killed are damaged. In its mildest form, sunburn consists of a reddening of the skin. The effects of a severe sunburn can last for several days, and may include blistering and peeling of the skin.

Skin ageing

Chronic overexposure to the sun can change the texture and weaken the elasticity of the skin. Sun induced skin damage causes premature wrinkling, sags and bags, and easy bruising. Up to 90% of the visible changes commonly attributed to ageing may be caused by sun exposure.

2 C. Fill in the words from the list, and then make sentences using the completed phrases.

induced, change, weaken, overexposure, doses, pigment

the dark-coloured melanin, high of UV radiation, chronic to the sun, the texture, the elasticity of the skin, sun skin damage

2 D. Fill in the prepositions from the list, then make up sentences using the completed phrases.

of, of, by, to, against, against

a shield damage, a sign damage, to offer protection damage, attributed ageing, to be caused sun exposure, sunburn consists a reddening of the skin

3. Fill in the chart with the information about your personal sunburn danger and the ways you follow to stay safe (Unit 2 Appendix C).

4 A. Read the questions, choose the correct answer, then read the text and check if your guesses were right. Give explanations to the words in bold.

- 1) What is the amount of non-melanoma cancers that occur globally each year?
a) 100.000 b) 1.000.000 c) 3.000.000
- 2) How many people all over the world get malignant melanoma cancers yearly?
a) 11.000 b) 58.000 c) 132.000
- 3) What is the proportion of North Americans that will currently develop some form of skin cancer?
a) one in a hundred b) one in thirty c) one in five
- 4) All forms of skin cancer are very rare among a) children / b) middle-aged people / c) elderly people.
- 5) At what age is frequent sun exposure and sunburn increase the risk of developing skin cancer?
a) 0 – 10 b) 11 – 17 c) 18 – 30 d) 31 – 50 e) 51 - older

Skin cancer

Frequent UV radiation exposure can cause skin cancer and accelerate cancer progression. Between two and three million non-melanoma skin cancers and approximately 132 000 malignant melanomas occur globally each year. Skin cancer incidence has been increasing in recent decades. Currently, one in five North Americans will develop some form of skin cancer in their lifetime. The three most common types of skin cancer are basal cell carcinoma, squamous cell carcinoma, and melanoma. In contrast to malignant melanoma, non-melanoma skin cancers are not usually fatal. All forms of skin cancer are extremely rare among children, as cancer development may take several decades. However, frequent sun exposure and sunburn during childhood significantly increase the risk of developing skin cancer later in life.

Basal cell carcinoma (picture 1)

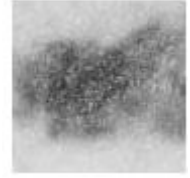
Usually appears as a **red lump** or **scaly** area. It grows slowly and rarely spreads to other parts of the body.

Squamous cell carcinoma (picture 2)

Appears as a thickened red scaly spot at body sites most often exposed to UV radiation, such as the ears, face, neck, and forearms. It tends to be slow growing but is more dangerous than basal cell carcinoma as it sometimes metastasizes and can be **fatal**.

Malignant melanoma (picture 3)

Is the rarest but most dangerous type of skin cancer. It may arise as a new mole or as changes in colour, shape, size or **sensation** of an old spot, freckle or mole. Melanoma tends to have an irregular outline and a patchy colouring. **Itching** is another common symptom but is also found in normal moles. If you have a **mole, freckle or spot** you are concerned about, go and see your doctor. If recognized and treated early, the chances of **survival** are good.



1. Basal cell carcinoma 2. Squamous cell carcinoma 3. Malignant melanoma

4 B. Number the skin cancers starting from the most dangerous one, then match the definitions using the same numbers.

..... basal cell carcinoma squamous cell carcinoma malignant melanoma

.....a) grows slowly and rarely spreads to other parts of the body;

.....b) appears on parts of body most often exposed to the sun, grows slowly but sometimes metastasizes and can be fatal;

.....c) its common symptoms are itching, irregular outline and patchy colouring.

4 C. Fill in the words from the list, then make sentences using the completed phrases.

non-melanoma, survival, significantly, globally, spread, outline, common, incidence, accelerate

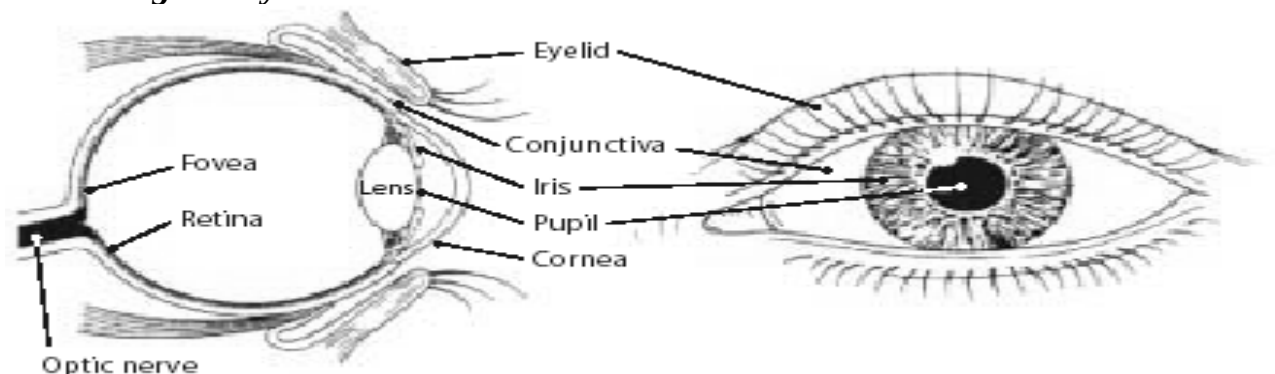
to cancer progression, skin cancers, occur , skin cancer increase the risk, to..... to other parts of the body, an irregular, a symptom, the chances of

4 D. Fill in the prepositions from the list, then make sentences using the completed phrases.

of, among, about, in, in, in

..... recent decades, develop some form skin cancer, their lifetime, contrast to, extremely rare children, concerned

5 A. Describe the functions of each part of the human eye making use of the picture and the glossary.



5 B. Read the text and give answers to the questions:

- a) What kind of sun radiation can be too strong for the human eye? Why?
- b) What is snow blindness and why does it occur?
- c) What leads to cataracts?
- d) How does UV radiation influence the immune system?

Eye inflammation and cataract

Extreme UV radiation conditions such as strong ground reflection from sand, water or snow can lead to inflammations of the cornea and the conjunctiva. These are comparable to a sunburn of the very sensitive skin-like tissues of the eyeball and eyelids. Snow blindness is an extreme form of corneal inflammation. Overexposure to the sun without eye protection may also lead to cataracts, a loss of transparency in the lens. Cataracts are the leading cause of blindness in the world.

A weakened immune system

UV radiation may reduce the effectiveness of the immune system. Consequently, too much sun exposure could potentially enhance the risk of infection.

6 A. Read the statements, choose the correct variant, and then read the text to check your answers.

- a) People with *pale* /*dark* skin, *blue* /*black* eyes develop skin cancer very rarely.
- b) Children's skin is *more* / *less* sensitive to the sun radiation.
- c) Sun burn in childhood *reduces* / *increases* the risk of getting skin cancer later in life.
- d) Children are usually *more* / *less* exposed to the sun.

Everyone is affected by UV radiation

Individuals produce different amounts of melanin, the coloured pigment in the skin, and as a result, the skin's sensitivity to UV radiation differs greatly. While people with pale or freckled skin, fair or red hair and blue eyes burn easily and do not tan much, people with dark hair and eyes rarely burn and may develop a tan more easily. Naturally brown- and black-skinned people can tolerate much higher levels of sun exposure without getting sunburnt.

Some individual risk factors for skin cancer

- fair skin
- blue, green or hazel eyes
- light-coloured hair
- tendency to burn rather than suntan
- history of severe sunburns
- many moles
- freckles
- family history of skin cancer

The incidence of skin cancers is much lower in dark-skinned people than in fair-skinned people, nevertheless, skin cancers occur and are often detected at a later,

more dangerous stage. The risk of other UV radiation-related health effects, such as eye damage and suppression of the immune system, is independent of skin type.

Children are particularly at risk

- Children's skin is more sensitive to UV radiation damage.
- Sunburn in childhood increases the risk of melanoma and other skin cancers later in life.
- Children are more exposed to the sun as they spend a lot of time outdoors.

6 B. Making use of the information above describe a person whose risk factors are the highest/lowest.

CHAPTER 3. SUN SAFETY THROUGH SUN PROTECTION

1 A. Before reading the text try to give answers to the questions:

a) Which of the following do you think is the main cause of the rise in the skin cancer rates?

- a) ozone depletion b) high levels of indirect radiation c) people's behaviour
- b) Can UV related health risks be prevented? Why / Why not?**
- c) What must be done to change the situation?**
- d) How would you describe "sunsmart" attitudes?**

1 B. Read the text and check your answers, give explanations to the phrases in bold, and make up sentences with them.

Sun damage is preventable through sensible behaviour

People's behaviour in the sun is the main cause of the rise in skin cancer rates in recent decades. An increase in popular outdoor activities, and changes in clothing fashions and sunbathing habits, often result in **excessive UV radiation exposure**. Skin cancer and other UV radiation-related health effects are largely preventable if **sun protection practices** are followed early and **consistently**. The key message is to avoid sunburn and practise sun protection.

Changing attitudes

Many people consider intensive sunbathing to be normal and perceive a suntan as a symbol of attractiveness and good health. Unfortunately, even children often adopt this attitude from a young age. **Attitudinal barriers** to sun protection must be addressed and changed before behaviours will change. Recognizing that people are born with different skin types and **strengthening the message**, that everyone should **be happy with** their natural skin colour is an important step in promoting **"sunsmart" attitudes**. It is important to provide opportunities for this to be addressed in teaching about the need for sun protection.

Action steps for sun protection

- **Limit time in the midday sun**

The sun's UV rays are the strongest between 10 a.m. and 4 p.m. **To the extent possible**, limit exposure to the sun during these hours.

- **Watch for the UV Index**

This important resource helps you plan your outdoor activities in ways that prevent overexposure to the sun's rays. While you should always **take precautions against** overexposure, take special care to adopt sun safety practices when the UV Index predicts exposure levels of very high or above.

- **Use shade wisely**

Seek shade when UV rays are most intense, but **keep in mind** that shade structures such as trees, umbrellas or canopies do not offer complete sun protection. Remember the shadow rule: "Watch your shadow – No shadow, seek shade!"

1 C. Fill in the words from the list, then make sentences using the completed phrases.

exposure, attitude, practices, radiation-related, habits, message, excessive, overexposure, strengthening

sunbathing, result in UV radiation exposure, health effects, sun protection, the key, adopt this , the message, limit to the sun, prevent

1 D. Fill in the prepositions from the list, then make sentences using the completed phrases.

against, through, with, for, in, in, in, to, to

preventable sensible behaviour, the rise skin cancer rates, changes clothing fashions, attitudinal barriers, be happy their natural skin colour, to provide opportunities , the extent possible, take precautions overexposure, keep mind

1 E. Read the list of the sun protection rules again and tick the ones that you always follow, explain why you do that. Can you say that your behaviour is sunsmart?

2. Promote sunsmart attitudes describing the swim costumes in Appendix B.

Working with Media: Recording a role-play

Work together. You are going to an African country with your partner.

Discuss the following questions using the words given.

to go sightseeing/ hiking/ walking/ horse riding/ scuba diving

to sunbathe to go on a cruise to go on safari to visit a historic sight

preparations: to choose a good tour operator, to book well in advance, to get vaccinations, to confirm a booking/ flight, to apply for a passport/ visa, to make a hotel reservation, to arrange travel insurance

clothing: wrinkle-free/ easy to pack clothing, sunglasses, sun hat, walking shoes, to travel light

medical: first aid kit, travel sickness tablets, insect repellent, suntan lotion, to get an upset stomach, to get sun burnt/ sunstroke

equipment: hand luggage, rucksack, binoculars, (video) camera, film

a) What preparations would you need to make before going on a holiday like this?

b) What things would you need to take with you?

c) What kind of problems might you encounter on a holiday of this type?

Record your role play and exchange it with your group mates (you can download your recording on Youtube and share it in your blog). Check each other's dialogues and comment them on. Emphasize the strong points at the beginning of your comment and be constructive when criticising the weak points.

TRANSLATION SECTION

1) What is the genre and style of the text?

2) Analyse the structural components (headings, subheadings, paragraphs) of the text paying attention to the thematic formation.

3) What do you know about the author and his/her intentions?

4) Characterize the cohesive content organization of the text.

5) Translate the text from English into Russian OR from Russian into English.

TEXT 1

This systematic review found no eligible study on the health outcomes of melanoma or NMSC (non-melanoma skin cancer) prevalence in association with occupational exposure to solar UVR (ultraviolet radiation). Very few studies reporting on the association between occupational exposure to solar UVR and mortality from melanoma (two studies) and NMSC (one study) were identified, which was inadequate for quantitatively summarizing and assessing the harmfulness of occupational exposure to solar UVR for these outcomes.

However, the systematic review and meta-analysis found that outdoor workers are at an increased risk of the incidence of melanoma and NMSC. These findings are based on low- and moderate-quality ratings of the body of evidence, for associations between occupational exposure to solar UVR and melanoma and NMSC incidence, respectively, of moderate effect size.

Based on the other considerations for evaluating the strength of evidence, it was concluded that there was “limited evidence of harmfulness” and “sufficient evidence of harmfulness” of occupational exposure to solar UVR in terms of melanoma incidence and NMSC incidence, respectively. The findings were based on 47 incident case-control studies, 36 of which were included in meta-analyses, and supported by three case-case studies and two prospective cohort studies documenting moderate, but not always consistent, effects of occupational exposure to solar UVR on melanoma and NMSC incidence in a large sample with heterogeneous characteristics (e.g. geographical location and occupation). The pooled effect estimates displayed large statistical heterogeneity, which may reflect clinical heterogeneity of the existing body of evidence, especially with regards to the exposure and how it was assessed.

(From The effect of occupational exposure to solar ultraviolet radiation on malignant skin melanoma and non-melanoma skin cancer: a systematic review and

meta-analysis from the WHO/ILO Joint Estimates of the Work-related Burden of Disease and Injury)

ТЕХТ 2

Ультрафиолетовое (УФ) излучение нельзя увидеть или почувствовать. Воздействию солнечного УФ-излучения подвергается каждый человек, а некоторые люди также контактируют с его искусственными источниками (медицинскими, промышленными, устройствами для дезинфекции и косметическими приборами). На уровень солнечного УФ-излучения влияет несколько факторов:

- высота солнца над горизонтом: чем выше солнце, тем выше уровень УФ-излучения. Интенсивность УФ-излучения меняется в течение дня и в зависимости от времени года;
- географическая широта: чем ближе к экватору, тем выше уровни УФ-излучения;
- высота над уровнем моря: с увеличением высоты уровень УФ-излучения повышается, поскольку разреженная атмосфера поглощает меньше УФ-лучей;
- состояние облачного покрова: уровни УФ-излучения наиболее высоки при безоблачном небе, но могут быть высокими и при наличии облаков;
- озон: озон поглощает часть солнечного УФ-излучения. При снижении концентраций озона доля УФ-излучения, достигающего земной поверхности, возрастает;
- отражение УФ-лучей: уровень УФ-излучения выше при наличии отражающих поверхностей, таких как вода, песок и свежеснеженный снег;
- ожидается, что изменение климата, в том числе изменение концентраций озона и состояния облачного покрова, повлияет на уровень УФ-излучения, достигающего земной поверхности.

Влияние на здоровье

В небольших дозах УФ-излучение полезно для здоровья и играет важнейшую роль в выработке витамина D. В то же время избыток УФ-излучения может приводить к негативным последствиям для здоровья, поскольку оно является канцерогенным для человека.

Последствия для кожи

К острым последствиям УФ-излучения относятся повреждения ДНК, солнечные ожоги, фототоксические и фотоаллергические реакции и угнетение иммунной системы. Снижение эффективности иммунитета может быть отнесено к факторам риска онкологических заболеваний и может также приводить к реактивации вирусов (например, лихорадки на губах).

К хроническим последствиям воздействия УФ-излучения для кожи и губ относятся:

- меланома кожи — опасная для жизни злокачественная опухоль кожи;

- плоскоклеточная карцинома (ПМК) — злокачественная опухоль, которая обычно развивается не так быстро, как меланома, и реже приводит к смерти;
- базальноклеточная карцинома (БКК) — медленно развивающийся рак кожи, возникающий преимущественно у пожилых людей; и
- преждевременное старение кожи — потеря эластичности кожи в молодом возрасте и снижение скорости ее восстановления после повреждений.

В 2020 г. из-за чрезмерного воздействия УФ-излучения произошло примерно 1,2 млн новых случаев развития немеланомных опухолей кожи (ПМК и БКК) и 325 000 случаев меланомы кожи, а также 64 000 случаев преждевременной смерти от немеланомных опухолей кожи и 57 000 случаев смерти от меланомы.

Последствия для глаз

Острые последствия УФ-излучения включают фотокератит и фотоконъюнктивит (воспаление роговицы и конъюнктивы соответственно). Эти последствия обратимы, легко поддаются профилактике путем ношения солнцезащитных очков и обычно не приводят к длительным повреждениям, но сопровождаются болезненными ощущениями и могут требовать медицинского вмешательства.

К хроническим последствиям УФ-излучения относятся:

- катаракта (болезнь глаз, при которой происходит постепенное помутнение хрусталика, приводящее к ухудшению зрения и в конечном счете к слепоте);
- птеригиум (формирование мясистой нароста, который может частично закрывать роговицу); и
- злокачественная опухоль (базальноклеточная карцинома, плоскоклеточная карцинома или меланома) глаз или прилегающих тканей.

Ультрафиолетовое облучение также предположительно способствует развитию возрастной макулярной дегенерации (ВМД).

Согласно оценкам, около 15 млн человек в мире страдают слепотой по причине катаракты; порядка 10% таких случаев могут быть вызваны воздействием УФ-излучения.

Выработка витамина D

В малых дозах УФ-излучение имеет важное значение для здоровья, поскольку стимулирует выработку витамина D в организме. Витамин D укрепляет костные ткани и опорно-двигательный аппарат. Людям, получающим крайне мало солнечных лучей, в частности проживающим в закрытых учреждениях или не имеющим возможность выходить из дому, обладателям сильно пигментированной кожи в высокоширотных районах, а также лицам, которые по религиозным или культурным причинам носят полностью закрывающую тело одежду на улице, рекомендуется принимать пероральные препараты, восполняющие нехватку витамина D.

(From Ультрафиолетовое излучение)

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UNIT 2 GLOSSARY

basal cell carcinoma (BCC) – the most common type of skin cancer, which originates from basal cells in the skin. Usually appears as a red lump or scaly area. Rarely spreads to other organs (metastasizes).

carcinogen – an agent that induces cancer. May be physical, e.g. UV radiation; chemical, e.g. tobacco tar; or biological, e.g. human papilloma virus.

cataract – partial or complete clouding of the eye lens which impairs vision and may cause blindness. Vision can be restored by surgical removal and replacement with artificial lens.

chlorofluorocarbon (CFC) – a compound containing carbon, chlorine, fluorine, and sometimes hydrogen. Used as a refrigerant, solvent, or aerosol propellant, or in the manufacture of plastic foams.

conjunctiva – the mucous membrane that lines the inner surface of the eyelids and covers the front part of the eyeball.

cornea – the transparent part of the eyeball that covers the iris and pupil. Admits light to the interior of the eye.

erythema – redness of the skin. A sign of sunburn.

immune system – the system that protects the body from foreign substances, cells, and tissues that can cause disease. Produces chemicals and cells that attack the invaders and thus help the body to fight disease.

malignant melanoma (melanoma) – malignant cancer of melanocytes. Usually has an irregular outline and patchy colouring. Rarest but most dangerous type of skin cancer that often spreads to other organs (metastasizes).

melanin – a group of black, dark-brown, or reddish pigments present in the skin. Produced by specialized cells called melanocytes.

melanocyte – a cell in the upper skin layer that produces the pigment melanin.

metastasis – the process where cells break away from a tumour and spread around the body.

ozone – a form of oxygen that has three atoms in the molecules. Found in high concentrations in the ozone layer.

ozone layer – the atmospheric layer at heights of approximately 32 to 48 km. High ozone concentrations block most solar UV radiation from entry into the lower atmosphere.

photosensitivity – a skin condition that makes a person particularly sensitive to UV radiation. Exposure leads to an allergic reaction such as a rash or severe sunburn. Often associated with the use of certain medications.

photosynthesis – the synthesis of chemical compounds by plants with the aid of energy from the sun. **phototherapy** The therapeutic use of light and/or UV radiation to treat diseases such as rickets, psoriasis, eczema, and jaundice.

skin cancer – a tumour arising in the skin that is caused by uncontrolled cell division. Classified as melanoma and non-melanoma skin cancers (basal and squamous cell carcinoma).

snow blindness – inflammation of the cornea leading to temporary blindness. Caused by exposure of the eyes to UV radiation reflected from snow or ice.

squamous cell carcinoma (SCC) - a scaly or plate-like malignant tumour of the skin that sometimes spreads (metastasizes) to other organs. The second most common form of skin cancer.

sun protection factor (SPF) - a laboratory measure that grades how much UVB a sunscreen can block. The numbers range from 2 upwards.

ultraviolet (UV) radiation - part of the solar emissions that include light, heat, and UV radiation. UV region covers the wavelength range 100–400 nm and is divided into three bands: UVA, UVB, and UVC. All three bands are classified as a probable human carcinogen.

UVA radiation - long-wavelength UVA covers the range 315–400 nm. Not significantly filtered by the atmosphere. Approximately 90% of UV radiation reaching the Earth's surface.

UVB radiation - medium-wavelength UVB covers the range 280–315 nm. Approximately 10% of UV radiation reaching the Earth's surface.

UVC radiation - short-wavelength UVC covers the range 100–280 nm. All solar UVC radiation is absorbed by the ozone layer.

UV Index (UVI) - describes the level of solar UV radiation at the Earth's surface. Educational tool to alert people about the need to adopt protective measures.

vitamin D - a vitamin that is essential for normal bone and tooth structure. Found in cod liver oil, egg yolk and milk. Bodily synthesis activated by UV radiation.

APPENDIX A

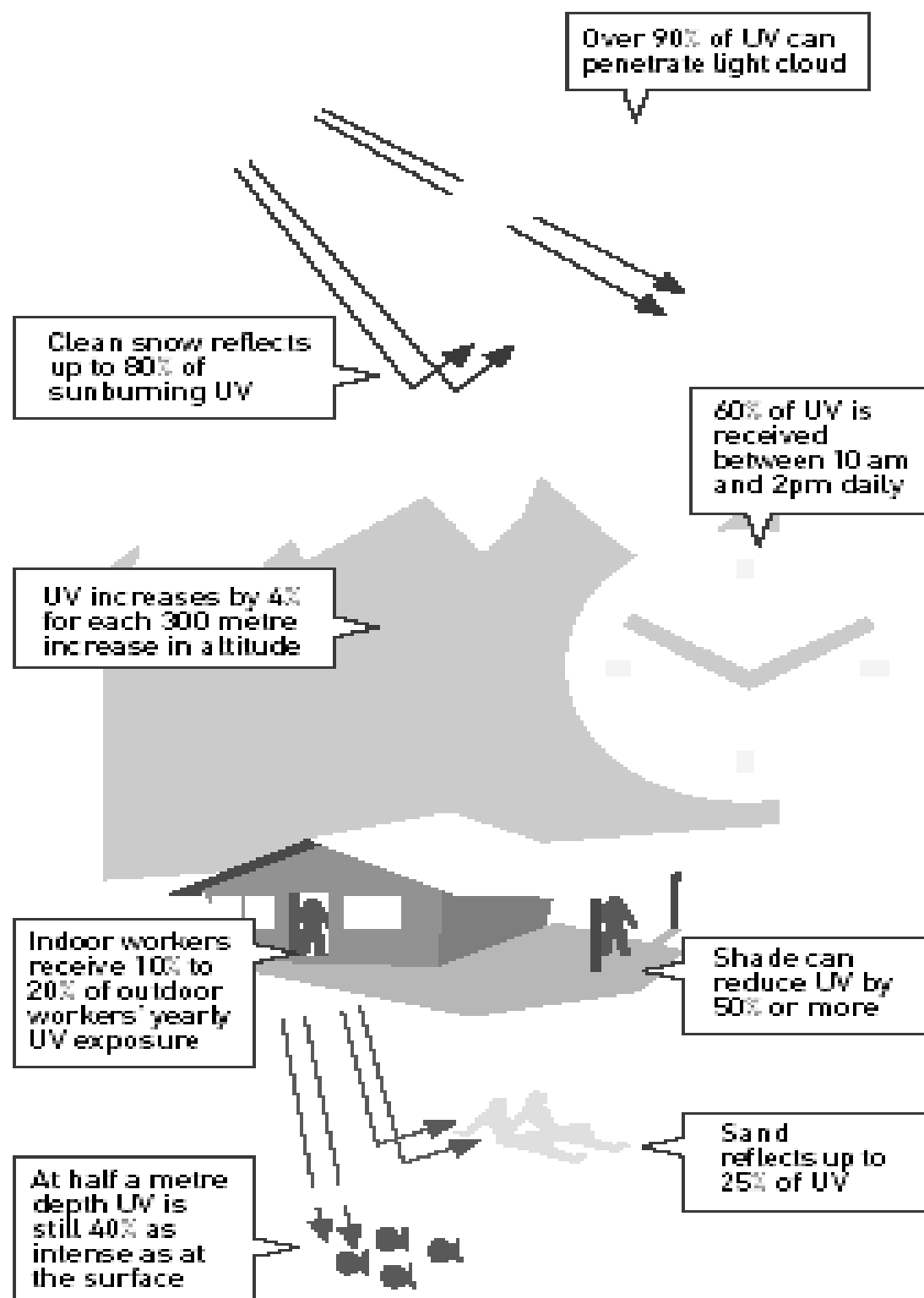


Figure 2: Factors influencing UV radiation

Fads and fashions

Ideas about swimwear have changed a lot and go on changing. Write what you think is good and bad about each of these designs. Label the ones that you think are SunSmart.



1880



1945



1980



1960



1930



1999



1965



1945



1900

1880

.....

.....

1945

.....

.....

1980

.....

.....

1960

.....

.....

1930

.....

.....

.....

.....

Write the dates in order on the back.

Personal sunburn danger zones

Body part	Sunburn ranking	How can you stay safe?
	5 = high risk 1 = low risk	
face	5	.....
arms	5	.....
shoulders	4	.....
neck	4	.....
legs	? __	.....
nose	? __	.....
back	? __	.....
chest	? __	.....
head	2	.....
stomach	? __	.....
back of knees	1	.....
feet	? __	.....
hands	? __	.....

Parts of my body I need to take special care to protect are:

1.
2.
3.

TESTS

PROTECTION OF THE HUMAN ENVIRONMENT FROM SOLAR RADIATION

Test 1 (Chapter 1)

Task 1. Complete the following phrases.

1. The Sun is essential for life on Earth

because.....

.....

2. Harmful effects of solar radiation include

.....

3. The factors that influence UV radiation levels are (name five factors)

.....

.....

4. The possible outcomes of ozone depletion are (innumerate three outcomes):

.....

.....

5. The Montreal Protocol is aimed at

.....

.....

Task 2. Fill in the gaps with

a) the words given: the level, indicate, increase, workers, penetrate, Earth's

..... light cloud, in latitude, indoor, to describeof UV radiation, at the
..... surface, designed tothe potential for

b) the prepositions: with, into, in, in, against, by, from

increase 4 %, to be protected UV radiation, found the Earth's atmosphere, protects
..... the harmful effects, an increaseadverse health effects, associated, rise
..... the atmosphere

Task 3. Match the definitions to the words.

1) beneficial	A a compound chemical formerly used in refrigerators
2) harmful	B the synthesis of chemical compounds by plants
3) adverse	C a form of oxygen
4) encourage	D consume, use up, eat up
5) exceed	E pass into or through
6) ozone	F opposed, negative
7) deplete	G support, promote
8) photosynthesis	H ruinous, unhealthy
9) CFCs	I do smth to a greater degree
10) penetrate	J favourable, curative, medicinal

1 _ 2 _ 3 _ 4 _ 5 _ 6 _ 7 _ 8 _ 9 _ 10 _

PROTECTION OF THE HUMAN ENVIRONMENT FROM SOLAR RADIATION

Test 2 (Chapter 2)

Task 1. Complete the following phrases.

1. Exposure to sunlight is very important because

.....
.....
.....

2. The three most common types of skin cancer are.....

.....
.....

3. Besides skin cancer overexposure to the sun can lead to

.....
.....

4. The individual risk factors for skin cancer include

.....
.....

Task 2. Fill in the gaps with a) the words given: produce, crucial, immune, pigment, doses, overexposure, accelerate, non-melanoma, globally

to enable the body tovitamin D, to play a role in, function, the dark-coloured melanin, high of UV radiation, chronic to the sun, to cancer progression, skin cancers, occur

b) the prepositions: to, by, of, in, among, about

attributedageing, to be caused sun exposure, sunburn consists a reddening of the skin, contrast to, extremely rare children, concerned

Task 3. Match the definitions to the words.

1) sufficient	A permanent small dark spot on the human skin
2) deficiency	B health, happiness or prosperity
3) housebound	C excessive exposure
4) wellbeing	D the state of being short of smth
5) overexposure	E having to stay at home
6) itching	F one of the small light-brown spots on the human skin
7) survival	G the range of the disease
8) mole	H enough
9) freckle	I feeling that causes a desire to scratch
10) incidence	J state of continuing to live or exist

1 _ 2 _ 3 _ 4 _ 5 _ 6 _ 7 _ 8 _ 9 _ 10 _

PROTECTION OF THE HUMAN ENVIRONMENT FROM SOLAR RADIATION

Test 3 (Chapter 3)

Task 1. Complete the following phrases.

1. The main cause of the rise in skin cancer rates is people's behaviour because
2. To change people's attitude to sun protection we should emphasize the message that
3. The simple rules of sun protection are
4. Sunsmart behaviour can be defined as

Task 2.

Fill in the gaps with

a) the words given: message, attitude, exposure, strengthening, practices, radiation-related
..... health effects, sun protection, the key, adopt this
....., the message, limit to the sun

b) the prepositions: with, to, in, for

changes clothing fashions, attitudinal barriers, be happy their
natural skin colour, to provide opportunities, the extent possible

Task 3.

Match the definitions to the words.

1) practice	A degree
2) consistently	B something done regularly
3) attitude	C piece of news
4) barrier	D care taken in advance to avoid a risk
5) message	E way of feeling, thinking or behaving
6) precaution	F area of shade, dark shape thrown on the ground
7) shade	G protecting or being protected
8) shadow	H limit, boundary, obstruction
9) extent	I with a regular pattern or style
10) protection	J something that reduces light

1 _ 2 _ 3 _ 4 _ 5 _ 6 _ 7 _ 8 _ 9 _ 10 _

PHOTO FILE SECTION

PHOTO 1



People attend a Global Campaign to Demand Climate Justice demonstration before the final session of the COP24 U.N. Climate Change Conference 2018 in Katowice, Poland, December 14, 2018.

PHOTO 2



PHOTO 3



KEYS

CLIMATE CHANGE

Test 1. Task 2: a) caps, develop, natural, phenomenon, dioxide, tip, contributor, water; b) with, to, by, of, behind, at, over

Task 3: 1 B, 2 H, 3 A, 4 G, 5 C, 6 D, 7 E, 8 F

Test 2. Task 2: a) patterns, size, action, consumption, currents, species, entire, habitat; b) to, by, by, in, to, towards, upon, per

Task 3: 1 I, 2 H, 3 G, 4 A, 5 C, 6 E, 7 D, 8 B, 9 F

Test 3. Task 2: a) fire, extreme, water, hoist, unpredictable, crop, consequences; b) to, in, to, away, to, by, of, of

Task 3: 1 I, 2 H, 3 E, 4 G, 5 A, 6 B, 7 F, 8 C, 9 D

Test 4. Task 2: a) affecting, enjoy, long-life, locally, concerned, economic, burden, report, sound, comprehensive; b) down, to, with, by, on, for, on, with, by, into

Task 3: 1 D, 2 E, 3 A, 4 F, 5 I, 6 B, 7 C, 8 G, 9 J, 10 H

SOLAR RADIATION

Test 1. Task 2: a) penetrate, increase, workers, the level, Earth's, indicate; b) by, from (or against), in, against or (from), in, with, in

Task 3: 1 J, 2 H, 3 F, 4 G, 5 I, 6 C, 7 D, 8 B, 9 A, 10 E

Test 2. Task 2: a) produce, crucial, accelerate, pigment, doses, overexposure, accelerate, non-melanoma, globally; b) to, by, of, in, among, about

Task 3: 1 H, 2 D, 3 E, 4 B, 5 C, 6 I, 7 J, 8 A, 9 F, 10 G

Test 3. Task 2: a) radiation-related, practices, message, attitude, strengthening, exposure; b) in, to, with, for, to

Task 3: 1 B, 2 I, 3 E, 4 H, 5 C, 6 D, 7 J, 8 F, 9 A, 10 G

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