1. The Universe
    a. Age, Size, Number of stars/galaxies
    b. Homogeneous, isotropic
2. Ancient Cultures
    a. Turtles all the way down
    b. Name ancient civilizations
    c. Know some of there views of the universe (Egypt, Mesopotamia, Greek, Hindu, etc.)
    d. Common beliefs
3. Greek Science
    a. Eratosthenes, Earth's circumference
    b. Geocentric models
    c. Anaximander, Eudoxus, Callipus, Aristotle, Aristarchus, Hipparchus, Ptolemy
    d. Epicycles
4. European Science
    a. Copernicus, heliocentric model
    b. Giordano Bruno
    c. Galileo, telescope, moon, Jupiter, Venus
    d. Tycho Brahe, Johannes Kepler, Galileo
    e. Isaac Newton, Edmond Halley, laws of motion, law of gravitation
    f. Michael Faraday, James Clerk Maxwell, Herts – electromagnetism
    g. Wavelength, frequency, wavespeed, ($c = f\lambda,\ d = vt$)
    h. Electromagnetic spectrum (visible range, x-ray, radio, ultraviolet, infrared, microwave, ..)
    i. Spectroscopy, Doppler effect (Blueshift, redshift)
    j. Olber's Paradox
5. Special Relativity
    a. Einstein's postulates
    b. Consequences – time dilation, length contraction, simultaneity, energy-mass equivalence
    c. Twin paradox
    d. Time travel
6. General Relativity
    a. Spacetime
    b. Curved spacetime – flat, positive, negative
    c. Tests of general relativity (Mercury's orbit, light bending, time dilation, GPS)
    d. Sir Arthur Eddington, eclipse and bending of light
    e. Gravitational Waves, sources
    f. LIGO,
7. History of Astronomy and Telescopes
    a. The Milky Way – size, where we live, type
    b. William and Caroline Herschel, Uranus, comets, telescopes
    c. Friedrich Bessel and parallax
    d. Charles Messier, star classification
    e. William Parsons, 3rd Earl of Rosse, Leviathan
    f. Nathaniel Pigott, John Goodricke (Algol, Cepheids, Variable stars)
    g. John Herschel and photography based on Daguerre's work

    h. Henry Draper, Edward Pickering, Harvard Observatory
    i. Harvard Computers – Williamina Fleming, Annie Jump Cannon, Henrietta Swan Leavitt
    j. The Great 1920 Debate – Shapley-Curtis
    k. George Ellery Hale, Yerkes, Mt Wilson, Lick, Mt Palomar-Hale observatories
    l. Edwin Hubble, distance of Cepheid in M31, Universe is expanding, Age of Universe
    m. Spectroscopy and Doppler Effect (blueshift, redshift), Huggins, Slipher

8. Birth of Modern Cosmology
    a. Slipher, Henrietta Leavitt, Edwin Hubble
    b. Cepheid variables, variable stars
    c. Olber's Paradox
    d. General Relativity and Cosmology – Einstein, Schwarzschild, Friedman, Lemaitre
    e. Cosmological constant, Hubble's constant