

Project ideas Version 11

This collection now contains some 1850 science fair and science project ideas. I am now developing help files, for the projects. These will give people planning projects extra ideas and pointers and hints, but no complete solutions. In the end, your project is *your* project, so you may expect help, but that is all. My aim has been not to give complete tasks, but to provide sparks that will give people some ideas, either directly, or indirectly, by making them think of something of their own that they could do.

The ideas are roughly grouped by the type of activity, and by subject matter, but you would be well-advised to spend some time browsing around, or searching for key words to see what may suit you. The ideas tend to get harder as you work down the list, but you can make a simple task from the hardest idea, or a complex study from a simple idea. And just because I have posed a question, that does not mean it can be answered — I might have just been wondering whether it was possible to find an answer at all. Any fool can ask a question that has no answer, and I am no exception!

No idea has gone in this list unless I thought I could probably do it, given the right materials and some research. There are a number of entries where all you have is a name, like Foucault's pendulum, where I have left you to find out what it was, and why it was important. In most cases, a Web search for the exact phrase will get you close to an answer.

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All the same, don't make too many copies — keep coming back to see what I have added, because I am adding two or three new ideas every day, and may add an "afterthoughts" section at some stage. Your suggestions for additions, and corrections are all welcome: you can e-mail your observations to me at the addresses shown on the last page. As I have indicated on the Web version, please try other avenues of help before you come to me — I am just a little bit busy until the end of 2002.

Poster/display projects

Animals

How my favourite animal moves

The invertebrates people eat

Insects: good or bad?

Flies

Mosquitoes

Bees

Cicadas

Butterflies

Ants

Dragonflies

Wasps

Stick insects

Spiders

Earthworms

Earthworms and soil

Primitive animals

Prehistoric animals

Prehistoric insects

The age of reptiles

Were dinosaurs warm-blooded?

Biological control methods

Birds in my garden

The care and feeding of birds

Parts of a bird

Migration of birds

Parts of a hen's egg

Parts of a horse

Rats are eating your food

Marsupials

Koalas

Possums

Kangaroos
Bandicoots
Dingoes
Rabbits as pests
Feral cats
Brumbies
Cloning an animal

Human biology

The human heart
Blood circulation
The nervous system
How a tooth decays
How skin forms
How skin heals
The human eye
Parts of the eye
The ear
Human nutrition
A healthy breakfast
Food values
Inside fruit
Testing for food starch

Plants

Prehistoric plants
Mosses
Liverworts
How plants reproduce
Growing trees
The life story of a tree
Leaf characteristics
Germination
Plants grow toward light
Chlorophyll
Miniature greenhouse
Nuts, cones and seeds
How seeds travel
Wild flowers
Parts of a flower
The parts of a cell
Flower collection
Different types of bark

Ecology

A balanced aquarium
Habitat studies
The street trees near my home
Weeds that grow near my home
Ecology of our school grounds

The things living on a single plant
Bushfires
Bushfire regeneration
Biomes of the world
Inside a rotten log
Inside an old tree
Animals under the ground
A model swamp in a tank

Space science

The solar system
The sun, moon and earth
Phases of the moon
Meteors
Asteroids
Auroras
My favourite constellations
X-ray astronomy
Radio astronomy
How an interferometer works

Earth science

Faults and joints
Earthquake damage
Volcanoes
How mountains are made
How cliffs form
How valleys are made
Coal
Oil and oil prospecting
Natural gas
Mud
Soil conservation methods
The origins of soil salinity
How do deserts develop?

Weather

The barometer and what it tells us
Clouds
Fog and mist
Rain and snow
Hail
Measuring winds
El Niño and La Niña

Medical

How vaccines work
The Black Death
How antibiotics work
Anesthetics

Clean water and health

Miscellaneous

What is matter?

What is matter made of?

Types of matter

Why perpetual motion does not work

The physics of toys

Bridges that fall down, and why

The Plimsoll line

Models and demonstrations

Electrical and magnetic

Rust and rust prevention

The electromagnetic spectrum

How electricity is made

The thermocouple

The Bunsen-Grove Battery

A Daniell cell

A model Galvanic pile

Fuel cells

Solar cells

A model generator

The telephone

The telegraph key

Sending messages by electricity

Working of a telegraph

A simple compass

Electromagnetism

The principles of a transformer

A working electromagnet

Wheatstone's 6-needle telegraph

An electromagnetic crane

A model train signal

How traffic signals work

The electric eye

Burglar alarm systems

A bell system

The action of a solenoid

The uses of a solenoid in the home

The electrical relay

A door chime

A model galvanometer

The blinker light

A crystal radio set

Fluorescent lights

Operation of a doorbell

Parts of an electric motor

The arc light

Bulbs in series and parallel

An electronic rain gauge

Linear motors

The practical uses of superconductors

Energy

Where we get energy from

The conversions of energy

Types of fuels

Products made from oil

Wave power

Wind power

Chemical changes

Fire must have air to burn

Power and food from the sea

Our natural resources

A solar furnace

Steam propulsion

Steam turbines

Overshot or undershot water wheels

Natural and machine jet propulsion,

The internal combustion engine

Applications of expansion and contraction

Applications of conduction and insulation

How does a nuclear reactor work?

The nuclear fuel cycle

Machines and engineering

Simple machines

Machines made work easier

The fulcrum and the lever

The science of the woomera

A model arm

A model skeleton

The efficiency of a block and tackle

Uses of the wedge

Power transfer by drive trains

Power transfer by line shafting, belts and chains

Power transfer by hydrodynamics

How jet engines and rockets work

Model aeroplanes

Paper aeroplane designs

What makes a kite fly well?

Parts of a sailing boat

Parts of a windmill

Workings of an irrigation pump

Pump design

A string pump in action

The science of the bow
Medieval building and lifting tools
Siege engines
Making tunnels by hand
Ballistas, onagers and their relatives

Body systems

Circulation in different animals
A model of the heart
Getting oxygen around the body
A lung model
Digestive systems
How do invertebrates chew their food?
Teeth in different animals
A comparison of several skeletons
Cleaning and articulating a skeleton
A model of an arthropod leg
Nervous systems
Reaction times
Hearing in different animals
Vision in different animals
A model of the eye
The depth of focus of the eye?
A model of the human ear
Making sound waves visible
Feedback in living things
Wings in bats, birds and insects

Fossils, the history of life

A history of shells
How fossils are formed
How fossils are found and prepared
How fossils are interpreted
The fossils in soft coal
Dating methods for fossils and rocks
Tree-ring dating

Earth sciences

Inside a cave
Minerals: origin, distribution
Cross section of a volcano
Cross section of an oil well
Cross section of the earth
Minerals
Rocks and the rock cycle
Hardness in rocks and minerals
Mining methods before 1750
Modern mining methods
Petroleum and oil
Forces changing the earth's surface

What causes erosion?
The evidence of erosion happening
How can soil erosion be prevented?
Air pollution: causes and solutions
Electrostatic particle precipitation
Precipitation: rain, snow and sleet
A seismograph
Measuring the ocean depths
Models of folding and faulting
The phosphorus cycle
The nitrogen cycle
The carbon cycle
Coriolis forces
Fossil seeds
Types of mud
Meanders and billabongs (oxbow lakes)

Water

The water cycle
El Niño, La Niña and the ENSO
Bubbles, films and surface tension
How are animals affected by physics?
Water pollution from industrial causes
Water pollution from run-off stormwater
Eutrophication and algal blooms
Algal blooms in sea water
The causes of salination in soil
The cures for salination in soil
Distillation of water
Solar distillation of salt water
Water filtration methods
Water finds its own level
How do steel boats float?
The Plimsoll line
Why don't ships and boats turn over?
Why don't ships and boats sink?
Canals and locks
A meter to measure liquid flow
Aqueducts
Water supplies and water management
Water supports heavy weights
Water is a compound
A study of a stream
Tides, their causes, and prediction
Floods and their causes
Droughts and their effects
A model water table
A model of a spring
Is spring water better for you?

The behaviour of waves
Dripping taps and water waste
Water drop formation
How much water will different fibres absorb?
The Coolgardie safe
Capillary effects

Meteorology

Global weather patterns
The evidence for global warming
Air currents
Climate and how it is assessed
Weather and human survival
A weather station
The effects of air pressure
Air pressure in a mercury barometer
A water or glycerin barometer
A model hygrometer
Weather instruments and forecasting
Wind vane design
Making an electronic anemometer
Detecting and tracking a thunderstorm
Making an effective anemometer
How does a rain gauge work?
Homemade weather instruments
Snowflakes
Frost
The climate of your own home
What makes some clouds black?
If the Earth was a cube
If water melted at 20°C
If ice was more dense than water

Space science

Causes of day and night
Causes of the seasons
Causes of eclipses
Astronomy without a telescope
A model of the solar system
The planets
The asteroids
Comets
Rotation of the planets
Our solar system
Phases of the moon
Constellations
Space travel is coming
Measuring outer space
A safe apparatus for observing the sun

Different types of telescope
How far away is the moon from Earth?
How far away is the sun from Earth?
How far away is a planet from Earth?
How far away is a star from Earth?
Finding planets of other stars

Materials

Viscosity and its uses
Does heat affect the viscosity of liquids?
Does the viscosity of a liquid affect its boiling point?
Which liquid has the highest viscosity?
Viscosity of fluids in flywheel bearings
Which liquid has the highest viscosity?
Glass and its uses
Expansion and contraction of liquids
Which metals conduct heat best?
The quartz family
Models of atoms
Models of molecules
Models of crystals
How flux works with solder
What kind of glue holds two boards together better?
Creep in copper wire
Creep in rubber
The creep of lead

Manufacturing and technology

Bridges
The strength of materials
How are metals made?
How are metals formed into useful things?
How are plastics made?
How are plastics formed into useful things?
How is glass made?
Moulding and casting
Salt and its uses
Sulfur in industry
Mercury, a peculiar metal
Manufacturing machinery
Machines and tools
Weaving and sewing techniques
Printing methods
Pottery and ceramics
Grain storage and transport
Food storage before refrigerators
Building ships and boats without nails
Stone tools
What affects the making of glass?

What affects the making of steel?

Inventions

A solar-powered water purifier

New uses for throwaway items

Getting to the clothes line in muddy conditions

Keeping snails off the garden

Building a fly trap

Making an efficient cockroach trap

A cockroach detector

A mouse detector

Keeping ants out of the kitchen

Keeping cats out of the garden

An apparatus to provide a constant force

A method for encouraging spiders that eat mosquitoes

Optics

Light and how it operates

Lamps old and new

The Argand lamp

Lenses, concave and convex

How spectacles work

Which type of sunglass lens blocks the most light?

A model periscope using prisms

How a burning glass works

How a microscope works

A simple microscope model

Cameras and their use

A projector

How a computer works

Making a chip

Sugar glow

Optical illusions

The Fraser illusion

Munsterberg illusion

The Pulfrich pendulum illusion

The blind spot in your eye

Camouflage in nature

The Fresnel lens

Mapping and measuring

Using a compass to map an area

Profiles of the bottom of a meandering river

Topographic mapping

Contour mapping

Surveying methods for mapping

Measuring latitude by the noon sun

Plotting the noon sun over six months

Calibrating water clocks

Temperature and the water clock?

Sundials and sundial design

Candles as timing devices

Making a more efficient candle

Forensic science

Fingerprinting as a method of identification

Forensic science methods

Pencil lines under the microscope

Identifying different inks

Identifying different types of pen

Identifying different pencil leads used in drawing

The Bertillon method of identification

The validity of Cesare Lombroso's system

Edmund Locard's exchange principle

How can you tell the age of buried bones?

Identifying different animal blood samples

Identifying textiles from a single fibre

Miscellaneous

How is sound obtained from a compact disc?

The flame of a wax candle and what it reveals

Spectroscopy of a candle flame

The effect of sound on a candle flame

Applications of Bernoulli's Principle

Demonstrations of Newton's Laws

Collections

A rock collection from an area

A collection of rock thin sections

A fossil collection from an area

A mineral collection from an area

A lichen collection from an area

A moss collection from an area

A crystal collection

Zircons from granite

A leaf collection

A wood collection

A seed collection

A shell collection

A feather collection

A collection of photos of birds in an area

A collection of photos of cloud formations

A tape of frog calls from an area

A tape of bird calls from an area

A herbarium collection of wildflowers

A herbarium collection of weeds from an area

Pollen grains from local plants

A photo album of the fish found in a small area

Scat photos and track casts of wild animals

A collection of fibre microphotographs
Photographs taken with a pinhole camera

Experiments

Electricity and magnetism

How do magnets work?
How are magnets made?
What kind of things do magnets attract?
How can you measure the strength of a magnet?
Core temperature of an electromagnet and its strength
The effect of temperature on the strength of a permanent magnet
How electromagnetic waves carry energy
Applications of electromagnetic waves carrying energy
Do electromagnetic fields affect plant growth?
Do strong electromagnetic fields affect microorganisms?
What blocks a magnetic force field?
Can magnets erase a floppy disc?
How is current affected by the type of conductor?
How is current affected by the temperature?
Does temperature affect electrical conductivity?
How do similar alloys conduct electricity?
How is current affected by the diameter of a wire?
Comparing electromagnets for strength
What affects the strength of an electromagnet
Comparing wires for electrical conductivity
The principles of fluorescent lights
Electrical discharges in different gases
How conductive is damp wood?
The forces on conductors carrying electric current
Does temperature affect the operation of a solar cell?
The forces between magnets
The efficiency of a 12 volt motor

Sound

How can we show that sound is vibration?
How can we tell where a sound comes from?
How good are we at hearing one voice in a crowd?
Can mothers recognise the cry of their own child?
Can fathers recognise the cry of their own child?
How do parents and other adults react to the cry of a child?
What makes three tenors all sound different?
How far can speech be transmitted through a tube?
How important is diameter in a long speaking tube?
The resonance of metal rings
The resonance of wine glasses
Do soap bubbles have a natural resonance?
The glass harmonica

Chladni figures
The dawn chorus
Voiceprints of birdsongs
Voiceprints of frog calls
Voices and how we tell them apart
An electro-mechanical speech synthesiser
The acoustic properties of a kettledrum
A new musical instrument
Which type of line carries sound waves best?
What factors affect the pitch of a musical instrument?
How do different solids affect the transmission of sound?
Does the length of a vibrating object affect sound?
Vibration of a rubber sheet
Transmission of sound through water

Classical physics

Which metal has the greatest heat capacity?
How do different metals compare in specific heat?
Measuring the heat capacity of different liquids
Do all metals expand at the same rate when heated?
Do metals expand at the same rate at different temperatures?
Will different air temperatures affect the size of a balloon?
Pressure/volume relationship in a rubber balloon
Forces in the skin of a balloon
How are hot air balloons different from blimps?
Does temperature affect the flight of hot-air balloons?
How much do liquids expand when they are heated?
The conduction of heat in different metals
Where are the main heat losses in a thermos flask?
How and where do humans lose heat in cold weather?
Does aluminium foil make a difference in cooking times?
How do metals compare in conducting heat?
How do different metals compare in density?
How does temperature affect the density of liquids?
Comparing the density and buoyancy of different objects
How much salt does it take to float a fresh egg?
Does water with salt boil faster than plain water?
Colour and the thermal radiation an object absorbs
Comparing the densities of different gases
The effects of different salts on the freezing point of water
How efficient are different types of steam engines
A wind powered AC generator system
How do water waves carry energy?
How do obstacles affect wave motion?
The effect of shelving on breaking of waves

Origins and forms of waves at interfaces
Three-dimensional waves in jelly
What limits the speed of a boat in water?
What limits the speed of a truck?
What limits the speed of an aircraft?
What is the best nose cone shape for a model rocket?
Plotting the path of a ball through air
The flight properties of a shuttle cock
Determining viscosity from the free fall of a sphere
Viscosity measurements

Light and vision

How long does the flash from a flashbulb last?
Designing a better pinhole camera
The optimum aperture of a pinhole camera
How is light affected as it passes through water?
How do rainbows form?
Lenses of ice and other materials
A simple reflecting telescope
A home-made microscope
Microphotography
Diffraction gratings
Lens making
Liquid crystals
Liquid lenses
Materials that polarise light
The polarisation of scattered light
The polarising effects of Sellotape
Polarised light from sky
How reflected light is polarised
Reflections
Measuring the speed of light
Moiré patterns
Oil films
Refraction
Chromatic aberration and achromatic lenses
Rutherford scattering
Scattering light
Shadowgrams
Stereoscopes
The Poisson spot
The spectra of different lamps

Chemistry

Are some substances more soluble than others?
Does temperature affect solubility?
How is chemical change affected by heat?
How is chemical change affected by light?
How is chemical change affected by catalysts?

How are acidic and basic solutions produced?
How can acidic and basic solutions be modified?
What acid and basic solutions are around the house
Does temperature affect the pH of acids?
Temperature and the pH and conductivity of water
Acid in orange juice
The pH levels of different types of apples and oranges
Acidic, basic, and neutral liquids
The amount of oxygen and the rate of burning?
Kitchen chemistry
Mayonnaise
Bathroom science
Garden chemistry
Laundry and bathroom chemistry
Coagulation
Colloidal suspensions
Emulsions
Flocculation
Diffusion and its uses
Gas chromatography
Liesegang bands
Monolayers
Paper chromatography
Salt fountains
Thin layer chromatography
Why do old oil paintings crack?

Technology

Necking and other effects in stretched polymer sheets
Design a vacuum pump
What are the properties of a good synthetic rubber?
Can cloth or string be made from local materials?
Designs for string bags
A reed basket
A hand-made fish trap
Cat's cradles
The physics of fly casting
Heat engines using rubber-bands
Hitches and knots
Sundials and sundial designs
How big should a parachute be?
What controls the descent rate of parachutes?
The aerodynamics of hang-gliders
The flight of the Frisbee
How do aeroplanes fly?
The best wing shape for an aeroplane
What makes a good kite?
Does the shape of a kite affect its flight?
Better boomerang designs

Parachute design and terminal velocity
How many blades should a fan have?
The hydrodynamics of sailing craft
Sail material, shapes, size and boat speed
The slot effect in close hauled sailing
Sea anchor designs
Efficient windmill designs
How does the design of a windmill's blades affect its power?
Which propeller shape works the best?
Turbine blades
The Stirling engine
Casting metals
The effects of pouring molten metal into water
What sort of sand works best for cire perdue casting?
Glass blowing
The structure of iron and other metals

Kitchen studies

How much weight does a tea bag lose?
How much will a celery strip curl when soaked in water?
Popcorn popping rates
Sorting and disposing of rubbish from the kitchen
Which decays first, brown bread or white bread?
Telling a fresh egg from a stale egg
Telling a hard-boiled egg from a raw one
Identifying a shaken can of drink without opening it
How biodegradable are 'biodegradable' products?
Brown bananas
What makes apples go brown?
How much of an apple is water?
How much water is there in dried fruit?
How much of an orange is water?
Will oranges rot faster in the refrigerator or out of it?
How can we speed or slow the ripening of fruit?
Does light affect the ripening rate of apples?
Does temperature affect the ripening rate of apples?
Will apples ripen slower if isolated from each other?
What conditions slow the ripening of fruit?
Does storage temperature affect the acid content of fruit?
How does ethylene affect the sugar content of apples?
Which part of the refrigerator is best for storing fruit?
Does all fruit keep better in the refrigerator?
Does lettuce keep longer in the refrigerator?
What is the best temperature to store milk?
Which freezes first, hot or cold water?
Salt, ice and anti-freezing effects at different temperatures

Can you separate salt from water by freezing?
Will water with salt evaporate faster than water without salt?
Does an ice cube melt faster in air or water?
Which part of the refrigerator is coldest?
How much detergent do we really need to wash up?
The physical efficiency of common surfactants
Dyes made from local plants
Fading rates in naturally-dyed cloth
Do all colours fade at the same rate?
Which fabric dyes last the longest in the wash?
Which flowers and/or foods act as indicators?
Which food colourings are also acid-base indicators?
Which coloured foods are also acid-base indicators?
Hydrogen ion content and pigment colour
What is the colour composition of red inks, dyes and paints?
Electrostatic precipitation of dust particles
What is in the dust that collects in my house?
Dust mites
Which natural fruit juices contain the most Vitamin C?
Does heat destroy Vitamin C?
Do light affect the Vitamin C content of juice?
Which type of packaging retains Vitamin C the best in orange juice?
Comparing the pH of different antacids
Which common beverage is most acidic?

Community science

Planning a community
The city of the future
How effective is recycling in my community?
Variations in the background radiation in my community
A sound and noise map of my community
A lead pollution map of my community
'Concrete cancer' in seaside or industrial areas
The influence of warming up on performance
Does a bath take less water than a shower?
The amount of daily unrecyclable household rubbish (trash)
How can feral predators be controlled?
Developing insect pest lures
Testing marigolds to control insect pests
The wattage of light bulbs and the heat they emit
More efficient design in light fittings

Water and other fluids

Fluids, and why they are special
Liquids
What is in tap water?

What types of bacteria are found in tap water?
Testing the purity of bottled water
Testing the quality of water
How clean is the water off my roof?
Can the sun's energy be used to clean water?
Does the amount of solute affect the rate of evaporation of a solution?
Does the type of solute affect the rate of evaporation of a solution?
How does temperature affect evaporation rates?
How does humidity affect evaporation rates?
How does wind speed affect evaporation rates?
How much cooling can evaporation produce?
Do all liquids cool as they evaporate?
Cleaning up oil slicks
The freezing of water
Freezing water, rates, and initial temperatures
Frost and how it forms
How strong is ice?
Hero's Fountain
Hydraulic rams
Water pumps for the developing world
Liquid streams
Design a highly efficient chimney pot
Non-Newtonian fluids
Does the flow rate of water affect its pressure?
The coiling of liquid streams
Convection currents in liquids
Vortexes in water and flames
Wakes and washes from vessels
What are the aerodynamic forces on a motor car?
What shapes the bow waves produced by a boat?
What makes a low-drag hull?
Hull design for different types of craft
How does wing design affect lift?
Factors affecting the lift of an aerofoil
What is the best design for reduced wing drag?
How does the shape of an aeroplane's fuselage affect drag?
Behaviour of drops on a hot plate
Behaviour of ink drops in water
Water droplets that float on water
Why does the shower curtain move inwards?
The flow of water around a U-bend
Water flow round obstructions
Water impact with a plane surface of water
The flow over dam spillways
Estimating the flow in a river
The efficient design of street drains

Plotting the water table on a beach
Sampling a 100-metre water column
Water temperature and flotation
The Venturi principle
What influences the flow of sand, powders and crystals?
The factors making the ideal spout for pouring
Rings formed by running water on flat plates
Rotating liquid surfaces
The study of splashes
Which materials absorb the most water?
What type of soil filters water best?
What materials dissolve in water?

Meteorology

What colours can be seen in the aurora?
How does day length vary over the year?
How does day length vary with latitude on a given day?
When does dew form?
Measuring how much dew is formed in a square metre
Do frost factors increase the amount of dew?
How reliable is a hygrometer?
How does the temperature change during the day?
Make your own thermometer and keep your own records
The rainfall near home and the daily weather reports?
How does cloud seeding work?
What does the structure of a hailstone tell us?
What would happen to the weather if the Earth was a cube?

Earth sciences

Columnar jointing in igneous rocks
Mud cracks
How do different soils differ?
How important are earthworms to soil and plants?
Soil components and the growth of plants?
What are the influences on soil of microarthropods?
How fast is the rock weathering on a fresh surface?
Can you get water out of a stone?
What are the densities of different rocks?
The water content of different soils
The water-holding capacity of different soils
Which type of soil will erode most easily by running water?
How does slope affect stream velocity?
How much water is there in dry "soil?"
Soil porosity and the water-holding capacity of soil
What is the porosity of different types of soils
Which type of soil absorbs the most heat from sunlight?
How do meanders form in a river?
How much silt is there in a river at different times?

A model Foucault pendulum

Beach science

Plants

What use is a stem for a flower?

What controls the movement of water through plants?

Day length, animals and plants

How much plant food is best?

How do plants get nitrogen?

Which plants add nitrogen to the soil?

Plants and their responses to light

How much light does a plant need to find the light?

What colour light do plants grow best in?

The best growing media for lettuce and radish seeds

Atmospheric pressure and seed germination rates

Atmospheric pressure and plant growth

The effects of increased oxygen levels on plants

How much water do plants absorb?

How do insectivorous plants catch their prey?

How water moves through the plant

Leaf internal structures in different genera

The structure of the flower in grass.

How fast do grass roots grow?

Variations in a single species of grass

Plant reproduction

Which plants move, why and how?

The effects of gravity on seed root growth and direction

Can endangered ferns be grown from spores?

Measuring the metabolism of a fungus

Measuring the metabolism of seeds

The effect of chlorination on algae

Controls for algal growth on wet paving

What really grows between the tiles in the shower?

Grafting in plants

Can a tomato plant be grafted to a potato plant?

Nutrition of plants and fertilisers: what do plants need?

Comparisons of artificial and organic fertilisers

Using plants for bioremediation

What effect does oil have on water plants?

Animals

What is the life cycle of a fly?

How long does a fly live?

What factors affect the pupating rate of house flies?

What is the life cycle of a butterfly?

How many ants are there in a nest?

How far do the ants of a nest travel for food?

How far do bees travel from their hive?

What conditions are best for the growth of walking stick

insects?

Behaviour of crickets in a closed system

The affect of humidity on the 'singing' rate of crickets

How does the intensity of light affect the behaviour of crickets?

How does acceleration affect the behaviour of crickets?

How do crickets respond to caffeine?

How does caffeine affect the heartbeat of water fleas?

What natural substances will kill mosquito larvae?

Which herbs can be used as a pesticide to control mosquito larvae?

Using citrus peel as a natural pesticide to control mosquito larvae

Testing the effectiveness of several natural insect control measures

Which environmental conditions do 'sow bugs' prefer?

What are the effects of temperature on insects?

Breed cockroaches to learn their life cycle

Regeneration in planarian worms

How do different environments affect the regeneration of flatworms?

Do magnetic fields affect the growth of flatworms?

How does pH affect the regeneration rate of planaria?

How does water temperature affect the regeneration rate of planaria?

How does the concentration of dissolved oxygen affect the regeneration rate of planaria?

Does an earthworm react to light and dark?

How does different coloured light affect the behaviour of earthworms?

Chemical communication in earthworms

Does an earthworm react to noise or tones?

How do earthworms manage with no skeletons?

How does earthworm population relate to soil type?

The effect of moisture on activity in earthworms

What soil factors do earthworms prefer?

Which travels faster: a snail or a worm?

How far does a snail travel in one minute?

How much can a caterpillar eat in one day?

What are the humidity preferences of a flour beetle?

What foods do mealworms prefer?

What foods make mealworms grow fastest?

Reactions of mealworms to different types of surfaces

How do different colours affect the behaviour of mealworms?

How do ultrasonic sounds affect mealworms?

Which environmental conditions do mealworms prefer?

How does temperature affect the activity of mealworms?

How do different levels of salinity affect brine shrimp?

How does pH affect brine shrimp?

What is the effect of temperature on the respiration rate of goldfish?
How do pet mice respond to different types of food?
What are bones made of?
What determines how strong a muscle is?
Seeing blood cells in various animals
What surface does a snail move fastest on?
Do ants like honey or sugar better?
Do different kinds of caterpillars eat different amounts of food?
Do different size caterpillars eat different amounts of food?
Do mint leaves or other herbs repel ants?
How does water quality affect the ciliates in a pond?
The effect of light on the growth of ciliates
How do detergents affect brine shrimp?
What environmental factors will increase the heart rate of daphnia?
The effects of water pollution on snails
What is the effect of an oil spill on brine shrimp?
Using bacteria in hydrocarbon bioremediation

Animal behaviour

Behaviour of magpies
Behaviour of crows
Behaviour of seagulls
Learning in cockroaches
Learning in slaters (woodlice)
Learning in planarian worms
Do mealworms prefer light of dark environments?
Does noise affect learning?
The effect of written and verbal stimuli on learning
How do learning styles affect memorisation?
How does a single species of animal communicate?
Does body language depend on your culture?
Do animals prefer or avoid coloured water?
How much can rats learn?
What instincts does a dog still have?
What instincts does a cat still have?
Can a goldfish learn?
Short term and long term memory
Stimulus and response
Subliminal messages
Does surrounding colour affect an insect's eating habits?
Responses of soil arthropods to light, moisture and soil
The effects of age on reflexes
How do day-old domestic chicks behave?
What colour of birdseed do birds like best?
Can you train a fish to respond to sound?
How high can a dog count?

What factors affect the ability of a rodent to negotiate a maze?
Wall-seeking behaviour in mice
How mice respond to being separated?
Colour preferences in gerbils
How does age affect learning abilities of hamsters?
What is the effect of height above ground on the attraction of birds to a feeder?
What colour of birdfeeder will attract the most birds?
Light and its affect on the eating behaviour of mice

Senses

How do people differ in the ability to match the pitch of two sounds?
Can you tell where sound comes from when you are blindfolded?
Does exercise affect your reflexes?
Does bright light affect acuity of vision?
Can you see better if you limit the light that gets to your eye?
The blind spot
Afterimages
The Benham disc
Humming and vision
How does your vision change with age?
Can colour-blind people see past camouflage?
Do dogs (or other pets) see colours?
It's better having two eyes!
Eyes and the ability to judge distances
Computer-generated stereoscopic images
The lateral line in fish
What senses does a starfish have?
Can food be tasted without being smelled?
How much does age affect the sensation of temperature?
How accurately can people judge temperature?
How does colour affect perceived taste sensations of noncarbonated beverages?
Taste sensitivity of smokers and non-smokers
Can things be identified by just their smell?
How much does age affect the sensation of smell?
How well do dogs smell?
Can land snails smell and hear?
Do boys and girls have similar powers of smell?
The effects of sight and smell on taste
Identifying food while blindfolded
How much does age affect the sensation of taste?
How well can boys and girls identify fruits by taste alone?

How well do we identify food by taste alone?

How well can people judge time without a watch or clock?

Is using two eyes to judge distance more accurate than using one eye?

Taste on the tip of the tongue

Does the human tongue have definite areas for certain tastes?

Which taste sense is most sensitive?

Tasting the difference between regular and fat free foods

How do people differ in their ability to detect sweetness?

Adults, children, and Cola drink recognition

Do animals have a magnetic sense?

Can you tell what something is just by touching it?

How reliable is the sense of touch?

Can we train our sense of touch?

How is 2-year-old talk different from ours?

How many words does a 2-year-old know?

How large is the vocabulary of a 12-year-old?

How large is the vocabulary of an adult?

How do roots respond to gravity?

Miscellaneous biology

Heart rate, fitness and exercise

Do children's heart rates change as they get older?

How does music affect heart rate?

What activities affect your heart rate?

What is the effect of caffeine on blood pressure?

What is the effect of exercise on blood pressure?

What is the effect of aerobic activity on respiration rate?

Pulse reactions

Do boys or girls have a higher resting heart rate?

Are boys taller than girls of the same age?

Do boys or girls have the biggest feet?

Do boys or girls have the smallest hands?

The history of a growing tooth, from casts

What effect does coffee have on blood pressure?

Making a terrarium

The physics and biology of pole-vaulting

What body form makes a good sprinter?

What body form makes the best distance runner?

What body form makes the best tennis player?

What body form makes the best swimmer?

What body form makes the best diver?

What body form makes the best gymnast?

Do taller people run faster than shorter people?

How friction effects a runner on different surfaces

Electronics

Which home materials make the best capacitor dielectric?

Transmitting still pictures

How does the gauge of wire affect the resistance in a circuit?

Which materials make the best resistor in a circuit?

Characteristics of a light dependent resistor

How do LDRs respond to different colours?

The photoelectric effect in semiconductors

Which two wires produce the most thermoelectricity?

The piezoelectric effect

The electrical characteristics of a solar cell

Using a transistor as a zener diode

The interference produced by electric switches

Minimising feedback in a microphone system

The noise in a hot resistor

The carbon microphone

The capacitor microphone

Making and testing a graphite strip microphone

Loudspeakers and enclosures

Building and testing an electrostatic speaker

A comparison of three loudspeakers

Computer-based projects

Practical applications of control systems

A walking machine with stepper motors

Maze-solving 'robot mice'

A simulation of evolution through natural selection

Number theory studies with a spreadsheet

A simulation of genetic drift

Surveys and reports

Engineering

The forces on fences

The forces on power line poles

The design of light poles near roads

Are bridges built to last?

Better hovercraft designs

Earth sciences

How the ancient Greeks knew the Earth was round

Geological structures in my area

Building stones used in my area, and their origins

The evidence of weathering and erosion in my area

Soil types in my area

Field Studies

Plant and animal life in the school grounds

A population study of a vertebrate species

Who eats what in the local park?
The pattern of grass species on a lawn
A study of a creek or stream
A study of a grassy field
A study of a single tree
A study of a home garden
The life in a compost heap
A study of a balanced aquarium
Changes in the populations of a grass clippings heap
Changes in the leaf litter animals of an area
Life in an area across several seasons
The diets of various animals
How dangerous is waste plastic in the environment?
How long does rubbish take to break down?

Biological

How does a spider make its web?
What weight can a spider's web hold?
How does a bird make its nest?
Bushfires: what factors influence bushfire danger?
How do roots detect and grow towards water?
Why do only some plants grow from cuttings?
The sequence of invasion by weeds in a disturbed area
The plant species flowering in an area, month by month
Time-lapse photography with a digital camera
What is the source of honey (from pollen analysis)?
Right-handed and left-handed shells, past and present
Handedness in twining plants
Vein patterns in insect wings from the same species
Where are wombats found?
What do koalas eat?

Astronomy

Compare the frequency of falling stars at different times
Map the main stars in the sky, using a cross-stave
The path of a planet with home-made instruments
Does the moon rise in the same place each night?
Map the moon's path across the night sky against the stars
How does the number of meteors vary during the night?
Meteor detection with a radio

Research projects

The skeptical enquirer

Does pyramid power really work?
Do crystals heal sick people in a double-blind study?
Does star sign or date of birth influence sporting ability?
Does the moon affect human behaviour?
Can a pendulum predict the sex of a chicken while it is

in the egg?

Materials

Powders
Sintering
Which metal wire has the most tensile strength?
Which fibre has the most tensile strength?
Can eggs stand more force from some directions?
How strong is human hair of different thickness?
How strong are nylon fishing lines?
How strong are spider webs from different species?
How strong is silkworm silk?
What factors affect the bounce of a dropped ball?
How do compression and tension make things strong?
How strong is a toothpick?
The strength of the bond between timber and a nail
The effect of light on degradable materials
What is chitin made of?
How much lignin is there in different types of wood?
What factors affect the strength of wood?
The conductivity of electrolytes in wood
Comparing the strength of solid and laminated wood beams
Are composites stronger than monolithic laminates?
Studying the effects of stretching different plant tissues
How do different woods expand when they are wet?
The mechanical properties of plastic sulfur over time
Which materials can be charged with static electricity?
High static, low static and anti-static carpets
How strong are plastic wraps?
Why does cling wrapping cling?
The properties of PTFE (Teflon)
Crosslinks and polymer elasticity
Comparing elasticity of different polymers
Temperature and the elasticity of a rubber band
The shattering of glass
Conchoidal fractures
Rupert's drops
How was iron made from bog iron ore?
How were bronze axes made?
How were metals made before 1500 AD? Which ones?
Industrial chemicals before 1800
Industrial chemicals before 1900
Making a mirror
The properties of foam plastic
The insulation properties of plastic cups
Properties of a paste of flour and water
The melting points of solders of various composition
Making a lava lamp

Sound

Underwater sound recording
The pitch of xylophone bars of different materials
More interesting wind chimes
Sound frequencies from metal plates
The scientific principles behind musical instruments
The singing of a kettle
Sounds generated in water pipes
What makes a whip crack?
What is the range limit for a string telephone?
What is the difference between music and noise?
Is there a formula for the frequency of a plucked string?
The harmonics in a note, using Helmholtz resonators
Is there a formula for the main tone of an organ pipe?
An electronic tuning device for musical instruments
How is sound produced?
How is sound transmitted?
What affects the pitch of sound?
Perfect pitch
What affects the volume of sound?
The analysis and synthesis of musical sounds
Whispering galleries
What makes some restaurants noisier than others?
The control of sound in rooms
The acoustics in large buildings
The reverberation time of a large hall
Measuring the velocity of sound accurately
Humidity and the speed of sound in air
The speed of sound in salt and fresh water
The speed of sound in different solids

Energy

The thermoelectric effect in metal wire and foils
An efficient thermopile
Which light bulb produces the most light?
Fire and burning- what factors affect burning?
Fuels and their efficiency in producing energy
How easy is it to make and use biogas?
Designing and constructing solar panels
Designing and constructing solar cookers
Making paraboloid mirrors for solar heating
A solar-powered steam engine
Models of wave and tide electricity production
What is maximum efficiency of a water wheel?
Water wheel designs
Does an overshot or undershot water wheel create the most kinetic energy?
Paddle wheel performance
The performance of a model diesel engine

Electricity and magnetism

Which pole of a magnet attracts the most magnetotactic bacteria?
Hysteresis in a transformer
Hysteresis in rubber
Magnetic suspension of a piece of iron
A practical humidity switch
A practical sound-operated switch
How far can a static electric telegraph transmit?
How long does a static charge last?
What makes charge leak faster from an electroscope?
Which battery lasts the longest?
How can battery power be increased?
Electric motors and their efficiency
Electric circuits, voltage, current, resistance
The strength of an electromagnet
Does the number of coil turns affect the strength of an electromagnet?
Do neater coils make a better electromagnet?
How does temperature affect the strength of an electromagnet?
How important is the metal in the core of an electromagnet?
Buzzers and bells and alarms
Radios and how they work
Jacob's ladder
The Tesla coil
A microammeter
Make an electrophorus
Make a Leyden jar
Make a Wimshurst machine
A Kelvin water dropper electrostatic generator
Generating high voltages
Measuring electrical forces
Vibration in a wire carrying AC current
Vibrations caused by an electric motor
The ionisation of air and van de Graaff generators
Electrical discharges
Electrostatic effects in liquids
Gas-discharge tubes
Glow discharges
High voltage generation
Negative resistance phenomena
Operational amplifiers
Practical uses of the Hall effect
The Van de Graaff electrostatic generator
Does a flame conduct electricity?
The conductivity of a solution
Eddy current heating

Paramagnetism
Superconductors
Making a theremin

Light

Rainbows
Sundogs
Retina patterns
Schlieren photography
Photomicrography
Moiré fringes as measuring devices
Assessing colour vision in animals
Tape glow in different brands
The stroboscope
Triboluminescence
Phosphenes
Colour theories
Colours on waves and in thin films
Holography
Producing a hologram
Production of diffraction gratings
Refraction of light by an unstirred sugar solution
The optics of thin films
Floaters in the eye
Optical interference
Thin-film interference
Kaleidoscopes
Anamorphic art
Animal colour preferences
Tyndall figures
Tyndall scattering and the sunset
Lenses: curvature and materials
How can the strength of light be measured?
What affects light reflection?
What affects refraction and diffraction of light?
Spectrum and colour production prisms
Birefringence in nature
Bunsen's other inventions
Designing a good photometer
A Fresnel lens for 3 cm rays/
Photonics and fibre optics
Transmission of light through perspex

Space

Astrophotography
Photographing the moon
Solar photography
Lunar eclipses
Photography of a lunar eclipse

Photography of a solar eclipse
The Geissler tube
Meteors
The angle of a meteor strike and crater shape
Sunspots
The orrery and its design

Radiation and radio-activity

The natural radioactivity of rocks
The velocity of particles from americium-241
A scintillation counter
Absorption of alpha radiation by different materials
Variations in the range of alpha-particles in air at low pressure
Reproducing Hertz's first radio experiment
Use a radio to detect meteors and meteor showers
Make an electronic lightning detector
A Wilson cloud chamber
A working Geiger counter
Making a cosmic ray detector
The back-scattering of beta particles
The effect of wearing a hat on ultra violet light exposure
Ultraviolet light and different roofing materials
Ultra violet absorption, transmission and reflection by water
How does different clothing absorb ultra-violet light?
How effective are different sun screens?
Do any local plants or seaweeds block UV radiation?

Other Physics

What controls the period of a pendulum?
The physics of the torsion pendulum
The physics of a chaotic pendulum
Coupled pendula
The Wilberforce pendulum
Resonance
Damping oscillations in liquids
The dashpot method of damping
Forced oscillations in mechanical resonating systems
A pendulum clock
The acceleration due to gravity in different places
Aerodynamics of falling objects
Do all objects fall to the ground at the same speed?
Does water temperature influence the flight of a water powered rocket?
How do streamer designs affect the free fall of a model rocket?
How do parachute designs affect the free fall of a model rocket?
How does shape and size affect the free fall and impact

of an object?
Galileo's cannonball and musketball dropping experiment
Using a water trough as an accelerometer
The Cavendish apparatus for measuring gravitation
A super-sensitive manometer
Brownian motion
Why do tops wobble?
Precession
Celt stones
Skipping stones
The Doppler shift
The Marangoni effect
The physics of balloons
Helium molecules escaping from a rubber balloon
The bursting of a balloon
Internal pressure and the performance of a football
Vacuum pumps
Vibration
The physics of amusement park rides
Glass fractures
Interferometers
Ionisation
Leidenfrost phenomena
Lichtenberg figures
Lissajous figures made electronically
Lissajous figures made with a pendulum
Lissajous figures with tuning forks and mirrors
Maxwell's demon
Osmotic pumps
What is the effect of concentration of a solute on osmosis?
What is the effect of temperature of a solution on osmosis?
Ripple tank design
Velocity of ripples in a ripple tank
Effect of wavelength on the angle of refraction of water ripples
Chimney plumes
Fractures and fracture patterns
Fraunhofer patterns
Fresnel zones
Friction effects
How is friction related to surface area and texture?
Friction and surface texture
Friction of shoe soles
Friction reduction by oil and grease
Variation of friction with the relative velocity of two bodies in contact

Surface coverings and rolling marble speeds
Does a ball-roll farther on grass or dirt?
Glass blowing
Air pressure
Water pressure
Variations on the Cartesian diver
The internal combustion engine
Convection patterns
The uses of heat convection
How we use the radiation of heat
The effect of cooling fins
What are the best materials for insulation?
The insulating properties of different fabrics
Which insulation works best?
Which material is the best home insulator?
What materials provide the best insulation?
What keeps things colder - plastic wrap or aluminium foil?
Comparing various natural fibres as insulating materials
Does fat insulate an animal?
Maxwell's spot
Isotope experiments
Kanizsa figures
The McCollough effect
The Pockels effect
How much does glass absorb electromagnetic waves?
The absorption spectra of different plant pigments
How much do different foods absorb microwaves?
How do different surfaces absorb radiant heat?
Measurement of water vapour by microwave absorption
Microwave ranging and detection

Mathematical applications

Fractals in nature
The fractal dimensions of ants' random paths
The effect of different types of music on people
Labyrinths, mazes, and their solutions
Mathematical machines
How random are random numbers?
Do some Lotto numbers pay more than others?
Tangram compositions
Tiling with Penrose tiles
Using Fourier transforms
The patterns in triangular numbers
The patterns in Pascal's triangle"
Examples of the Fibonacci series in nature
Approximating pi by experiment
Handedness in helical cords
The mathematics of knots

Why recreational mathematics is useful

Engineering

Gears, efficiencies, different lubricants

Lubrication with graphite

Which homemade aeroplane design flies best?

Which paper aeroplane design flies the longest time?

Which type of lawn sprinkler works best?

The Coanda effect

Improving the efficiency of a rudder

Designing an energy-efficient home

Efficient use of renewable energy resources

Determine the accuracy of various thermometers

Specific heats

Principle of energy conservation

Active and passive solar energy systems

Measuring the efficiency of airscrews

Making an electrical weighing machine

Making and calibrating a strain gauge

The reliable measurement of paper thickness

Applications of the pantograph

Concrete hydration

How strong is a brick?

Which beam design makes the strongest truss?

Which beam design supports the most stress?

Which truss design supports the most weight?

Which truss design supports the most compressional stress?

Designing a strong bridge

Which bridge design will support the most weight?

Which building design best withstands an earthquake?

Which folded paper structure will support the most stress?

Earth science

How large is the earth?

How much does the earth weigh?

How far away are the sun and the moon?

A geological stream table

Sedimentation and how it varies

Using a laser beam to measure the sediment in water

The settlement of particles from aqueous suspensions

How salt settles clay minerals from a suspension

How turbid does the water get after rain, and why?

How long does a harbour stay turbid after rain?

How do the sand grains vary on a single beach?

How do the pebbles vary on a beach?

When in the tide are pebbles deposited on a beach?

How do the sand grains vary on nearby beaches?

Zircons in sand and sandstone

Do desert sand grains differ from beach sand grains?

How much of beach sand is shell grit?

How much of beach sand is organic matter?

What determines the slope of a beach?

How does slope angle and soil depth influence erosion rates?

What is the angle of rest in different dry sands?

The stability of slopes derived from different rock types

The formation of sand dunes

Wave groups on a beach

Wave patterns in a tidal inlet

The behaviour of large waves in a narrow channel

Meteorology

What happens when snow melts?

What does melted snow contain?

How much life is going on, under the snow?

Why does the sky colour change at different times

The common wind patterns in your area

What makes flags flap in the wind?

Cloud formation, altitude, and temperature

How do clouds relate to weather patterns?

Wind speed and direction at different heights

The speed and force of raindrops

The effect of rain on soil, with and without ground cover

Does fresh water hold heat longer than salt water?

What factors affect the cooling of land at night?

The sunlight reflected and absorbed by different surfaces

Measuring the sunshine available each day

The humidity at different temperatures

The difference between sun and shade temperatures

An automatic recording weather device

Human hair and changing humidity?

How does human hair compare with other animals' hair?

Materials that expand and contract in changing humidity

An electronic barograph with a digital output

Chemistry

Optical activity

Optical isomers and their structures

Oscillating chemical reactions

Shape-memory alloys

Stacking schemes and crystals

Make some pure elements from natural materials

The effects of temperature on the viscosity of oil

What type of oil has the greatest viscosity?

How can the viscosity of an oil be increased?

What type of oil has the greatest density?

The effects of temperature on chemical reactions

The effects of temperature on Brownian movement
Concentration and the rate of chemical reactions
The chemicals in cosmetics
Testing of consumer products
Effects of sunlight on rubber, ink, paper
Chemical reactions that produce or require energy
An automatically operating burette
Can conductivity identify the end-point of a titration?
Temperature change and the end-point in a titration
Temperature zones in a flame
The pH levels in a human mouth through the day
Compare the surface tension of various liquids
How does the adhesion to glass vary in different liquids?
How do different substances affect the adhesion of water to glass?
Does temperature or pressure affect adhesion in water?
How do different substances affect the surface tension of water?
Water rise up polymer threads
Absorption of liquids by filter paper
What is the average size of soap bubbles?
How thick is a soap film?
Shapes and oscillations of large soap bubbles
Soap foams
Why do soap films burst ?
Making giant bubbles
Making long-lasting bubbles
Do soap bubbles last longer on warm or cold days?
Bubbles with strange shapes
Factors affecting the production of uniform bubble rafts
Formation and bursting of soap bubbles
Bumping and boiling in different liquids
How do bubbles change when rising?
Dealing with chemical spills from industry
How thick is an oil film on water?
Which methods are best for dealing with oil spills?
Analyzing snow and rain for pollutants
Effects of temperature on density of gases
Effects of salt and other contaminants on the rate of rusting
Do all iron objects rust at the same rate?
How effective are rust inhibitors?
Which metals corrode more quickly in water?
Corrosion and the cathodic protection of metals
Making a corrosion map of your area
How does salt affect the corrosion of iron and steel?
Developing a defence against iron corrosion
Which coins are most affected by standing in vinegar?
Growing double crystals

Crystals from household products
Solution temperature and crystal growth
Do sugar crystals grow faster in tap water or distilled water?
Does temperature affect crystal growth?
Does the concentration of solute affect the rate of crystal growth?
Getting water from ink, vinegar, milk?
Exercise and carbon dioxide production
Soil samples and their properties
Particle pollution in my area
The types of particle in pollution fallout
Catalysts and their uses
How fire extinguishers work
How acids react with different metals
Identifying different metals by the flame test
Ordering metals by activity, from potassium to gold
How does electroplating work?
What metals can be used in electroplating?
What industrial methods are used in electroplating?
What are the practical applications of electroplating?
The extraction of caffeine from beverages
The measurement of caffeine in beverages

Consumer science

How is paint drying affected by temperature changes?
How is paint drying affected by humidity?
Is oil stain or paint more durable to weathering?
Which battery lasts longest?
Which house plant fertiliser works best?
Which pens can write on all surfaces?
Which pens will write upside down?
Which brand of pen lasts the longest?
How much writing can be done by one pen?
Which socks are warmest in winter?
Which glue sticks best?
Compare the water content of some foods
What is the fat content of various sausages?
Which foods contain the most carbohydrates?
Which foods contain the most protein?
Comparing the sugar content of different juices
Which type of food contains most thermal energy?
How hard are different nail polishes?
How effective are various shampoos?
How effective are various hairsprays?
A comparison of biodegradable detergents
Which detergent makes the most suds?
The effects of freezing on bacteria
Do different colours of light affect bacterial growth?

The effect of ultraviolet light on bacteria
Does soap kill bacteria?
Do disinfectants really kill bacteria?
The effect of spices on bacterial growth
Does garlic have antibacterial properties?
Will fungi inhibit bacterial growth?
Does mouthwash kill bacteria?
Can trace amounts of heavy metals kill bacteria?
The effects of antibiotics on bacterial growth
Does mouthwash damage higher life forms?
Should we use antibacterial wipes in our homes?
Does washing your hands stop the spread of bacteria?
Which brand of garbage bag can hold the most sand without tearing?
Which density of plastic bag has the best impact strength?
Which brand of napkin (diaper) absorbs the most moisture?
The absorption rate of different brands of paper towels
Which toilet paper is strongest?
Is there a relationship between types of paper and their strength?
Do all papers of the same type have the same strength?
Is recycled paper as strong as paper in its first use?
How many times are packaging materials recycled?
How good are bricks made of earth?
How effective are oven cleaners?
Will Coca Cola really rot teeth?
Does temperature affect the results of a soft drink challenge?
Does price predict the effectiveness of sunblock?
Which home smoke detector is the most sensitive?
Which engine oil reduces friction the most?
Which home insulation system works best?
Which self-adhesive floor tile resists wear the most?
Which building material is most flammable?
The flammability of various fabrics
Making fabrics fire resistant

Animals

How effective is aquaculture?
What conditions are favourable for growing brine shrimp?
How do some Aedes mosquito larvae live in brine?
Do magnetic fields harm any life forms?
Why don't fish get washed downstream over time?
The swimming motions of different fish
A better way to view aquatic animals and plants
Why don't spiders eat fruit?
Breeding spiders

Collecting spider webs
Spider thread
Culturing aquatic insects
Learning in the slater/woodlouse/sow bug
Ant pheromones and how they are used
Snail breeding
What is the effect of temperature on respiration in snails?
What is the effect of temperature on yeast in dough?
The effect of temperature on yeast growth in a culture
The effects of ultraviolet radiation on yeast fermentation
What factors affect the production of carbon dioxide in yeast?
What factors affect the growth of yeast?
The effect of temperature on the action of yeast
How do different animals breathe?
Do the songs of a bird species vary from place to place?
How are the colours on butterfly wings formed?
How are the colours of beetles formed?
What makes the colour in a feather?
Why do large birds have a slotted wing?
How birds and insects hover
Bioelectrical senses in animals
Animals which give electric shocks
Detecting electric signals made by animals
Measuring the metabolism of insects
Measuring the metabolic rates of small animals

Plants

Why don't potatoes or trees need lungs?
Why are seeds the shapes they are?
What are the advantages of having a leaf that is divided?
What influences the shape of a leaf?
The spiralling flight paths of different winged seeds
How far do the seeds from a plant travel?
How far can weed seeds penetrate into a forest from a road?
What influences the rate of transpiration in corn seeds?
Plant tropisms
How does light intensity affect phototropism in plants?
Geotropism
Do the roots of a plant always grow downward?
Does it matter in which direction seeds are planted?
Sensitive plants
How fast do carnivorous plants move?
How much weight can a growing plant lift?
How do physical vibrations affect plant growth?
Plant growth and ultrasonic vibrations
Does music help plants grow?

Extracting growth-promoting substances
 Plant growth inhibitors
 Antibiotics from the soil
 Antibiotic effects in lichens
 Resistance to antibiotics in common bacteria
 Using plant extracts to control the growth of bacteria
 The planting depth of wheat and germination
 Does temperature affect the growth of plants?
 Does a plant need some darkness to grow?
 The effect of photoperiodism on plants
 What colour of light do plants grow best in?
 How does light direction affect plant growth?
 How much does the duration of light affect plant growth?
 Do different kinds of lights affect the way plants grow?
 What affect does the gibberellic acid have on plant growth?
 Can plants grow without soil?
 What is the effect of different soils on plant growth?
 The effect of different fertilisers on plant growth
 Do plants grow better in hydroponics or in soil?
 What minerals are needed for plants to grow?
 The effects of iron on plant growth
 What is the best spacing for plants?
 Is compost better than manufactured fertilisers?
 Does sugar in a vase make cut flowers last longer?
 Do living plants give off moisture?
 Which soil type is best for plant growth?
 Do plants need air?
 Monocot and dicot germination patterns
 How does heat affect germination rates in seeds?
 How does light affect germination rates in seeds?
 How does carbon dioxide affect germination rates?
 How does pH level affect germination rates in seeds?
 Soil, tree seedlings and germination rates
 How does a magnetic field affect plant growth?
 Does magnetism affect seed germination?
 Does microwave radiation affect the rate of seeds' germination?
 Does seed size affect the rate of germination?
 Does the presence of light affect the germination rate of seeds?
 Does centripetal force affect the germination of seeds?
 How does centripetal force affect plant growth?
 Does X-ray radiation affect the rate of seeds' germination?
 How does temperature affect seed germination?
 Earthworms and the germination and growth of seeds
 How much pressure do germinating seeds produce?
 The rate of seed germination in different soil types
 The effect of heat on seed viability
 The effect of mechanical impact on seed viability
 What is the effect of planting depth on the germination of seeds?
 What substances are natural inhibitors of seed germination?
 Photosynthesis and temperature
 Photosynthesis and light intensity
 Photosynthesis and water availability
 Photosynthesis and carbon dioxide levels
 Photosynthesis and the colour of the light
 The number and size of stomates in different plants
 Covering a leaf's stomate
 Does soil pH affect plant growth?
 Does noise affect the growth of plants?
 Soil water-holding capacity and the plants growing in it
 Do packet seeds germinate better than ones collected at home?
 How much salinity can tomato plants take?
 Which plants can withstand the most salt in the water sprayed on them?
 Is hydroponics as good as growing in soil?
 Do microwaves affect seed germination and growth?
 Does smoke trigger germination in bush plants?
 How much water is used by different plants?
 What is the effect of temperature, sunlight on transpiration?
 How does soil type influence vegetation distribution?
 How do different types of soils affect the stability of trees?
 What kind of soil is best for certain kinds of plants?
 What determines where mosses grow?
 What effect does water have on root growth?
 What effect does oxygen have on root growth?
 What effect does soil type have on root growth?
 What effect do minerals have on root growth?
 The effect of on plant growth/crop yield
 The effect of nutrients on plant growth/crop yield
 The effect of water on plant growth/crop yield
 The effect of hours of sunlight on plant growth/crop yield
 The effect of strength of weed killer on plant growth/crop yield
 The effect of temperature on plant growth or yield
 The effect of pollutants on plant growth/crop yield
 The effect of soil pH on plant growth/crop yield
 The effect of pest animals on crop yield
 How much water does a 1 kg yield of different crops need?

How much of various plants is water?
The size of a plant and the amount of water it uses
What conditions are favourable for fungus growth?
What conditions are favourable for mushroom production?
What conditions are favourable for algae growth?
Algal culture methods
What conditions favour bacteria growth or control?
What conditions favour mutations?
What conditions favour striking cuttings?
What conditions favour the survival of planarian worms?
What conditions favour the growth of nitrogen fixing bacteria?
What conditions are favourable for lichen growth?
How are lichens influenced by pollution?
How fast do lichens normally grow?

Field Studies

The rate of decomposition of leaf litter
The changes in a rock pool across a day
What are the effects of herbicide spraying?
Does bush regeneration make a difference?
Is there acid rain in nearby lakes?
Ammonia and pH in a local stream
How does the pH in a swamp change over time?
How does the pH in different parts of a swamp?
The pH in a water body and weather changes
The effect of vehicle exhausts on roadside plants
The effect of SO₂ emissions on plants
What types of bacteria are found around the home?
What types of bacteria are found on the body?
What types of bacteria are found in soil of different types?
How do protozoa react to changes in the environment?

The preferred soil pH level for various plants

Genetics

Metagenomics
The connections between hair and eye colour?
Do bigger seeds produce bigger plants?
What determines the number of seeds in an apple?
Is there a link between sex and left handedness?
Is the tasting of cabbage or broccoli inherited?
Is a hatred of cabbage inherited or learned?
Are all the pea seeds in a pod the same size?
Do apple cores contain the same number of seeds?
Do seeds of the same type germinate at the same rate?
Is there a link between hair colour and strength?
Undertake a family study on inheritance
Do brothers and sisters have similar fingerprints?
Do parents and children have similar fingerprints?
Extract the DNA from an onion, or other plant
Are the variable leaf patterns in clover inherited?
How alike are the peas in a pod?
How easily do plants hybridise?
Do related plants form a graft more easily?

Information fossicking/history of science

How did the elements get their symbols?
Scientists who gave their names to things
Twenty plants or animals with really odd names
Who named the minerals?
How does an epidemiologist work?
The idea of atoms
How do we know that atoms are real?
A hundred years of quantum physics
A hundred years of genetics

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