

Súkromné gymnázium Žilina

GEOGRAPHY

Exercise book

Level 1

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The Planet Earth

The Earth is the planet of the Solar System. The Solar System contains 8 planets (Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus and Neptune) and the Sun creating the centre. The planets orbit around the Sun which is one of the thousands of stars in our galaxy called Milky Way. The planet Earth as the third nearest planet to the Sun is also part of universe created 13.7 billion years ago by the Big Bang. The consequence of this event was the creation of the celestial bodies like planets, moons, comets and stars. The planets of the Solar System (e. g. Mercury, Venus ...) were created 4.60 billion years ago. The Sun is 100x bigger then the Earth and the distance between this star and our planet is approximately 150 000 000 km.

The planets are of globular shape, due to the rotation of cosmic matters. Because of the Earth's rotation days follow nights. The axis around which our planet rotates is an imaginary line that passes through the Poles – South and North. A complete turning around this axis takes approximately 24 hours.

Problem: *Which hemisphere (northern or southern) is colder and why?*

The Earth's crust consists of the oceans and the landmass. The majority of continents is located north off the Equator. It means that ocean or rather water surface forms mainly the southern hemisphere. The temperature of ocean varies by the depth 75% of the ocean is made up of the deep waters. The deeper we go the colder the colder we get. It's well – known that the Pacific Ocean includes most of abysses explored till this day. On the other hand, the continental crust has layers of mass between the mantle and surface, which is acting as an isolator for the core.

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Match the following terms into pairs.

A = Nicolaus Copernicus	1. principles of celestial bodies' motion
B = Isaac Newton	2. geocentric system
C = Johannes Kepler	3. heliocentric system
D = Aristotele, Ptolemy	4. geo – heliocentric system
E = Tycho Brahe	5. principle of gravitation

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Cross the odd term out.

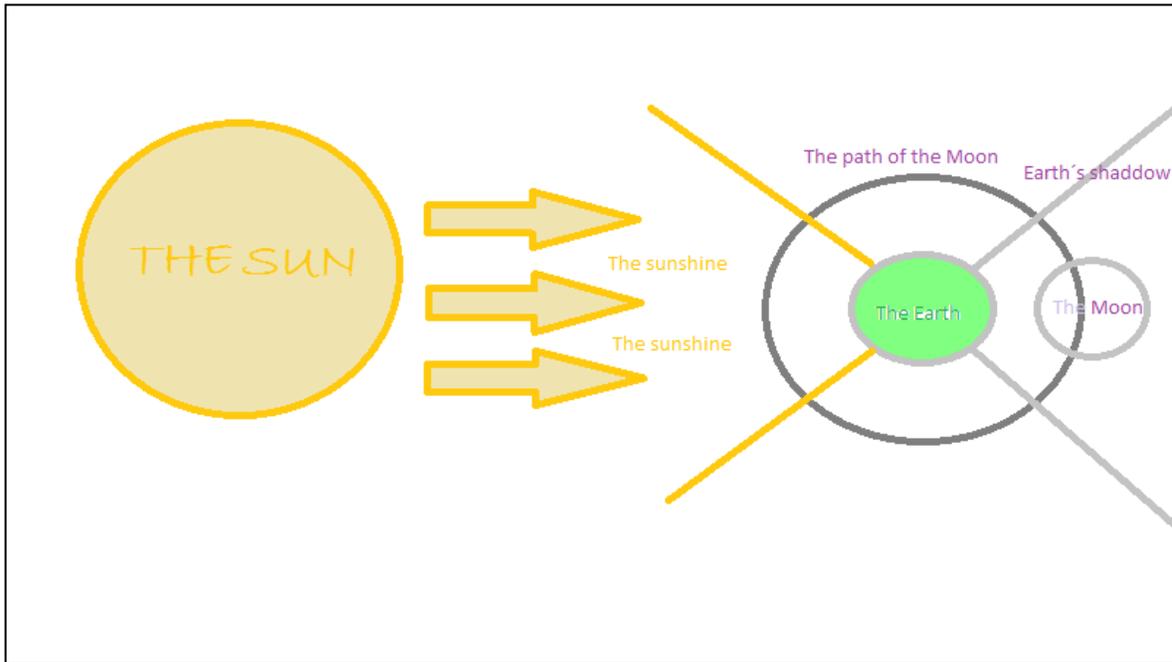
- Big Bang – basalt – Sun – Milky way – Solar system
- Tycho Brahe – Isaac Newton – Aristotle – Edison – Galilei

Underline 2 impacts of the rotation around the axis.

- cosmic matters – Venus – days and nights – seasons – polar night

The eclipse of the Moon

The Moon eclipse occurs when the Sun, the Earth and the Moon are in one line and the Earth is in the middle. The Sun shines on the Earth. There is a Moon's path around the Earth. The Earth's shadow hides the Moon. This is called the Moon eclipse.



Practical Geography and Maps

Geographic Coordinate System is a system that helps us determine every location on the Earth by main coordinates – latitude, longitude and altitude by their set of numbers measured in degrees apart from altitude which is measured in metres above sea level (m. asl.). The sample of coordinates is mainly displayed on the map.

Map is a visual representation of a certain area or the whole Earth. One of the most important parts of the map are cartographic animations explained by legend, also specified as the key of the map and the map scale which is the relationship between distance on the map and the real distance (world, road atlas and tourist map). As map content we indicate the small symbols and signs shown on the map which provide us with various types of information.

Multi map projection known as cartographic projection is a method of displaying the Earth's three dimensional globular shape to the flat two dimensional drawing area by distortion process which is divided into three projections – conform, equivalent and equidistant projection.

One of the ways to take precautions against the natural disaster is the meteorological usage of Earth Survey. Earth Survey is a system which collects information about the surface without the direct connection to it. Another system of location is called GPS (Global Positioning System). It is the global navigation satellite system that provides the exact location, speed and time information of all weather around the whole world.

Problem: *What is the usage of cartography and map projections in common life?*

Cartography, in other words mapping, is also known as the study and practice of making maps. It is a term closely integrated with geographic information science, which represents the terrain of the mapped object on the flat media – map projections. We use cartography and map projections for orientation, to get from one point to another and depending on distance we can use different types of map, e.g. world map, map of the region or country, city maps, etc.

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Cross out the unsuitable terms.

latitude - altitude - solar panel - parallels - Equator – meridians

Match the following.

A = cartography	1 = simplifying, representing information of a map
B = map content	2 = description
C = generalization	3 = mapmaking
D = legend	4 = objects shown on the map by signs and symbols

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Underline 2 characteristics of a map.

representation of the area – 2D projection of 3D world – cartographic work – GPS – satellite

Group the following terms logically.

world map, small-scale map, 1:200,000, large-scale map, 1:50,000, road atlas, tourist map, 1: 10,000,000, medium-scale map

Time Difference

The earth rotates around its axis from west to east. It means that when there is 2:27 pm in London, Búdir (Iceland) has 1:31 pm. We subtract 56 minutes because the day starts earlier in London than in Búdir.

London 14:27 (0°W)

Búdir ? (14°W)

$$1^\circ = 4'$$

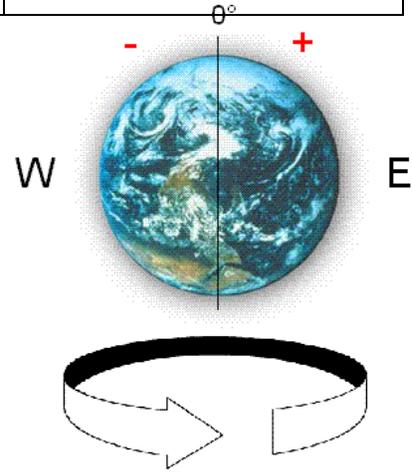
Counting:

London 14:27

Búdir ?

$$14^\circ \times 4' = 56 \text{ min.}$$

$$14:27 - 0:56 = 13:31$$



1. Why is summer in Sweden longer than in Anctartica?

Because when the Earth rotates around the Sun, on one side it is always closer and on the other it's further from the Sun. This is because of the unequal distances between the Earth and the Sun. The points which the Earth gets to when revolving around the Sun are called *aphelion* (further point) and *perihelion* (closer point).

2. When and where is the shortest and the longest day in the northern hemisphere?

The longest day is on 21 June summer solstice. (e.g. Slovakia)

The shortest day is on 21 December winter solstice. (e.g. Norway)

Lithosphere

The Earth consists of core, mantle and crust. Lithosphere contains mostly crust and a little bit of upper mantle. It includes the crustal (tectonic) plates floating on relief asthenosphere which is made of semi-molten magma (a thin layer of upper mantle). Tectonic plates are big segments of the Earth's crust which converge, diverge, slide and collide with each other, move horizontally next to each other. Landmass and oceanic floor can be divided into mobile zones and platforms (stable parts).

The structure of the Earth's crust is quite thin. It is made of different types of rocks, which also come from different geological periods. The Earth's crust is divided into continental and oceanic. The continental crust is thicker than the oceanic crust and it consists of three layers – sedimentary, granitic and basaltic layer. The oceanic crust is made of sedimentary and basalt layer only.

Minerals are chemical substances or elements which are formed by crystallization of magma. Minerals and particular organic remains create rocks. We know three types of rocks – igneous (e.g. granite), sedimentary (e.g. sandstone), and metamorphic (e.g. marble) rocks. They are all made by different processes.

The Earth can bring us unexpected situations. For example earthquakes, tsunami, volcano. These processes are very important in our life. Those would be, for example, volcanic activity, tsunami, or earthquakes. Besides the volcanic and seismic activity, there are also orogenic processes like folding. Orogenic processes take long time to change the Earth's relief. Tectonic plates play an important role because they move and create mountains or trenches. Folding is another endogenic process which also causes mountain building.

The lithosphere is the upper layer on which we live. Roads and railways are constructed on this layer. It is also important because this is the part of the surface from which we extract many valuable raw materials. It is the source of our energy needs, for example, coal which is an important fuel used in the production of electricity. Thanks to the rocks from the lithosphere the architecture is diverse, for example, basalt and granite are used as building stones, bricks or tiles are also products used in the building industry. Andesite, travertine and marble are among the decorative ones.

Problem: *Natural hazards harm nature and people.*

The Earth is very unpredictable. We are often affected by disasters such as tsunami, earthquake, volcanoes, etc. We are not able to stop these processes but we can only reduce the consequences. How can we protect us against endogenic processes?

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Match the following.

- | | |
|---------------------------|-----------------------|
| A = magnetic field | 1 = mid-oceanic ridge |
| B = basalt | 2 = metamorphic |
| C = convergence | 3 = oceanic floor |
| D = marble | 4 = outer core |
| E = constructive boundary | 5 = trench |

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Underline two tsunami countermeasures.

- ❖ zoning of land use – concrete walls – shelters – rubber shocks – dust-air filters
- ❖ planting the new trees on a coast – shipyards – volcanic warning system – new facilities built on higher ground – coastal hotels

Underline two earthquake countermeasures.

seawall – monitoring – weird animals behaviour – tourist paths – tree shelters

Underline two countries with active volcanoes and give an example of that volcano.

Slovakia – Italy – Finland – Mexico – South Africa

Cross the odd term out.

- convergence – volcano – mid-oceanic ridge – tectonic plates – new oceanic crust
- limestone – dolomite – sandstone – granite – claystone

Write the right triplets from these words.

folding, core, metamorphism, crust, destructive plate, earthquake, mantle, endogenic process, constructive plate

Georelief

Georelief is the very ground we walk on, the hills we climb or the waters we sail. We distinguish the continental georelief (land above the sea level) and submarine georelief which creates the ocean floor.

The face of the Earth is shaped by many processes like winds (eolian processes) whose force is capable of causing great changes in the environment - like wiping out all vegetation and create deserts. Another important factor is water, which is the leading component of marine, slope, fluvial, cryogenic (ice) and karst processes. Gravitation and weathering are usually the triggers of rock fall, soil creep, landslide, mudflow, etc. However, the Earth isn't sculptured only by forces that originate within the Earth itself. The cosmogenic processes – asteroids and dust can be the cause of major changes of the georelief. Temperature is another significant factor – the georelief acts differently in various climatic environments, for example, in the cold climate and polar areas, the frozen water becomes the most influential factor. It modifies the georelief in the form of ice, snow, avalanches, glacial processes, tarn, corrie or moraine. The last but not least are biogenic processes - landforms produced by animals and plants like coral reefs, termite mounds, beaver dams, etc.

However, nature isn't the only factor that alters our surroundings. In comparison to the past, anthropogenic processes have become one of the most influential factors that change the environment. Today, more than ever it is not unusual for us, the humans, to change our surroundings, the georelief, according to our needs and wants. All factors mentioned above are categorized among exogenic processes - actions that take place on the surface. On the other hand, there are also endogenic processes which are actions that take place inside the Earth and influence the surface by, for example, volcanic eruptions. The science that studies all concerning the georelief (topography) is called geomorphology.

Problem: *A landslide destroyed big part of Velké Kapušany.*

The area surrounding Velké Kapušany is known for large expansion of deforestation. Also it holds great reserves of underground water. But when the water rises even above its normal level the land slides down onto roads, houses and fields below. Similar processes can be caused by wind, rain but also by moving tectonic plates. Those processes are divided into endogenic and exogenic and cause quite a chaos in nature. Write down what the effects it has on people themselves and how we can prepare ourselves for those effects!

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Match the following:

1 = winds

2 = Hekla

3 = Himalayas

4 = weathering

5 = topography

A = ash, lava

B = geomorphology

C = desert storm

D = moraine, glacial processes

E = rockfall

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Group the following terms into triplets:

volcano, Himalayas, plants, glacier, endogenic processes, molehill, earthquake, moraine, biogenic processes

Cross the odd term out.

marine – slope – eolian – fluvial – cryogenic
deforestation – changing river courses – coral reef – new roads – smog

Underline a landform influenced by winds.

chernozem, desert, rainforest, Tierra del Fuego, tundra

Underline 2 gravitational processes.

meteorite, rockfall, fluvial, landslide, earthquake

Fill the gaps.

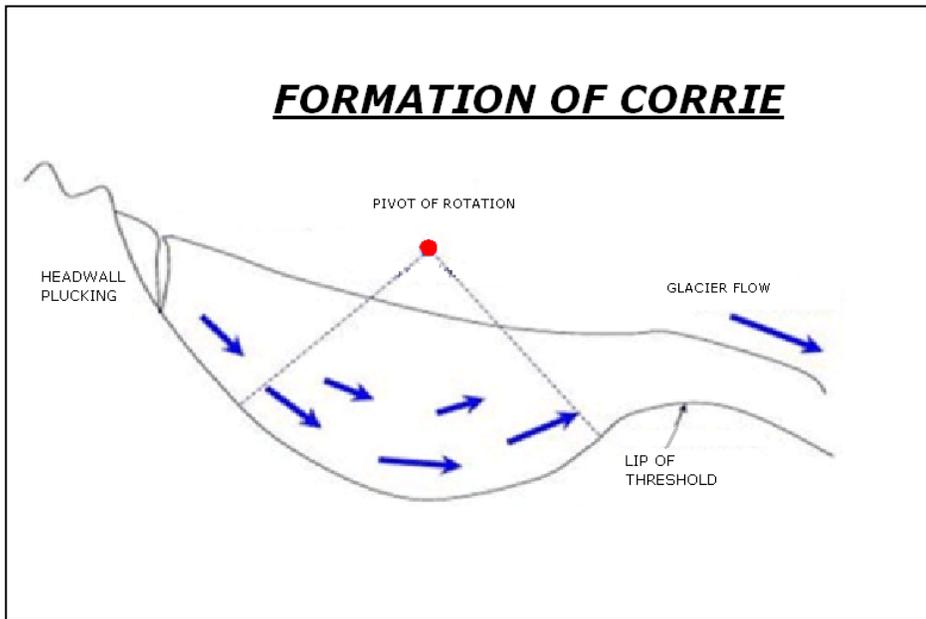
1. Rockfalls are caused by due to weathering!
2. Coral reefs are typical example of processes.
3. Frozen water is result of temperature in polar areas.

Sunny days bring warm air which causes melting of glaciers on the top of mountains. Glaciers thaw and move down the hill. The moving creates U-shaped valley. At the deepest point water stays and creates a lake. Lakes with the glacial origin are called tarns. Water from the glacial lake evaporates into clouds. It can rain or snow. Snowy weather brings snow back to the mountains and creates new glaciers.

A Corrie Formation

The process of formation of a corrie starts with the development of a small hollow in which there is the annual accumulation of snow – the hollow is enlarged by nivation processes. A continued enlargement occurs and as further fresh snow falls, compression of snow results in the eventual formation of true glacial ice. As the ice reaches a critical depth, rotational movement of the ice under its own weight occurs resulting in deepening of the base of the hollow. As rotational movement results in extending flow, plucking of the back wall occurs, making it steeper.

The availability of debris under the ice allows abrasion to further erode the hollow. Due to the deepening of the hollow, the ice at the front is thinner and therefore has less erosive power leaving a rock lip at the end which may also contain moraine deposits. In post-glacial times, corries are often filled by glacial lakes known as tarns.



Pedosphere

Pedogeography is a part of physical geography that studies the distribution of soils. *Pedosphere* is the outer layer of the earth that is comprised of soil and soil formation processes; and it is the youngest part of physical sphere. *Pedology* is the science that studies soils and their structure. It focuses primarily on the natural formation and arrangement of soil.

Soil consists of rock and mineral particles (abiotic or anorganic parts) mixed with organic matter (biotic = organisms). According to *Soil pH* (measure of the soil acidity or soil alkalinity) there are three types of soil: acid, neutral, basic. Pedosphere is also affected by climate. Main soil types change according to latitude and altitude.

The soil profile is the vertical cross-section through a soil. Soil is made of a number of distinct, horizontal layers placed one above other. Each of these distinct layers is known as a soil horizon. The most important part of soil is humus (topsoil- contains mainly C and N= fertility of soil) that creates upper part (horizon) of soils.

Have a look at the table concerning the horizontal zoning of soils in the northern hemisphere:

Polar climate	permafrost
Temperate climate	deciduous forests: brown earths steppes (pampas, prairies): chernozems (black earths) taiga (coniferous/evergreen forests): podzols
Subtropical climate	yellow soils, terra rosa soils
Tropical climate	desert soils
Subequatorial climate	red ferruginous soils
Equatorial climate	red-yellow soils, ferralitic soils

Problem: *How can we avoid or slow down the process of soil erosion?*

Erosion is a natural process of weathering and transport of solids as sediment, soil, rock and other particles in nature. Erosion is usually caused by transport of wind, ice or water. It is one of the natural processes, but it has been dramatically increased by humans and their land use, especially industrial agriculture and deforestation.

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Match the following.

- | | |
|----------------------------|--|
| A = polar zone | 1 = soil horizons |
| B = vertical cross-section | 2 = mixture of biotic and abiotic elements |
| C = compost | 3 = soil profile |
| D = horizontal layers | 4 = permafrost |

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Cross out the odd term.

- C and N, topsoil, upper horizon, ferralitic soil, humus
- alpine meadows, high altitude, fertility, infertility, grass

Underline terms which refer to the temperate zone.

deciduous forest, permafrost, desert soil, steppes, chernozems

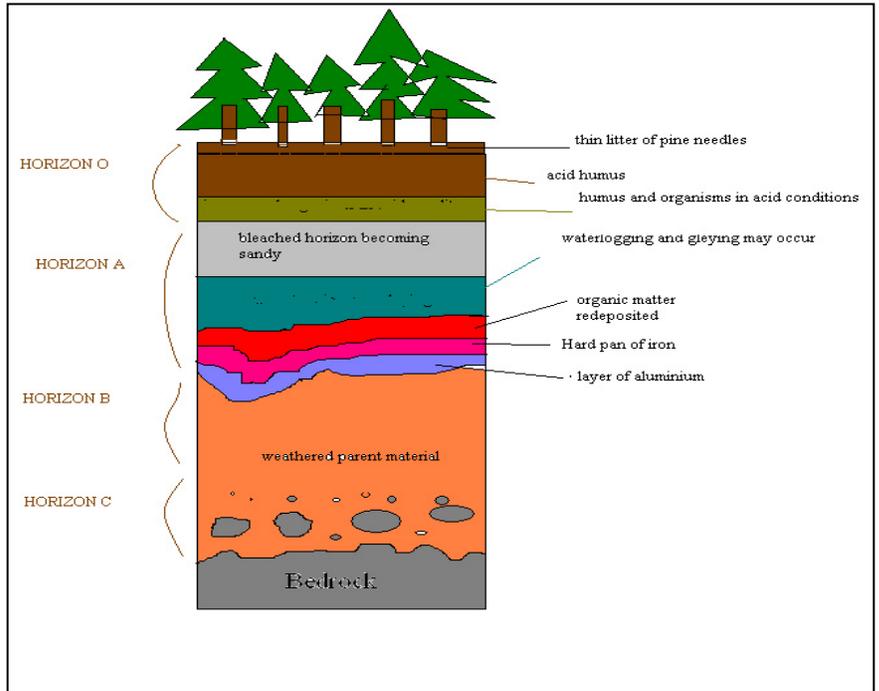
Underline soil type that was developed upon calcareous rocks.

cambisol, redzina, fluvisol, terra rosa soils, podzol

Podzol – soil profile

The O-horizon: thin litter of pine needles, acid humus and humus and organisms in acid conditions.

- The A-horizon: leached horizon becoming sandy, water logging and gleying may occur, organic matter redeposited, hard pan of iron and layer of aluminium.
- The B-horizon: accumulation of clays stained by iron oxides.
- The C-horizon: weathered parent material.



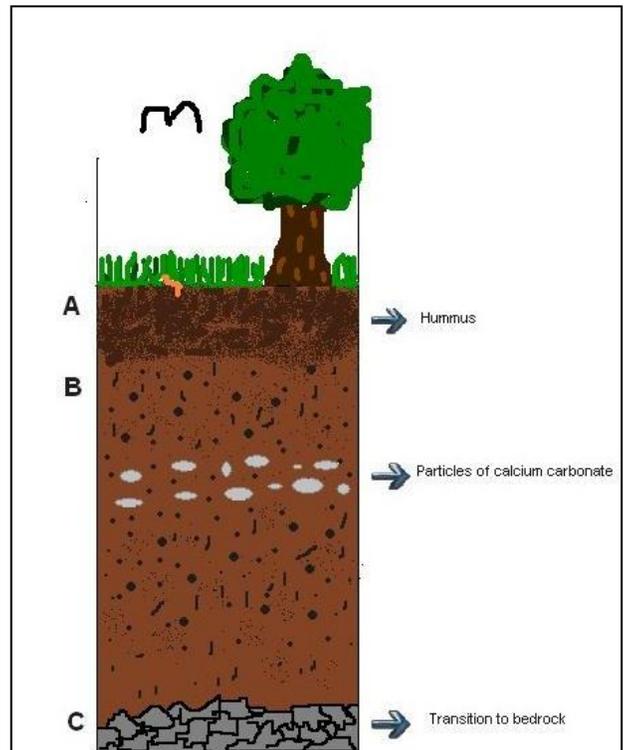
Chernozem – soil profile

Chernozem is the most fertile and so the most suitable soil for agriculture. We can find it in warmer and drier areas. It appears in temperate climate.

To get to the description of the picture, the soil profile consists of several parts, horizons. At the very top of chernozem, there is humus (horizon 0), which is the most fertile part of all. As we go lower, the consistence of horizons is less fertile. There is topsoil, eluviation layer, subsoil, regolith and finally at the bottom, there is bedrock.

Why to protect soil cover

The main part of pedosphere creates soil that includes organic and anorganic elements. Soil is very important for human beings because without fertile soil our agriculture and forestry cannot be efficient. People should not build thier houses and infrastructure on fertile soils because this is better to use for agricultural purposes and because people need to grow crops, cereals or some vegetables for life. Soil absorbs the surface waters and it helps to prevent floods.



Atmosphere

Atmosphere is necessary for life, and all living organisms would not stay alive without it. Atmosphere consists of gaseous, liquid and solid particles called air. It is composed of N (70%), O₂ (21%), O₃, CO₂, air and other gases.

Atmosphere consists of 5 main spheres: Troposphere, Stratosphere, Mesosphere, Thermosphere and Exosphere.

Weather shows short-term conditions of atmosphere in certain locality and it always changes. Weather is studied by meteorology and it deals with meteorological factors such as solar radiation, air temperature, air pressure, air humidity, evaporation levels, clouds, precipitation, height of snow cover, direction and speed of wind.

Climate refers long-term conditions of the atmosphere in a region. It is influenced by latitude, distance from the sea, global circulation within troposphere, ocean currents, altitude, relief, anthropogenic activities.

Temperature depends on ocean currents, altitude and distance from the sea.

The amount of precipitation is relative to air pressure, air humidity, ocean currents, atmospheric circulation, distribution of oceans and land mass. With increasing altitude, precipitation also increases.

Air pressure is changing by unequal heating of air above land mass. Winds are the air blowing from high air pressure areas to low air pressure areas.

Climate is divided into the regions called equatorial zone, subequatorial zone, tropical zone, subtropical zone, temperate zone and polar zone.

Atmosphere – structure

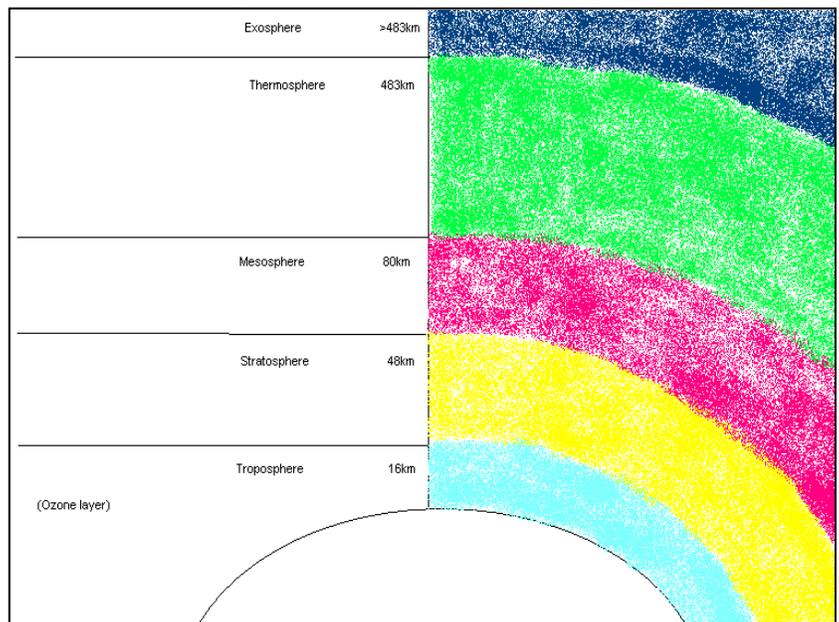
As previously written, there would be no life on the Earth if the atmosphere wasn't here. Troposphere is the closet layer to the Earth as you can clearly see on the graph. The interesting fact about the troposphere is that it is wider at the equator than at the poles. The planes and hot air balloons fly there.

The temperature of stratosphere increases with altitude due to the absorption of sunlight by ozone. It's the opposite case to troposphere where temperature and pressure drops as you go higher, which you know from flying. The ozone layer absorbs most of the harmful ultraviolet radiation from the Sun.

Mesosphere is the cold layer where the meteors occur.

The temperature changes in the same way as in the troposphere.

Thermosphere is the heat layer because the position is closest to the Sun and furthest from the Earth. The very outer layer of it is called exosphere and we do not really know where it ends. So it extends into the infinity in the space. This layer can be set as the most extended and greatest one.



Problem: *Do you think there will be more tropical hurricanes like Katrina in the United States in the future?*

Hurricane Katrina was one of the strongest storms, which impacted the south coast of the United States in 2005. Impacts of hurricane Katrina were terrifying; almost 2,000 people died, most of them in Louisiana. It had huge impacts on environment, economy, social life etc. Hurricane Katrina cost the United States an estimated \$110 billion in damages. It was caused by the interaction of a storm south of the Bahamas known as Tropical Depression Ten and another tropical wave. This reaction created a tropical storm on August 23, 2005. But a break in the levee system during Hurricane Katrina caused massive flooding throughout most of the city.

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Use of the Atmosphere

Man uses air (atmosphere) in many ways. Here's the list of some of them.

- **Energy Production:**
 - We create energy by wind turbines moved by blowing wind, and also by absorbing solar radiation by the solar panels.

- **Solar energy production:**
 - We can use solar radiation to produce energy. This is environmentally friendly. This energy is useful in households, for example, for heating.

- **Keeping the temperature on the Earth:**
 - Greenhouse gasses keep the temperature of the Earth. Without these gasses there would be too cold for living.

- **Entertainment:**
 - People make use wind for fun, e.g. windsurfing, sailing, paragliding, etc.

- **Transport:**
 - We live in the atmosphere so we have to move through the atmosphere so we use the wind, air and pressure to fly airplanes (air transport) and also the power of wind to sail (water transport).

- **Weather forecast:**
 - People listen to forecast to know what they can do tomorrow. It is also good for farmers. If the weather conditions will fit we can plan a trip or water our gardens or field.

Match the following.

- 1 = rain shadow effect A = Florida
- 2 = cloudiness B = seasonality
- 3 = hurricanes C = mountains
- 4 = jungle D = weather
- 5 = winters E = storms
- 6 = savannas F = climate
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Cross out the odd term.

- N – Ar – Cu – O₂ – CO₂
- polar bear – permafrost – polar timber line – oak – tundra
- climate – air pressure – ocean currents – asteroid – weather

Underline 2 countries which are endangered by hurricanes.

Madagascar – USA – Slovakia – Kazakhstan – Fiji – Haiti

Underline 2 countries which do not lie in the equatorial zone.

Brazil – South Africa – Congo – Egypt – Indonesia – Colombia

Complete the table logically.

Equatorial climate		no seasons
Polar climate	tundra	
	deserts	the hottest climate

Fill the gaps.

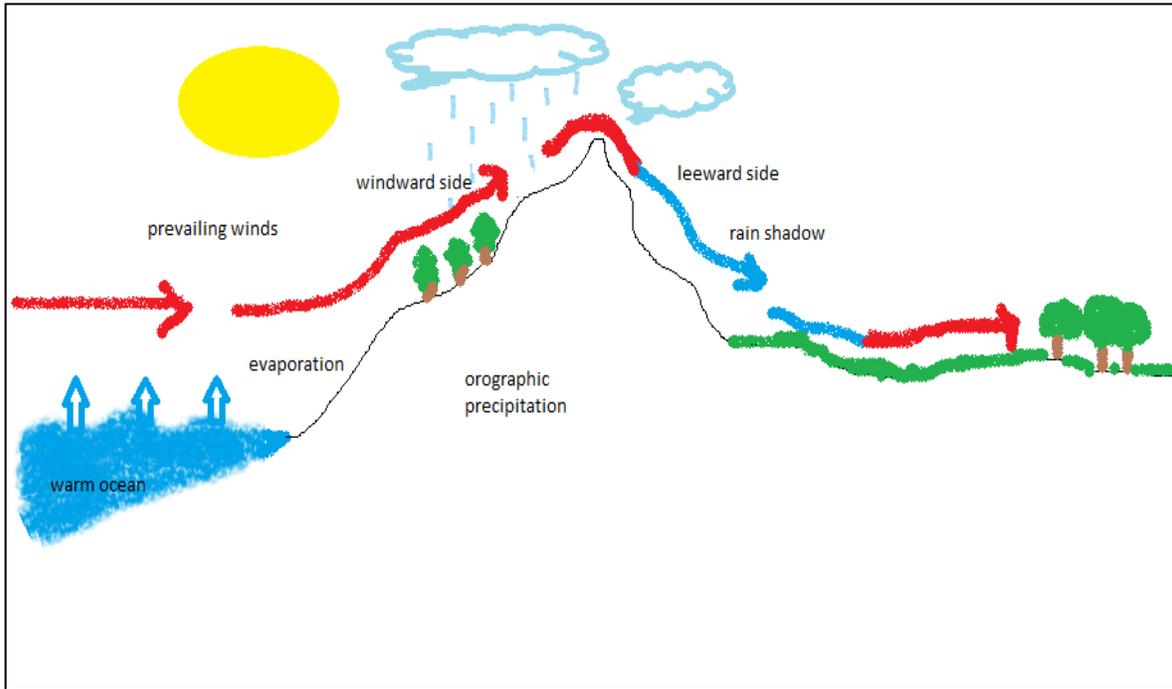
Summer monsoon brings heavy rainfall from a to the
 Military aircrafts reach the highest altitude in, the layer in the atmosphere.

Underline the proper term.

Bora flows *off//to* the mountains and brings a **warm//cold** air.
 Columbus was pushed by **trade winds//westerlies** to get to the **west//east** from Europe.

Rain shadow effect

Warm air with evaporated water from the ocean is carried by the prevailing winds over a mountain. Then it condenses and precipitates and the dry air moves forward leaving a rain shadow behind the mountain. So the lee ward side of the mountain is dry and this is called rain shadow effect.



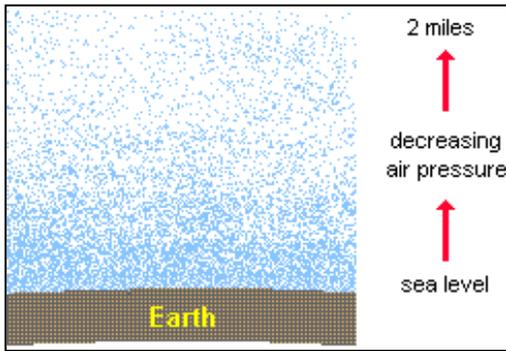
Summer monsoon

Monsoons are seasonal winds. Summer monsoon obviously occurs during summer when land and ocean are unequally heated because land heats faster than the ocean. Wind blows from an ocean towards land due to high pressure from the cooler ocean. It results in heavy rains on the coasts where high pressure meets low pressure. It occurs in subequatorial areas, South and South-East Asia (e.g. Bangladesh).



Why can't we breathe easily at the mountains of the Himalayas?

People never truly appreciate the ability to breathe until they can't! When somebody is ascending into high altitude he leaves lower parts of troposphere, where the air pressure is higher as well as the air heat.



For example a body exercise – the breathing quickens and person uses more of the O₂. Breathing problems become more pronounced. The same happens with cold air. Breathing issues are momentary most of the time at high altitude. They can be corrected by reversal of whatever brought it on - slow down, move lower down or warm up. Of course, there is a limit to the level of adaptation: mountaineers refer to the altitudes above 8,000 meters as the "death zone", where no human body can acclimatize. The well known fact is that the Himalayan highest peak, Mt. Everest, is 8,848 m above the sea level. This refers us to the usage of equipment for breathing.

Write down two reasons of bad breathing in high levels.

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The most common weather conditions in Slovakia

	<i>Summer</i>	<i>Winter</i>
<i>Anticyclone</i>	clear skies, high temperatures → around or above 30 °C, sunny weather	low temperatures, sunny mountainous weather, cloudy and foggy valley weather → though usually only till noon when the fog dissolves = <i>temperature inversion</i>
<i>Cyclone</i>	cloudy skies, lower temperature → below 25 °C, rainy weather	not that frosty weather (-5°C), cloudy sky, snowing

Hydrosphere

Hydrosphere is a part of physical geography which includes all water on the Earth (oceans, atmosphere, vapour) and also under the surface (geothermal water) known as underground water. Hydrology is a science that studies the water and water resources around the entire Earth and oceanography studies the oceans and seas on the surface.

Water on the Earth is divided into 4 (5) world oceans – the Pacific Ocean, the Atlantic Ocean, the Indian Ocean, the Arctic Ocean and the Southern Ocean. A small part of oceans are seas – marginal and inland. Sea water is defined by few characteristics as salinity, movement, and ocean water as warm and cold ocean currents which are determined by the direction of the flow. Warm ocean currents flow from the equator to higher latitudes and cold ocean currents from the latitudes towards the equator.

Salinity is a process of dissolving mineral substances and can be influenced by evaporation, precipitation or vertical and horizontal movements of sea water. The unit of measurement is per mille.

The movement of oceanic water is caused by three factors: cosmic, mechanical and geodynamic factors of which results are natural disasters or flow and ebb.

Water located on the land is called water of land mass and is mostly created by the precipitation or by the melting glacier (rivers and lakes).

Problem: *How can we prevent the high consumption of fresh water?*

Since the world population rose up to triple during the 20th century, the usage of freshwater resources has grown up to six times more than normally. In the next fifty years, population of the world will increase at a rate of 40-50%. This high population growth will result in an increasing demand for the freshwater and will have serious and maybe catastrophic consequences on the environment.

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Match the following.

A = precipitation	1 = oil
B = Gulf of Mexico	2 = evaporation and precipitation
C = tsunami	3 = rainfall and snowfall
D = water cycle	4 = floods

Cross out one term logically.

- summer – monsoon – winter – floods
- mineral water – water protection – drainage basin – timber
- water of land mass – sea – glacier melting – rivers/lakes

Group the following terms logically.

cosmic factors, tsunami, moon, mechanical factors, ocean currents, earthquake, flow and ebb, geodynamic factors, air circulation

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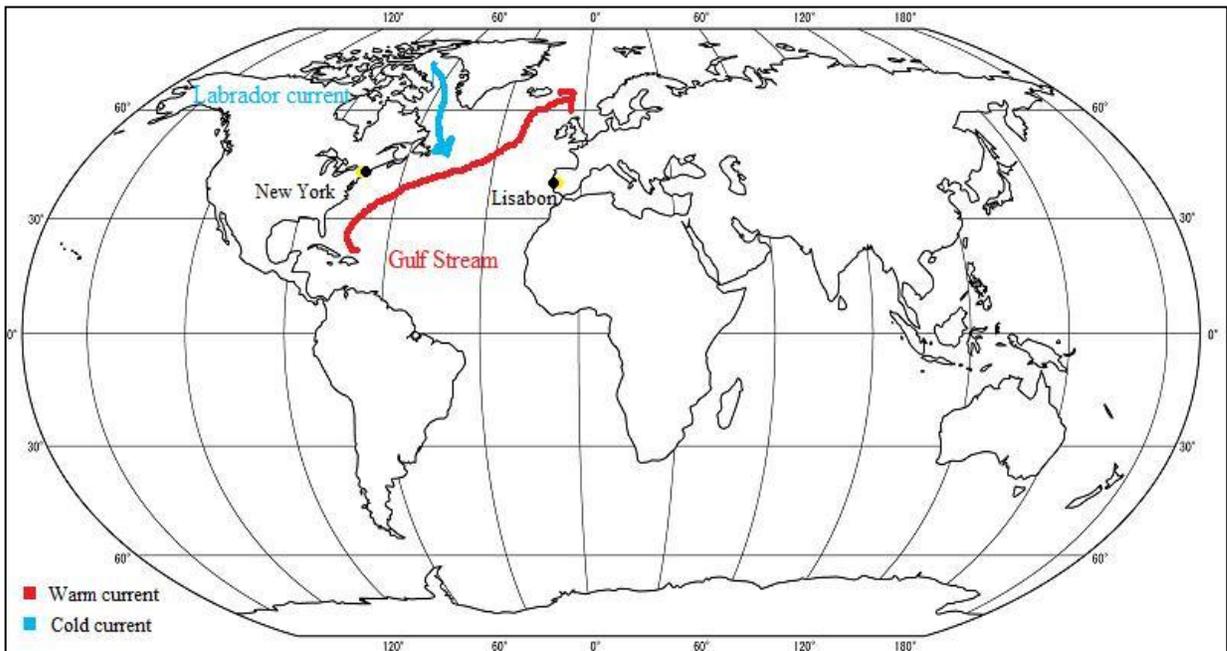
Underline a marginal sea.

Black Sea, Caspian Sea, Arabian Sea, Dead Sea, Lake Baikal

Underline the longest river.

Nile, Danube, Congo, Vřivák, Zaire, Ob, Kysuca

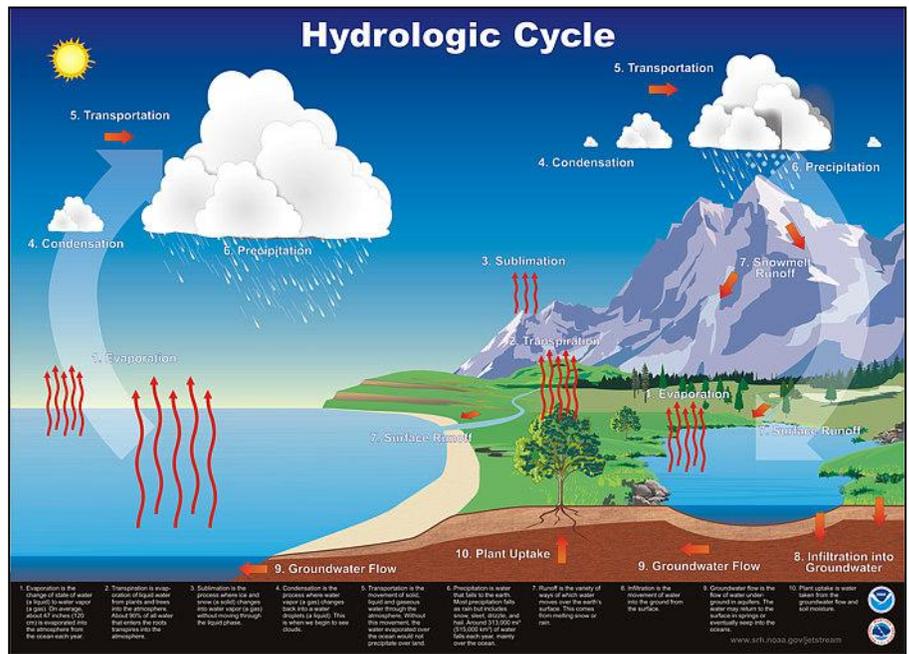
How does an ocean current influence climate?



Some currents on the surface influence the climate by their close proximity to the land. New York is influenced by the Labrador current which is cold and runs southward along the eastern Canadian coast and dips below the Gulf Stream to reach the eastern seaboard of the USA and it is giving New York cool climate even though the state is at the same latitude as warm Lisbon. Gulf Stream is fast moving current carrying warm water in a narrow band from the eastern coast of Florida and it influences the warm climatic area of Lisbon.

Hydrological cycle

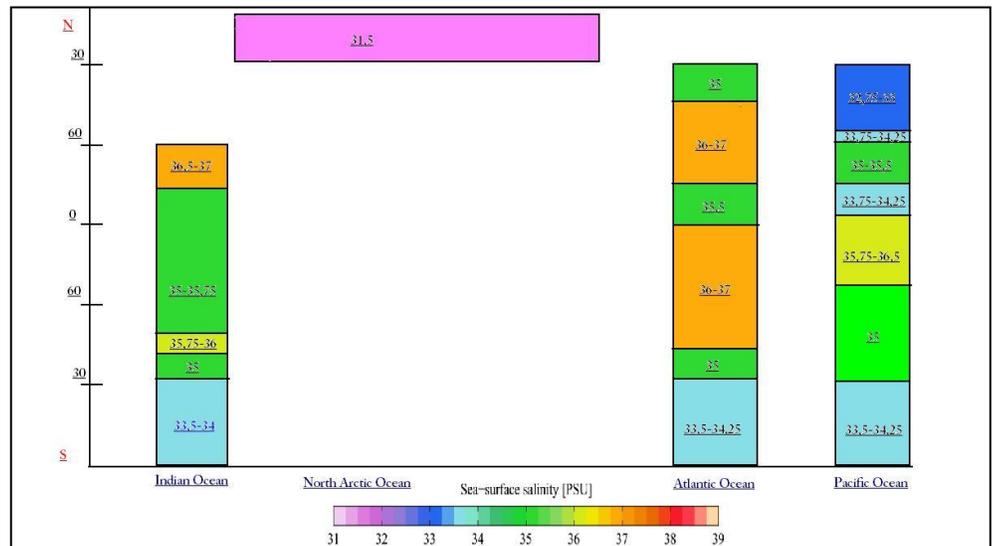
The Sun's energy results into evaporation from water surfaces like oceans, lakes or rivers. Plants evaporate water as well, this is called transpiration. Such evaporation creates clouds. When they meet cool air over land, they tend to change into a form of precipitation, e.g. rain or snow. Part of it falls onto the ground or seeps into the underground. The most of water returns back to the seas by flowing in a river bank.



Oceanic Water Salinity

We all know that sea or ocean water is salt. Salinity, however, varies in its saltiness due to change of latitude and environment surrounding the water. Here is a graph, describing salinity of all four oceans of the Earth in per mille (‰).

As we can see in the south and north, where the glaciers are, the ocean salinity is lowest, because of glaciers that thaw into the ocean thus giving it more fresh water and reducing the salinity. Around the equator, however, there are no glaciers to melt and there is not any other provider of fresh water, therefore the salinity is the highest. (to let you imagine the saltiness of those specific values of salinity in ocean, average salinity of fresh water we drink is 0,5 ‰)



Types of lakes according to their origin

Tectonic lakes: Lake Tanganyika, Lake of Victoria, Lake Baikal (The blue eye of Siberia)

Glacial lakes (tarns): Skalnaté pleso, Lake Ontario, Great Bear Lake, Lake Superior

Volcanic lakes: Crater Lake, Heaven Lake, Lake Pinatubo,

Biosphere

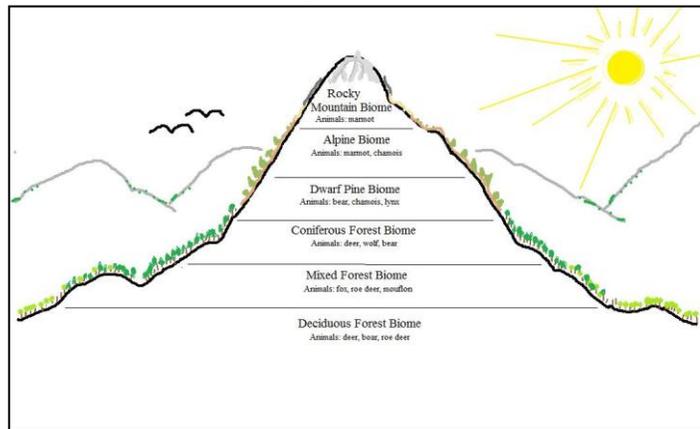
Biosphere includes all ecosystems. We could also call it the zone of life on the Earth. It is the part of the Earth where all organisms live. Biosphere is the global ecological system integrating all living beings and their relationships, including their interaction with the elements of the lithosphere, hydrosphere and atmosphere. Biogeography studies plants and animals as a part of landscape. We distinguish several ecological factors according to temperature, light or air humidity (aridity). An ecosystem is a system formed by the interaction of a community of organisms with their environment. There are animals or plants living only in some areas, nowhere else. They are called endemics. (E.g. platypus in Australia)

Biomes are regions of the world with similar climate (weather, temperature) animals and plants. Every bioclimatic zone is different because of its influences. Therefore we know major climatic regions which change from the equator to the poles. The hot regions are, for example, deserts or tropical rainforests. The warm regions are savannas, subtropical woodlands and steppes. Deciduous and coniferous forests are even colder, but the coldest climatic region is tundra.

Flora and fauna are divided into different vertical zones, as a result of increasing altitude. We know that savannas occur at the lowest level of vertical zonation. As the altitude rises, there are mountain rainforests with upper timberline, shrubs, meadows, wasteland and finally snow-and-ice cap.

Diversity of trees appears in different levels as well. Trees grow in areas which provide everything they need to grow and survive. Here are some types of common trees: oak, beech, spruce, fir, pine, dwarf pine, lime, willow, poplar tree, maple, hornbeam and birch. They occur in different levels such as flood-plain (riverine) forests (willow, poplar-tree, ash-tree), oak level (oak, chestnut, birch, horn-beam), beech level (beech, maple, fir), spruce level (fir, spruce, pine), dwarf pine level (dwarf pines), alpine meadows (grass, herbs) and eventually rocks and ice which are the highest level of vertical zonation.

Vertical zonation in Slovakia



Problem: *Rainforest in Amazon is the largest but it is still diminishing.*

The deforestation is a serious problem. The Amazon rainforest is the world's greatest remaining natural resource. Rainforests covered 14% of the earth's land surface. Nowadays it is only 6 % and the Amazon rainforest represents half of the total rainforests left on the Earth. Write down how you would stop or even decrease deforestation.

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Cross the odd term out.

- *fir – spruce – dwarf pines – larch – horn-beam*
- *elephant – baobab – giraffe – gorilla – acacia*

Match the following.

A = zoogeography

B = deserts

C = rainforests

D = steppes and prairies

A = ...

B = ...

C = ...

D = ...

1 = greatest biodiversity

2 = prairies

3 = animal

4 = oases

3. Make the right triplets from these words:

Kilimanjaro, polar fox, river, tundra, vertical zoning, willow, ice, fluvisols, ice cap

Environmental issues

Why should we protect the environment? (Five reasons)

1. The more trees we cut, the less oxygen we have.
2. It causes the global warming, which raises the sea level (melting of glaciers). The water covers many low land islands. So it covers the plants and some of them die. When they die, the animals lose a source of food so they can die too. When the plants and animals die, people lose two sources of food and die.
3. To avoid water pollution. Water pollution affects the drinking water, rivers, lakes and oceans all over the world. It may harm the human health and the natural environment.
4. It may cause the extinction of animal species.
5. Collapse of ecosystems which may cause the uncountable damage for all living organisms.

Which types of landscapes should we protect and why?

In general, every landscape should be protected. We are supposed to take care of it instead of destroying it and causing global warming etc. There are types of landscapes or objects which have to be protected more than the others. The most protection of objects or either countries might be where are endemics and type of countries which are rarely seen in the world or nowhere else like in New Zealand – It is not allowed to build huge industrial facilities because then they can waste wonderful nature and type of country which u can't see everywhere. I'm pretty sure that more examples like this can be mentioned.

Examples of endemic species in the world: Platypus (Australia), Kiwi Bird (New Zealand), Iguanas (Galapagos Islands), Chamois, Pulsatilla, Marmot (Slovakia)

Decide if these statements are true. Correct them in case of no.

- Solar energy is not friendly to nature.
- There is a coal-fired power station In Jaslovské Bohunice.
- NP Poloniny is located in the district of Snina.

Name the national park described by these features.

Since the 1940s, this protected and well-preserved natural territory is located in the Poprad, Liptovský Mikuláš and Kežmarok districts. Man can find here the highest settled municipality in Slovakia. Chamois or marmot represents the endemics.

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Name the protected landscape area which is described in the following text.

The area covers the Oravské Beskydy mountains. The Orava Dam is one of the tourist destinations here. Locals have usually more children than the Slovak average.

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Name the cave which is described in the following text.

It is a natural phenomenon located near Dobšiná, more precisely in the Volovské vrchy Mountains. Decorated by many stalactites, stalagmites of columns, calcareous waters formed one of the most spectacular caverns on the borders of the Spiš, Gemer and Horehronie regions.

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Deciduous trees

Silver birch (*Betula pendula*) – grows in moderate-climatic areas, wood is used for making furniture and brooms.

White willow (*Salix alba*) – it occurs along river banks, wood is mostly used for decoration.

Poplar tree (*Populus trichocarpa*) – growing on the shores or in the wet-soil areas, important type of plywood used in production of beds (generally furniture-making).

Maple (*Acer pseudoplatanus*) – it flourishes mostly in the north temperate climatic zone while being great source of fuel, for instance.

Black alder (*Alnus glutinosa*) – it grows along rivers is used like a protection of endangered coasts and shores.

European Beech (*Fagus Sylvatica*) occurs in areas from 200 – 1100 m asl. Younger trees are widely used as attractive hedges, the older ones for paper production or heating.



Rowan (*Sorbus Aucuparia*) grows in higher areas from 900 – 1500 m asl. Fodder crops represent the usage of its fruit.

Sycamore (*Acer Pseudoplatanus*) occurs in areas from 700 – 1300 m asl. The wood is used for making musical instruments as violin or bass. Furniture, parquetry or decoration is composed of this type of wood.



Silver Birch (*Betula Pendula*) occurs in areas from 400 – 1600 m asl. Burned often in a fireplace, it is also used as luxury wood in airplanes.

Lime (*Tilia Cordata*) it is a deciduous tree growing to a height of 20 – 38 m. Limes occur in areas from 400 – 800 m asl. Used for making statues, ladles and other folk work-of art, widely in carpentry and wood-carving.

Name the tree species according to the pictures.

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Coniferous trees

Spruce (*Picea abies*) – occurrence in taiga and northern temperate regions, several larvae feed on its dead trunk and bark, the wood serves as

Pine (*Pinus sylvestris*) – grows in temperate zone (some of the pine species grow in large quantities also in the Mediterranean area), valued for its timber used in gardens.

Larch (*Larix decidua*) – cooler temperate zone, used for building yachts, for instance.

Fir (*Abies alba*) – grows in mountains and used for manufacture of plywood, often like a Christmas-tree.

Spruce (*Picea Abies*) naturally occurs in Slovakia in areas from 700 – 1,600 m asl. Wood from spruce is usually used for wooden houses and log cabins. The young trees are planted instead of beeches cut in order to get the fuel-wood.



Fir (*Abies Alba*) is a continental tree occurring in areas from 500 – 1300 m asl. Mainly used in carpentry, it is not commonly used because of hard processing of wood. Durable type of wood. Compared to a spruce it has needles all around the branch.

European Larch (*Larix Decidua*) grows in areas from 700 – 1600 m asl. Very durable wood recommended for facing bricks and furniture. Young needles contain lot of the C-vitamin therefore it supplied people with nutrients mostly in the past.



Scotch Pine (*Pinus Sylvestris*) occurs in areas from 200 – 800 m asl. in Slovakia. Wood has high quality. Even though there is small processing of it. Specially used for buildings with waterproof floor, e.g. water moles or bridge. Also used for making window frames and furniture.

Why to protect the animal life?

Protection of animal life is one of the most important element to avoid the complication in the food chain which is very important in nature. If one species of animal dies out everything above it will also die out because of lack of food which was the main food source for the certain species. Another reason why to protect animal life is that they make primary products as milk, eggs and other good demanded in whole world for making secondary products for sell and they are also used for transport and ploughing, in other words they make humans work easier and more effective, especially in economically less developed countries such as Bangladesh or Mozambique. Domestic animals do not serve only as producers but also as pets and family friends.

Svalbard

This archipelago was recently described as an external hard drive, for it stores backup of seeds for more than 1/3 of all crop varieties. According to some, it is a home to more polar bears and humans – an anomaly that springs an interest among the scientists. And thanks to the *His Dark Materials* series became a popular tourist destination also.

In the 1920, Svalbard officially became a part of Norway, subjugating itself under placed regulations.

The pros of life on this archipelago appear grand- wages are relatively high, the borders are open to immigrants and carrying a gun outside is obligatory. However, the cons argument just as well – the long months of polar darkness and summer temperature that rarely goes over 7°C probably do not characterize many people’s dream-home.

**Would you like to live there? Why?
Which country is Svalbard a part of?**

Cross out one unsuitable term

- tourism, coal, oil, research, polar bears

Problem: *Why did the land cover slide down in Palestine?*

Palestine survived several great landslides during the last decade. The reason is the connection of past deforestation and monumental rains which undercut the stability of the ground layer of a soil. The available information points at several months of raining in the same area. Precipitation multiplied the deforestation of a hillside above the city of Nablus, Palestine, resulting in easily predictable and apparent landslide, which unfortunately resulted in death of many citizens.

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1. Where else can we find landslides? Write down at least 5 examples of landslide-risk area.

2. Write down at least 2 examples of factors triggering a landslide. What other causes of landslides can you think of?

3. Name 2 similar natural hazards endangering the life of people.

4. What about motorcycles roaring in the countryside?

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Other plants and herbs

Dandelion

A perennial plant native to Eurasia and Northern America, name dandelion comes from French dent-de-lion meaning the lion's tooth, uses: in the kitchen, but also for dandelion wine or coffee, a traditional cure for various illnesses ranging from liver problems to cancer.

Marsh Marigold

A perennial plant native to woodlands and marshes of the Northern Hemisphere. This plant is poisonous.



Daisy

Occurrence: Native to western, northern and central Europe. Name comes from the Greek word aster meaning star. Herbaceous plant, uses: in ancient Rome the bandages were soaked in the daisy juice it helped the wounds to close.

Bellflower

A plant of bell shaped flowers, campanula- little bell, native to the temperate regions of Northern hemisphere. Uses- the leaves used to be used as spinach.

Wild thyme

Low subshrub native to Europe and Northern Africa, has strongly scented flowers of the lilac or pink color, is resistant to pedestrian traffic. Uses: herbal medicine (seasoning), especially against coughing, also for honey – with the assistance of bees.

Match these herbs to the pictures.

Wild-thyme, Marsh Marigold, Daisy, Bell-flower

