

Natural Environment GEOGRAPHY 141

Chapter 1

ALL Spatial questions: **WHERE** is location? **WHAT** are characteristics? **WHY/how** it functions?

SYSTEMS - difference of open and closed systems; able to explain the basic parts of a system

System feedback loops = positive and negative

Explain steady-state equilibrium; dynamic equilibrium; threshold

Models are idealized and simplified representation of the real world (maps, globes, diagrams)

Understand Location with Latitude/Longitude; parallels/meridians; aka geographic grid

Prime Meridian, International Date Line, Tropic of Cancer, Tropic of Capricorn

SCALE (Reference Factor RF), What is GIS, GPS, Remote Sensing

Be able to read a topographic lines and calculate slope. Understand terminology on Field Exercise.

Exogenic vs Endogenic

Chapter 2

SOLAR SYSTEM AND EARTH'S ENERGY What ? Where? Why?

Thermo-nuclear energy created by Hydrogen FUSION -Exogenic

Solar Wind, Solar insolation

Earth's magnetic field (nova Magnetic Storm notes) (what where why?)

Aurora Borealis, Aurora Australis (where & why?)

Short Wave and Long-wave **fig 2.8**

Elliptical path; Perihelion- closest in ellipse Aphelion – most distance in ellipse

Wave-length and frequency **Fig 2.5**

Short wave lengths respectively (Gamma, X-rays, ultra violet, visible spectrum, near infrared, shortwave infrared), Long wave (middle infrared Thermal Infrared, Microwave, radio-tv) **See fig 2.6:** and know the sequence but not the micron or numbers.

Sub-solar point :What and where different times of the year

Solstices & Equinoxes

SEASONALITY 2.14

ATMOSPHERE make-up (major gases) **Fig 2.20**

COMPOSITION- **Fig. 2.18** homosphere heterosphere what are they what do they represent ?

TEMPERATURE layers in order (not altitude)

Normal lapse rates and inverted lapse rates of each Temp layer

FUNCTIONAL layers IONOSPHERE 2.23 OZONOSPHERE Where? What? and Why?

Ozone = O₃ Three oxygen molecules weakly bound

CFC's Chloro-fluoro-carbons and role in atmosphere; Residence time? Affect on UV

Natural Chlorine (oceans and volcanoes) breaks down and dissolves in water.

Chapter 3

Flow of Energy and Pathways fig 3.1 3.10 What are they and explain? Where & why they occur?

Earth system balance = Transmission IN and OUT

Earth - Atmosphere energy budget in general.

Transmission and pathways of wavelengths via= Scattering Refraction Reflection (Albedo rates)

fig. 3.5 do not memorize but understand main points.

Absorption is a conversion process

Conduction; Convection; Advection

Types of Heat *Sensible - Specific – Latent*

What is latent heat? Absorption of solar insolation. Review Ch 2 pg 44 fig 2.7

Major Controls on Temperature: Latitude, Elevation, Cloud cover and Land/Water heating differences

Greenhouse Effect; Green house forcing and Cloud cover; Jet contrails effect from 9/11

Diurnal temperature pattern; Landmass vs. Water affects climate locations on earth.

Water transparency and transmission (convection and conduction processes of absorption)

specific heat and land and water differences; Continental Effect vs Marine Effects on temperature.

See graphs and be able to read graphs and discuss effects and differences.

Chapter 4

Circulation Patterns transfer and distribute heat energy

WINDS and OCEAN CURRENTS are instrumental in troposphere.

AIR PRESSURE= WEIGHT OF ATMOSPHERE; VARIES PLACE TO PLACE fig 4.2 measured in Millibars

Differences in pressure cause wind;

Pressure gradient determine s wind speed fig. 4.7 4.8

LOW PRESSURE: Rising, cooling, likely precip, density increases, converging at surface,

HIGH PRESSURE: descending, divergent at surface, warms, expands, light wind, potential to evaporate

MIXING due to uneven pressure causing advection and convection

Largest scale of pressure gradient force is equator to pole (hottest to coldest).

Winter is most dynamic when pressure gradient is steepest. Warm air aloft pulls cold air along surface.

CORIOLIS FORCE 4.8.

DEFLECTS AIR OR FLUID FROM A STRAIGHT PATH; the momentum changes with latitude

Know location and why Easterlies (aka Trade Winds) Westerlies; directions of high and low pressure movement in hemispheres and cyclone anti-cyclone directions

FRICTION – mountain and topography create friction.

Hadley Cell important to earth mixing. Understand parts, why they shift and how they work.

ITCZ where? What? and why?

Subtropical high pressure where ?what? and why?

Upper atmosphere=JET STREAM direction and characteristics that effect us.

Trough and Ridges of jet stream (see Rosby waves figure to visualize).

Local winds: Onshore and offshore breeze ; valley wind; monsoon and ITCZ

SURFACE WINDS push Ocean surface currents **4.21**

Know where and the direction of current (gyres) on a world map. Find/ place them in the major ocean basins Atlantic and Pacific Oceans (north Atlantic Basin, South Atlantic Basin, North Pacific Basin and South Pacific Basin

North Equatorial Currents South Equatorial Currents Gulf Stream North Pacific Current; Kuroshi or (Japan Current) Peru Current, California Current, Brazilian Current Benguela Current(off Western Africa)

DEEP CURENTS Thermohaline currents; upwelling, Downwelling cyclic time?