

CONCEPT OF GEOMORPOLOG

UNIT 1 : Concept of Geomorphology: Geomorphic cycles. A brief amount of first order, second order, and third order landforms. Land forms created by Wind: Erosion and deflation: features produced by erosion and deflation. Abrasion – features produced by abrasion. Attrition: features produced by attrition. Transportation: suspension, saltation, and surface. Deposition: loess, sand deposits. Sand dunes and their types.

Unit 1

Geomorphology is the study of **landforms**, their processes, form and sediments at the surface of the Earth (and sometimes on other planets). Study includes looking at landscapes to work out how the earth surface processes, such as air, water and ice, can mould the landscape.

What are the types of geomorphology?



There are many sub disciplines in **geomorphology** including tectonic, fluvial, storm, aeolian, floodplain, glacial, groundwater, climate, tsunami, and many others. These sub disciplines are mainly driven by distinctions in the mechanics and dynamics involved in the processes.

Geomorphic cycle, also called geographic **cycle**, or **cycle** of erosion, theory of the evolution of landforms. In this theory, first set forth by William M. Davis between 1884 and 1934, landforms were assumed to change through time from “youth” to “maturity” to “old age,” each stage having specific characteristics.

Geomorphic cycle, also called geographic **cycle**, or **cycle** of erosion, theory of the evolution of landforms. ... The **geomorphic cycle** could be applied to all landforms such as hillslopes, valleys, mountains, and river drainage systems.

Landform

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A landform is a natural or artificial feature of the solid surface of the Earth or other planetary body. Landforms together make up a given terrain, and their arrangement in the landscape is known as topography. [Wikipedia](#)

First order landforms: Continents and oceans.
Continents are the huge landmasses on Earth. Huge water bodies are called Oceans.

...

Theory:

First-Order landforms	Second-Order landforms	Third-Order landforms
Continents Oceans	Mountains Plateaus Plains	Valleys Beaches Sand dunes

1.

First order relief – refers to the coarsest level of **landforms**, including continental platforms and ocean basins. 2. **Second order** relief – intermediate level of **landforms**, including mountain masses, plains, and lowlands. 3.

In the ocean basins, the second order of relief includes continental rises, slopes, abyssal **plains**, mid-ocean ridges, submarine canyons, and subduction trenches. Continental features that are classified in the second order of relief include continental masses, **mountain** masses, **plateaus**, **plains** and lowlands. 02-Apr-2016

Third order landforms generally form over the second order landforms. The examples of third order landforms include **deltas**, **lakes**, **volcanoes**, **peaks**, **gorges**, cols, **cirques**, etc. The third order landforms are formed because of the actions of forces like water, air, etc. 12-Mar-2017

Mountains, hills, plateaus, and plains are the four **major** types of **landforms**. Minor **landforms** include buttes, canyons, valleys, and basins. Tectonic plate movement under the Earth can create **landforms** by pushing up mountains and hills. 08-Aug-2011

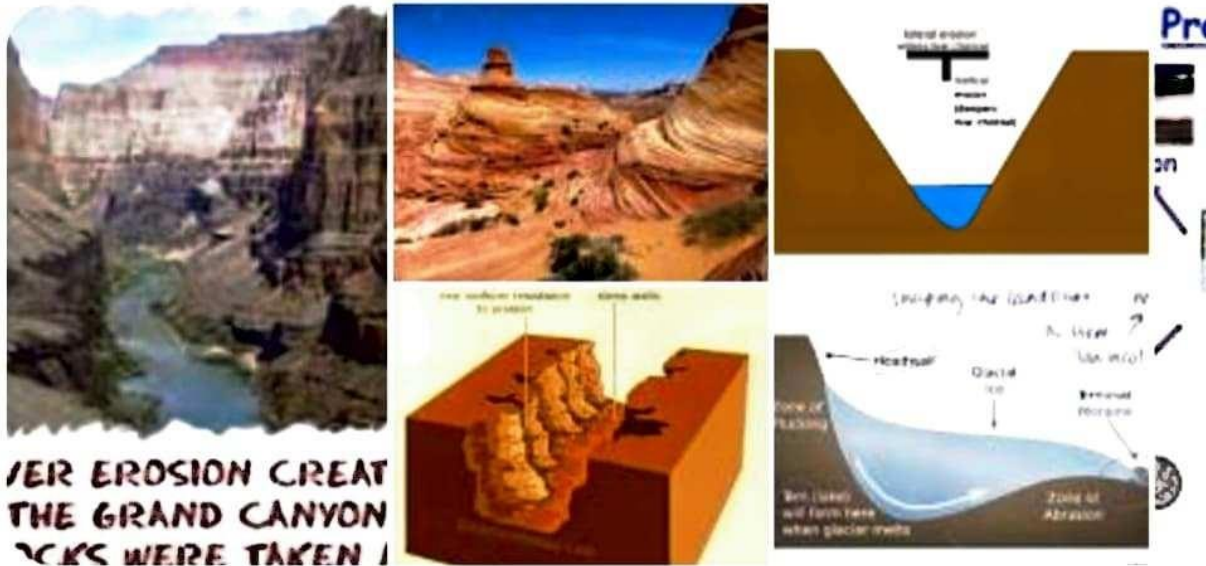
Wind erosion



Wind erosion is a natural process that moves soil from one location to another by **wind** power. ... **Wind erosion** can be caused by a light **wind** that rolls soil particles along the surface through to a strong **wind** that lifts a large volume of soil particles into the air to create dust storms.

30-Jan-2020

Erosional landforms include headlands, bays, caves, arches, stacks, stumps and wave-cut platforms. There are also depositional **landforms** such as beaches, spits and bars. Geography.



Erosion is the geological process in which earthen materials are worn away and transported by natural forces such as wind or water. ... Most **erosion** is performed by liquid water, wind, or ice (usually in the form of a glacier). If the wind is dusty, or water or glacial ice is muddy, **erosion** is taking place. 20-Mar-2018

Deflation is an action of **wind** when it picks up or remove loose particles from an area and leaves a denuded surface covered with coarse material too large for **wind** transport. ... The ability of the **wind** to pick up loose particles is due to eddies and cross currents produced in the air.



Abrasion – Very small particles of rocks are hit against the rock surfaces which lead to the formation of some **characteristic features** of desert like Zeugens, Rock pedestals and Yardangs. **Deflation** – The depressions are **formed** when **wind** blows away the wastes of rocks to distant areas.

An **abrasion** is a type of open wound that's caused by the skin rubbing against a rough surface. It may be called a scrape or a graze. When an **abrasion** is caused by the skin sliding across hard ground, it may be called road rash.

Abrasion – Very small particles of **rocks** are hit against the **rock** surfaces which lead to the formation of some characteristic features of **desert** like Zeugens, **Rock** pedestals and Yardangs. Deflation – The depressions are formed when wind blows away the wastes of **rocks** to distant areas.

Abrasion - this is when pebbles grind along a rock platform, much like sandpaper. Over time the rock becomes smooth. Attrition - this is when rocks that the sea is carrying knock against each other. They break apart to become smaller and more rounded.

Attrition is a process in which the workforce dwindles at a company, following a period in which a number of people retire or resign, and are not replaced. A reduction in staff due to **attrition** is often called a hiring freeze and is seen as a less disruptive way to trim the workforce and reduce payroll than layoffs.

Erosion is the wearing away of rock along the coastline. Over time the rock becomes smooth.

... **Attrition** - this is when rocks that the sea is carrying knock against each other. They break apart to become smaller and more rounded.

Attrition is the act of rubbing things together and thus wearing them down. It is used in physical **geology** for “the wear and tear that rock particles in transit undergo through mutual rubbing, grinding, ..., etc., with resulting comminution in size” (Thornbury, 1954, p. 48).

Attrition is a process in which the workforce dwindles at a company, following a period in which a number of people retire or resign, and are not replaced. ... **Attrition** can also refer to a company losing its customer base, often as a result of older customers aging or moving on and fewer newer customers opting in. 18-Jan-2021



1 : an act, process, or instance of transporting or being transported. 2a : **means** of conveyance or travel from one place to another. b : public conveyance of passengers or goods especially as a commercial enterprise.

Transport refers to the processes by which the sediment is moved along – for example, pebbles rolled along a river-bed or sea shore, sand grains whipped up by the wind, salts carried in solution.

Transport geography is a sub-discipline of **geography** concerned about the mobility of people, freight, and information and its spatial organization considering attributes and constraints related to the origin, destination, extent, nature, and purpose of movements.

Definition: Suspension is a method of transporting very fine sediment in a river. The sediment is probably eroded from larger rocks upstream and is then carried in the water. When the sediment is deposited from the water it is known as silt. **Suspension.**

A **suspension** is a heterogeneous mixture in which the solute particles do not dissolve, but get **suspended** throughout the bulk of the solvent, left floating around freely in the medium. ... This distinguishes a **suspension** from a colloid, in which the **suspended** particles are smaller and do not settle.

Saltation is a form of transport for sediment in rivers. ... Small rocks or pebbles which are too big to be carried within the water are transported and bounce along the bottom of the river bed.

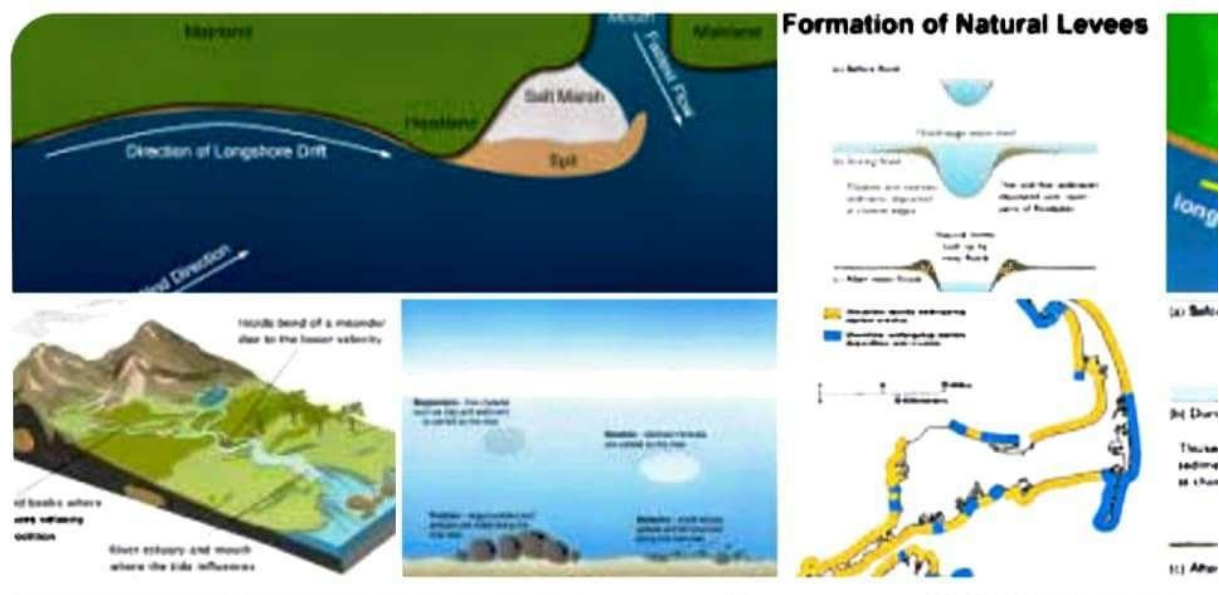
Saltation. The leaping movement of sand or soil particles as they are transported in a fluid medium over an uneven surface.

Saltation - pebbles are bounced along the river bed, most commonly near the source .

Suspension - lighter sediment is suspended (carried) within the water, most commonly near the mouth of the river. **Solution** - the transport of dissolved chemicals.

Wind erosion abrades surfaces and makes **desert** pavement, ventifacts, and **desert** varnish. **Sand dunes** are common wind deposits that come in different shapes, depending on winds and sand availability. Loess is a very fine grained wind-borne deposit that can be important to soil formation.

Deposition definition Geography



Deposition is the laying down of sediment carried by wind, water, or ice. Sediment can be transported as pebbles, sand & mud, or as salts dissolved in water.

Loess definition Geography



In some parts of the world, windblown dust and silt blanket the land. This layer of fine, mineral-rich material is called **loess**. **Loess** is mostly created by wind, but can also be formed by glaciers. When glaciers grind rocks to a fine powder, **loess** can form. ... Unlike other soils, **loess** is pale and loosely packed.

Loess, an unstratified, geologically recent deposit of silty or loamy material that is usually buff or yellowish brown in colour and is chiefly deposited by the wind. **Loess** is a sedimentary deposit composed largely of silt-size grains that are loosely cemented by calcium carbonate.

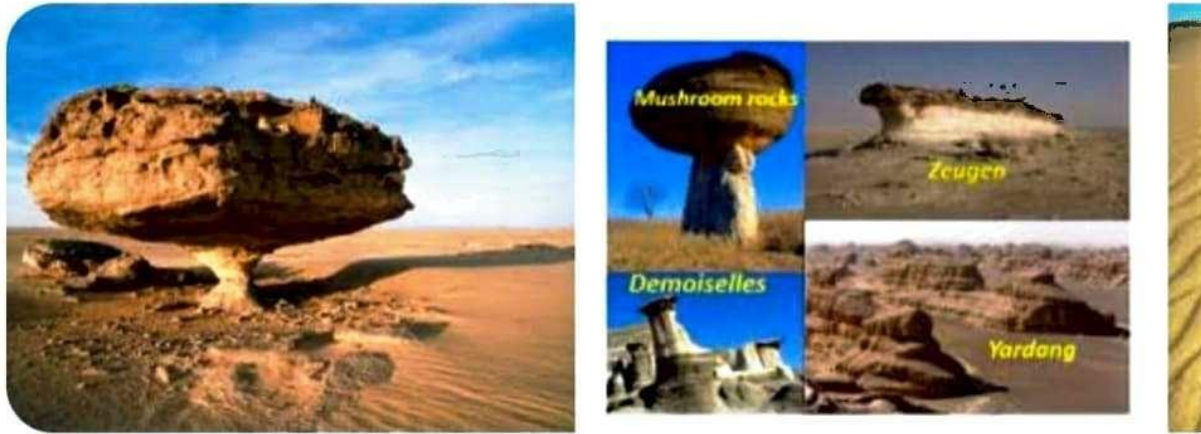
Deposition is the geological process in which sediments, soil and rocks are added to a landform or landmass.

Wind, ice, water, and gravity transport previously weathered surface material, which, at the loss of enough kinetic energy in the fluid, is **deposited**, building up layers of sediment.

Sand and gravel **deposits** found on beaches or in rivers and streams, are mostly quartz (silicon dioxide, SiO_2) grains.

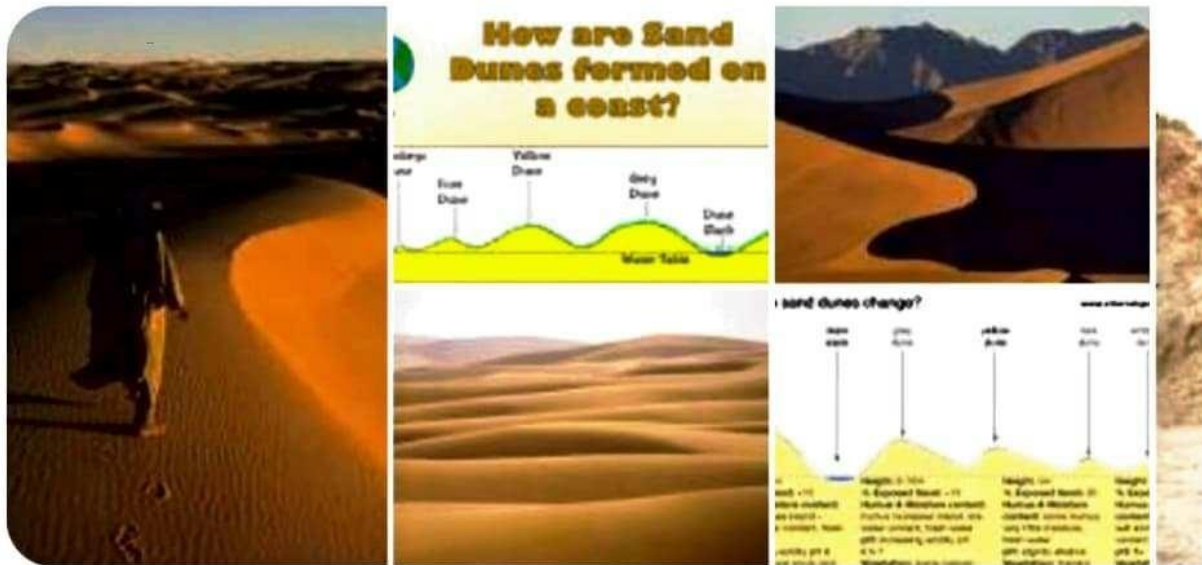
Weathering of rocks such as granite forms these quartz grains. ... The more resistant quartz eventually is ground down in size, but does not break down chemically.

Sand forms when rocks break down from weathering and eroding over thousands and even millions of years. Rocks take time to decompose, especially quartz (silica) and feldspar. Often starting thousands of miles from the ocean, rocks slowly travel down rivers and streams, constantly breaking down along the way. 09-Apr-2020



Wind Eroded Arid Landforms – Deflation basins, **Mushroom rocks**, Inselbergs, Demoiselles, Demoiselles, Zeugen , Wind bridges and windows. Depositional Arid Landforms – Ripple Marks, **Sand dunes**, Longitudinal **dunes**, Transverse **dunes**, Barchans, Parabolic **dunes**, Star **dunes** and **Loess**. 28-Dec-2015

Sand dunes definition Geography



A **dune** is a mound of **sand** formed by the wind, usually along the beach or in a desert. **Dunes** form when wind blows **sand** into a sheltered area behind an obstacle. **Dunes** grow as grains of **sand** accumulate. Every **dune** has a windward side and a slipface. 28-Jan-2011

Sand dunes are created when wind deposits **sand** on top of each other until a small mound starts to **form**. Once that first mound forms, **sand** piles up on the windward side more and more until the edge of the **dune** collapses under its own weight.

In physical geography, a **dune** is a hill of loose **sand** built by aeolian processes (wind) or the flow of water. **Dunes** occur in different shapes and sizes, formed by interaction with the flow of air or water. **Dunes** occur in some deserts and along some coasts. 10-Feb-2018

Types of Sand Dunes:

- **Barchan Dunes:** These are solitary **sand dunes** shaped like a crescent and with their tips pointing downward. ...
- **Longitudinal Dunes:** These **dunes** form as long ridges of **sand**, more or less parallel supplies are moderate. ...
- **Parabolic Dunes:** ...
- **Star Dunes:** ...
- **Ripple Marks on Sand Dunes:**

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