September 30, 2015

Unit 2 (finishing up)

Earth shape and size, sort-of an ellipsoid, various "spheres" (atmosphere, lithosphere, hydrosphere, biosphere, cryosphere), distribution of land and water amongst hemispheres, continents and oceans, continental shelf, continental slope, abyssal plains, mid-ocean ridges, deep-ocean trenches.

Unit 3

Maps, cartography, rotation of earth, degrees, parallels and meridians, great and small circles, equator and latitude, prime meridian and longitude, coordinate systems, vertical datums & mean sea level

Projections, scale, conformal (shape/area preserving), equal-area, orthographic, cylindrical (like Mercator), conic, planar, compromise projections like the Robinson. West Wing clip "Why are We Changing Maps?"

Isolines, contour lines, evolving technologies (GIS, GPS, RS), Story about Eratosthenes

Unit 4

Gravity, Earth's planetary motion, elliptical orbit, perihelion, aphelion, speed of light, solar constant (1372 W/sq. m) at top of atm

Reasons for seasons, (a) revolution, (b) rotation [circle of illumination, polar axis], (c) axis tilt [plane of the ecliptic], (d) axial parallelism, (e) sphericity

March of the seasons, insolation, day-length variation, zenith & solar altitude, subsolar point, insolation changes with seasons, Tropic of Cancer, Tropic of Capricorn, Arctic Circle, Antarctic Circle, Vernal and Autumnal Equinox, Summer and Winter Solstices, Sunrise, sunset, dawn, twilight

Unit 5

Energy and heat transfer – thermal energy, heat vs. temperature, EM radiation, longwave, shortwave, emission by sun and earth, conduction , convection, sensible heat, latent heat

Global energy balance – energy transfers are both radiative and nonradiative, solar radiation into the atm (180-220 W/m2 tropics – 240-280 W/m2 low-lat deserts), direct and diffuse radiation, albedo, terrestrial radiation, greenhouse gases and greenhouse effect, effect of clouds?, counterradiation, latitudinal variations in net radiation,

Finish with (1) hypothetical effects of volcano on global temps, (2) refraction of setting sun question