Intermediate Level Science

Physical Setting - Key Idea 1: (explain daily, monthly and seasonal changes on Earth)

- the sun rises in the East; sets in the West
- revolution of earth/sun causes seasons
- rotation causes day/night
- even though the sun is hottest and stays our longer on the 1st day of summer at noon, the temperature is hottest at 4:00/5:00 pm because the earth's surface takes that long to warm up
- compare different points on earth to see difference in daylight hours on the same day
- sun is at different < in the sky depending on the date and location of the earth

Physical Setting - Key Idea 2: (describe volcano and earthquake patterns, the rock cycle and weather and climate changes)

- ring of fire
- acid rain breaks down rocks as does water/wind erosion
- air masses are based on the different densities. . . moist air----less dense
  dry air----more dense
- research plate movement in NYS
- plot volcano and earthquake locations on a map
- compare rock layers at a sight
- volcano and earthquakes are most common on or near plate boundaries
- it cools down before melting

Physical Setting - Key Idea 3: (observe and describe properties of materials, such as density, conductivity and solubility)

- see why Christmas lights will not work when one light is out
- check to see what materials will be the best insulators
- a small piece of lead is heavier than larger pieces of wood, plastic, etc
- why are there always sugar crystals in the bottom of my coffee cup (hot cocoa)
- why do steel boats float and why did wooden boats sink
- determine factors (stirring, heating, amounts . . .) that affect the amount of solute will dissolve in a solvent
- water is the most abundant solvent
- specific gravity of water 1.0 Density = 1.0glcm3

Physical Setting - Key Idea 3.1: (distinguish between chemical and physical changes)

- cut a piece of paper (p)
- burn a piece of paper (c)

- iron oxide (rusting nail) (c)
- food coloring in H2O (p)
- cutting hair (p)
- melting ice (p)
- boiling water (p)
- change in color of a carnation if you put it in water
- bleach on a pink towel (towel becomes white)
- crush a can (p)
- visit a limestone cave looking for evidence of chemical changes and looking for evidence of weathering on the outside of the cave

Physical Setting - Key Idea 4: (observe and describe the properties of sound, light, magnetism and electricity)

- sound causes "things" to vibrate
- shadows form on the opposite side of an object from the source
- doppler effect -- sound and light
- electricity follows the path of least resistance
- light travels faster and sound
- light is composed of many colors
- compass points to the North
- ultrasounds (pre-natal) and for therapy
- electrical currents to relax muscles during physical therapy
- show a picture of a room in the ; what energy changes are taking place?

Physical Setting - Key Idea 5: (describe different patterns of motion of objects)

- projectiles move in parabolic paths
- falling objects stop accelerating eventually in the air
- pendulum oscillating
- objects continue in a straightline until acted upon by an outside force
- objects tend to remain at rest until acted upon by outside force
- centripetal force (ex. clothes dryer)
- centrifugal force (ex. round-up; gravitron)
- toys (swings on a playground, yo-yo, slinky)
- visit an amusement park
- build a model of an amusement park
- inclined plane, electricial circuit, electromagnetism, potential/kinetic energy
- make a motor, telegraph, buzzer, etc
- compass

Intermediate Level Science

Living Environment - Key Idea 1: (explain the functioning of the major human organ systems and their interactions)

- heart/lung transplants (kids interest in body function)
- a cut healing (skin)
- eating (how food is processed)
- exercise (effect on heart rate; metabolism)
- cancer

- disease epidemics
- robotics
- artificial body parts (technology; popular culture)
- weight control issues (young girls concerns)

Living Environment - Key Idea 2: (describe sexual and asexual mechanisms for passing genetic materials from generation to generation)

- plant grafting
- genetic engineering (farmers)
- cloning
- traits you have inherited
- bacteria immunity to antibiotics
- virus protein coat changes
- adaptations
- comparing fossils
- hybridization

Living Environment - Key Idea 3: (describe factors responsible for competition within species and the significance of that competition)

- habitat destruction would affect competitive factors (development, pollution)
- manatees (farmer runoff/boats)
- purple loostrife/cattails crowding cattails, creates runoff
- Kodak (pollution of water)
- introduced species (zebra mussels; fire ants)
- human population overcrowding

Living Environment - Key Idea 4: (observe and describe cell division at the microscopic level and its macroscopic effects)

- cancer research
- virus control (west nile virus)
- aids reserch
- genetic diseases (down syndrome)
- regeneration
- bacteria growth & infection

Living Environment - Key Idea 5: (describe the importance of major nutrients, vitamins, and minerals in maintaining health and promoting growth; and explain the need for a constant input of energy for living organisms)

- relationship between diet and nutrition and overall health
- anerexia and bulimia
- health food industry (all natural vs medical)
- phen phen (FDA approvals)
- school lunch programs
- what a mother-to-be eats affects the fetus
- human fitness
- diets (fats, proteins, carbohydrates)
- nutritional deficiency diseases

Living Environment - Key Idea 6: (describe the flow of energy and matter through food chains and food webs)

- over use of herbicides/insecticides can cause
- collapse of food chains/webs
- agent orange use
- Ginna plant (thermal effect on water)
- pig (animal) waste runoff - changes ecosystem (drinking water pollution; e-coli contamination
- land use decisions
- overhunting; overhunting

- hunting and fishing seasons
- FingerLakes development

Living Environment - Key Idea 7: (describe the effects of environmental changes on humans and other populations)

- solid waste problem (trash)
- deforestation of rain forest
- global warming (ice caps melting)
- development - how it effects their community (housing, malls, filling in of wetlands)
- animal waste runoff (e-coli; phisteria)
- ocean pollution
- overhunting, causing extinction (many students hunt)