

# Syllabus for Senior Science Bee

Source for Syllabus - Integrated Science (Red/Green/Blue 2008 Books):

<http://www.glencoe.com/sites/california/student/science/index.html>

<u>Subject</u>	<u>Topic</u>	<u>Sub-topic</u>	<u>Detail / Expectation / Science Vocabulary</u>
Earth & Space	Geology	Rocks	Composition; Rock Cycle; Rock Types - Igneous; Sedimentary; Metamorphic; Lava; Foliated; Nonfoliated; Crystal Structure and Sub-Types; Intrusive; Extrusive; Rock Types vs Grain Size; Shale; Rock Breakdown - Chemical; Mechanical; Filtration; Cementation; Mineralization; Fermentation; Clastic vs Non-clastic Rocks; Lithification;
Earth & Space	Geology	Minerals	Natural vs Synthetic; Organic vs Inorganic; Crystalline Solids Types; Ore; Fracture; Streak; Cleavage; Element; Cooling Rate and Crystallization; Granularity; Common Elements in Minerals; Magma; Flammability; Hardness; Specific Gravity; Density; Durability; Mohs Scale; Luster; Magnetism & Mineral Identity; Rarity; Gem; Vein Minerals; Mineral Classification vs Crystallization;
Earth & Space	Geology	Plate Tectonics	Tectonic Plates; Crust; mantle; Core; Alfred Wegener; Continental Drift Theory; Fossil Evidence; Pangaea; Studying Ocean Floor; Seafloor Spreading; Magnetic Field Reversal; Magnetometer; Plate Tectonic Theory; Lithosphere; Plate Boundaries; Faults; Rift Valleys; Convergent Boundary; Divergent Boundary; Shearing; Crust formation; Sliding; Convection; Colliding; Folding; Warped; Unwarped; Bouyancy; Volcanic; Erosion; Transformation;
Earth & Space	Geology	Earthquakes and Volcanoes	Earthquake; Types of Fault; Types of Forces; Seismic Waves; P-waves; S-waves; Focus; Hypocenter; Epicenter; Seismographs; Richter Scale; Volcanoes; Shield Volcano; Cinder Cone; Composite Volcano; Lava Composition; Lava Viscosity; Volcanic Rocks; Volcano & Plate Boundaries; Pacific Ring of Fire;
Earth & Space	Geology	Weathering and Erosion	Weathering - Mechanical; Chemical; Sunlight; Freezing; Thawing; Agents- Gravity; Ice; Abrasion; Runoff; Erosion; River; Lake; Glacier; Rill; Gully; Stream; Wind; Till; Sediment; Deposition; Deflation; Loess; Silt; Delta; Sand Dunes; Mountain Bowls; Erosion/Weathering by Plants & Animals; Oxidation; Ironization;
Earth & Space	Oceanography	Oceans	Depth & Pressure; Depth & Temperature; Stratification - Cline; Salinity; Currents & Coriolis Effect; Layers & Currents - Density & Surface; Ocean Movement- Upwelling; Waves; Tides; Longshore Current; Hurricanes; Plankton; Nekton; Diatoms; Bottom-dweller; Consumer; Producer; Decomposer; Respiration; Food Chain; Excretion; Wave Motion; Food Web;
Earth & Space	Meteorology	Atmosphere	Atmosphere Benefits; Layers of Atmosphere; Composition; Formation of Solar System; Ozone Layer; Pollutants; Troposphere; Stratosphere; Mesosphere; Thermosphere; Exosphere; Ionosphere; Pressure; Critical Weather Components; Gases; Vapors; Ions; Ozone; Ultraviolet; X-ray; Sunlight; Gravity; CFC; Conduction; Convection; Radiation; Recycle; Hydrosphere; Water Cycle; Cumulus; Nimbus; Stratus; Cumulonimbus; Fog;
Earth & Space	Meteorology	Winds	Wind Speed; Wind Direction; Wind Pressure; Coriolis Effect; Storms; Fronts; Land Breeze; Sea Breeze; Jet Stream; Doldrums; Westerlies; Easterlies; Trade Winds; Air Density vs Air Pressure;
Earth & Space	Meteorology	Weather	Definition; Influence of Sun / Temperature; Wind; Instruments - Anemometer; Weather Vane; Barometer; Rain Guage; Humidity; Relative Humidity; Saturation; Dew Point; Clouds - Cumulus; Nimbus; Stratus; Cumulonimbus; Cirrostratus; Sleet; Hail; Air Front; Stationary; Air Draft - Updraft; Converging Front; Occluded Front; Storm Classification; Meteorologist; Isobar; Isotherm; Station Model; Weather Map; Dopplar Radar; Hurricane Scale; Tornado Classification;
Earth & Space	Meteorology	Climate	Definition; Latitude; Longitude; Landform; Equator; Air Currents; Heat; Precipitation; Desert; Windward; Leeward; Rainstorm; Aspects of Climate Classification; Hibernation; Adaptation; Extinction; Deforestation; Reforestation; Plant Adaptation to Desert; Earths Tilt; Pollution; Earth Ages - Ice Age; Glacial Periods; Forest Fires; Movement of Earth Crust; Sun Spot; Solar Flare; Cluster; Coronal Mass Ejection (CME); Trace Gases; Major Pressure vs Wind Systems; Rotation of Earth vs Atmosphere; Biosphere; Continental Climate; El Nino;
Earth & Space	Environment	Earth's Resources	Natural Resource; Nonrenewable Resource; Renewable Resource; Coal; Oil; Hydroelectric Power; Wind Power; Solar Energy; Nuclear Energy; Uranium; Geothermal Energy; Solid-waste Management; Landfills; Composting; 3 Rs of Conservation; Type 1 Plastic; Recycling; Reducing; Reusing;
Earth & Space	Environment	Pollution	Fossil Fuel; Air pollution; Acid Rain; Acid Precipitation; Global Warming; Algae Blooms; Ozone Layer; Radon; Drinking Water Source; Groundwater; Water Pollution;
Earth & Space	Earth's History	Paleontology	Paleontologist; Fossil Evidence; Premineralized Remains; Carbonaceous Films; Coal; Fossils in Amber; Trace Fossils; Superposition; Relative Age; Absolute Age; Unconformities; Radiometric Dating; James Hutton;

Earth & Space	Earth's History	Geologic Time	Index Fossil; Organic Evolution; Eons; Eras; Periods; Epochs; Precambrian time; Cretaceous Period; Paleozoic Era; Cenozoic Era; Mesozoic Era; Species; Interbreeding; Darwin's Natural Selection; Trilobite; Ediacara Life-forms; When Pangaea broke; Dinosaurs;
Earth & Space	Astronomy	Earth in Space	Earth Shape - Reasons; Rotation vs Sunrise; Orbit; Revolution; Season; Winter Solstice; Summer Solstice; Different Equinox; Crater; Maria; Telescope; Astronomical Unit; Light-Year; Nebula; Black Hole; Galaxy; Comet; Comet Orientation; Oort Cloud; Sesimograph; Spectroscope; Centrifuge;
Earth & Space	Astronomy	Earth & its Moon	Solar Eclipse; Lunar Eclipse; Solar Radiation; Earth's Axis; Rotation; Solstice; Craters; Rill; Maria; Highlands; Core; Waxing; Waning; Youngest and Oldest Moon Rocks; Gibbous; New Moon; Full Moon; Moon Formation Theories; Earth Rotation vs Revolution; Equinox; Asteroids; Meteorites; Comets; Phases of Moon; Visible Side of Moon; Sphere; Axis; Earth's Magnetic Fields; Clementine's Mission;
Earth & Space	Astronomy	The Solar System	Planets; Atmospheres; Moons; Mercury-Craters; Sunspots - Cyclic patterns; Galileo; Kepler; Copernicus; Asteroid Belt; Comet; Meteor; Meteorite; Jupiter its Moons; Outer & Inner Planets; Mars - Red; Mercury's Atmosphere; Saturn; Pluto's Moons; Uranus & its Orbit; Viking Probe; Jupiter - Volcanic Moons; Fusion; Sun-Centered Model; Star Formation; Planet Orbit and Proximity to Sun; Astronomical Unit; Pathfinder Mission; Mars vs Earth Similarities; Barringer Crater;
Earth & Space	Astronomy	Stars and Galaxies	Red Shift; Star Cycle; Nuclear Fusion; Black Hole; Core; Photosphere; Radiation Zone; Convection Zone; Chromosphere; Corona; Galaxy; Constellation; Supergiant; Neutron Star; Black Dwarf; Nebula; Arp's Galaxy; Milky Way Galaxy; Barnard's Galaxy; Andromeda Galaxy; Alpha Centuri; Betelgeuse; Sirius; Pleiades; Galaxy Cluster; Universe; Sun Age vs Composition; Circumpolar Constellations; Supernova; Forces holding Universe; Sun's Orbit; Fission; Fusion; Prominence; Coronal Mass Emissions; North Star; Blue Shift; Parallax; White Dwarf; Galaxy Types - Irregular; Spiral; Elliptical; Binary System; Magnitude - Absolute; Relative; Aurora; Aurora Borealis; Black Hole;
Earth & Space	Astronomy V	Exploring Space	Star Energy Emission; Space & Sound; Frequency Of Electromagnetic Waves; Reflection vs Refraction - Telescope; Active Optics; Radio Telescopes; Space Travel Limitations; Rocket - Types & Uses; Satellites; Artificial Satellites - Applications; Space Probes vs Satellites; Space Stations- Names & Nationalities; New Millennium Program; Next Generation Space Telescope; Moon Habitation; Convex Lens & Mirror; Concave Lens & Mirror; Pioneers in Space Exploration; Speed of Light; Gravity; Escape Velocity; US Space Projects - Surveyor; Apollo; Gemini; Mercury;
Life Science	Life's Diversity	Classification of Life	Properties of Organism; Carolus Linnaeus; Binomial Nomenclature; Phylogeny; Genus; Species; Cell Organelles; Cell Theory; Viruses;
Life Science	Life's Diversity	Invertebrate Animals	Unicellular; Multicellular; Characteristics; Feeding Habits; Body Symmetry; Arthropods; Insects; Crustaceans; Arachnids; Sponge; Molluscs; Echinoderms; Annelids; Tapeworms; Roundworms; Metamorphosis; Regeneration; Bivalves; Parasitism;
Life Science	Life's Diversity	Vertebrate Animals	Ectotherm; Endotherm; Vertebrae; Skull; Backbone; Mammals; Amphibians; Reptiles; Fish; Birds; Monotremes; Marsupials; Placentals; Umbilical Cord; Placenta; Internal Fertilization; External fertilization; Bony Fish; Cartilaginous Fish; Estivation; Hibernation; Metamorphosis in Amphibians;
Life Science	Life's Diversity	Plants	Plant vs Animal cell; Binomial Nomenclature; Vascular Plants; Nonvascular Plants; Mosses; Ferns; Spores; Gymnosperm; Angiosperms; Epidermis; Cuticle; Herbaceous Stems; Woody Stems; Rhizoid; Phloem; Xylem; Cones; Pioneer Species;
Life Science	Life's Diversity	Genes & Inheritance	Genes; DNA; 46 Chromosomes; Mitosis; Meiosis; Independent Assortment; Sexual Reproduction; Asexual reproduction; Regeneration; Cloning; Trait; Phenotype; Genotype; Allele; Dominant; Recessive; Hybrid; Polygenic Inheritance; XY Chromosomes; Down's Syndrome; Sex-linked Disease; Gene Therapy; Mutations; Selective Breeding; Mendel; Purebred; Punnett Square; Diploid; Haploid;
Life Science	Life's Diversity	Evolution & Paleontology	Lamarck; Adaptation; Darwin's Natural Selection; Gradualism; Punctuated Equilibrium; Extinction; Paleontology; Imprint Fossil; Radiometric Dating; Relative Dating; Embryology; Homologous Structures; Vestigial Structure; Primate Origins; Prosimian; Hominid; Cro-Magnon Humans;
Life Science	Cell Life	Cell structure	Robert Hooke; Microscope; Animal Cell; Plant Cell; Chloroplast; Cell Wall; Cell membrane; Nucleus; Cytoplasm; Mitochondrion; Vacuole; Ribosome; Tissues; Organs & Organ Systems; Smallest Organism; Inorganic & Organic Substances; Nucleic Acids and Genes;
Life Science	Cell Life	Cell function	Passive Transport; Active Transport; Osmosis; Endocytosis; Exocytosis; Metabolism; Fermentation; Cell Respiration; Enzymes; Phases in Mitosis; Meiosis; Sexual Reproduction; Asexual Reproduction; Haploid & Diploid; DNA Code; Mutation; Chromosome & Genes;

Life Science	Human Body	Blood, Circulation and Respiration	Blood Cells & Function; Anemia; Blood Groups; Arteries; Capillaries; Veins; Lymphatic System; Cellular Respiration; Pharynx; Larynx; Trachea; Bronchi; Alveoli;
Life Science	Human Body	Digestion and Excretion	Digestive Tract; Mouth; Esophagus; Stomach; Small Intestine; Large Intestine; Liver; Pancreas; Bile; Enzymes; Peristalsis; Villi; Chyme; Food Groups; Urinary System; Kidneys; Nephrons; Ureters; Bladder; Urethra;
Life Science	Human Body	Structure & Substance	Skin as Defense; Dermis; Epidermis; Vitamin D; Sweat Glands; Types of Bone; Immovable Joints; Types of Joints; Water Content in Body; Organic Substances; Inorganic Substance; Carbohydrates; Fats; Proteins; Cells; DNA; Homeostasis; Positive feedback mechanism;
Life Science	Human Body	Brain & Coordination	Synapses; Central Nervous System; Cerebrum; Cerebellum; Hypothalamus; Brain Stem; Gray Matter; White Matter; Peripheral Nervous System; Afferent; Efferent; Interneuron; Parts of Eye; Parts of Ear; Voluntary response; Involuntary response; Reflex; Sensory; Motor;
Life Science	Human Body	Hormones and Reproduction	Endocrine system; Hormones; Fight-or-Flight; Negative-Feedback System; Insulin; Thyroxine; Male Reproductive System; Female Reproductive System; Menstrual Cycle; Fertilization; Embryo; Identical Twins; Fraternal Twins; Neonatal Period;
Life Science	Human Body	Immunity	Antibody; Pasteurization; AIDS; Infectious Disease; Pathogens; Food-borne Diseases; Inflammation; Allergy; Vaccination; Antigen;
Life Science	Ecology	Ecosystems	Ecosystem; Biosphere; Food Chains; Food Webs; Biotic Factors; Abiotic Factors; Temperature; Latitude; Rainfall; Water Cycle; Carbon Cycle; Nitrogen Cycle; Energy Pyramid; Examples of Communities; Primary Succession; Secondary Succession; Pioneer Species; Climax Communities; Niche; Competition; Mutualism; Parasitism; Symbiosis; Predation; Exotic Species;
Life Science	Ecology	Biomes	Species in Biomes; Tundra; Taiga; Temperate Deciduous Forest; Grasslands; Tropical Rain Forest; Desert; Freshwater Ecosystem; Wetlands; Ocean Biome; Intertidal Zone; Salinity; Permafrost;
Life Science	Ecology	Population	Population Size; Population Spacing; Clumped Spacing; Carrying Capacity; Trap-Mark-Release; Sampling; Limiting Factor; Human Population;
Physical Science	Matter	Properties & Changes	Physical Properties; Chemical Properties; Solid; Liquid; Gas; Plasma; Change of State; Malleable; Ductile; Metal; Non-Metal; Metalloid; Homogeneous; Heterogeneous; Density; Bouyancy; Density Problems; Melting Point; Boiling Point; Surface Tension; Specific Heat; Latent Heat - Fusion; Vaporization; Viscosity; Pressure vs Volume; Sublimation; Solubility vs Temperature F/C/K; Physical Change; Chemical Change; Flammability; Acidic; Color; Agents/Processes that cause Physical/Chemical Change; Conservation of Matter; Force vs Pressure; Viscosity; Work vs Energy; Crystalline Solid; Thermal Energy; Amorphous; Hydraulic Pressure;
Physical Science	Matter	Substances, Mixtures, and Solubility	Interpret Temperature vs Solubility Graph; Concentration; Dilute; Neutralize; Acidic; Basic; Weak Acid; Weak Base; Strong Acid; Strong Base; Aqueous Solution; Corrosive; pH; Polar; Nonpolar; Solute; Solvent; Compound; Heterogeneous & Homogeneous Mixtures; Hydroniums; Suspension; Insolvent; Substrate; Unsaturated; Saturated; Supersaturated; Nonpolar Solute; Fractionation; Emulsification; Ionic; Covalent; Atom; Colloids;
Physical Science	Chemistry of Matter	Inside the Atom	Isotopes of Nitrogen; Isotope Stability; Beta Particle; Alpha Particle; Atomic Structure; Aristotle; Arrhenius; Democritus; Chadwick; Atomic Number; Atomic Mass; Protons; Neutrons; Isotope; Electromagnetic Force; Weak Force; Strong Force; Half-life; Half-life Calculations; JJ Thompson; Element; Compound; Mixture; Transmutation; John Dalton; Ernest Rutherford; Carbon Dating; Radioactive Decay; Atom Energy Levels; Mass Number; Repulsion of Protons; Nucleus; Electrode; Electron Cloud; Nucleon; Quark;
Physical Science	Chemistry of Matter	The Periodic Table	Elements - and their State; Metalloid; Alkali Metal; Alkaline Earth Metal; Lanthanide; Actinide; Transition Metal; Halogen; Nobel Gas; Catalyst; Iron Triad; Rare Earth Elements; Reactivity; Mendeleev; Zones in the Periodic Table; Element Key; Moseley; Family; Group; Zone; Malleability; Ductility; Radioactive; Conductor;
Physical Science	Chemistry of Matter	Atomic Structure and Chemical Bonds	Electronic Configuration; Bonds - Covalent; Ionic; Metallic; Energy Levels vs Electrons; Molecule; Polar Bond; Nonpolar Bond; Mendeleev; Mendelssohn; Minsk; Outermost Electrons; Double Bond; Triple Bond; Chemical Equation; Subscript; Superscripts; Chemical Formula;
Physical Science	Chemistry of Matter	Chemical Reactions	Rust; Endothermic; Exothermic; Rate of Reaction; Concentration; Lavoisier; Balancing a Chemical Equation; Chemical Change; Physical Change; Nuclear Reaction; Synthesis; Coefficients; Reactants; Products; Inhibitor; Catalyst; Enzyme; Activation Energy; Precipitate; Symbol for Energy; Chemical Reaction vs Temperature; Electrolysis of Water; Rate of Reaction vs Concentration;

Physical Science	Energy	Conservation of Energy	Conservation of Energy; Momentum; Work; Energy; Power; Forms of Energy - Electrical; Thermal; Chemical; Nuclear; Potential; Kinetic; Activation; Transformation of Energy; Conduction; Convection; Radiation; Conductor; Insulator; Exothermic; Endothermic; Reactant; Product; Catalyst; Initiator; Inhibitor;
Physical Science	Energy	Energy and Energy Resources	Interpret Graphs of Energy usage; Generator; Quads; Energy Transformation; Solar Energy; Nuclear Power; Entropy; Electrical; Thermal; Potential; Chemical; Kinetic; Law of Conservation of Energy; Turbine; Renewable; Nonrenewable; Work; Power; Momentum; Boiler; Furnace; Treadmill; Geothermal; Radioactive; Nuclear Reactions; Enthalpy;
Physical Science	Energy	Heat Energy	Compressor; Condenser Coil; Expansion Valve; Freezer Unit; Coolant; Exhaust; Power; F / C / Kelvin Temperature Scale; Heat Transfer; Potential Energy; Kinetic Energy; Atomic Particle and Energy Transfer; Buoyancy; Diffusion; Thermal Expansion; Work; Matter & Energy; Melting Point; Heat of Vaporization; Current; Insulator; Absolute Zero; Conduction; Convection; Radiation; Heat Pump;
Physical Science	Energy	Electricity & Magnetism	Atoms & Ions; Electrons; Nuclear Force; Electrical Field; Electrical Discharge; Conductor; Insulator; Ground; Current & Amperes; Voltage & Volts; Resistance & Ohms; Batteries; Ohm's Law; Series & Parallel; Electrical Power; Watts; Magnetic Force; Magnetic Field; Polarity; Magnetic Field Lines; Magnetic Domains; Earth as Magnet; Magnetosphere; Compass; Homing Pigeons; Electromagnet; Permanent Magnets; Power Plant ; Generator; Turbine; Transformer; Direct Current; Alternating Current; Static Charge;
Physical Science	Energy	Light & Sound Waves	Electromagnetic Spectrum; Sound; Light; Longitudinal/Compressional; Transverse; Stationary; Wave - Trough; Crest; Frequency; Wavelength; Amplitude; Pitch; Wave Velocity; Medium; Refraction; Rarefaction; Diffraction; Destructive Interference; Constructive Interference; Reverberation; Reflection; Normal Ray; Incident Ray; Reflected Ray; Hertz; Decibels;
Physical Science	Force & Motion	Motion and Momentum	Problems with Acceleration; Velocity; Displacement; Momentum; Instantaneous Speed; Average Speed; Elastic vs Inelastic Collision; Friction; Inertia; Initial Speed; Final Speed; SI Units; Graphical representation; Conservation of Momentum;
Physical Science	Force & Motion	Force and Newton's Laws	Problems on Force; Frictional Force; Horizontal Force; Mass; Acceleration; Force; Weight; Gravitational; Static; Sliding; Net Force; Force Pair; Unbalanced Forces; Reference Motion; Air Resistance; Displacement; Friction -Rolling; Static; Sliding; Newtons 2nd Law; Newtons 1st law; Newtons 3rd Law; Average Speed; Instantaneous Speed; SI Units;
Physical Science	Force & Motion	Work and Simple Machines	Problems in Work; Input Output Forces; Pulley; Inclined Plane; Wheel & Axle; Mechanical Advantage; Efficiency; Screw; Lever; Pivot; Wedge; SI Units; Energy Transfer; Power; Pulley System;
Science Inquiry	Scientific Method	Scientific Method	Theory; Hypothesis; Method; Experiment; Measure; Observation; Variables; Constants; Models; Concept; System; Independent Variable; Dependent Variable; Graphing; Control; Tabulate; Procedure; Inference; Conclusion; Bias; Data; Repeatability; Technology; Scientific Law; False positives; True positives; False negative; True negative;
Science Inquiry	Measurement	Measurement	Measuring; Estimating; Organize data; Accuracy; Precision; Significant Digits; Rounding; Quality; Mass; Length; Temperature; Volume; SI System; Weight; Force; Rate; Line Graph; Bar Graph; Circle Graph; Pictograph;
Science Inquiry	Measurement	Units of Measurement	Distance; Mass; Weight; Volume; Force; Energy; Heat; Temperature; Humidity; Voltage; Current; Resistance; Charge; MKS (Meter, Kilogram, Seconds) units; CGS (Centimeter, Gram, Seconds) units; FPS (Foot, Pound, Seconds)
Science Inquiry	Biographies	Biographies	Albert Einstein; Neils Bohr; C. V. Raman; S. Chandrashekar;

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