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,the free encyclopedia that anyone can edit.107,590 active editors 7,027,312 articles in EnglishLobby of the Daily News Building, c.1941The Daily News Building is a skyscraper in Manhattan, New York City. The original tower, completed on July23, 1930, was designed by Raymond Hood and John Mead Howells in the Art Deco style; a similarly-styled expansion, designed by Harrison & Abramovitz, was completed in 1960. The 36-story tower, rising 476 feet (145m), consists of a 14-story printing plant and an 18-story annex. There is a large carved-granite entrance leading to a rotunda lobby with a rotating painted globe (pictured). The Daily News' parent company, Tribune Media, sold the building in 1982, and the newspaper moved out entirely in 1995. SL Green Realty bought the building in 2003 and sold a partial ownership stake to Meritz Alternative Investment Management in 2021. When it opened, the building received mixed reviews and was described as having a utilitarian design. It is a National Historic Landmark and its exterior and lobby are designated city landmarks. (Fullarticle...)Recently featured: HippocampusRed (Taylor Swift album)Sir William Gordon-Cumming, 4th BaronetArchiveBy emailMore featured articlesAboutLucy Beall Lott... that Lucy Beall Lott (pictured) was expected to die in infancy, but later earned master's degrees from Cambridge and London while modeling for Cosmopolitan and Vogue?... that the May1995 Pale air strikes during the Bosnian War were the first offensive operations carried out by the Spanish Air Force since 1957?... that Audrey Hawthorn volunteered as curator while spending more than 20 years establishing a museum of anthropology?... that the origin myth of the Mori polity involved a man appearing from a bamboo shoot?... that the role of Julia Santos was created for Sydney Penny after she was nominated for an Emmy Award for her work in Santa Barbara?... that lyme& cybelle's "Follow Me" was the first of only three songs by Warren Zevon to chart on the Billboard Hot100?... that cycling's governing body ended Chelsea Wolfe's career through a rule change?... that the Canons Regular of St.John Cantius have trained some 2,000 priests in the Extraordinary Form of the Roman Rite of the Catholic Mass?... that the ancient Greek orator Lysias wrote a "Funeral Oration", but may have been forbidden from delivering it?ArchiveStart a new articleNominate an articleOzzy OsbourneOzzy Osbourne (pictured), the lead singer of Black Sabbath, dies at the age of 76.A fighter jet crashes into a college in Dhaka, Bangladesh, killing more than 30 people.In golf, Scottie Scheffler wins the Open Championship.A tourist boat capsizes during a thunderstorm in H Long Bay, Vietnam, leaving at least 36 people dead.Ongoing: Gaza warRussian invasion of UkrainetimelineSudanese civil wartimelineRecent deaths: Phoebe AsiyoGary KarrClaus PeymannWayne ThomasAndrea GibsonRaymond GuiotNominate an articleJuly 23: Birthday of Haile Selassie (Rastafari)Megawati Sukarnoputri reciting the oath of office1921 The first National Congress of the Chinese Communist Party opened in a house in Shanghai.1940 Sumner Welles, U.S. Under Secretary of State, issued a declaration that the U.S. government would not recognize the Soviet Union's annexation of the Baltic states.1982 A helicopter crashed during the filming of Twilight Zone: The Movie in Valencia, California, killing actor Vic Morrow and two child actors.2001 Megawati Sukarnoputri was sworn in (pictured) as the first female president of Indonesia following her predecessor's impeachment.2010 The English-Irish boy band One Direction were formed while auditioning for the 2010 series of the British singing competition The X Factor.John Babcock (b.1900)Sergio Mattarella (b.1941)Olivia Manning (d.1980)Amy Winehouse (d.2011)More anniversaries: July 22July 23July 24ArchiveBy emailList of days of the yearAboutAmlia Rodrigues (23July 1920 6October 1999) was a Portuguese fado singer (fadista). Dubbed Rainha do Fado ('Queen of Fado'), she was instrumental in popularising the genre worldwide and travelled internationally throughout her career. She remains the best-selling Portuguese artist in history. This photograph shows Rodrigues performing at the Grand Gala du Disque Populaire, an annual Dutch gala for popular music, held in 1969 in Amsterdam.Photograph credit: AnefoRecently featured: Atari video game burialSouthern scrub robinC/2022E3 (ZTF)ArchiveMore featured picturesCommunity portal The central hub for editors, with resources, links, tasks, and announcements.Village pump Forum for discussions about Wikipedia itself, including policies and technical issues.Site news Sources of news about Wikipedia and the broader Wikimedia movement.Teahouse Ask basic questions about using or editing Wikipedia.Help desk Ask questions about using or editing Wikipedia.Reference desk Ask research questions about encyclopedic topics.Content portals A unique way to navigate the encyclopedia.Wikipedia is written by volunteer editors and hosted by the Wikimedia Foundation, a non-profit organization that also hosts a range of other volunteer projects: CommonsFree media repository MediaWikiWiki software development Meta-WikiWikimedia project coordination WikibooksFree textbooks and manuals WikidataFree knowledge base WikinewsFree-content news WikiquoteCollection of quotations WikisourceFree-content library WikispeciesDirectory of species WikiversityFree learning tools WikivoyageFree travel guide WiktionaryDictionary and thesaurusThis Wikipedia is written in English. Many other Wikipedias are available; some of the largest are listed below. 1,000,000+ articles DeutschEspaolFranaisItalianoNederlandsPolskiPortugusSvenskaTing Vit 250,000+ articles Bahasa IndonesiaBahasa MelayuBn-lm-gCataletinaDanskEestiEsperantoEuskaraMagyarNorsk bokmlRomnSimple EnglishSloveninaSrpskiSrpskohrvatskiSuomiTrkeOzbekcha 50,000+ articles AsturianuAzrbaycancaBosanskiFryskGaeilgeGalegoHrvatskiKurdLatvieuLietuviNorsk nynorskShqipSloveninaRetrieved from " 2Founding conference in 1921Not to be confused with 1st National People's Congress.You can help expand this article with text translated from the corresponding article in Chinese. (July 2021) Click [show] for important translation instructions.View a machine-translated version of the Chinese article.Machine translation, like DeepL or Google Translate, is a useful starting point for translations, but translators must revise errors as necessary and confirm that the translation is accurate, rather than simply copy-pasting machine-translated text into the English Wikipedia.Do not translate text that appears unreliable or low-quality. If possible, verify the text with references provided in the foreign-language article.You must provide copyright attribution in the edit summary accompanying your translation by providing an interlanguage link to the source of your translation. A model attribution edit summary is Content in this edit is translated from the existing Chinese Wikipedia article at [[:zh:]]; see its history for attribution.You may also add the template {{Translated|zh|}} to the talk page.For more guidance, see Wikipedia:Translation.1st National Congress of the Chinese Communist PartySite of the 1st Congress in ShanghaiBeginsJuly23,1921(1921-07-23)EndsAugust2,1921(1921-08-02)Location(s)Shanghai and JiaxingNext event2nd National Congress of the Chinese Communist Party (1922)Participants13 representativesActivityFormal establishment of the Chinese Communist Party1st National Congress of the Chinese Communist PartyTraditionalChineseSimplifiedChineseTranscriptionsStandard MandarinHanyu PinyinZhnggu Gngchndng Dyc Qungu Dibio DhuGwoyeu RomatzyhJonggwo Gonqchaandaang Dihitsyh .Chiuangwo Daybeau DahhueyWadeGilesChungkuo Kungchantang Tiyichi Chankuo Taipiao TahuiAbbreviationChineseTranscriptionsStandard MandarinHanyu PinyinY DOf the 13 delegates who attended the congress in 1921, Mao Zedong and Dong Biwu were the only two to also be present at the proclamation ceremony of the PRC in 1949, as pictured here.The 1st National Congress of the Chinese Communist Party was held in Shanghai and Jiaxing between July 23 and August 2, 1921.[1]:252 The Congress established the Chinese Communist Party (CCP). The congress began in a shikumen building of the French Concession area of Shanghai (near present-day Xintiandi in Huangpu District). In early June 1921, Dutch national Henk Sneevliet, also known as Ma Lin, a representative of Comintern, arrived in Shanghai, and urged various Communist cells in the country to get together for a national-level meeting. Russian Comintern representative Nikolski[ru; de] also attended the meeting. At the time, there were 57 members of the CCP.[2] Notably, the two founders of the party did not attend the congress: Chen Duxiu and Li Dazhao.The meeting was put to an end due to harassment from the French Concession police on July 30. The delegates then agreed to move the meeting to a rented tourist boat on South Lake in Jiaxing. The Congress elected Chen Duxiu as Secretary (in absentia), Zhang Guotao as Director of Organization, and Li Da as Director of Propaganda.[2]The General Assembly adopted The First Program of the Communist Party of China, stating that "the Party is to be named the Communist Party of China" and specifying its objectives: "to overthrow the power of the capitalist class[,]" to "eradicate capitalism and private ownership of property[,]" and to "join the Comintern."[3] The Program was not a formal constitution, but described the basics of the Party's program, organization, and discipline.[1]:116Of the 13 representatives who attended the congress in 1921, only two would be present at the proclamation ceremony of the People's Republic of China 28 years later: Mao Zedong and Dong Biwu. Others either became casualties of war in the decades that followed or left the party in one way or another (e.g. by expulsion or defection).The site of the conference in Shanghai was converted into a museum in 1961. The South Lake Revolutionary Museum in Jiaxing, located on a central island of the lake, was constructed in 1959. A complex hosting more exhibits was constructed north of South Lake in 2011, also to commemorate the 1st Congress. The Congress was followed by the 2nd National Congress of the Chinese Communist Party, held in July 1922.[1]:112Li Da (Shanghai)Li Hanjun (Shanghai)Zhang Guotao (Beijing)Liu Renjing[ca; de; ru; zh] (Beijing)Mao Zedong (Changsha)He Shuheng (Changsha)Dong Biwu (Wuhan)Chen Tanqiu (Wuhan)Wang Jinmei (Jinan)Deng Enming (Jinan)Chen Gongbo (Guangzhou)Zhou Fohai (representing Chinese students in Japan)Bao Huiseng[ca; zh] (representing the absent Chen Duxiu)^ a b c Li, Ying (2024). Red Ink: A History of Printing and Politics in China. Royal Collins Press. ISBN9781487812737.^ a b "". Communist Party of China.^ Huang, Yibing (2020). An ideological history of the Communist Party of China. Vol.1. Qian Zheng, Guoyou Wu, Xuemei Ding, Li Sun, Shelly Bryant. Montreal, Quebec: Royal Collins Publishing Group. p.20. ISBN978-1-4878-0425-1. OCLC1165409653.Retrieved from " 3The following pages link to 1st National Congress of the Chinese Communist Party External tools(link counttransclusion countsorted list) See help page for transcluding these entriesShowing 50 items.View (previous 50 | next 50) (20 | 50 | 100 | 250 | 500)Chinese Communist Party (links | edit)July 23 (links | edit)Mao Zedong (links | edit)1921 (links | edit)Politburo of the Chinese Communist Party (links | edit)Chinese Civil War (links | edit)Hu Yaobang (links | edit)May Fourth Movement (links | edit)Chen Duxiu (links | edit)Jiang Zemin (links | edit)Hua Guofeng (links | edit)Politburo Standing Committee of the Chinese Communist Party (links | edit)Zhao Ziyang (links | edit)Hu Jintao (links | edit)State Council Information Office (links | edit)Central Military Commission (China) (links | edit)General Secretary of the Chinese Communist Party (links | edit)Hammer and sickle (links | edit)Eight Elders (links | edit)Princelings (links | edit)Chinese Soviet Republic (links | edit)Secretariat of the Chinese Communist Party (links | edit)Shanghai clique (links | edit)National Congress of the Chinese Communist Party (links | edit)Central Committee of the Chinese Communist Party (links | edit)Central Foreign Affairs Commission (links | edit)New Culture Movement (links | edit)16th National Congress of the Chinese Communist Party (links | edit)Constitution of the Chinese Communist Party (links | edit)1st Congress (links | edit)Henk Sneevliet (links | edit)United Front Work Department (links | edit)Chairman of the Chinese Communist Party (links | edit)Zhang Guotao (links | edit)Li Lisan (links | edit)Mount Lu (links | edit)Dong Biwu (links | edit)Zunyi Conference (links | edit)Central Commission for Discipline Inspection (links | edit)Taiwan Affairs Office (links | edit)Propaganda in China (links | edit)610 Office (links | edit)Xi Jinping (links | edit)Bo Gu (links | edit)Zhang Wentian (links | edit)South Lake (Jiaxing) (links | edit)Xiang Zhongfa (links | edit)Publicity Department of the Chinese Communist Party (links | edit)Tsinghua clique (links | edit)Lushan Conference (links | edit)View (previous 50 | next 50) (20 | 50 | 100 | 250 | 500)Retrieved from " WhatLinksHere/1st_National_Congress_of_the_Chinese_Communist_Party" The drainage basin is the area of land drained by a river system (a river and its tributaries). It includes the surface run-off in the water cycle, as well as the water found in the ground. Drainage basins are separated by watersheds. This is the area that separates on drainage basin from another, indeed, the water shed is the upper limit around the drainage basin. A drainage basin is an example of an open system because it is open to inputs from outside, such as precipitation, and is responsible for outputs out of the system, such as output of water into the sea and evaporation of water into the atmosphere. It can also be seen as a cascading system, as the outputs from drainage basins become the inputs to other systems such as the coastal system. You can see a diagram of the drainage basin below. The North East of England has 3 major drainage basins, the Tyne, Tees and Wear, and several other smaller drainage basins. These are tiny compared to the worlds largest drainage basins, such as the Nile, Amazon and Mississippi 1, which covers 3,225,000km2. The drainage basin major flows and stores The drainage basin as an open system The drainage basin starts with an input from the water cycle precipitation, after the processes of condensation and cloud formation. This precipitation can be stored on the surface as snow or ice (surface storage), or can be intercepted by trees and vegetation. On the trees or vegetation the water can be dripped off leaves, flow down the vegetation as stem flow or be taken up and lost as transpiration. Some water is stored in plants as vegetation storage (aka biospheric water). The combined losses of water through transpiration and evaporation are known as EVAPOTRANSPIRATION. It could also fall straight into the ground where it can infiltrate (into the soil then percolate (the downward movement of water within the rock under the soil surface) into the rock underneath if the soil and rock are permeable. If the rock is not permeable or the soil stores are full then surface runoff will occur. This water will then work its way through the soil (soil flow/throughflow) or rock (groundwater flow - the slow movement of water through underlying rocks) or over the land as overland flow (the tendency of water to flow horizontally across land surfaces when rainfall has exceeded the infiltration capacity of the soil and all surface stores are full) and into streams and rivers. This is also known as run-off - all the water that enters a river channel and eventually flows out of the drainage basin. These small tributary streams join at confluences and the river will grow in size and strength. These processes are true for hillslopes and larger scale drainage basins. Factors affecting infiltration rate 3 The infiltration capacity is the maximum rate at which water can be absorbed by a given soil per unit area under given conditions. There are several factors which affect how much water can be infiltrated by a soil; 1. Soil type (texture, structure, hydrodynamic characteristics) - the soil characteristics influence capillary forces (the ability of a liquid to flow in narrow spaces without the assistance of, or even in opposition to, external forces like gravity) and adsorption. This can be seen in the table below for uncompacted soils; Source: Minnesota Pollution Control Agency 4 2. Soil coverage. Vegetation has positive influence on infiltration by increasing the time of water penetration in soil, this is because plant roots can create channels for the water to soak through. 3. The topography and morphology of slopes it has been suggested that steeper slopes have lower infiltration rates and more surface runoff. 4. The flow supply (how intense is the rain? is there drainage?). 5. How humid are the soils already - this is an important factor of infiltration regime. The infiltration regime changes for dry or wet soils. 6. Soil compaction due to rain drop impact and other effects. The use of hard agricultural equipment can have consequences on the surface layer of soil. In reality, infiltration rates are affected by a combination of these factors. These could be a potential NEA study. If the rainfall intensity is greater that the infiltration rate then water will remain at the surface of the soil as surface storage and overland flow can occur. Similarly, if soil pores are full no water can infiltrate and the soil is said to be saturated. In both cases there is the potential for localised flooding. Factors affecting soil storage Rain water can also be stored in the ground as soil storage. Soils consist of particles and pores. Those pores can be filled with air but also with water. The amount of pores is a soil is different for different types of soil. The pores in a clay soil account for 40% to 60% of the volume. In fine sand this can be 20%45% The soil particles have small pores in them where water can enter (soil water) and between the particles are larger pores that can be filled. The soil is filled with water up a certain level. This level goes up and down with changing weather conditions.6 This water level is the ground water level also known as the water table. This can best be studied at local scale such as a valley or hill slope, as shown below. Factors affecting interception rates Interception is another important factor controlling flows and stores within the drainage basin. It is basically when plants trap water or stop it from reaching the ground during a rainfall event. The rates of interception are controlled by; The plant type and shape for example coniferous trees intercept 25-35% of annual precipitation whilst deciduous trees intercept 15-25% of annual precipitation, but just as much as coniferous trees during the growing season. Grasses have high interception capacity during the growing but then either die (annual plants) or loose mass (perennial plants); also they are grazed and harvested (spring wheat intercepts 11-19% of precipitation before harvest). Plant density Plant structure in terms of size, flexibility, strength and pattern of branches. Leaves- their texture, surface area and orientation Plant community structure - secondary interception occurs in stratified forest communities where water drips from the canopy and is intercepted by lower plants Precipitation intensity - water can be delivered too quickly for the plants to intercept Precipitation duration - absolute interception storage increases with increasing storm duration Wind speed - promotes interception loss by evaporation Type of precipitation: rain versus snow 5 All of this can be considered in the diagram above. Note that most ocean water evaporated is returned back the sea as ocean precipitation. The water balance The Water balance is the balance between inputs and outputs within a drainage basin. When the INPUTS and OUTPUTS of the drainage basin system are balanced over longer periods of time it is said to be in dynamic equilibrium. However, there will be periods were there is more rainfall than others leading to more erosion, or drier periods where there will be deposition occurring. All of this can be interpreted as a systems diagram. This can also be shown in a water budget, which is; Precipitation (P) = Runoff (Q) - Evapotranspiration (E) +or- Change in storage (S) A positive balance indicates that inputs are greater than outputs and water will be stored in the system. A negative balance indicates that outputs are greater than inputs and stores will deplete and be used up. This can be shown on a soil moisture budget graph, examples for Harrogate and Malaga are shown below. This graph comprises 3 basic sections. Where potential evapotranspiration (is a measure of the ability of the atmosphere to remove water from the surface through the processes of evaporation and transpiration assuming no control on water supply2) is above precipitation soil moisture utilisation will take place, that is, soil stores will be used and not replaced. This could continue until soil moisture depletion, where there is no water left in the soil and plants will begin to die. Once precipitation rises above evapotranspiration soil moisture recharge will occur, and soil stores will be replaced slowly. Once the field capacity of the soil is reached (the normal amount of water a soil can hold) then we reach a situation of soil moisture surplus. NEXT TOPIC - Hydrographs & River Regimes Sources 1 - Wikipedia (2018). Mississippi River. Accessed 13th October 2018 from 2 - Michael Pidwirny (2014). Introduction to the Hydrosphere. PhysicalGeography.net FUNDAMENTALS eBOOK. Accessed 13th October 2018 3 - Infiltration - Accessed 13th October 2018 4 - Accessed 13th October 2018 5 - University ofRegina (2018). Hydrology. Accessed 13th October 2018 sauchyn/geog327/intercept.html 6 - Floodsite Project (2008). Water Storage in soil. Accessed 13th October 2018 Written 13/10/2018 - by Robert Gamesby On land, water accumulates on the surface through lakes and rivers. Each river is confined to its drainage basin, the region of land where the river drains from its origin, where it starts, to its mouth, where it concludes by flowing into a sea, ocean, or lake, along with its smaller contributing streams.The main features of a drainage basinThe edge of a drainage basin is marked by an elevated ridge called the watershed. When a tributary converges with the main river, it is called a confluence. In certain instances, confluences are distinctly visible if the two converging rivers have differing water characteristics, such as the confluence in Brazil, where the River Negro and the River Solimoes merge.A drainage basin, also known as a watershed or catchment area, is a geographical area that collects precipitation and channels it through a network of rivers and streams until it ultimately drains into a larger water body, such as a river, lake, sea, or ocean. This natural hydrological unit is defined by topographical boundaries known as divides, which direct the flow of water within the basin.What is a Drainage Basin?A drainage basin functions as an integral part of the Earth's hydrological cycle. It plays a crucial role in collecting and conveying surface water and groundwater from a specified area to a common outlet. The size of a drainage basin can vary dramatically, from just a few hectares to millions of square kilometers. Key features of a drainage basin include its area, shape, slope, soil type, and vegetation cover, each influencing the quantity and quality of water that flows through it.Drainage basins are demarcated by topographical features such as ridges or hills which act as divides. Precipitation falling within these boundaries contributes to the basin's flow systems, feeding streams that converge into larger rivers. These systems are vital for supplying water resources, supporting ecosystems, and sustaining human activities.Understanding drainage basins is essential for resource management, environmental protection, and urban planning. They serve as fundamental units in hydrology for analyzing water flow and are critical in flood management, water conservation, and assessing the impacts of land use changes on water systems. FAQsHow do drainage basins impact the environment?Drainage basins impact the environment by influencing water availability, soil erosion, and habitat diversity. They are critical in determining the distribution and quality of aquatic habitats and play a role in nutrient cycling and sediment transport.What factors affect the functioning of drainage basins?Factors affecting drainage basins include topography, climate, soil type, vegetation, and human activities such as urbanization, deforestation, and agriculture. Each factor influences water flow, erosion rates, and the overall health of aquatic ecosystems within the basin.Why are drainage basins important for flood management?Drainage basins are important for flood management because they determine how quickly and effectively precipitation is collected and transported out of an area. Understanding the characteristics of a drainage basin helps in predicting flood events and implementing measures to mitigate flood risks.How are drainage basins delineated?Drainage basins are delineated using topographical maps and elevation data to identify high points and divides that form the basin's boundaries. Geographic Information Systems (GIS) and remote sensing technologies are commonly used for accurate drainage basin delineation.A drainage basin, also known as a watershed or catchment area, is a geographical area that collects precipitation and channels it through a network of rivers and streams until it ultimately drains into a larger water body, such as a river, lake, sea, or ocean. This natural hydrological unit is defined by topographical boundaries known as divides, which direct the flow of water within the basin.What is a Drainage Basin?A drainage basin functions as an integral part of the Earth's hydrological cycle. 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There are no inputs or outputs.The drainage basin hydrological system is a local open system.A drainage basin is an area of land drained by a river and its tributaries (river system). It includes water found in the water table and surface run-off. There is an imaginary line separating drainage basins called a watershed. Usually, this is a ridge of high land. The red line in Figure 1 shows the watershed for a river basin. Any precipitation that falls on the other side of the watershed will flow into a river in the adjacent river basin.Figure 1. A drainage basin and its watershed.Source: The drainage basin hydrological cycle may be defined as a single river basin bounded by its own watershed and the sea. The drainage basin hydrological cycle is an open system. This means it has inputs and outputs. Energy from the sun and precipitation (including rain and snow) enter the system and water leaves it.This open system has a range of inputs, outputs, stores, transfers and flows.Figure 2. The drainage basin hydrological systemInputs include precipitation (including rain and snow) and solar energy for evaporation. Outputs move moisture out of the drainage basin and include evaporation and transpiration from vegetation (together known as evapotranspiration), run-off into the sea and percolation of water to underlying rock strata into underground stores. Stores include puddles, rivers, lakes (surface storage), glaciers, soil storage and groundwater storage along with water stored on vegetation (interception) following precipitation.Transfers or flows include percolation, overland flow, infiltration, stemflow, throughflow and overland flow.Key TermsThere are lots of keywords that you need to learn and understand for this section. The key terms you need to understand are listed below.Inputs water coming into the systemPrecipitation all forms of moisture that reach the Earths surface e.g. rain, snow, sleet and hail.Storage water stored in the systemInterception this is when precipitation lands on buildings, vegetation and concrete before it reaches the soil. Interception storage is only temporary as it is often quickly evaporated.Vegetation storage this is water taken up by vegetation. It is all the moisture in vegetation at any one time.Surface storage the total volume of water held on the Earths surface in lakes, ponds and puddles.Groundwater storage the storage of water underground in permeable rock strata.Channel storage -the water held in a river or stream channel.Flows and Processes water moving from one place to anotherBaseflow water that reaches the channel largely through slow throughflow and from permeable rock below the water table.Channel flow the movement of water within the river channel. This is also called a rivers discharge.Groundwater flow the deeper movement of water through underlying permeable rock strata below the water table. Limestone is highly permeable with lots of joints and can lead to faster groundwater flow.Infiltration the downward movement of water into the soil surface.Interflow water flowing downhill through permeable rock above the water table.Percolation the gravity flow of water within the soil.Stemflow water running down a plant stem or tree trunk.Surface Runoff the movement of water over the surface of the land, usually when the ground is saturated or frozen or when precipitation is too intense from infiltration to occur.Throughflow-the movement of water downslope within the soil layer. Throughflow is fast through pipes (cracks int he soil or animal burrows).Outputs water leaving the systemEvaporation the transformation of water droplets into water vapour by heating.Evapotranspiration the loss of water from a drainage basin into the atmosphere from the leaves of plants + loss from evaporation.Transpiration evaporation from plant leaves. River discharge the amount of water that passes a given point, in a given amount of time.Supporting ResourcesVideosThe Hydrological Cycle BBC Learning Zone Class ClipsCheck your knowledgeCheck what you know with thedrainage basin hydrological cycle quiz. Which factors control the amount of discharge in a drainage basin? This all depends on the drainage basin characteristics and what processes are found there. Physical characteristics Basin size This influences the lag time a large drainage basin will mean that water takes a long time to travel through tributaries or the ground to reach the channel. Conversely, a small drainage basin means that water has a shorter distance to travel and will result in a shorter lag time. Basin shapeCircular drainage basins mean that all points on the watershed are equidistant from the channel and this will lead to a shorter lag time and higher peak discharge. Elongated drainage basins are characterised by longer lag times and lower peak discharge as the water drains from the furthest reaches of the watershed to the channel. Elevation and slope A steeply-sided river valley means that gravity assists water in its descent towards the river channel, whereas gently sloping valleys tends to produce longer lag times and lower peak discharges. Rock type This has a profound influence on the rate of drainage in a basin. Permeable rock assistspercolation: Porous rock (sandstone, chalk) allows water to percolate through the pore spaces Pervious rock (limestone) allows water to travel along joints and bedding planes within the rockBoth types of rock are characterised by a lack of surface drainage and have high rates of infiltration. Impermeable rock (granite, shale, clay) impedes drainage by restricting percolation. These areas are characterised by high rates of overland flow or surface runoff. Soil type Soil type controls the rate of infiltration, soil moisture storage and rate of throughflow. Sandy soils have high rates of infiltration due to relatively large air spaces or voids between soil particles, whereas clay soils and silts have small pore spaces which allow very little throughflow. Drainage density This is the total length of streams in a drainage basin divided by the area of the basin. Drainage basins characterised by impermeable rock and soils tend to have higher drainage density due to the lack of infiltration and percolation. This means that water enters a channel quickly, leading to an increase in discharge. Conversely, drainage basins with permeable rock and soil types tend to have low drainage density. Meteorological factors These play an important role in the controlling the amount of discharge in a drainage basin. Rainfall typeThe amount and duration determine how saturated the ground is. Long periods of rainfall often lead to soil reaching field capacity (saturation capacity), which impedes infiltration and leads to high rates of surface runoff. Snow can act both as a store (it intercepts water) and as a transfer when it melts. The amount of rainfall which reaches the drainage basin is also influenced by vegetation cover. A drainage basin covered in dense vegetation will experience high rates of interception, root uptake and evapotranspiration - this will reduce the amount of discharge within the basin. Tropical rainforests are thought to intercept up to 80% of rainfall, whereas arable land intercepts less than 10% of rainfall. Rainfall intensity Heavy rainfall may exceed the infiltration capacity of the soil, leading to surface runoff and a rapid increase in discharge. Antecedent conditions This refers to the weather conditions in the period preceding a storm event. Several weeks of prolonged, heavy rainfall will mean that a drainage basin reaches saturation capacity very quickly after a storm event. This can also lead to a rise in the level of the water table, further increasing the likelihood of saturation capacity being exceeded. Rates of evapotranspiration Rates of evapotranspiration are not constant throughout the year in mid-latitude locations like the UK. High temperatures in summer months increase rates of evapotranspiration, reducing discharge.Low temperatures in the winter reduce evapotranspiration (vegetation also experiences reduced growth rates at this time, meaning that there is less root uptake and so less interception). Human factors Urbanisation Urbanisation reduces infiltration to 0 through its use of impermeable surfaces (tarmac, concrete), and drains and gutters transport water quickly to the river channel. This means that lag time is reduced and discharge is increased. Rivers which flow through urban areas are characterised by "flashy" hydrographs and represent a high flood risk. Deforestation Deforestation reduces interception, evapotranspiration and the protective canopy layer. This leads to an increase in rates of infiltration and can result in saturation capacity being reached quickly. Rainfall will travel by overland flow and can lead to high rates of soil erosion without the binding nature of root systems in place. Afforestation This is the planting of trees (often as a soft engineering method for flood management). Afforestation has the effect of increasing rates of interception and evapotranspiration. This will reduce the amount of discharge in the drainage basin, although it can take many years for trees to mature. Water extraction Water extraction for industrial or domestic use reduces the amount of discharge in the drainage basin. It is unrealistic to examine any of these factors in isolation as they are all linked. For example, weeks of heavy rain may have fallen in a drainage basin with sandy soils and gentle slopes following a particularly dry summer when the water table fell significantly. In this case, the ground may not reach saturation capacity for many weeks and an intense storm will not produce torrents of overland flow and flooding. Similarly, drainage basins tend not to be characterised by only one type of soil and rock (or the presence or absence of an urban area) and so will experience differences in infiltration rates and drainage density throughout the area. Which factors are more important in controlling the amount of discharge in a drainage basin - physical or human? The answer to this lies in the location and composition of the drainage basin. In central London, there is no doubt that human factors have the most significant influence over discharge, whereas in rural Wales it could be argued that physical factors play a more central role. However, it is estimated that while over 80% of the population in the UK lives in an urban settlement, only 5-10% of the country is actually classed as "urban". Urban areas comprise a lot of green spaces (parks, gardens, grass verges), making the drainage pattern of basins extremely complex. It is inevitably going to be a combination of physical and human factors which control how much discharge is in a drainage basin. This is a must-read article from the BBC, suggesting our image of the UK as a concrete jungle may not quite be reality! Read The great myth of urban Britain Study Fig. 1, which shows information about flows through the drainage basin(i) What is meant by transpiration?[1 mark]AnswerThe changing of water to water vapour by plants/evaporation of water by plants/trees/vegetation [1](ii) Identify the processes that take place at X , Y and Z in Fig 1.[3 marks]AnswerX = Overland flow/surface runoff [1]Y = Through flow [1]Z = Ground (water) flow [1]Page 2Erosion is the wearing down of surfacesThere are four erosion processes that change the shape of the river channel:Hydraulic action The force of the water, which removes material from the bed and banks of the riverAbrasion When the materials carried by the river scrape away the banks and bedAttrition When the material being carried by the river hits each other, the pieces become rounder and smallerCorrosion (solution) When rocks are dissolved in slightly acidic waterTypes of erosionErosion can be mainly vertical or lateral:Vertical erosion is dominant in the upper course of rivers. It increases the depth of the river and valley as the river erodes downwardsLateral erosion is dominant in the middle and lower courses of rivers. It increases the width of the river and valley as it erodes sidewaysThere are four processes of transportation:Traction Occurs when larger rocks and materials are rolled along the riverbedSaltation Smaller material, which can be lifted by the water, bounces along the riverbedSuspension Lighter material carried within the river flowSolution When materials are dissolved in the river waterIt can sometimes help to remember a word and the process it refers to if you know what the word means.Traction: the action of pulling something over a surfaceSaltation: leaping or jumpingWhen a river does not have enough energy to carry materials, it drops themThe causes of reduced energy include:Reduced discharge due to a lack of precipitation or abstraction upstreamDecreased gradientSlower flow on the inside of a river bend or where the river is shallowerWhen the river enters a sea, ocean or lakeThe heaviest material is deposited first; this is known as the bedloadThe lighter materials, gravel, sand and silt, are known as alluvium and they are carried further downstreamThe dissolved materials are carried out to seaAs a result of erosion, transportation and deposition the character of a river changes as it moves downstreamThese changes are summarised in the Bradshaw modelThe Bradshaw ModelStudy Fig. 1, which is a photography of a river in an upland area.Explain how the river in Fig 1 is likely to carry out erosion.[5 marks]AnswerHydraulic action [1]The power of water wears away bed and banks, releasing air compressed in cracks [1]Abrasion [1]Material carried by river grinds bed and banks/sandpaper action [1]Corrosion / solution [1] Rocks dissolved by chemical reactions [1]Attrition [1] Load reduced in size as particles hit each other when being carried bywater [1]Vertical erosion [1]Remember, you will receive 1 mark for the type of erosion and the second mark for explaining how the erosion process works.All rivers have long and cross-profilesEach river's long and cross profiles are unique but they do have some characteristics in commonThese profiles show changes in river characteristics from the source to the mouthThe long profile of a river shows the changes in the river gradient from the source to the mouthMost long profiles have a concave shape with similar characteristics:The source is usually in an upland areaThe upper course of the river includes steep areas with uneven surfacesIn the middle course, the gradient decreasesIn the lower section, the gradient decreases further until it becomes almost flatLong ProfileThe cross profiles of a river are cross-sections from one bank to anotherCross profiles of the upper, middle and lower courses show the changes in the river channelUpper course characteristics include:ShallowSteep valley sidesNarrowLow velocityLarge bedloadRough channel bedHigh levels of frictionVertical erosionMiddle course characteristics:Deeper than upper course channelGentle valley sidesWider than upper course channelGreater velocity than upper course channelMaterial in river decreases in sizeSmoother channel bedLower levels of friction than upper course channelLateral erosionLower course characteristics:Deeper than middle course channelFlat floodplainsWider than middle course channelGreater velocity than the middle course channel (apart from as the river enters the mouth)Material carried mainly sediment and alluviumSmooth channel bedLowest frictionDeposition is dominantRemember, valley shape and river shape are not the same thing. If you are asked to describe a valley shape, you should focus on the gradient and shape of the land on either side of the river channel.Page 3Syllabus EditionFirst teaching 2018Last exams 2026Exam code: 0460 & 0976The changes in river channel characteristics, lead to changes in the river landscapeThe upland and lowland areas of rivers have distinctive landformsUpland:WaterfallsGorgesV-shaped valleysInterlocking spursWaterfalls form when there is a drop in the river bed from one level to anotherThis drop is often due to changes in the hardness of the rock, where hard rock overlies soft rockHydraulic action and abrasion are the main erosional processes:The soft rock erodes quicker, undercutting the hard rock and creating a plunge poolThis leads to the development of an overhang of hard rock which eventually over time, collapsesThe overhang falls into the plunge pool increasing abrasion and making the plunge pool deeperThe process then begins again and the waterfall retreats upstream leaving a steep-sided gorgeWaterfall formationVertical erosion is dominant in the upper course of the riverThis cuts down into the river bed and deepens the river channelWeathering and mass movement lead to material from the valley sides collapsing into the river, forming a steep v-shaped valleyIn the upper course of the river, the channel starts to meanderErosion happens on the outside of the bendIn the upland areas this forms interlocking spursInterlocking SpursPotholes are round depressions in the riverbedThey are formed by abrasionWhere there are dips in the riverbed, the river flow can cause the sediment to spinThis erodes the dip, forming a circular hollow (pothole)As the size of the hollow increases, larger material becomes trapped in the potholeThis further increases the erosion of the potholeMeandersOx-bow lakesFloodplainsLeveesIn lowland areas, lateral erosion is dominantMeanders increase in sizeThe fastest water flow(thalweg) is on the outside of the river bends, leading to erosion:The erosion undercuts the riverbank, forming a river cliffThe riverbank collapses and the edge of the meander moves further outThe slowest flow is on the inside of the river bends, leading to deposition:The deposits form a slip-off slopeDeposition on one side and erosion on the other leads to the meander migrating across the valleyCross-section of a MeanderWith distance downstream, the size of the meanders increasesThe erosion on outside bends can eventually lead to the formation of a meander neckAt a time of the flood, the river may cut through the neck of the meander, forming a straighter course for the waterThe flow of water at entry and exit from the meander will be slower, leading to depositionThe meander becomes cut off from the main river channel, forming an oxbow lakeOxbow Lake FormationRemember when describing the formation of oxbow lakes, it is important to state that the river will break through the neck of the meander during a flood. At other times, the river does not have enough power to break through.Floodplains are flat exp

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