

## Senior Project Example Topics

### SCIENCE

#### A) Biology:

- The effect of sound on plants
- Plants in different environments (light intensity, colour)
- The effect of nicotine, air, yeast on mold growth
- Factors affecting the strength of hair, the growth of bacteria, molds or yeast
- Experiment with Hydroponics
- Use seedlings started from seed with three types of soil and >different rates of fertilizer
- The effectiveness of Antiseptics and soaps on household bacteria
- The effect of air pollution on algae, protozoa, fish, insects or mosses and lichens
- Comparing types of artificial light on plant growth
- Conditions necessary for the life of a brine shrimp
- The commercial uses of algae methods of production
- Producing mutations in bacteria, yeast, protozoa or molds
- Best conditions for mushroom production, growth of ferns
- The effects of ultrasonic antibiotics temperature changes on bacteria count
- Microbial antagonism
- Reaction of paramecia, planaria to pH, light and temperature conditions
- Plant tropisms and growth hormones
- Transpiration rates for different plants and conditions
- Sugar level in plant sap at different times and dates
- Using radioisotopes to study uptake of plant nutrients
- A study of territoriality in mice
- A study of the cleaning habits of mice
- Observation of conditioned responses in different animals
- A study of animal phosphorescence and other bioluminescences
- Learning and perception in animals and humans
- Studies of memory span and memory retention
- Age versus learning ability
- A study of the relation between physical exercise and learning ability
- Is audio or visual information better remembered
- The effect of bleaching and dyeing on hair
- A study of the percentage of DNA (by weight) in different species
- Factors affecting the enzyme's reaction rates
- Genetic variations across a Sansevieria leaf
- Factors affecting seed germination (e.g. soil temperature, pH)
- Root formation in cuttings versus lighting conditions
- Factors affecting flowering
- Study of sterility in plant hybrids (F1 and F2)
- Comparison of different plant's ability to add humus to the soil
- Factors affecting Nodule Formation in Legumes
- Can household compounds (e.g. tea) be used to promote good health in plants
- Effects of cigarette smoke on the growth of plants
- The effects of water impurities on plant growth
- The effects of phosphates on aquatic plants
- Effect of mineral deficiencies on protein content in soybeans
- The effect of excess salinity on plants
- A study of the tumours produced in plants by agrobacterium tumifaciens
- The effect of polarized light on plant growth directica
- The effects of solar activity on plant growth
- Tracing solar activity cycles in tree growth rings
- The effects of electric fields on plants
- The effects of magnetic fields on plant growth
- Effects of magnetism on the size and frequency of blooms and fruits

- Does magnetizing seeds before planting affect growth
- The effects of XRay and other radiation on plants
- The effect of music of varying types and duration on plants
- Organic fertilizer versus chemical Fertilizer
- Study of population fluctuations in insects
- A study of toxicity of insecticides versus temperature
- Is polarizes light the guidance system for Foraging ants
- A study of stimuli that attract mosquitos
- The factors affecting the rate at which a cricket chirps
- Study of insect of animal behaviour versus population density
- A study of diffusion through cell membranes
- Growth of plant and animal cells by cloning
- Regeneration in sponges, Paramecia, Planaria, etc.
- Manipulation of Vegetative reproduction in plants
- Search for nearvacuum environment tolerant plants

#### B) Physical Science

- Study of accuracy of calculators
- The mathematics of snowflakes
- Observational orbit determination of comets, meteors or other minor planets
- The effect of solar activity on radio propagation
- Observations of sunspots, flares and prominences
- A study of solar flares through the sudden enhancement of atmospherics
- The identification of elements in the solar and stellar spectra
- Experimental exploration of the photoelectric effect
- Experimenting with electron diffraction
- Observations of magnetic permeability of different materials
- Comparing magnetic pysteresis for different material
- A study of radiation patterns from different antenna types
- Factors affecting scent propagation
- Factors affecting sound propagation
- Factors affecting sound dampening
- Index of refraction of liquids versus temperature
- Index of refraction of liquids versus amount of additive
- A study of infrared qualities of certain solutions
- Crystal growth rates versus solution strengths, temperature, etc
- Observation of freezing rates of water for different starting temperatures
- Reproduce the stanley miller experiments "The Origin of Life"
- Find the optimal gas mixture for a stanley miller experiment
- Experimenting with various separation techniques (e.g. electrophoresis)
- A study of catalyzed reactions
- A study of saponification reactions
- A study of esterification reactions
- The physics of ski waves

#### C) Earth Science

- Observations of experimentally induced seismic waves
- Is there a relation between sunspot cycles and earthquakes
- Observations of geomorphic factors in the local areas
- Tracing glacial till fragments to local rock outdrops
- Exploring methods of controlling erosion
- Fossil studies in limestone and other rocks
- A study of phosphorescence as a tool for geologists
- Comparison of the load bearing strength for different soils

- Observations of fluctuations in stream flow following rain
- Study of air tides: phases of the moon versus barometric pressure
- Effects of weather on human emotions
- Changes in snow density and other characteristics with time
- The factors affecting ice patterns on glass
- Study of the relation between wind direction and temperature inversions
- A study of small scale wind currents around buildings
- Observations of local anomalies in the earth's magnetic field

#### D) Environmental Science

- The study of flora in a given region
- Observations of urban wildlife
- Study of adaptations of city flora to smog
- An ecological study of the animal and plant populations occupying the same tree
- The effects of crowding (with the same or other species) on a certain plant
- Annual variations in the ecology of a body of water
- A study of a shoreline
- Observations of the spread of Dutch Elm disease
- A study of the relation between soil type and vegetation
- A study of the relation between vegetation and insects
- Monitoring the changes in wildlife caused by human encroachment
- The study of the impact of pollution on an ecosystem
- A study of water pollution from feed lot farms
- Tracing chemical(e.g. DDT) concentrations in successive food chain levels
- Ozone destruction experiments
- A study of air purification methods
- Efficient methods of breaking down crude oil in seawater
- Experimenting with microbial degradation of petroleum
- Experimenting with biodegradability
- Finding efficient methods of harvesting and using plankton
- Find and ink that would decompose for recycling paper