

**МИНИСТЕРСТВО НАУКИ И ВЫСШЕГО ОБРАЗОВАНИЯ
РОССИЙСКОЙ ФЕДЕРАЦИИ
КАЗАНСКИЙ ФЕДЕРАЛЬНЫЙ УНИВЕРСИТЕТ
Институт управления экономики и финансов
Кафедра иностранных языков и профессиональной коммуникации**

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Данное учебное издание составлено в соответствии с современной структурой изучения учебных дисциплин по иностранному языку и является дополнением к основному курсу «Иностранный (английский) язык» для студентов 2 курса бакалавриата, обучающихся по направлениям 05.03.02 «География», 05.03.03 «Картография и геоинформатика», 20.03.02 «Природообустройство и водопользование».

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Пояснительная записка

Согласно новой образовательной парадигме независимо от специализации и характера работы любой начинающий специалист должен обладать фундаментальными знаниями, профессиональными умениями и навыками деятельности своего профиля, опытом творческой и исследовательской деятельности по решению новых проблем, опытом социально-оценочной деятельности. Составляющие образования формируются именно в процессе аудиторной работы студентов, дискуссии, развития коммуникативных навыков.

Целью учебно-методического пособия по дисциплине «Английский язык» является формирование у студентов 2 курса бакалавриата, обучающихся по направлениям 05.03.02 «География», 05.03.03 «Картография и геоинформатика», 20.03.02 «Природообустройство и водопользование», умения анализировать, четко, грамотно формулировать и представлять свою работу на английском языке. Данное учебное издание нацелено на углубление и расширение знаний по английскому языку, формированию и развитию познавательных способностей, укреплению междисциплинарных связей. Составлено в соответствии с программой дисциплины «Английский язык» и календарно-тематическим планом.

Работа со статьей включает выполнение следующих пунктов:

- а) чтение и перевод;
- б) составление словаря незнакомых слов;
- в) подготовка пересказа прочитанного материала на английском языке.

Контроль выполнения заданий проводится во время занятий и оценивается по балльно-рейтинговой системе.

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Glossary

C

carbon dioxide

gas produced when things containing carbon are burned

conservationist

a person who acts to protect the environment or wildlife

cowshed

a farm building in which cattle are kept

D

deforestation

destruction of forests by people

dorsal fin

the part of a shark`s back that sticks up

E

electronic device

equipment such as calculator, computers, and radios

elusive

extremely rare and difficult to see

emission

an amount of gas or other substance that a machine or factory produces and sends into the air

environment

the natural world; the air, land, and water in which people, plants, and animals live

extinction

a situation in which a particular kind of animal or plant no longer exists

F

fossil fuels

remains of long – dead animals and plants to be burned for energy

G

glacier

a large mass of ice which moves slowly down a mountain valley

global warming

increase in Earth`s temperature caused by gases preventing heat leaving

H

habitat

the natural home or environment of an animal or a plant

L

lifespan

the time that something is likely to live (for people, we say life expectancy)

livestock

animals such as cows and sheep that are kept on a farm

P

pollution

dirty and dangerous gases, chemicals, that harm the environment

predators

an animal that kills and eats other animals

S

solar panel

a piece of equipment, usually on a roof, that uses the heat of the sun to heat water or to make electricity

species

a group of animals or plants which are all similar

Reading № 1

Can trees help climate change?

25 MAR 2020

A forest in Staffordshire (in the UK) transformed into a hi-tech laboratory. Researchers here are investigating how the trees use carbon, and it's difficult to find out. In an unusual **experiment**, extra carbon dioxide is piped to the trees, to create the kind of atmospheric conditions expected in the middle of the century. And **instruments** measure how the forest reacts.

The scientist in charge says there's still a lot to learn. And he worries that governments and companies are rushing to plant trees as an easy answer to climate change.

Professor Rob MacKenzie, University of Birmingham

If you try and use trees to tidy up the mess that we're making through emissions, you are putting those trees into a very rapidly changing climate and they will struggle to adapt.

This device **tracks** the movement of carbon dioxide. In a healthy forest, the gas is not only absorbed by the trees but some is released as well.

What scientists here are finding out is the way carbon flows into a forest and out of it, is a lot more complicated than you might think. So, if mass tree planting is meant to be a solution to tackling climate change, the trees are going to have to be **monitored** and cared for, over not just decades, but maybe centuries as well.

Of all the challenges, the task of planting is the simplest. Shelby Barber from Canada can do an amazing 4,000 trees in a day.

BBC reporter, David Shukman

People talking about planting millions, billions of trees around the world. Is it possible do you think, physically?

Shelby Barber, Planter

It's definitely possible with the right amount of people, the right group of people. I've personally, in three years, planted just over half a million trees.

Once planted the trees need to survive, and experts are mixing different types to minimise the risk of disease.

Eleanor Tew, Forestry England

It's a bit like making sure you **don't put all your eggs in one basket**, you're spreading out your risk. And then if one part of that woodland fails, for whatever reason it gets disease, it can't tolerate future climatic conditions, there are other parts of the forest that are healthy and able to fill in those gaps.

This must be the hardest way to investigate why the trees of the Amazon are so important – climbing right up into them. Down on the ground a scientist, Erika Berenguer, is asking for samples of the leaves.

Erika has studied the same batch of trees for ten years now, measuring exactly how they're growing and how they affect the climate. This matters to the whole world because of sheer size of this forest.

We've used graphics to show how the billions of leaves are breathing in **carbon dioxide** – a gas which is **heating up** the planet.

As human activity keeps adding more and more carbon dioxide to the air, magnificent trees like this pull a lot of it in. But chop it down and burn it, and all the carbon that's been stored inside over the many years is suddenly released back to the atmosphere, which of course increases the speed of **global warming**.

In the last few months, the rate of **deforestation** here has suddenly increased. The new government of Brazil wants to encourage development. So Erika's research is all the more urgent.

In this lab, she studies the leaves collected from the forest, to work out how much carbon the Amazon holds. It's the equivalent of America burning **fossil fuels** for nearly a century.

Dr Erika Berenguer, Oxford Environmental Change Institute

We're never going to be able to build an Amazon. It's going to be gone forever. So once it's gone, it's just gone.

All that's left where forest once stood. A stark reminder of what's vanishing, and of consequences for the rest of the world.

Test № 1

Choose the correct option



- Overfishing
- Exhaust fumes
- Melting of glaciers



- Cutting down forests
- Air pollution
- Water pollution



- Climate change
- Aerosol can
- Avalanching



- Burning of fossil fuel
- Melting of glaciers
- Extinction of species



- Snowstorm
- Nuclear accident
- Man-made disaster



- Epidemic
- Sea level rise
- Volcanic eruption



- Ecologist
- Ice age
- Pollutant



- Light pollution
- Nuclear accident
- Radioactive pollution



- Emission of dangerous gases into the atmosphere
- Oil spill
- Dumping the waste into rivers



- Cutting down forests
- Burning of discarded plastic
- Flood



- It is a meadow covered with flowers
- It is a dense forest. The trees are bright green
- It is a thin forest. The trees are dark brown



- We see a wide clear lake and a green forest
- We see a flowing river and a yellow forest
- We see a wide lake and a field



- We see high mountains. They are covered with snow in some places
- We see a deep cave. It is covered with snow
- We see a valley between the high mountains



- Here we can see a huge waterfall and a green meadow
- Here we can see a small stream in the forest
- Here we can see a small waterfall in the forest



- It is a still river. The water is clear and blue
- It is a rough sea. The water is dark green
- It is a swamp. The water is dark brown



- We see a rapid stream in the mountains
- We see a swamp in the forest
- We see a rapid swamp in the forest

Reading № 2

Underwater

Brian Skerry

1 Finding the oceanic whitetip shark is an experience I won't forget. This is one of the most dangerous sharks in the world, but its numbers are falling. Just as we arrived there, some sports fishermen in the central Bahamas saw some oceanic white-tips when they were fishing for tuna. So I planned sixteen days to go searching for them.

For the first few days out of Palm Beach, we didn't see a thing. Then, on the fifth day, I was looking out from the bridge when I spotted a shark on the surface. The white tip of its dorsal fin was sticking out of the water, so I knew we had an oceanic whitetip. I quickly put on my wetsuit and jumped in the water. The shark was very curious about me and swam right up to me. It was about three meters long and it even stayed around while we were putting the cage in the water for the scientist. I got some great pictures! That was really the high point of the assignment.

2 At the end of the assignment, after a year of work, we were going after the great hammerhead shark. This species is so elusive that there were no pictures of it up until five or six years ago. For the entire first week, the weather was appalling and it was impossible to dive. It was very frustrating. Then, on the eighth day, my assistant flew home because his mother was seriously ill.

Suddenly, I was working alone as well as trying to deal with the bad weather. That was definitely the worst moment on the assignment. It is so important to have a really good assistant with you. Without him there, my workload more than doubled. While I was trying to decide what to do, the weather unexpectedly improved and I got a couple of not – bad days! And on one of those days, everything clicked and I got some great pictures of hammerhead. I was lucky.

The average lifespan of a shark is about 25 years but some can live to be 100. They are unusual in that they have no bones in their body, and large sharks may have up to 4,000 teeth. They are very dangerous when they hunt, but only a few attack humans: more people die from bee stings than from shark attacks.

3 The fish with hands

Everyone knows that fish live in water, they move by swimming, and they use their fins and tail to help them move. But there's an exception to every rule and this is it. Named, appropriately, the handfish, these odd fish have fins which look like hands, and they use them to walk on the ocean floor. Four specimens of this ten centimeter – long species were seen near Tasmania, Australia. Handfish walk along the seabed eating small worms and other creatures. They move slowly and so must be an easy target for predators. However, researchers think they may have a secret weapon: a toxic skin that kills most attackers.

4 Is it a squid? Is it a worm?

This nine centimeter – long marine animal was a big surprise to the researchers who first saw it. A remotely – operated underwater vehicle captured images of it at a depth of 2.8 kilometers in the sea around the Philippines. It looks like a squid because it has tentacles on its head. And it looks like a worm because its body is divid-

ed into segments. So the scientists, thinking it might be either a type of squid or a kind of worm, decided to name it squidworm. Closer examination shows it is indeed a worm and suggests it could belong to a new family of segmented worms, but the name of squidworm has stuck.

Reading test №2

Choose the correct option.

- 1 **spotted**: photographed/saw
 - 2 **high point**: best moment/top of the boat
 - 3 **deal with**: survive/solve the problem
 - 4 **workload**: amount of work you have to do/ problems
 - 5 **doubled**: increased by twice as much/increased by three times as much
 - 6 **clicked**: was quiet/was successful
 - 7 **the handfish**: walks on the seabed/ eats fruit
 - 8 **the squidworm**: is a key part of the forest eco-system/it has tentacles on its head
 - 9 **shark**: they are quite small and eat insects. They have eight legs. Some make webs/it lives in water. It has fins and a tail. It`s pretty big
 - 10 **predators**: a word that means poisonous/a word for animals that kill and eat other animals
 - 11 the average lifespan of a shark is 12/25 years
 - 12 large sharks may have up to 4,000/2,000 teeth
 - 13 sharks have bones/have no bones in their body
 - 14 sharks sting/bite when they attack
- These statements are true for one of Skerry`s stories. Write W (whitetip), H (hammerhead)
15. Bad weather made it almost impossible to do any work
 16. Some fisherman told Skerry where the sharks were.
 17. Skerry had to work without an assistant.
 18. Skerry got into the water as soon as he saw a shark.
 19. The shark spent some time swimming close to Skerry.
 20. Skerry wasn`t sure what to do.

Watching test № 1

Fill in the gaps

There ...Polar Regions in the world. The Arctic is situated in the... hemisphere of the planet. The Antarctic is a ...surrounded by ocean. The Arctic has...and

no...Despite the harsh weather conditions, ... have populated the Arctic for thousands of years. The Antarctica is...the largest continent in the planet. The Antarctica is...than the Arctica.

Watching test № 2

Do the following statements agree with the information in the video 2?

TRUE if the statement agrees with the information

FALSE if the statement contradicts the information

NOT GIVEN if there is no information on this

The population of the shown settlements is numerous in number. On the days between migrations people take care of reindeer and fix tools. The TV presenter has passed a course on surviving before going to this polar region. The TV presenter succeeded in catching fish. The weather in polar region is extremely cold. The learning process seemed to be long for local people because of extreme temperatures. The TV presenter is going to come back there in a year.

Watching test № 3

Understanding key details

Read these sentences about Turere and his invention. Circle the answers as you watch of his TED Talk.

1. Turere`s invention works because lions are afraid of –

- a. the flashing light
- b. the loud noise
- c. the bright colors

2. Turere learned about electronics –

- a. from his parents
- b. by listening to talks on a radio
- c. by taking apart an old radio

3. Turere used a battery from a –

- a. car
- b. motorcycle
- c. radio

4. Other people use his invention to scare away hyenas, leopards, and –

- a. cheetahs
- b. elephants
- c. rhinos

5. Read the statements. Which one best matches Turere`s overall message?
- We must do everything we can to protect lions in Africa.
 - It`s possible for humans and lions to live together without conflict.
 - The needs of livestock farmers are more important than the needs of lions.
6. Which statements best matches Turere`s attitude toward lions?
- I still feel very angry that a lion killed one of my family`s cows.
 - I hated lions, but now I`ve found a way to live with them.
 - I thought lions were okay, but now I realize how dangerous they are.

Discussion № 1

Read the quotation: The rapid tempo of technology development has improved our lives.

Group 1: for the quotation

Group 2: against the quotation

Collect arguments in favor of each opinion and be ready for the cross discussion.

These ideas can help each group

- People learn new skills
- There are more advances in medical treatment
- Housework is more convenient
- Communication is easier
- Technology can lead to future improvements in pollution
- Most people have a higher standard of living
- People lose their job
- People basically do not like change
- Medical advances only help rich people
- Technology can lead to more pollution
- People cannot communicate as well as before
- People may become richer, but not happier

Discussion № 2

Discuss ways of reducing the harmful effects of air pollution

Air pollution

Smoke, dust and fumes from fires, quarries, vehicles and factories cause pollution of the air. Polluted air harms living things. It makes people cough and damages their lungs. It blocks the pores in plants` leaves and poisons soil. Plants may stop growing and die.

Activity 1

Work in group to identify these pollution sources.

A)



B)



C)



D)



E)



Have you seen pollution like this near you? How has it affected people and other living things? Hold a discussion.

Reducing air pollution

This list shows how we can reduce air pollution.

- Vehicles must be well maintained and tested regularly.
- Drive less. Walking and cycling do not cause pollution.
- Government should pass laws to make industries clean up their emissions.
- Protect trees. Healthy forests help to keep the air clean. Trees act as natural filters for the air.
- Don't smoke! Smoking pollutes the air you breathe with carbon monoxide and chemicals causing cancer.
- Burn less rubbish. It's better to recycle, compost or bury your waste.

What you have learnt

Air is caused by dust and fumes. Factories and vehicles are major of air pollution. Air pollution damages people's health, so it is important to find ways to it, for example by burning less rubbish and maintaining vehicles.

Key words:

Pollution

Reduce

Sources

Check your progress:

1. Describe two ways in which air pollution harms living things.
2. List four different sources of air pollution.
3. Explain five steps that can be taken to reduce air pollution.

Discussion № 3

Discuss the causes and consequences of global warming.

Air pollution is making the whole world hotter! This is called global warming. Coal, oil and gas burnt in power stations and vehicles increase carbon dioxide in the atmosphere. Felling and burning trees is called deforestation. This releases carbon dioxide too. Carbon dioxide and other greenhouse gases act like a blanket around the Earth. They trap the sun`s heat like the glass in a greenhouse. The heating of the atmosphere due to this is called the greenhouse effect.

What might happen?

If global warming continues, the weather will change dramatically. There will be more storms and hurricanes. Droughts and crop failures will be more frequent. Deserts will spread. Millions of people could starve.

More ice will melt at the North and South Poles and the water in the oceans will expand. This will make sea levels rise. Coastal and island communities will be flooded.

Activity 1

Work in group.

Discuss what might happen to plants, animals and people where you live if global warming continues. How might you be affected by:

- Higher temperatures.
- More droughts.
- Stronger winds.
- Rising sea levels?

What you have learnt.

Carbon dioxide and other gases trap the sun`s heat in the atmosphere like glass in the greenhouse. This is called the __ __. Because we are burning more fuel and cutting down more trees, carbon dioxide is increasing .This causes __ __. The whole Earth is heating up.

Key words:

Global warming

Greenhouse effect

Check your progress:

1. What is global warming? What is causing it?
2. List four ways in which people and other living things may be harming by global warming.
3. Describe an experiment to demonstrate the greenhouse effect.

Article №1: “The worldwide plastic problem”

12 AUG 2020

Need-to-know language...

scale – size (of something)

staggering – very surprising

unimaginable – so big it is difficult to picture in your mind

estimated – roughly worked out or guessed

daunting – worrying because it is a difficult or big problem

It is everywhere because it's almost endlessly useful. And when it's thrown away, if plastic finds its way into a plant like this, a lot of it can be made into something useful all over again.

But every year more and more plastic waste ends up here. And a global team of scientists has now tracked the production and disposal of plastic all around the world and used that information to forecast the scale of our plastic pollution problem for the next 20 years.

Dr Costas Velis, University of Leeds

If you were to count all together all the plastic waste that is going to be released into the environment both on land and reaching the seas, these would be the staggering number of 1.3 billion tonnes of plastic.

Victoria Gill, BBC science correspondent

1.3 billion tonnes is so big of a number it's almost unimaginable. How can you even visualise how much waste that is?

Dr Costas Velis

If you were to spread these on a thin layer of land, it would be 1.5 times the size of the UK.

Household waste, the scientists say, is by far the biggest source of all this pollution. They calculated that every year 30 million tonnes is dumped on land; nearly

50 million tonnes is burned out in the open, and that's in addition to the 10 million tonnes that finds its way into our oceans.

Many of us might do our bit with reusable water bottles and coffee cups. But there's an estimated two billion people in the global south who have no access to any formal waste collection – they're simply left to work out what to do with all their rubbish.

Providing protection and safe employment for workers in low-income countries who collect and sort all of that waste will be just as important globally as reducing the production of single-use plastic. And while these new figures are daunting, the researchers say that recognising the source and the scale of this problem is the first step in stemming the worldwide tide of plastic pollution.

Did you get it?

How many people in the global south have no access to formal waste collection?

Two billion people.

Article №2: “Changing Antarctica”

18 MAR 2020

Need-to-know language

challenge – (here) physical effort needed to survive

compensated – physically changed to survive in a particular situation

thrive – exist or grow successfully

adapt – change to enable something to survive in a new situation

to their max – as much as they can / to their limit

Antarctica is the most extreme continent on Earth. Few animals can survive the bitter cold. But one Antarctic environment is surprisingly stable – the ocean. But it is cold – minus two degrees centigrade.

Like everywhere else in the world, the Antarctic environment is changing. In some places the water is already warming – a huge challenge for animals that have never experienced any change.

Justin Rowlatt, BBC correspondent

So some of the incredible Antarctic animals are in this tank. Now Anne Todgham is a marine biologist; you've been studying these animals for years...

Dr Anne Todgham, Associate Professor, University of California Davis

So they have anti-freeze proteins inside that keep them from freezing. They have different red blood cells that are in fact not red. They have compensated for the cold, so they can go about their daily lives and actually thrive in an environment that most animals will find very stressful.

The big question for Anne is how well these extraordinary creatures will be able to adapt. The results so far are not promising.

Dr Anne Todgham, Associate Professor, University of California Davis

I am actually pretty worried, I wish the data was wrong, I wish I didn't have to be worried. But you know there are lots of things that are going to change in the ocean, and these animals are being stressed to their max.

You may wonder why we should worry about the fate of a few unusual species, but the scientists here say we should think of what's happening as a warning. If these animals can't survive in our changing world, what does that say about our future?

Did you get it?

What is the temperature of the ocean around Antarctica?

It's a cold, minus two degrees centigrade.

Article 3: “Rainbow recycling”

18 SEP 2019

Need-to-know language

sort – arrange a number of things into groups or a particular order

colour code – system of organisation that uses colours to sort things

jumbled up – mixed in an untidy or chaotic way

separate – move things apart from each other

cross-contamination – accidental mixing of two groups that should be kept apart resulting in neither group being pure

Rainbow-coloured rubbish. This is the colourful waste created by a Swedish city with a unique recycling system. Like many cities in Sweden, Eskilstuna has an impressive recycling record. It met the EU's 2020 target of recycling 50 % of waste many years ago.

But almost everyone who lives here follows a strict recycling policy at home. People are expected to sort their household waste into seven separate categories, including food, textiles, cartons and metal. But what really makes the system stand out is the bright colour code.

The reason for this becomes clear at the city's recycling plant. The bags arrive all jumbled up because they're collected altogether, once a fortnight from outside people's houses.

But thanks to those bright colours, scanners can select the bags and separate them efficiently. The food waste in green bags is processed on site into slurry to make bio gas, which powers the city's buses. One of the benefits of this method of re-

cycling is that there is less cross-contamination, so more of the recycled waste can actually be used to make new things.

Like the rest of Sweden, Eskilstuna is committed to sending zero waste from its citizens to landfill. Waste that cannot be recycled is incinerated at a local plant to generate electricity. This reduces reliance on fossil fuels, but does create greenhouse gases.

As countries around the world try to improve their recycling rates, some may look to Eskilstuna as an example to follow - as long as they think they can persuade their citizens to get busy sorting at home.

Did you get it?

How are the bags sorted once they arrive at the recycling plant?

Once they arrive, scanners select the bags and separate them efficiently.

Article № 4: “Can floating farms help us cope with climate change?”

21 AUG 2019

Need-to-know language

dairy products – foodstuff made from or containing milk

milked – drew milk from a cow or other animal

manure – animal excrement used as a fertiliser

herd – large group of animals of the same species that live together

animal welfare – care for the physical and mental needs of animals

Fresh milk – within touching distance of the city. These cattle have been recruited as part of an experiment to show rapidly growing urban populations how to produce our meals closer to home.

Peter believes this is the future of milk and cheese.

Peter van Wingerden, 'floating' dairy farmer

You see a huge migration from the countryside towards cities and the other thing is we have [a] climate change going on. So we were looking also for what we call a climate-adaptive location. So no matter how much rain falls, no matter how high sea level goes, we can always produce our life essential[s] – healthy food.

The floating pontoon is built on three levels. In the basement they're growing fruit to flavour the dairy products, which are processed in the middle. And on top, 32 native Dutch Meuse-Rhine-Issel cows.

The cows are milked by robot machines. Their manure is collected by pooper-scooping robots. They're fed by robots too.

The farmer lives nearby, but he can keep an eye on his herd remotely via apps on his mobile phone. The cows seem to be adjusting to this hands-free approach.

And on the question of animal welfare...

Minke van Wingerden, 'floating' dairy farmer.

We try to make them happier on [a] floating farm than in a regular stable.

This living lab will help to determine whether floating farms make enough environmental and commercial sense to expand and export them.

Did you get it?

What's the advantage of floating farms in a world facing climate change?

They say floating farms can continue operating no matter how high sea levels go.

Article № 5: “Extreme weather and climate change”

31 JUL 2019

Need-to-know language

scorching – very hot

heatwaves – periods of time where it's hotter than normal

heating up – becoming hotter

drought-resistant – able to survive in long periods of dry weather

baking – being heated to a high temperature

Temperatures were among the highest in the UK [today] here at Kew Gardens [in London]. A scorching 37.7 degrees [Celsius]. So those who braved the sunshine came prepared. And climate scientists are now confident that heatwaves are more likely and more extreme because of climate change.

Professor Liz Bentley, Chief Executive, Royal Meteorological Society

The fact that we've seen these temperature rises, the baseline temperature has increased by about one degree globally since pre-industrial times and it's that level that just means... in normal conditions we'd see heatwave conditions and temperatures around, kind of just above average, but you add that extra layer of heat on, that's when we start to break those records.

And globally over the last century the trend is clear – it has been heating up. The last four years were the warmest ever recorded. For the future, the temperature increase depends on global carbon emissions.

Current targets that governments have signed up to to limit those emissions will see a rise of about 3.3 degrees by 2100. Under the Paris Climate Agreement – that's the more ambitious deal signed up to by almost 200 countries in 2016 – the aim is to keep that below 1.5 degrees.

Today of all days we've come to the hottest glasshouse in Kew Gardens [because] this is where all the desert-adapted plants live. And even for these plants they've opened all of the windows to try and get some ventilation in here, because ac-

According to my thermometer it is now more than 39 degrees in here. And these plants are adapted to the hottest, driest conditions on Earth.

It's those adaptations that scientists here are studying in order to work out how we might grow more drought-resistant plants in the future. While the collections here look exotic, they contain plants that could eventually become familiar food crops.

Dr James Borrell, Plant Ecologist, Kew Gardens

Days like today tell us that if we carry on doing exactly what we've done in the past, then that that's not going to work. So we're going to have to adapt what we do and potentially adapt the crops we grow, and so we need to be exploring, we need to be researching, we need to [be] understanding our options so that we can change, as climate begins to bite.

With the gardens baking in the Sun today, the preparation continues for a warmer, more uncertain climate in the future.

Did you get it?

By what amount does the Paris Climate Agreement aim to limit the rise in global temperature?

Under the Paris Climate Agreement the aim is to keep the rise in global temperature below 1.5 degrees.

Article № 6: “Robot recycling”

12 JUN 2019

Need-to-know language

puncture-resistant – strong enough to prevent holes appearing

sensors – pieces of equipment that react to changes in heat or light

simulated – created as a model to test something

algorithms – mathematical rules used by a computer to calculate something

automation – operation using machines not humans

This robot can automatically sort recyclable rubbish. The RoCycle system by MIT has a soft, puncture-resistant hand. Pressure sensors on its fingertips detect an object's size and material. It then autonomously places the item in the appropriate recycle bin.

Professor Daniela Rus, Director, MIT CSAIL

With computer vision alone, the systems are not able to separate paper from plastic. Many paper and plastic cups look the same, but by introducing the ability to squeeze the object and to know whether it's flexible or not – we are able to go one step beyond what today's methods can do.

The goal of the system is to reduce the back-end cost of recycling. It currently has 85 percent accuracy in identifying stationary items, but only 63 percent accuracy on a simulated conveyer belt.

A common error was identifying paper-covered tins as paper. But how are researchers looking to improve the system?

Professor Daniela Rus, Director, MIT CSAIL

We plan to create a much more detailed sensorised skin. We plan to develop the hand at different sizes and we plan to improve our algorithms for recognition. We're very excited to see the use of robot automation in solving a problem that matters globally.

Did you get it?

What percentage of stationary items could the robot identify?

The robot currently has 85 percent accuracy in identifying stationary items.

Article № 7: "Turning plastic waste into sportswear"

19 JUN 2019

Need-to-know language

thread – long, thin fibre

yarn – fibres combined to form a thicker thread

polyester – cloth made from artificial fibres

textiles – cloths that are woven or knitted by hand or machine

apparel – clothes

Nearly 30,000 kilograms of thread are produced at this factory every day. But this thread isn't spun from traditional yarn - it's made from two million plastic bottles. Demand for this type of recycled polyester is growing, as brands become more conscious about waste.

Makarand Kulkarni, Chief Marketing Officer, Polygenta

Today we are supplying this product not only for sportswear but for outerwear, for home textiles, for ladies' apparel(s). So all types of applications are possible because the quality of this recycled yarn is comparable with any conventional polyester made.

The cost of recycled polyester is about ten to twenty percent higher than traditional thread. But as factories increase capacity to meet growing demand, the price of recycled material is coming down. That's good news for brands like Adidas. It's already making the switch to recycled thread. The sports company promised to remove all single – use plastic from its supply chain by 2024.

India has one of the biggest plastic problems in the world, with trash spilling out onto beaches and piling up in cities. Commitments like the one made by Adidas might be a step in the right direction, but experts say more brands and consumers will need to buy into products like these to have a meaningful impact on our problem with plastic.

Did you get it?

Which costs more: recycled polyester or traditional thread?

The cost of recycled polyester is about ten to twenty percent higher than traditional thread – although the price is coming down.

Article № 8: “Tackling food waste and obesity”

20 MAR 2019

Need-to-know language

leftover – remaining after the rest has been used or eaten

piling up – (here) creating a pile of food by adding more

stale – old and no longer fresh or good to eat

culinary – connected to cooking or kitchens

loading up – gathering a large amount of something on or in one place

This hotel in Tromsø, is trying to halve its food waste. But how?

Let's start with these smoothie shots. These are made from yesterday's leftover fruit.

Then, crafty tricks to nudge people into taking less, like skinny tweezers to stop you piling up the salmon. Or little spoons to serve the herring. Another idea, instead of guests taking a big melon slice and leaving some, the staff dice it. So you take precisely what you want.

Linn Alexandersen, Thon Hotel Polar, Tromsø

Many people load onto their plates so they don't have to go multiple times. We're able to make people think about how they put food on their plate, and how much they bring to the table to make sure that they eat it all.

Another trick is to keep food looking fresh. As a serving dish empties, guests assume the remains are stale. So why not switch the food into a smaller dish? Then again, so it still looks fresh and it all gets eaten.

Ideas like this have cut food waste almost 10% in a year for this chain. The target is 20 % by 2020, and then 50 % by 2030 – the same as the UN target.

The chef weighs the daily waste. So far, the policy has saved the hotel chain 26 tonnes of carbon dioxide emissions. And there's a bonus.

Linn Alexandersen, Thon Hotel Polar, Tromsø

We're also making money of it, which is really a positive side effect by reducing food waste.

So, how do guests respond to this culinary nanny state?

Female guest.

[I] think it's a very good thing. I feel that it helps the environment, but it also helps myself to not gain – what do you call it? – weight that I don't need.

There is no ban on loading up your plate here, but you'd better not leave it.

Did you get it?

What do both the hotel and the UN wish to do by 2030?

They both wish to reduce food waste by 50 %.

Article № 9: “Clothing and the environment”

26 DEC 2018

Need-to-know language

junked – discarded or destroyed

scrapped – disposed of because it's no longer useful or wanted

incinerated – burned

sustainable – good for the environment because it lasts a long time

throwing away – getting rid of something no longer useful or wanted

Fashion is worth £28 billion a year to the UK economy. MPs (Members of the British Parliament) say British shoppers buy far more new clothes than any nation in Europe.

Mary Creagh, Member of Parliament

Clothing production has more than doubled globally over the last 15 years, and in the UK we're buying twice as much as we were buying 15 years ago. What that means when we have more clothes is that we're using them, we're wearing them less. But what happens to all these clothes that are loved and then junked? This warehouse in North London sorts some of them and sends them to charity shops for resale. That saves the environmental impact of making new clothes. But it's only a tiny proportion of garments and shoes that get recycled. Most are scrapped with around 80% ending up in landfill – around 20 % getting incinerated.

Andrew Opie, British Retail Consortium

We as retailers have a really big responsibility in making sure that those clothes are as sustainable as possible, and we know from the figures that we've been looking at, working with government, how we have cut things like energy and water use. There's much more we can do.

The MPs welcome the move but say there is a fundamental problem with an industry that relies on people throwing away good clothes because they're last year's colour. They say fashion firms must try harder.

Did you get it?

What percentage of clothes in the UK ends up in landfill?

80 % of clothes in the UK end up in landfill (a place where rubbish is buried).

Did you know?

£44 billion is spent annually on clothes in the UK. 30 % of clothes in an average wardrobe have not been worn in a year. [Source: Wrap UK]

Article № 10: “Underwater sound pollution”

05 DEC 2018

Need-to-know language

listening in on something – secretly listening to something

picking up sounds – noticing or detecting sounds

ruptured – broken, burst or torn

eardrum – skin in the ear that vibrates when sound reaches it, allowing you to hear

swamping – arriving in too great an amount to be dealt with

Listening in on life underwater.

This small device is picking up sounds we rarely get to hear - and it's helping scientists establish how too much noise is stressing out ocean wildlife.

Professor Steve Simpson, marine biologist

Whales and dolphins, we know have very sensitive hearing and we know that sound causes stress. It affects their migration behaviour. It affects their reproductive behaviour. We've then looked at fish. Fish also have ears and are affected by noise.

Today we joined Professor Steve Simpson, a marine biologist who's dedicated much of his time to studying and collecting sounds from the sea.

Professor Steve Simpson, marine biologist

So, very close to loud sources of noise, we see animals with ruptured eardrums - so whales and dolphins. We see fish with their swim bladders burst because of the noise. Offshore construction and busy shipping lanes are interfering with the way marine life communicates.

Professor Steve Simpson, marine biologist

That is really loud, isn't it? I mean, that's totally swamping anything out. If you were trying to communicate, if you were a dolphin in the area, or you were a fish, then you wouldn't get yourself heard over the noise of that boat.

Solving the problem of plastic pollution in our oceans will take many years.

But when it comes to noise pollution, Steve says it can be reversed.

Did you get it?

What effect can sound have on whales and dolphins?

Sound can cause them stress and affect their migration and reproductive behaviours.

Did you know?

Sound waves travel at approximately 343 metres per second in air at room temperature. In water sound is 4.3 times faster and goes further, travelling at around 1,484 metres per second.

Land pollution

Land can become polluted by household garbage and by industrial waste. In 2014, Americans produced about 258 million tons of solid waste, according to the U.S. Environmental Protection Agency. A little over half of the waste — 136 million tons— was gathered in landfills. Only about 34% was recycled or composted.

Organic material was the largest component of the garbage generated, the EPA said. Paper and paperboard accounted for more than 26%; food was 15% and yard trimmings were 13%. Plastics comprised about 13% of the solid waste, while rubber, leather and textiles made up 9.5% and metals 9%. Wood contributed to 6.2% of the garbage; glass was 4.4% and other miscellaneous materials made up about 3%.

Commercial or industrial waste is a significant portion of solid waste. According to the University of Utah, industries use 4 million pounds of materials in order to provide the average American family with needed products for one year. Much of it is classified as non-hazardous, such as construction material (wood, concrete, bricks, glass, etc.) and medical waste (bandages, surgical gloves, surgical instruments, discarded needles, etc.). Hazardous waste is any liquid, solid or sludge waste that contain properties that are dangerous or potentially harmful to human health or the environment. Industries generate hazardous waste from mining, petroleum refining, pesticide manufacturing and other chemical production. Households generate hazardous waste as well, including paints and solvents, motor oil, fluorescent lights, aerosol cans and ammunition.

Water pollution

Water pollution happens when chemicals or dangerous foreign substances are introduced to water, including chemicals, sewage, pesticides and fertilizers from agricultural runoff, or metals like lead or mercury. According to the Environmental Protection Agency (EPA), 44 % of assessed stream miles, 64 % of lakes and 30 % of bay and estuarine areas are not clean enough for fishing and swimming. The EPA also

states that the United State's most common contaminants are bacteria, mercury, phosphorus and nitrogen. These come from the most common sources of contaminates, that include agricultural runoff, air deposition, water diversions and channelization of streams.

Water pollution isn't just a problem for the United States. According to United Nations, 783 million people do not have access to clean water and around 2.5 billion do not have access to adequate sanitation. Adequate sanitation helps to keep sewage and other contaminants from entering the water supply.

According to National Oceanic and Atmospheric Administration (NOAA), 80 % of pollution in marine environment comes from the land through sources like runoff. Water pollution can also severely affect marine life. For example, sewage causes pathogens to grow, while organic and inorganic compounds in water can change the composition of the precious resource. According to the EPA, low levels of dissolved oxygen in the water are also considered a pollutant. Dissolved is caused by the decomposition of organic materials, such as sewage introduced into the water.

Warming water can also be harmful. The artificial warming of water is called thermal pollution. It can happen when a factory or power plant that is using water to cool its operations ends up discharging hot water. This makes the water hold less oxygen, which can kill fish and wildlife. The sudden change of temperature in the body of water can also kill fish. According to the University of Georgia, it is estimated that around half of the water withdrawn from water systems in the United States each year is used for cooling electric power plants.

"In nearly all cases, 90 % of this water is returned to its source, where it can raise the water temperature in an area immediately surrounding the water discharge pipe. Depending on water flow, the water temperature quickly returns to ambient temperatures that do not harm fish." Donn Dears, former president of TSAugust, a not for profit corporation organization focused on energy issues, told Live Science.

Nutrient pollution, also called eutrophication, is another type of water pollution. It is when nutrients, such as nitrogen, are added into bodies of water. The nutrient works like fertilizer and makes algae grow at excessive rates, according to NOAA. The algae blocks light from other plants. The plants die and their decomposition leads to less oxygen in the water. Less oxygen in the water kills aquatic animals.

Air pollution

The air we breathe has a very exact chemical composition; 99 % of it is made up of nitrogen, oxygen, water vapor and inert gases. Air pollution occurs when things that aren't normally there are added to the air. A common type of air pollution hap-

pens when people release particles into the air from burning fuels. This pollution looks like soot, containing millions of tiny particles, floating in the air.

Another common type of air pollution is dangerous gases, such as sulfur dioxide, carbon monoxide, nitrogen oxides and chemical vapors. These can take part in further chemical reactions once they are in the atmosphere, creating acid rain and smog. Other sources of air pollution can come from within buildings, such as secondhand smoke.

Finally, air pollution can take the form of greenhouse gases, such as carbon dioxide or sulfur dioxide, which are warming the planet through the greenhouse effect. According to the EPA, the greenhouse effect is when gases absorb the infrared radiation that is released from the Earth, preventing the heat from escaping. This is a natural process that keeps our atmosphere warm. If too many gases are introduced into the atmosphere, though, more heat is trapped and this can make the planet artificially warm, according to Columbia University.

Air pollution kills more than 2 million people each year, according to a study published in the journal of Environmental Research Letters. The effects of air pollution on human health can vary widely depending on the pollutant, according to Hugh Sealy, professor and director of the environmental and occupational health track at the Department of Public Health and Preventive Medicine, St. George's University, St. George's, Grenada. If the pollutant is highly toxic, the effects on health can be widespread and severe. For example, the release of methyl isocyanate gas at Union Carbide plant in Bhopal in 1984 killed over 2,000 people, and over 200,000 suffered respiratory problems. An irritant (e.g. particulates less than 10 micrometers) may cause respiratory illnesses, cardiovascular disease and increases in asthma. "The very young, the old and those with vulnerable immune systems are most at risk from air pollution. The air pollutant may be carcinogenic (e.g. some volatile organic compounds) or biologically active (e.g. some viruses) or radioactive (e.g. radon). Other air pollutants like carbon dioxide have an indirect impact on human health through climate change," Sealy told Live Science.

Noise pollution

Advertisement

Even though humans can't see or smell noise pollution, it still affects the environment. Noise pollution happens when the sound coming from planes, industry or other sources reaches harmful levels. Research has shown that there are direct links between noise and health, including stress-related illnesses, high blood pressure, speech interference, hearing loss. For example, a study by the WHO Noise Environ-

mental Burden on Disease working group found that noise pollution may contribute to hundreds of thousands of deaths per year by increasing the rates of coronary heart disease. Under the Clean Air Act, the EPA can regulate machine and plane noise.

Underwater noise pollution coming from ships has been shown to upset whales' navigation systems and kill other species that depend on the natural underwater world. Noise also makes wild species communicate louder, which can shorten their lifespan.

Light pollution

Most people can't imagine living without the modern convenience of electric lights. For the natural world, though, lights have changed the way that days and nights work. Some consequences of light pollution are:

- Some birds sing at unnatural hours in the presence of artificial light.
- Scientists have determined that long artificial days can affect migration schedules, as they allow for longer feeding times.
- Streetlights can confuse newly hatched sea turtles that rely on starlight reflecting off the waves to guide them from the beach to the ocean. They often head in the wrong direction.
- Light pollution, called sky glow, also makes it difficult for astronomers, both professional and amateur, to properly see the stars.
- Plant's flowering and developmental patterns can be entirely disrupted by artificial light.
- According to a study by the American Geophysical Union, light pollution could also be making smog worse by destroying nitrate radicals that helps the dispersion of smog.

Turning on so many lights may not be necessary. Research published by International Journal of Science and Research estimates that over-illumination wastes about 2 million barrels of oil per day and lighting is responsible for one-fourth of all energy consumption worldwide.

Other pollution facts

- Americans generate 30 billion foam cups, 220 million tires, and 1.8 billion disposable diapers every year, according to the Green Schools Alliance.
- According to the WHO, ambient air pollution contributes to 6.7 % of all deaths worldwide.
- The Mississippi River drains the lands of nearly 40% of the continental United States. It also carries an estimated 1.5 million metric tons of nitrogen pollution into

the Gulf of Mexico each year, resulting in a dead zone each summer about the size of New Jersey.

- Pollution in China can change weather patterns in the United States. It takes just five days for the jet stream to carry heavy air pollution from China to the United States, where it stops clouds from producing rain and snow.
- About 7 million premature deaths annually linked to air pollution, according to WHO. That is one in eight deaths worldwide.

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