Soil Science Ice Ages Unit Notes

Name:_____

(DO NOT LOSE)

AREA OF FOCUS: WEATHERING

- Erosion: Process where fragments of _____and rock are broken off from the ground surface and_____.

- Deposition: Process by which fragments of rock are _____ in a new location

Weathering

- The breaking of rock into _____ pieces.
- Either mechanical or chemical

Mechanical Weathering:
_____ breaking rocks into smaller pieces without chemicals.

Mechanical Weathering

- Heat
- _____
- Ice
- Pressure

} **Gravity**

Ice/Frost Wedging: Water enters cracks in the rocks, freezes, expands and _____ rocks.

Water

- It causes rocks to hit each other and become smaller and smoother.

Mechanical Weathering Continued…

Sheeting / Exfoliation – layers fall off like an _____.

Thermal Expansion: repeated _____ and cooling of rocks will induce stress and breakage.

_____ Wedging: Plant roots enter crack, grow and expand the crack.

Animal Activity: Animals mechanically wear away the rock.

Human Activity – Humans mechanically break up rock. Can occur at a rate faster than occurs in nature.

_____weathering: Particles of sand, pebbles, and dust are carried by wind and cause abrasion and <u>slowly</u> break down rock.

Chemical Weathering: Chemical processes _____and decay earth materials.

- Chemical weathering rate depends on
- Temperature
- Amount of surface area
- Availability of water or natural acid

Examples of Chemical Weathering

- _____: Water and CO_2 create carbonic acid which wears down rock.
- _____: Chemical reaction between the minerals in the rock and hydrogen in rain water (H2O) wear down rock.

- _____: The process by which oxygen combines with water and minerals in the rock to weaken it.

- _____: Process by which minerals in the rocks dissolve directly in water.

Stalagmite Stalactite

- _____: Process where minerals in the rock absorb water and expand, creating stress.

- Other sources of chemical weathering
  - Sulfuric Acids from volcanic activity.
  - Organic acids in soil and from lichens.
  - Salts (Chemical)
  - Human air pollution

Mass _____: The down slope movement of earthen materials from **gravity.**

Landslide: A slide of a large mass of dirt and rock down a mountain or cliff.

Soil Creep: The slow, steady downhill _____ of soil and loose rock.

Freezing soil expands, melting contracts it. _____ pulls it down slope. (Soil Creep)

Slump: A landslides in which the moving material moves in a block, more or less.

Synergism of mechanical and chemical weathering.

Mechanical weathering increases _____, which speeds chemical reaction rates.

Chemical weathering weakens rocks which facilitates entry of water and further mechanical weathering.

Biological processes accelerate both types of weathering.

_____affects rate of weathering. As pieces get smaller, they have more surface area and thus weather faster.

Angle of Repose -The maximum angle of a stable slope determined by friction, cohesion and the shapes of the particles.

NEW AREA OF FOCUS: SOIL

Soil is

- A mixture of weathered _____ and decaying organic material.
- Plants, animals, fungus, bacteria…

Dirt is…

- Mainly mineral based
- Pebbles and finely ground rock

Color

If soil is black

- Lots of _____matter (carbon).
- May be poorly drained.
- Usually _____.

If soil is brown

- Lots of _____ and _____.
- Well drained
- Good soil

Very light browns, whites, orange, red, yellow.

- Many compounds present, Iron, Manganese, Sulfur.
- High in _____.
- Not as healthy.

-Particle Size in soils (large to small)

Boulder – Largest (Greater than 25 cm)
Cobble (6-25 cm)
Gravel (2cm-7.5cm)
Coarse Sand (2mm)
Sand (2mm - .125mm)
Fine Sand
Very Fine Sand

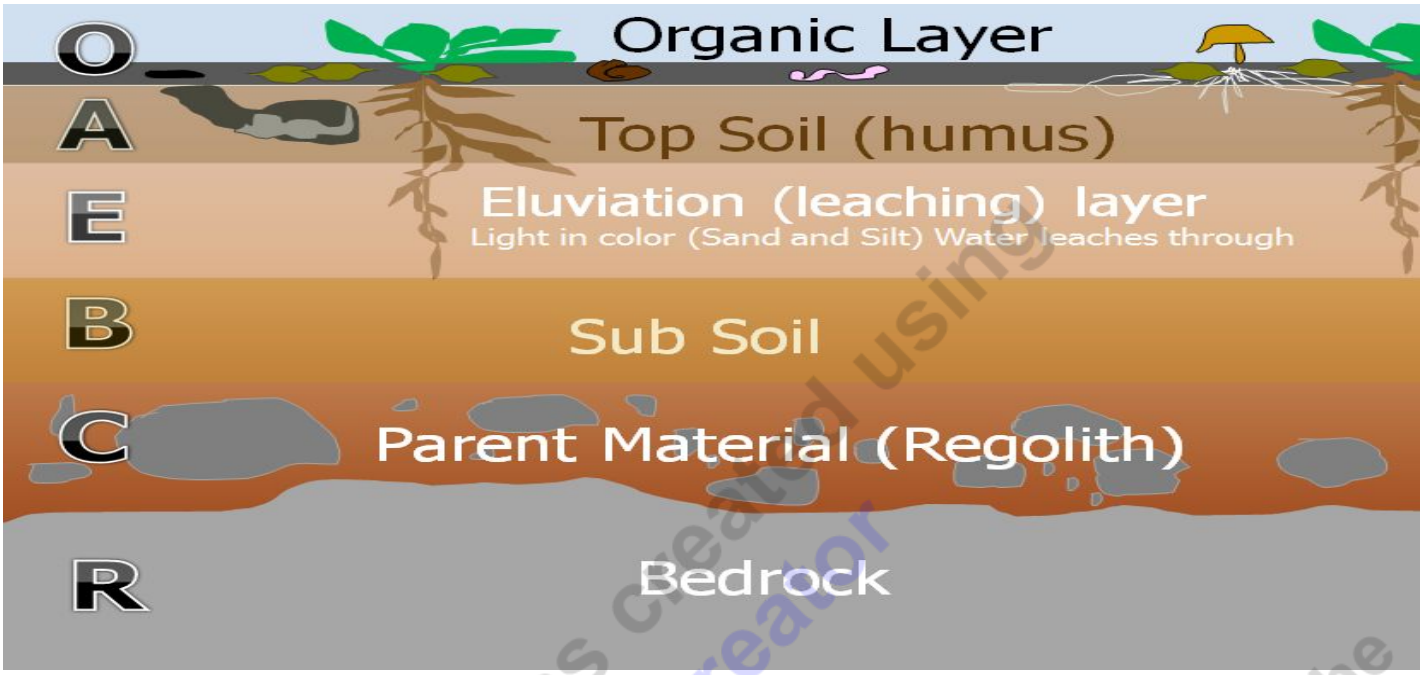
Silt
Clay (less than .002mm)
Dust – (Into the micrometers)

Soil Permeability: The rate at which _____ and _____move through the soil.

Soil Porosity: The spaces that allow air and water to move through the soil.

Soil Horizon – _____ of different types of soil.

O Horizon (Organic Matter) Leaves
A – Topsoil – High in organic matter (humus)
E – Eluviation (leaching) layer –Light in color (Sand and Silt) water leaches through .
B - Subsoil
C – Parent Material (Regolith)
D- Bedrock



NEW AREA OF FOCUS: SOIL CONSERVATION

Erosion - Process of wearing or grinding something _____.

Deposition: The natural process of _____ _____a deposit of something. (Sediment)

Soil degradation is a real and serious problem.

- Soil takes _____ of years to form.
- It takes very little _____ to destroy it.

Two key factors to conserve soil

- - Reduce _____
- - Restore _____ (nutrients)
  -Nitrogen, Phosphorus, Potassium

Soil Conservation Measures

- -_____ Plowing: Disturbing the ground and plant cover as little as possible.
  -Use of a seed injector.
- _____: Creating steps against water erosion.

- Contour plowing: A practice of slowing water run-off by planting _____ a hills contours.

- _____Crop: A plant that grows first and protects the cash crop.

  - Strip Cropping: Alternate the _____of plant on each row to control water and nutrient uptake.

  - Alley Cropping: Plant _____ in between ground crops
    Provides shade, wind break, and prevents water loss.

  - Crop Rotation: Planting _____crops each year.
    Changes nutrient uptake (increased soil fertility over a long period)

- Gully Reclamation: _____gullies to trap silt
  Plant ground vegetation to stabilize slopes.

- Plant _____Breakers: Trees at edge of field to break the wind.

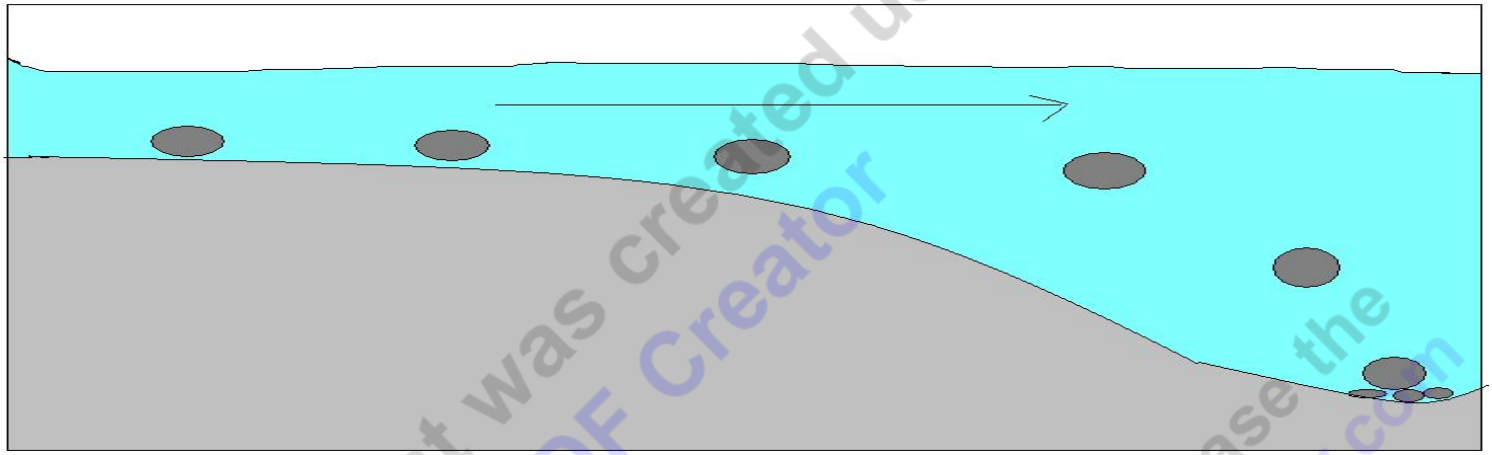
Increasing_____: Adding animal manure to plants for nutrients.

Green Manure: Add _____to plants

_____r: A chemical or natural substance added to soil or land to increase its fertility.

AREA OF FOCUS – Ice Ages, Paleoecology, Glaciers, Glacial Landforms

Erratic Boulders entry question



Glacier- A moving mass of _____and _____ that moves downhill

Glaciers form when more snow and ice accumulate than melt. It takes many years and the snowfall compacts into ice.

- Two types of glaciers
  - -_____ Glaciers: A Giant ice sheet that spreads out from a center of accumulation.

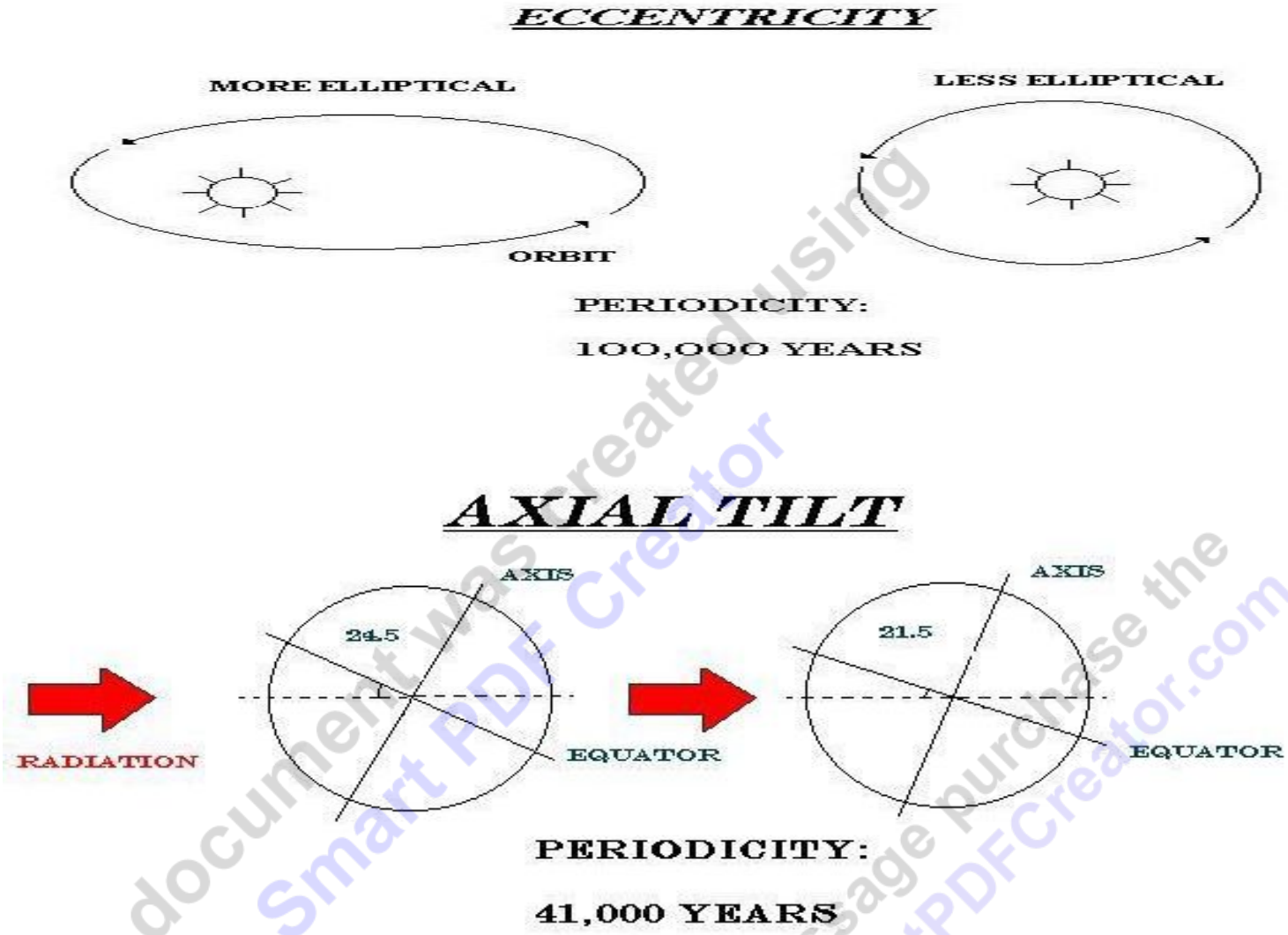
- -_____Glaciers: A glacier that starts in a mountain and moves into a valley.

Glaciers form when more snow and ice accumulate than melt. It takes many years and the snowfall compacts into ice.

_____ – A giant piece of freshwater ice that broke off of a glacier or ice shelf.

Ice Age: A cold period marked by episodes of extensive glaciation alternating with episodes of relative warmth.

- Milankovitch Cycles
  - Eccentricity (100,000 year cycle)
  - Axial Tilt (41,000 year cycle)
  - Precession (26,000 year cycle)



- Maunder Minimum: A period roughly spanning 1645 to 1715 when sunspots became exceedingly rare, as noted by solar observers of the time.
  - Fewer sun spots = less solar radiation.
  - This lead to a cooler period on Earth / Little Ice Age. (Theory)

- Glacial erratic: A piece of rock carried by glacial ice some distance from the rock outcrop from which it came.

Talus – Piles of weathered glacial rock.

_____: Manmade pile of stones, usually conical, and often marks the path of an alpine trail.

Glacial Landforms

Glacial Striations: Multiple, straight_____ lines which represent the movement of the sediment loaded base of a glacier.

U-Shaped Valley: Glaciers_____ valleys into a U shape.

Fjord: U-Shaped valley near the _____

Kettle Lake : A depression filled with _____ left by a glacier.

Tarn: A glacial lake produced by scouring. These are often found in cirques.

Horn - A sharp peak on a _____cut by glaciers.

Cirque - a steep-sided carve into a mountain by a glacier.

Aret'e- A _____edge caused by glaciers and erosion.

Esker- A narrow, steep-sided ridge of sediment, the remains of sediment piling up in a winding river under the glacier.

Moraine- Material _____by a glacier and then deposited. Many types of Moraines.

Drumlins: Formed glacial till (sediment). They are elongated features that can reach a kilometer or more in

_____

Outwash - Material deposited by the debris-laden glacial_____.

Please save these notes for the unit assessment.