

Science Fair Project Ideas

Behavioral & Social Science

- A study of territoriality in mice
- A study of the cleaning habits of mice
- Observation of conditioned responses in different animals
- Learning and perception in animals and humans
- Studies of memory span and memory retention
- Worker efficiency vs. number of hours worked: Do long hours really pay off?
- A study of the relation between physical exercise and learning ability
- Is audio or visual information better remembered
- Which gender, grade, and ethnicity have the most stress?
- Study the "comfort zone" different people have, how the comfort zone varies between sexes, and between friends and strangers
- Analysis and Documentation on Color's Effects on Emotion Between Genders
- Determine if there is a difference between various groups in overcoming visual illusions to determine what is really there
- Can spatial skills be improved with practice?
- The Effect Of Birth Order On The Personality Types Of Teenagers
- See if subliminal messages have an effect on one's behavior and decisions
- Are people who can taste PTC strongly would be more likely to dislike broccoli than those who cannot taste it at all
- Which hand is more sensitive and how does age/gender/health habits affect that sensitivity?
- What effect does being scared have on blood pressure, and does age/gender/health habits affect this situation?
- What effect does eye color have on the ability to distinguish between colors in low light?
- Determine if people respond more quickly to visual or auditory stimuli.
- Determine if a person's reading comprehension is greater when reading written material on paper or from a computer screen.
- Determine whether elementary grade students comprehend directions better with visual, aural, or typed directions.
- Can people really taste the difference between fat free and regular foods? Does age, gender, or other factors affect the ability to taste the difference if there is one?

- Which of the three senses-- sight, hearing, or touch--produces the quickest reactions in humans.
- Determine if males and females have different abilities in estimating an object's size
- Determine how well people identify foods using only the sense of smell
- Determine if people can identify the original scents used to make homemade fragrances and perfumes
- Determine if smells, odors or scents affect peoples' mood. If so, how?
- How does the group affect our personal behavior, and how can our personal behavior affect the group?
- Does age have any influence in deciding what color car to buy?
- Determine the range of response of differing human ages to the Stroop Effect.
- Teenage values: Are they different between males and females?
- A study of animal phosphorescence and other bioluminescences
- Does response time deteriorate with age? If so, by how much?
- Do TV stations increase the volume of advertisements in order to get your attention and influence your buying habits?
- Can a person recognize the sex of another people from pictures of bare feet?
- Is there such a thing as "sidedness" that goes beyond left-hand, right hand? Is there also a right foot, left foot, right eye, left eye, etc.?
- Do horoscopes work or are they merely entertainment?
- Compare the suggestibility of males vs. females in copying actions of those around them (sniffing, scratching, coughing, yawning, etc.)?
- Devise a test to measure peer pressure and then examine how well it works among your friends.
- Can we tell the difference between genetic traits and behavioral traits? (There's a lot of new research going on in this area.)
- Research what type of facial expressions babies can mimic and how young they start to mimic them. (A new baby brother or sister would be helpful)
- Does gender affect teenagers' planned career choices?
- Compare rewards vs. punishment as methods of controlling behavior. Are there better methods for controlling behavior?
- Praise vs. performance - Does boosting students' self-esteem lowers their grades on tests or improve upon them?
- Compare age groups as regards concepts of right and wrong. Are there absolute rules or do rules depend upon the situation and circumstance?
- Does parental occupation and/or financial status influence stated student goals as to college preferences or occupational goals?

- Do males and females of different age groups minds' react to color and words at different speeds?
- Do boys see different optical illusions than girls?
- Does Age Affect Hearing
- Can Goldfish Learn To Eat From A Certain Color Container By Using Operant Conditioning?
- The Effect Of Mental And Physical Stimulation On The Learning Ability Of Mice
- The Impact Of Sleep Deprivation on Mood And Cognitive Performance In Three Age Groups
- Sound To Sight: Study Of Peoples Cognitive Responses To Mozart's Music
- Comparison Of Stress In Reproducing Wild Type And "eyeless" Drosophila Melanogaster
- Effects Of Coping Mechanism Type On Physiological Stress Response
- Do Your Fears Change With Age?
- Effects Of Contrast And Luminance On Magnocellular-Defined Boundaries
- Do Ambidextrous People Have an Advantage In Cognitive Hearing?
- Are Americans Ready For Mom To Be President? A Study Of Gender And Politics
- Gender Effects On Story Comprehension And Preference
- Does Age Affect a Child's Perception Of Time?
- The Effect Of Sleep Restriction On The Cognitive Function Of Elementary And School Children
- Are People More Attracted Towards Teddy Bears With Childlike Features Than Towards Teddy Bears That Look Like Real Bears?
- Patterns, Pressure, And Preference: The Influence Of Social Pressure And Mathematical Patterns On Musical Preference In Adolescents.
- The Effects Of Caffeine On The Short-Term performance Of High School Athletes
- Does Different types of Lighting Affect Academic Performance?
- Effects Of Allelochemicals In Insect Behavior And Physiology
- Training methods to improve the detection of deception by adolescents.
- Media violence: its impact on adolescents and parents.
- Does smell affect memory?
- Music's affect on concentration.
- Effects of weather on human emotions
- A study of reading retention between computer and written material.

- How Nicotine Affects *Caenorhabditis elegans* Behaviorally Neurotransmitter-Amphetamine Interactions in Rats
- The Effects of Age Progression on Information Processing
- Reaction Time in Serial Learning: A Re-examination of the Ranschburg Effect
- Reading and remembering with different colored paper - which works best?
- Do babies prefer a familiar or unfamiliar toy?
- Working vs. non-working parents: effects on kids' grades.
- Effect of student seating on academic performance.
- Does the level of noise affect eye-hand coordination?
- Assertiveness: are there differences between junior high boys and girls?
- Does a blindfolded person walk in a circle? If so then why?
- Does chewing gum affect students in a testing situation?
- Audio memory vs. visual memory.
- Are eye witness testimonies accurate?
- Audio, Visual, and Kinesthetic Learning
- Do Blind Fruit Flies Have A Superior Sense of Smell than Their Sighted Counterparts?
- Does Sleep Affect Your Grades?
- Effect of Location on Seasonal Affective Disorder (S.A.D.)
- Talking on a cell phone while driving. Is it dangerous?
- What strategies do pre-schoolers use to deceive people?
- What are the affects of multiple washings on flame resistant sleepwear / clothing?

Botany

- How do different conditions affect the speed at which fruit and vegetables ripen?
- How do different types of fertilizers affect plant growth?
- What happens when you grow sweet potatoes next to other plants?
- How do different treatments change how fast seeds sprout?
- How close does a pesticide have to be to protect a plant?
- What effect does seed size have on how well a crop like oats or wheat grows?
- The effect of sound on plants
- Does The Use of Vitamin B1 Reduce The Risk of Root Shock in Plants?

- Plants in different environments (light intensity, color)
- Experiment with hydroponics
- Sugar level in plant sap at different times and dates
- Use seedlings started from seed with three types of soil and different rates of fertilizer
- Comparing types of artificial light on plant growth
- Best conditions for mushroom production, growth of ferns
- Transpiration rates for different plants and conditions
- Sugar level in plant sap at different times and dates
- 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
- What are the effects of watering plants with distilled water vs. non distilled water?
- Can Paper Chromatography be Used to Identify Different Species of Plants
- 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
- Does The Type Of Plant Life That Lives In The Soil Affect The Number Of Nematodes That Live There
- Effect of mineral deficiencies on protein content in soybeans
- The effect of excess salinity on plants
- 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
- Chitosan and its derivatives have plant protecting and antifungal properties (possibly use crawfish, shrimp, or crab shells. Which one would be better?)
- 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 X-Ray and other radiation on plants
- The effect of music of varying types and duration on plants
- Organic fertilizer versus chemical fertilizer
- Manipulation of Vegetative reproduction in plants
- Search for near vacuum environment tolerant plants
- Germination - how monocots and dicots differ - the effects of heat, light, carbon dioxide, pH level, etc. on germination rate
- Photosynthesis - factors affecting the rate of photosynthesis temperature, light intensity, water, carbon dioxide - part of light spectrum used in photosynthesis
- Leaf - do the numbers and sizes of stomata vary with different plants - what happens if stomata are covered and why
- Roots - how much water is used by different plants - what is the effect of temperature, sunlight, etc., on the use of water (transpiration) - how do different types of soils affect the ability of roots to anchor plants - what factors encourage root growth and what is the effect of water, oxygen, soil type, minerals on root growth
- Plant growth - determine the effects of various nutrients, amounts of water, hours of sunlight, strength of weed killer, temperature, pollutants, pH levels on plant growth and crop yields - can plants live without oxygen, carbon dioxide - what percentages of various plants is water
- The preferred pH level in the soil for various plants
- Nutrition - plants and fertilizer
- How do plants get nitrogen?
- Why do plants grow towards light?
- The effects of gravity on seed germination
- How water moves through the plant
- How plants reproduce and factors that affect the process
- The effect of soil components and organic matter on growth of plants.
- The effect of music of varying types and duration on plant growth
- The effects of magnetic fields on plant growth.
- The effects of phosphates on aquatic plants.
- The effects of water impurities on plant growth
- What happens when you grow sweet potatoes next to other plants
- What happens to the way plants grow if there are no microorganisms in the soil?

- Do onion root cells divide at certain times during a 24-hour period?
- Can Water Hyacinths remove nitrates from waste water?
- The relation between cotton fiber length and their strength.
- A comparison between stored seed and seed germination.
- Comparison of cotton growth in sandy loam and alkali soils.
- Analysis of lawn seed germination at winter, spring, summer and fall temperatures.
- Bean plant growth in various nutrient deficient soils.
- Does the pyramid change the growth of plants?
- Using radioisotopes to study uptake of plant nutrients
- A study of the tumours produced in plants by agrobacterium tumifaciens
- Does soil type change how well crops grow?
- Show how the growth rate of some plants may change when exposed to higher than normal carbon dioxide gas
- What type of water additive helps plants grow best?
- Does the amount of water a plant receives affect how much water it gives off?
- Do steroids affect plant growth?
- Will the amount of light affect how fast a Venus Fly-Trap closes its jaws around an insect?
- Which vegetables serve as the best conductors of electricity?
- What are the effects of aspirin, vitamin C, calcium, and Benadryl on plant growth?
- Investigating the effects of gravitational forces on plant growth.
- What effect would freezing have on how well seeds sprout?
- Does the depth a seed is planted affect its ability to sprout?
- Examine phototropism, the study of why plants grow towards light.
- What is the effect of gibberellic acid on plant growth/flowering/fruiting?
- Where are there more stomata, the top or bottom of a leaf?
- Is there a relationship between seed shape and the method of seed dispersal?
- The Antimicrobial Effective Of Folk Medicines
- What are The Factors Effecting The Transformation Of Crimson Clover?
- Determining Whether Length Affects Grass Growth
- What Are The Effect Of Salt On Different Varieties Of Carrots?
- How Does Hydrogen Peroxide Affect Wheat Germination?

- How Does Water Conservation Affect the Germination of Grass?
- What are the effects of ant mound soil on the growth of bean seeds?
- What are the effects of dryer lint on plant growth and soil?
- How do different types of wood absorb water?
- Which wood is the hardest and why?
- Does the density of wood affect the time for a flame to burn through to the other side?
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Biochemistry

- Can pigments from lichens be extracted for dyes?
- An analysis of the pH of saliva of students at your school.
- Analysis of reducing sugars in common foods
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- Does The Amount Of Fertilizer Change The Simple Sugar Content
- Separation of blood components from cow's blood.
- What esters are common in basic flavors?
- Will artificial sweeteners replace sugar?
- DNA extraction techniques from beef liver.
- Comparison of the Effects of Inorganic Catalysts and Enzymes on Peroxide Decomposition
- How do different conditions affect the speed at which fruit and vegetables ripen
- What effects do different amounts of exercise have on the production of carbon dioxide in humans?
- Compare the amount of protein in different brands of milk.
- Is there a difference between plant and animal DNA?
- Do different varieties of the same fruit have the same level of vitamin C?
- How can we extract DNA from onions?
- What Is the Effect of Heat on the Extraction of DNA from Fruit Flies (Drosophila) Larvae Cells
- Drosophila Eye Pigment Chromatography
- Restriction Enzyme Analysis of DNA
- Does Heteroplasmy in Mitochondrial DNA (mtDNA) Vary by Race

- Do different varieties of the same fruit have the same level of vitamin C?
- A study of the percentage of DNA (by weight) in different species
- Factors affecting the enzyme's reaction rates
- How can we test for the presence of starch?
- Illustrate how a sewage plant could produce natural gas
- Can you reproduce the effects of the commercially produced (Pomona's Universal Pectin) with homemade citrus pectin?
- DNA related projects.
- Paper Chromatography, what colored dyes are found in powdered drink mix and markers?
- Nucleic Acids and Recombinant DNA projects.
- How is calcium involved in muscle function and metabolism?
- Acid-Base Behavior of an Amino Acid
- The Effect of Various Household Chemicals on Hemoglobin Testing with Luminol
- Isolation of Lysozyme from Egg White
- Qualitative Analysis of Sugars
- Isolation of Phosphatidylcholine from Egg Yolk
- Qualitative Analysis of Lipids
- Purification and Activity of Phospholipase D
- pKa of a Buffer
- Kinetics of Alkaline Phosphatase
- A Modeling Experiment Demonstrating H-bonding of Purine and Pyrimidine Bases
- DNA Computation Of a Subset Sum
- Understanding the Mechanism Of Cytotoxicity Of Sphingosine and its Derivatives on Candida Albicans
- The Occurrence Of The Putative Tr1 Taste Receptor In Mammals
- Diabetes: The Carbohydrate Connection
- The Role Of Nitric Oxide (NO) In The Proliferation Of Endothelial Cells
- Effect Of Nerve Growth Factor On Sensory Neuron Growth And Survival
- Magnetic fields and enzymes.
- Is there an inheritance pattern in mitochondrial DNA?
- Effect of Light on the Vitamin C Content of Juice
- Effect of Temperature on Vitamin C in Orange Juice

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Chemistry

- Effects of temperature on viscosity of oil, chemical reactions, Brownian movement, burning of different materials.
- Everyday activities that illustrate chemical principles
- Chemical reactions that produce energy or that require energy
- Testing of consumer products- glues, stain removers, antiseptics, mouthwash, detergents, paper towels, making salt water potable, removal of pollutants
- Effects of sunlight on rubber, ink, paper
- Illustrate how hydrogen gas might be stored efficiently using carbon nanotubes
- Demonstrate how liquid methanol could be made from natural gas
- Effects of increased concentrations on the rate of chemical reactions
- Compare the pH levels in mouths of various animals and humans at different times in the day
- Compare the surface tension of various liquids
- Dealing with chemical spills from industry. Are there better ways to mitigate the problem?
- How Does Surface Temperature Above the Boiling Point Affect the Rate of Evaporation of Certain Alcohols
- Analyzing snow and rain for pollutants; samples from different locations
- Effects of temperature on density of gases
- Understand how different physical properties and chemical agents affect microwave superheating of water
- Build your own small liquid air generator. Show how pure nitrogen, oxygen, and other gases can be removed from the liquid air by a process known as fractional distillation
- Effects of salt and other contaminants on rate of rusting
- Growing crystals- factors that affect the rate and the size
- Can you obtain water from ink, vinegar, milk?
- What effects do different amounts of exercise have on the production of carbon dioxide in humans?
- Analyze soil samples for their components, ability to hold moisture, fertility and pH
- Does the amount of particle pollution vary with distance from a road, with location, with height. Determine types of particles found in pollution fallout
- Catalysts- how they work and why; commercial applications and problems

- Determine the effect of different brands of detergents on surface tension
- Fire extinguishers-principles of operation and factors affecting their efficient use
- How do acids react with different metals under varying conditions
- Identify different metals by the color of flame when they burn
- Can you devise an experiment that will list metals in order of their activity, from the most potassium to the least active ore gold
- Electroplating- the principles, how different metals can be used and the practical applications
- Chemical Change and the factors that affect the rate such as heat, light and catalysts
- Acid and basic solutions, how are they produced, how can they be modified; practical considerations in soil, lakes, food; acid or basic solutions around the house.
- Factors affecting the making of glass.
- The effects of salts on the freezing point of water and other liquids.
- Techniques of fractional distillation of oil samples.
- Testing the mineral concentrations in hard and soft water.
- Investigation of pH variations of soils.
- Can negative ions (anions) can be separated and analyzed with exchange resins.
- Can light energy influence chemical reactions?
- A study of acidity in different types and brands of milk
- Effects of temperature on viscosity of oil, chemical reactions, Brownian movement, burning of different materials.
- Testing of consumer products- glues, stain removers, antiseptics, mouthwash, detergents, paper towels, making salt water potable, removal of pollutants
- Effects of sunlight on rubber, ink, paper
- Effects of increased concentrations on the rate of chemical reactions.
- Dealing with chemical spills from the industry.
- Effects of salt and other contaminants on rate of rusting
- Growing crystals- factors that affect the rate and the size
- Can you obtain water from ink, vinegar, milk?
- How do acids react with different metals under varying conditions
- Identify different metals by the color of flame when they burn
- Can you devise an experiment that will list metals in order of their activity, from the most potassium to the least active ore gold

- Electroplating-the principles, how different metals can be used and the practical applications
- Calcium magnesium acetate (CMA) as a deicer
- Effects of drying times on the properties of glue mixtures
- Effect of chlorine bleach on fabric strength
- Chemical reactions that consume versus produce energy
- Factors affecting an enzyme's reaction rate
- What household material will put out fire the fastest?
- What type of metal, steel, copper, or bronze, will rust faster?
- Which hair coloring product has the greatest amount of lead acetate?
- A Study Of Chromium In Cigarette Smoke
- Atomic Absorption Spectroscopy
- The Titration Of Air: The Determination Of Oxygen In Air
- Can hydrogen be produced from waste aluminum?

Computer Science

- Study of accuracy of calculators
- Studies of storage/retrieval techniques for computer systems
- Handling of data transfer between I/O devices
- Data manipulation and information management techniques and procedures
- Applications in education using the computer as an education tool
- Compiler design
- Statistics and random number problems
- Simulation of nonscience areas e.g. history, life or other planets
- A programmable processing unit design, function and operation
- Developing a video game
- Pascal programming tools
- Developing a program to write a new custom program
- Use of computers in managing industrial processes
- Illustrate how inkjet printing schemes could be used to fabricate inexpensive solar photovoltaic panels, printed onto glass
- Using computers to help people do what they want to do

- Search Engines: Which is the Best?
- Life and Death of a Network Virus
- The Durability of Floppy Disks or CDs
- Can computers simulate a form of artificial life?
- How can a computer be used as a time clock to keep track of time worked.
- Determining which computer is the fastest for different kinds of programs.
- Which factors most affect the operating speed of a computer?
- Can a computer can be used as an educational tool?
- Demonstrate how internet data can be used to predict the weather patterns in your home town.
- Create a program that gives people information based on their birthday.
- Which WWW search engine produces the most accurate results?
- Show how computer programs can simulate astronomical events.
- How do web pages work?
- Create a program that quickly teaches the user how to program in BASIC.
- Do computers or computer monitors generate radio signals?
- Examine the effect of magnetic fields on recording mediums (tapes, disks, etc.)
- Create a program that simulates intelligence, responding to a user based on what the user inputs into the program.
- Can a computer program affect childrens' learning ability?
- Demonstrate how examinations can be administered by computer and simultaneously graded.
- Develop and demonstrate a program to predict a comet's orbital path.
- Develop an advanced computer program designed to solve one of several problems in the mathematics of probability.
- Develop a computer program designed to solve one of several problems in advanced mathematics.
- Create a program which teaches the user a set of technical facts thorough the use of branched programmed learning methods.
- How does the C programming language work?
- Compare the speed/effectiveness of different programming languages in running the same program.
- Develop a program which will determine the feasibility of takeoff and flight for an aircraft.
- Develop a program to solve mathematical formulas.

- Develop a program to recognize animal tracks based on their shape.
- Can a computer program predict the future population of nations based on past population statistics?
- Develop a medical program to identify common childhood illnesses based on the symptoms exhibited.
- Exploring 3D Computer Graphics
- Design A System Of Gatering, Sorting, Digitalizing, And Displaying Local Weather Conditions Via The Internet
- The Role Of Spectral Peaks And Spectral Shape In Speech Recognition
- Secure Encryption: How Safe Is Your Data?
- Microstructure Of The Discrete Fourier Transform
- Does Temperature Affect The Performance Of Computer Components?
- Design A Computer Mouse Design For People Without Arms Or Hands.
- Hacker protection.
- Aid for finding the centroid of two dimensional rectangular shapes.
- Computer-aided design and simulation of digital circuits.
- Microcomputer programs for the blind.
- Writing an Applesoft BASIC program that plays checkers.

Earth & Space

- A study of solar flares through the sudden enhancement of atmospheric
- The identification of elements in the solar and stellar spectra
- Crystal growth rates versus solution strengths, temperature, etc
- Observations of experimentally induced seismic waves
- Is there a relation between sunspot cycles and earthquakes
- Observations of geomorphic factors in the local areas
- Fossil studies in limestone and other rocks
- Sunlight- how do different surfaces affect the amount of sunlight reflected and absorbed? Design a method of measuring how much sunshine is available each day.
- A study of phosphorescence as a tool for geologists

- Do major earthquakes set off other fault areas in other parts of the world? Does the depth have any effect on other possible resulting quakes? Is there a period of the year when quake frequency is higher than the other times
- Dew formation- how much is formed on a square meter for a period of time; account for variations
- Comparison of the load bearing strength for different soils
- Evaporation- which effects the rate of evaporation most- temperature, humidity, wind speed or other factors?
- Frost formation- what must the temperature be to form first; what are the effects of humidity? What is the make-up of frost and dew?
- Do Lost Pet Ads Predict Earthquakes
- Are There Observable Relationships Between Air Pressure, Temperature, Wind Speed, and Current Weather Conditions?
- A Comparison Of The Sun's Angle With Ozone & UVA & UVB On Different Surfaces
- Heat Retention- does fresh water hold heat longer than salt water? How does water compare to land and what effect does this have on the weather? What factors affect the cooling of land?
- Build a snow and rain monitor. Perhaps light from an infrared light emitting diode could used to detect the reflections off the rain drops and snow flakes
- Build Your Own Seismometer and demonstrate how it works.
- Observations of fluctuations in stream flow following rain
- Study of air tides: phases of the moon versus barometric pressure
- 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
- Sky Color- account for differences in color at different times
- Is cloud formation related to height, weather systems and temperature?
- Study and record varying levels over the year in a body of water; account for differences and the results on the surrounding environment
- How much is formed on a square meter for a period of time; account for variations
- Does wind travel at same speeds and in same directions at different heights?
- What must the temperature be to form first; what are the effects of humidity? What is the make-up of frost and dew?
- Which effects the rate of evaporation most- temperature, humidity, wind speed or other factors?

- Can you measure the speed and force of raindrops?-What is the effect on soil, with and without ground cover? Could you simulate the effect of rain?
- Does fresh water hold heat longer than salt water? How does water compare to land and what effect does this have on the weather? What factors affect the cooling of land?
- How do different surfaces affect the amount of sunlight reflected and absorbed? Design a method of measuring how much sunshine is available each day.
- Can you collect the amounts of water in the air at different temperatures?
- What is the difference between direct sun and in the shade? Is the difference constant?
- Weather records- Design and build an automatic recording weather device. Test it over a period of time.
- What happens to hair during periods of changing humidity?
- Record length of days and nights over a period of time; what effects do the changes have on things like household plants, pets, etc.
- Can you measure how much dew is formed in a square meter.
- How does the temperature change during the day? What time is usually the warmest? Can you construct your own thermometer to keep your own records.
- Observations of experimentally-induced seismic waves
- A study of small scale wind currents around buildings
- A study of solar flares through sudden enhancement of atmospherics
- The effects of solar activity on radio propagation
- Build a "tornado in a box" to show how tornadoes form
- Demonstrate how clouds form via condensation around particulate matter.
- Explain how fog forms and build a device that produces fog.
- Which affects evaporation the most.. air temperature, water temperature, or wind speed?
- Build and demonstrate a weather station with rain gauge and wind indicators.
- What is wind chill and what effect does it have on inanimate objects?
- Explain why the sky is blue and then sometimes changes color. Demonstrate how moisture or dust in the air can change apparent color of the atmosphere.
- Can you demonstrate how an undersea earthquake produces a tsunami?
- What causes earthquakes? Build a working model that demonstrates the cause of earthquakes. Build a homemade device to measure earthquakes
- What factors affect the slope stability of sand/gravel hillsides?
- Demonstrate which holds heat the longest, water or soil.
- Will different types of salt grow different kinds of crystals?
- Is there a relation between sunspot cycles and earthquake?

- What is the accuracy of Web-based Weather forecasting services?

Engineering

- Build a working model of a device that indicates how level a surface is. Perhaps it would make different tones when a bubble moved in a tube.
- Designing a strong bridge, an energy efficient home
- Comparing insulative properties of various natural and commercial insulators. Which are the best?
- Find the maximum speed in fiber optic links
- How does weight and shape affect the rate at which an object sinks?
- How can I build a home-made thermos bottle?
- What is the most efficient design for a windmill?
- Which type of barrier is most effective in reducing highway noise?
- Design and construct a simple device to demonstrate hovercraft principles
- What is the effect of dampening on a shock absorber?
- What is the strength of dome shaped eggshells as demonstrated by their weight bearing capacity?
- Is it to build a working water clock?
- Which style of roof truss is the strongest?
- Which building design is best in withstanding an earthquake?
- Demonstrate how an AM radio detector can be constructed out of scrap materials and explain the function of the various components.
- Build a working model of a body temperature monitor and alarm. Might be great for hikers worried about hypothermia
- Can a small sensory robot be built for use on pavements and highways which will automatically search for and indicate when pavement or highway cracks of a certain size are found so they can be repaired?
- Build a freeze alarm. The device would sound an alarm when the temperature dropped below 32 degrees F.
- Design An Aluminum Powered Fuel Cell
- How Does Air Pressure, Materials & Construction of a Ball Affect its Ability to Bounce?
- Correlation Between Electric Motor Cooling And Efficiency
- A Study Of Factors Affecting Capacitance In Double Layer Capacitors
- Design A Catalytic Converter For 4-Cycle Engines

- Develop And Construct A Robotic Insect
- Can Acoustical Methods Be Used To Detect And Characterize Corrosion?
- Design A Electrically Driven Micrometer
- Why do the inside of cars get so hot in the sun and what are ways to reduce the heat?
- Is it possible to reduce noise by adding certain types of noise?
- What are the effects on dry wall thickness on sound transmission?
- Is it possible to eliminate foundation by temperature variation?
- Is it possible to make a clothes dryer more efficient by using an air-to-air heat exchanger?

Environmental Science

- Invent an electronic water usage monitor that could be easily attached to a shower head to help the user conserve water
- Build a wind energy monitor. The output signal from a simple wind speed meter (anemometer) would be fed to a computer that would calculate and plot the potential energy per unit area each day. Such a system might be useful to help define locations for wind energy farms.
- Design considerations for "Solar Heated" homes
- Design considerations for "Solar-Cell" powered homes
- What are the best designs for propellers for wind generators?
- Production of electrical energy from mechanical sources
- Which substance is best to use in blocking floodwaters?
- Develop a shower water temperature monitor. Such a device might help conserve energy
- Study of efficient home insulation. Which is the best?
- Illustrate a working model of an electrodeless sulfur lamp. Show how such lamps could save energy in home, office and street lighting needs
- The effect of landscaping and architecture on energy consumption. Which is best?
- What are the annual variations in the ecology of a body of water
- The study of the impact of pollution on an ecosystem
- A study of water pollution from feed lot farms
- Make your own aerogel cubes. Describe some uses for this new material
- Illustrate how glass foam might be used to make strong building materials with high insulation properties

- Tracing chemical (e.g. DDT) concentrations in successive food chain levels
- Ozone destruction experiments
- A study of air purification methods
- Come up with some non-chemical methods of purifying water.
- Build a lawn moisture sensor. Tells you when it is time to water the lawn. Saves water by not allowing sprinkler to turn on if the lawn is moist enough
- Demonstrate how sea wave action could be used to produce fresh water from sea water using reverse osmosis
- Build an energy monitor that displays gas and electricity usage. Unit connected to the power and gas meters. Maybe place the display next to the thermostat. Displays real time usage as well as weekly and monthly totals
- Efficient methods of breaking down crude oil in seawater
- Experimenting with microbial degradation of petroleum
- Experimenting with biodegradability
- Can Centrifugal Filtration Be Used to Remove Particles from Water Efficiently and Economically
- Find an ink that would decompose for recycling paper
- Rain- can you measure the speed and force of raindrops?-What is the effect on soil, with and without ground cover? Could you simulate the effect of rain?
- Use of solar energy- design and construct solar cookers, solar panels, etc.
- Comparing active & passive solar energy systems in cost and efficiency. Which are the best?
- An analysis of exhaust emissions of cars as related to the size of cars and tune-up conditions
- How Carbon Dioxide Affects the Temperature of Air
- An analysis of carbon monoxide, oxides of nitrogen, and hydrocarbons in our ambient air.
- How much air space maximizes insulation in various materials?
- Design, construction, and testing of a mechanical method of separating solid waste for recycling.
- The effect of air pollution on algae, protozoa, fish, insects or mosses and lichens
- What type of materials are strongest when they interact with acid rain?
- Which material filters water the best?
- The effect of air pollution on algae, protozoa, fish, insects or mosses and lichens
- Does the amount of particle pollution vary with distance from a road, with location, with height. Determine types of particles found in pollution fallout

- Exploring methods of controlling erosion
- Is air in your house the same temperature at floor level and near the ceiling? How could you spread heat more evenly through the house?
- Can magnetism be used to remove minerals from "hard" water?
- Research and demonstrate methods of pasteurizing or purifying water using only sunlight as the source of heat.
- Is there a relationship between well water contamination and animal pens?
- Compare the buffer capacity of local water sources and a means of measuring the relative pollution levels of those bodies of water.
- How effective is lettuce as a bioassay medium for determining the toxicity of water contaminants?
- What effect does water turbidity have on dissolved oxygen?
- What are the effects of biodegradable wastes on dissolved oxygen?
- From which direction does our area receive the most particulate air pollution?
- Does carbon dioxide contribute to warming in a closed environment?
- What aerosols are in the air and does air quality affect asthma rates?
- Research and experiment with different plants to see if any of them can be used as an indicator of air pollution.
- What are the effects on plant life when detergents are added to the soil?
- Examine and compare the biodegradability of different soap powders.
- Compare the effects of Polyacrylamide vs. Polyacrylate on soil erosion.
- Which types of paper decompose the most rapidly when buried?
- What effect would an oil spill have on plant life?
- Demonstrate the greenhouse effect by measuring the temperature within a light trap (box covered with glass or plastic).
- Research methods of determining past climate conditions, and prepare a demonstration relating past climates in your local area to the tree rings shown in a recently cut down tree.
- Does the pH of rainwater vary from place to place in our community?
- How does air pollution affect the growth of algae?
- The Environmental Impact Of Poultry Litter Fertilizer On Watersheds
- How Should Students Use Correction Pens Correctly?
- Surfactant Solubilization of Polyaromatic Hydrocarbons
- The Use Of Biofiltration For The Decontamination Of water
- Can water be disinfected without using chemicals?

- What are the effects of carbon dioxide on land plant life? What about water plant life?
- Are macroinvertebrates indicators of stream health?
- Can biomass be used to generate electricity by creating methane gas?
- Can soil besides a roadway be a health hazard?
- What are the best grasses to use to reduce the amount of soil in runoff?
- How to different fabrics compare as barriers against UV radiation?
- Is it possible to use recycled newspaper to fertilize plants?
- Which enzyme works best to reduce grease in a grease trap? Liquid or solid?

Gerontology

- Which age of people use their left brain more often?
- Does age effect the rate at which people get cancer?
- Compare the temperature adaptability between different age groups of people.
- Does taste change with the onset of old age?
- Does Gerovital H3 really contribute to anti-aging?
- Do age-associated changes in 'physiologic' autoantibodies contribute to infection, atherosclerosis, and Alzheimer's disease?
- If the mind is inactive during old age, does the body start to deteriorate quicker?
- Does the frequency of auto accidents increase with old age? If so should there be an age limit?
- Do people live longer in different parts of the country? If so then identify the factors that would contribute to this phenomenon?
- Age-related changes in nervous system structure and function; relationship of brain changes to changes in cognitive function and perception
- Does DNA break down as we get older?
- If elderly people interact with computers, do their mental alertness improve with time?
- Does weight training add strength in people of old age?
- Do children and or grandchildren of 90+ year olds have fewer medical ailments than those whose parents / grandparents died in their 70's?
- Alzheimer And Its Variability By Sex And Age
- The Effect of Aspartame on Maze Learning Behavior on Genetically Identical Elderly Female Rats
- Does the amount of sleep affect the aging process?

Mathematics

- The mathematics of snowflakes
- Infinity comes in different "sizes". What does this mean? How can it be explained?
- Compare the mean, median and range of heights for males and females in your class. How will this compare to a class one year older?
- What is the probability of reaching into a bin and selecting a particular color of M&M candy?
- Demonstrate the bell shaped curve for random distribution
- Does a sphere hold a volume greater than the apparent volume of a cylinder?
- Is it possible to develop mathematical systems based on numbers such as 4 or 5 instead of the normal base 10 system we use?
- Fractals Encryption & Encoding
- Can parallax be used to measure distance to distant objects?
- How Does The Number Of Trials Performed Affect The Probability
- Demonstrate experimental methods of determining the value of pi.
- Research, explain and demonstrate the use of fractals.
- Determine how the size of a statistical sample affects its accuracy.
- Can statistics be used to predict the contents of edible consumer products such as fruit snacks, a bag of jelly beans or M&Ms?
- What equalities of lengths and angles are sufficient to prove two sets of four points (quadrilaterals or quadrangles...) are congruent?
- Build models showing that parallelograms with the same base and height have the same areas. (Is there a 3-dimensional analogue?) This can lead to a purely visual proof of the Pythagorean theorem, using a physical model based on dissections.
- Consider tiling the plane using shapes of the same size. What's possible and what isn't? In particular it can be shown that any 4-sided shape can tile the plane. What about 5 sides? Make sketches in a geometry program (Sketchpad, Cabri, or using Kali
- Investigate compass and straight-edge constructions - showing what's possible and discussing what's not. For example, given a line segment of length one can you use the straight edge and compass to "construct" all the radicals? Investigate constructions using origami (paper folding). Can you construct all figures that are constructed with ruler and compass? Can you construct more figures?
- What is the fewest number of colors needed to color any map if the rule is that no two countries with a common border can have the same color. Who discovered this? Why is the proof interesting? What if Mars is also divided into areas so that these areas are owned by different countries on earth. They too are colored by the same rule but the areas there must be colored by the color of the country they belong to. How many colors are now needed?

- Polyominoes are shapes made by connecting certain numbers of equal-sized squares together. How many different ones can be made from 2 squares? from 3, from 4, from 5? Investigate the shapes that polyominoes can make. Play the "choose-up" Pentomino game.
- Investigate the creation of secret codes (ciphers). Find out where they are used (today!) and how they are used. Look at their history. Build your own using prime numbers.
- Find out all you can about the Catalan Numbers, 1, 1, 2, 5, 14, 42, ...
- Build models to illustrate asymptotic results such as Stirling's formula or the prime number theorem.
- There is a well-known device for illustrating the binomial distribution. Marbles are dropped through the top and encounter a number of pins before dropping into cells where they are distributed according to the binomial distribution. By changing the position of the pins one should be able to get other kinds of distributions (bimodal, skewed, approximately rectangular, etc.) Explore.
- Use Monte Carlo methods to find areas or to estimate pi. (Rather than using random numbers, throw a bunch of small objects onto the required area and count the numbers of objects inside the area as a fraction of the total in the rectangular frame).
- Look at the ways different bases are used in our culture and how they have been used in other cultures. Collect examples: time, date etc. Look at how other cultures have written their number systems. Demonstrate how to add using the Mayan base 20, maybe compare to trying to add with Roman numerals (is it even possible?) Explore the history and use of the Abacus
- There are several methods of counting and calculating using your fingers and hands. Some of these methods are still in common usage. Explore the mathematics behind one of them.
- Find out all you can about the Fibonacci Numbers - In particular, where do they arise in nature?
- What is the Golden Mean? Study its appearance in art, architecture, biology, and geometry, and its connection with continued fractions, Fibonacci numbers. What else can you find out?
- Investigate triangular numbers. If that's not enough, do squares, pentagonal numbers, hexagonal numbers, etc. Venture into the third and even the fourth dimensions.
- What is/are Napier's bones and what can you do with it/them?
- Discover how to construct the Koch or "snowflake" curve. Use your computer to draw fractals based on simple equations such as Julia sets and Mandelbrot sets.
- Martin Gardner in defines a paradox to be "any result that is so contrary to common sense and intuition that it invokes an immediate emotion of surprise." There are different types of paradoxes. Find examples of all of them and understand how they differ.
- Is there an algorithm for getting out of 2-dimensional mazes? What about 3-dimensional? Look at the history of mazes (some are extraordinary). How would you go about finding someone who is lost in a maze (2 or 3 dimensional) and wandering randomly? How many people would you need to find them?
- Investigate the Steiner problem - one application of which is concerned with the location of telephone exchanges to minimize costs.

- Construct a double pendulum and use it to investigate chaos.
- All forms of gambling are based on probability. Investigate how much casinos anticipate winning from you when you play black-jack, roulette, etc. Study a variety of lotteries and compare them. Should one ever buy a lottery ticket? Why does three of a kind beat two pairs in poker? Discover why the different types of hands are ranked as they are.
- Study the cycloid curve: its tautochrone and brachistochrone properties and its history. Build models.
- Investigate visual representations of different finite numbers. For example, if p is a prime with 100 digits, then if 1 and p are on the same line segment, with p say 6 inches to the right of 1, then $p^{1/2}$, the square root of p , is about 10^{-50} inches to the right of 1, less than one atom away. (And it's by inspecting the lattice points in the $p^{1/2} \times p^{1/2}$ array that one proves that p is the sum of two squares!) Investigate further.
- Investigate self-avoiding random walks and where they naturally occur.
- Find as many triangles as you can with integer sides and a simple linear relation between the angles. What about the special case when the triangle is right-angled?
- What is a hexaflexagon? Make as many different ones as you can. What is going on?
- Build models to illustrate asymptotic results such as Stirling's formula or the prime number theorem.
- What is fractal dimension? Investigate it by examining examples showing what happens when you double the scale to (a) lines (b) areas (c) solids (d) the Koch curve
- Explore Penrose tiles and discover why they are of interest.
- Do different genres of music each exhibit a unique mathematical pattern?
- How can the shortest path algorithm be modified to include traffic conditions?
- How does the size of a statistical sample affect its accuracy?

Medicine & Health

- Do the non-smoking sections in a restaurant protect you from second-hand smoke?
- Does a person's body temperature vary during the day?
- What is the affect on the kidneys from drinking different types of liquids?
- Does drinking alcohol dehydrate the body?
- How accurately can people judge room temperature?
- Construct a homemade stethoscope and use it to listen to heartbeats and measure heart rate.
- Does a person's pulse rate vary during the day?
- The objective is to determine whether the mental connotation of smells correlates with the heart's response to the scents of aldehydes (primarily fruit and flower based) and phenols (primarily leave, bark, or root based).

- What are the effects of passive smoke on ciliary function?
- Following strenuous exercise, does pulse rate stabilize faster in athletes than in non-athletes?
- Following strenuous exercise, which fluid is best to drink?
- Does the type of pushup affect muscle growth?
- Compare the neural discrimination times between assorted groups of people.
- What is the effect of ingested orange juice on blood sugar levels?
- What affect does exercise have on the oxygen level in the bloodstream?
- Compare blood pressure readings between assorted groups: male/female; athletes/non-athletes; young/old, etc.
- How effective is hypnosis as a method for reducing stress?
- Chitosan is considered potentially useful for numerous applications ranging from biomedical to industrial. Experiment with ways it would be beneficial in the medical field.
- Does jet lag affect the performance of professional sports teams?
- Are there measurable changes in temperature, pulse or respiration following ingestion of caffeine?
- Does caffeine have an effect on blood pressure?
- Do creatine supplements enhance athletic performance?
- Are herbs a viable alternative to modern medicines?
- Which beverage stains your teeth the worst?
- Determine the effect of different liquid substances on the decaying of teeth. (use animal teeth from an animal clinic.)
- Do filtered cigarettes really prevent tar from getting into your lungs when compared to non-filtered cigarettes?
- Does the use of wood burning stoves contribute to respiratory illnesses?
- Does smoking have an immediate effect on temperature, pulse, respiration or blood pressure?
- Does playing video games affect heart rate?
- Does loud Rock Music have any effect on a person's hearing?
- Does music beat have any effect on a person's blood pressure?
- Do males have a larger visual blind spot than females?
- Does visual therapy and exercise improve vision?
- Are there any health hazards associated with video display terminals?

- Is the same point on human skin equally sensitive to heat, cold, pain, etc., or do different points feel different sensations?
- Compare the temperature adaptability between different groups of people.
- What effect does phosphoric acid have on tooth enamel?
- Is there a relationship between taste and smell? If yes, what is it?
- Which is better - commercial antacids or herbal remedies?
- Determine if dosage levels affect the safety of common vitamins.
- How much sleep, exercise and nutrition do students need to maintain a healthy lifestyle?
- Does dieting affect reaction time among teenage girls?
- Are fresh, home-cooked foods more nutritious than microwave dinners?
- Are all nerves on human skin equally sensitive to heat, cold, pain, etc., or do different nerves feel different sensations?
- Is there an identifiable relationships between fingerprints in a family?
- The study of Hyperglycemia and Hypoglycemia in different test groups.
- Cockroach Allergens as Risk Factors for Pediatric Asthma.
- Garlic as an Antifungal Agent
- How does exercise affect the blood sugars in a diabetic?
- Effects of smoking on skin temperature.
- Which method of cooking is better for retaining vitamin C in foods?
- Pupil size and reaction to light - age and sex differences.
- The effect of color on depth perception.
- Does eating breakfast affect short-term memory?
- Hot tubs and their effect on blood pressure.
- Effects of foul smell on blood pressure.
- Biostatistical approach to cancer survival.
- Blood glucose level home monitors: A comparison of their accuracy.
- Cyclosporin A: How does it affect immune cells?
- Does structured breathing increase pain tolerance?
- Effect of physical exertion on physical and mental response.
- Effect of vitamins on the regenerative powers of planaria.
- Effects of optical exposure to low-intensity light.
- A study of temperature effects on CO₂ output.

- Stress: The key element in the development of diabetes.
- Are Magnetic Insoles Really superior to Conventional Ones?
- Effects of Hot & Cold Foods on Oral Body Temperature in Adults.
- Effects of Exercise on Visual Acuity
- Effects of Exercise on Blood Sugar in Diabetics
- Effects of Garlic and Vitamin C on High Blood Pressure in Human Subjects
- Effects of multi-tasking and Aging on Driving Ability.
- Hearing Damage Potential in a Dentist Office

Microbiology

- Which kind of bread grows mold the fastest?
- What kind of mouthwash kills the most bacteria?
- How can genetic engineering be used to make glow in the dark bacteria?
- Is it possible to make and use a nutrient agar from materials at home?
- Compare the amounts of bacteria in different poultry samples.
- How sanitary are the wash cloths, sponges, and sinks of the average home?
- Do the worst odors indicate the highest concentration of bacteria?
- Compare the relative bacterial levels in milk samples with different expiration dates.
- What is the effect of temperature on bacteria in milk?
- What effects do magnetic or electric fields have on bacteria?
- The Synergistic Effect of Hydrogen Peroxide and Ultraviolet Irradiation in Killing Escherichia coli
- What effect does pH have on bacterial growth?
- What effect does garlic have on bacterial growth?
- A Study Of The Effect Of Anti-bacterial Herbs On E.coli Dh5a
- What is the most effect plant antibiotic?
- The effect of nicotine, air, yeast on mold growth
- Are some types of makeup more prone to bacterial growth?
- What levels of bacteria are present in school drinking fountains?

- Which brand of mouthwash is the best control for oral bacteria?
- The effects of ultrasonic on bacteria count
- Are common sanitary procedures such as hand washing and alcohol swabbing really effective in preventing the spread of bacteria?
- How Does Ultra Violet Radiation Affect the Growth of Fresh Water Algae Spirogyra?
- Is Agar The Ideal Media Supportive Material For Tissue Culture?
- Can naturally occurring substances be used as disinfectants or antibacterials?
- Which type of bread molds the most rapidly?
- What factors are beneficial to the growth of bread molds? Detrimental?
- What is the effect of light and temperature on bread mold?
- Will penicillin mold grow best in apple juice, vinegar, water, or milk?
- What is the effect of microwave radiation on bread molds?
- Will mold(s) grow on mascara?
- What effect does ultraviolet light have on the fermentation rate of yeast?
- What effect does the sun's ultraviolet rays have on the growth of yeast?
- Will soil bacteria assist in degrading phenol?
- What are the effects of various growth medias on dinoflagellates' ability to produce bioluminescence?
- Devise a biological method to turn cellulose into sugar.
- Demonstrate how germs are killed using electrically induced pressure waves in water.
- The effect of nicotine, air, yeast on mold growth
- The effects of ultrasonic antibiotics temperature changes on bacteria count
- Microbial antagonism
- Reaction of paramecia, planaria to pH, light and temperature conditions
- Do flies transmit bacteria from one area to another? From what media is transfer easiest?
- Is the tobacco mosaic virus inhibited by modified purine and pyrimidine analogues?
- How do microscopic predators differ in their prey consumption?
- What are the effects of ultrasonic antibiotics temperature changes on bacteria count?
- Experimenting with microbial degradation of petroleum
- Demonstrate how germs are killed using electrically induced pressure waves in water.
- What atoms are in sour foods? What is it that makes some foods taste so sour? Foods are sour when they have a high concentration of loose hydrogen atoms. Do an experiments to predict how sour some foods are without tasting them.

- What molecules are in scabs? When you cut yourself, molecules in your body make a blood clot to seal the wound. The blood clot soon dries into a scab. Make a blood clot and find out what molecules are in blood clots and scabs.
- What molecules make the holes in bread? Have you ever noticed the holes in bread? Look at some bread and find the holes in it. Find out what molecules make these holes.
- Sanitizing A Child's Medicine Dispensing Device
- Effects Of Lemon Juice On Rhizopus Stolonifer
- In Vitro And The In Vivo Study Of Bacteriophage Therapy
- A complex study of bacterial growth on water bubblers (water fountains).
- What Does It Take To Kill the Bacteria On The Top of Soda Cans?

Physics

- Make your own electrets (capacitors with permanent charge) using a mixture of waxes baked in an oven. Experiment with some possible uses for the large devices.
- Build a time to dust alarm. The device would flash a light when it was time to dust. Perhaps a simple pulsed light emitting diode and photo transistor could be made to work.
- Demonstrate some uses for super bright light emitting diodes. Perhaps you could build a solid state flashlight that uses the latest super bright white light emitting diodes.
- Demonstrate a camera system linked to a VCR that is turned on only during human motion. Such a device is useful for security camera systems
- Build a voice "Babble" Generator. Circuit generates a sequence of nosey room sounds, with hundreds of people talking, interleaved so in can be continuous. Used to mask other voices, jamming of radios
- Compare the surface tension of various liquids
- Does temperature affect the output of a photo-electric cell?
- Under what different conditions can the human body act as a battery?
- What is the affect of light concentration on the output of solar cells?
- Build a "Jacobs Ladder" to demonstrate air ionization.
- Does Temperature Affect The Strength Of A Magnet
- What is the effect of heat on luminosity?
- Does the presence of water, and or other liquids, affect the magnetic force of a magnet?
- Experiment with electrical signals that are detected from metal probes pushed into the ground. Worms, insects, distant lightning strikes and human foot steps might be detectable
- Illustrate how a micro-mirror array could be used as a high speed light modulator

- Build a Tesla Coil and demonstrate the theory behind it.
- Build a working model of a system that sends data through walls using magnetic pulses
- Can an electronic device automatic sort objects by color?
- Can the earth's magnetic field be detected by a rapidly spinning coil of wire?
- What happens to the force needed to lift a weight when an additional pulley is added to a block and tackle?
- A study of radiation patterns from different antenna types
- How Does Temperature Affect the Optimal Performance of Fiber Optics
- Comparing magnetic pysteresis for different materials
- Experimental exploration of the photoelectric effect
- Experimenting with electron diffraction
- Experimenting with various separation techniques (e.g. Electrophoresis)
- Factors affecting sound dampening
- Factors affecting sound propagation
- The Relationship Between Kinetic Energy of a Dropped Object Impacting Water and Height of Its Resulting Wave
- Index of refraction of liquids versus amount of additive
- Index of refraction of liquids versus temperature
- Observations of magnetic permeability of different materials
- The physics of ski waxes
- Demonstration of principles: how is current affected by type of conductor,temperature,filament,etc.
- Efficiency studies on transformers
- The effect of temperature on resistance
- Study of formation of images on a T.V tube
- Does temperature affect data transmission in fiber optic cables?
- Voice communication with infrared light and fiber optics
- Compare transmission speeds of copper wire vs. fiber optic cable. Which is better?
- Do bends in fiber optic cable cause loss of audio data transmission?
- Which materials exhibit a photoelectric effect?
- A study of radiation patterns from different antenna types
- How Light is Affected passing through water e.g. viewing objects under water, formation of rainbows.

- How is current affected by type of conductor, temperature, filament, etc.
- Which thermometers are more accurate?
- How much heat is required to raise the temperature of various substances by an equal amount?
- Cloud chamber investigations of particles and cloud formation
- Lenses - effects of curvature, materials on light beams
- What factors affect the bounce of a dropped ball
- How can the strength of light be measured - its effect on degradable material
- What affects light reflection - refraction and diffraction of light
- How is sound produced - what affects the pitch of sound - what affects the volume of sound - how to measure the velocity of sound
- A study of infrared qualities of certain solutions
- Observation of freezing rates of water for different starting temperatures
- How does ultraviolet light react with different materials?
- What material carries the most static electricity?
- Does cold or heat affect how high a ball bounces?
- Does the amount of air in a balloon, the color of the balloon or the material the balloon is made of change the affect of heating or cooling the balloon?
- Do all objects fall to the ground at the same speed?
- Does aluminum leach out of Teflon pans?
- Does water droplet size affect rainbow brilliance?
- How long does it take fire to consume oxygen?

Zoology

- What are the conditions necessary for the life of a brine shrimp?
- Is polarized light the guidance system for Foraging ants?
- A study of stimuli that attract mosquitoes
- The factors affecting the rate at which a cricket chirps
- Study of insect or animal behaviour versus population density
- How do pet mice respond to different types of food (pellets, crushed, solid)?
- Insects' adaptations to pesticides
- Pheromones as biological control of insects.

- Cockroach behavioral studies
- Compare the PH levels in mouths of various animals and humans at different times in the day . What are the benefits from knowing the results.
- What are the effects of aspartame on the learning ability of planaria?
- Effects on the chromosomes of fruit flies.
- How Does the Amount of Protein Affect Chick Growth?
- Analysis of the effects of soil chemicals on pill bugs
- How does the amount of protein affect chick growth?
- Are most horses right or left handed and how would that information benefit you?
- What are the reactions of worms to various surfaces?
- How fast is a snail's pace on various surfaces?
- What are the effects of aspartame on the learning ability of planaria?
- Planaria regeneration experiments.
- Analysis of owl pellets for determining owl diets and mammal distribution.
- Investigating the homing instincts of pigeons using celestial navigation
- Is it possible to get ants intoxicated? How can you tell if they are?
- Does room temperature have any effect on ant populations?
- What are the effects of light and darkness on ants?
- Does an extract of crushed lady bugs work as an ant repellent?
- Do insecticides always work against roaches or do they develop a tolerance?
- What natural insecticide is most effective against crickets?
- Does host species affect the wing size of adult female *Melittobia digitata*?
- Does alcohol, caffeine or other drugs affect a spider's ability to weave its web?
- What makes a lightning bug glow? Can we reproduce the glow?
- What is the effect of strong magnetic or electric fields on insects?
- What is the effect of exposing moth pupa to radiation?
- Does temperature affect how well an insecticide will work?
- Is color a factor in attracting various types of insects?
- What is the role of oxygen's radical in the aging of fruit flies?
- What is the effect of caffeine and/or tobacco on the growth of mealworms? What are the best conditions for hatching chicken or duck eggs? Build a simple incubator and then test with different temperatures/humidity

- What effects will synthetic steroids have on the growth of chickens? (SRC Approval needed prior to project)
- Does playing music increase egg-laying in chickens? Ducks?
- Are hummingbirds attracted by any certain color of feeder?
- How does temperature affect the growth of tadpoles?
- Does the amount of light present affect the activity level of goldfish?
- What is the reaction of brine shrimp to changes in water salinity, pH, temperature changes or light variations?
- What effect does light have on crawfish?
- What effect does light have on euglenas?
- Can clams survive in solutions other than salt water?
- Does different types of music affect the ability of mice to run a maze?
- Does diet affect the memory of mice to run a maze?
- What is the effect of androstenedione on a rodent's weight? (SRC Approval needed prior to project)
- Will the use of lithium chloride affect a rodent's food preferences? (SRC Approval needed prior to project)
- Can artificial lighting be used to alter an animal's sleeping habits?
- What effect does increased soil acidity have on earthworms?
- Can the heartbeat of an earthworm be monitored?
- What is the effect of different levels of light, temperature on an earthworm?
- Are there any effects from feeding snails alcohol-saturated food?
- Hamster activity and the phases of the moon
- Does surrounding color affect an insect's eating habits?
- Is There A Frequency of cricket chirps vs. air temperature?.
- Determination of adhesion strength in *Collisella scraba*, a limpet.
- Effect of cromolyn sodium on mouse heart rate.
- How do different planarian species react to various mitotic inhibitors?
- Synaptic response in the cockroach.
- The effect of regeneration upon memory in planaria.
- What is The Effect of Different Temperatures on the Number of Eggs Chickens Lay
- Do Purebred Dogs Have More Health Problems Than Mixed Dogs?
- Does the Ingestion of Aspartame or Nutrasweet affect the Life cycle of Mealworms?

- What are the effects of Water Temperature on the Color of Fish?
- Does animal tissue regenerate faster in a high magnetic field?