

Science in the Kitchen

General Outlines for Science Studies

Suggested Outline for General Study of Biology

- Science of life
 - the beginning of life
 - chemistry of life
 - life cycles
 - classifications of life
- Plants (Botany)
 - structure of plants
 - life cycles of plants
 - purpose of plants
 - type of plants
- Animals (Zoology)
 - invertebrates
 - vertebrates
 - viruses
- Ecology
 - balance of nature
- Man
 - anatomy and physiology
 - nutrition

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- medicine
- conception, birth, and death
- spiritual being
- Bio-ethics
- Careers in Biology
 - medicine
 - dietician
 - public health
 - veterinarian services
 - anthropologist
 - landscape architect

Suggested Outline for General Study of Chemistry

- Definition - Define chemistry including root words.
- What does the Bible say about chemistry?
- History of chemistry (including some important chemists)
- Matter
 - structure of matter
 - molecules
 - Molecular structure
 - atoms
 - atomic structure
 - periodic table
 - properties of matter

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- mass
- density
- chemical bonding
- conservation of matter
- Laws of Chemistry
- Law of Definite Proportions
- Solutions
 - solutions of electrolytes
 - compounds, elements, mixtures
 - effects of heat, cold & pressure
- Gases
 - volume, pressure & temperature
 - Boyle's Law
 - Combined Gas Law
 - Law of Partial Pressure
 - ideal gas law
- Acid and Bases
 - pH
 - how to determine
 - neutralization reactions
 - titration
- Basic Chemical Groups (families of elements)

Familiarity with the following groups, and their uses,

- halogens - tendency to form salts, fluorine, chlorine. Bromine Iodine, very poisonous

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- sulfur - metalloids, so much like metals, sulfur (most abundant, occurs free in Nature), selenium, tellurium, polonium (very rare radioactive element)
- phosphorus - this group below nitrogen, phosphorus, arsenic, antimony and bismuth
- carbon, silicon & boron - non-metals (explore each element separately)
- alkali metals - soft light metals, one electron in outmost shell, always found chemically combined. Lithium, sodium, potassium, rubidium, cesium
- alkaline metals - beryllium, magnesium, calcium, strontium, barium, radium
- Alloy metals - titanium, vanadium, chromium, manganese, cobalt, nickel, molybdenum, tungsten, silicon, zirconium, tantalum (define ally)
- noble & rare metals - inert, free in nature silver, gold, platinum metals, uranium, plutonium, structural similarity
- Organic Chemistry (a good lead into biology)
- Nuclear Chemistry (please only read about this, don't try any experiments.)
- Other interesting subjects to explore
 - consumer chemistry
 - the make-up of foods
 - chemical additives
 - what is in our cleaners and household products
 - fuels
 - synthetics
 - environment and chemistry
 - drugs
- Careers in chemistry (this is often left to the end of the course, but I like to include it at the beginning to spark any interest that may be latent)
 - teaching
 - chemical engineer
 - environmental protection

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- pharmaceutical
- atomic energy technician
- criminological chemist
- metallurgist
- research
- biochemist

Suggested Outline for General Study of Physics

- History of Physics
 - Greeks - Aristotle
 - Galileo
 - Newton
- Mechanics - Physics of Motion
 - speed - rate of motion
 - velocity - speed in particular direction
 - force - pushing or pulling action of one object on another
 - acceleration - a change in velocity
 - Newton's Laws of Motion
 - simple machines:
 - inclined plane
 - lever
 - pulleys
- Other forces of Nature
 - strong nuclear force

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- weak nuclear force
- electromagnetic force
- Waves and Sound
 - waves and energy
 - type of waves
 - wave measurements
 - wave behavior
 - what is sound?
 - characteristics of sound
 - the Doppler effect
 - reflection of sound
 - refraction of sound
 - diffraction of sound
 - radio waves
 - microwaves
- Light and Color
 - theories of light
 - the spectrum
 - reflection of light
 - refraction of light
 - diffraction of light
 - polarization
 - infrared
 - ultraviolet
 - X-rays

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- laser light
- Magnetism and Electricity
 - magnets and magnetism
 - nature of magnets
 - law of magnetic force
 - earth as a magnet
 - atomic magnets
 - nature of static electricity
 - electrostatic laws
 - electro magnets
 - Electricity
 - electrons in motion
 - DC and AC current
 - voltage, amperage, and power
 - electric circuits
 - using electricity
 - motion from electricity
 - producing electricity

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- Electronics
 - history
 - vacuum tube
 - Cathode-ray
 - Edison effect
 - semiconductors
 - integrated circuits
 - computers
- Nuclear Physics
- Theory of Relativity
- Careers
 - engineer
 - meteorologist
 - seismic observer
 - optometry
 - aeronautics
 - atomic energy

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