

A summary of ideas from the IT in Secondary Science Book

by Graham Bray

Attainment targets (Engla Age range

[IT Tools used \(Key below\)](#)

"Biol" "Chem" "Phys" 11-14 15-16 16-18

Title	Page	AT2	AT3	AT4	KS3	KS4	16+	Spread	Datab	Word pr	Sensors	Graphics	Models
Designing a database	21	*			*				*				
Minibeast hunt	23	*			*				*				
The Planets	25			*	*				*				
Looking at the Weather	26	*	*		*				*				
The chemical elements	27		*		*				*				
Classifying the elements	30		*		*				*				
Identifying the parts of the body	31	*			*				*				
Measuring the energy in food	36	*			*	*		*					
Nutrition and breakfast cereals	37	*			*	*		*					*
A population of wolves and deer	38	*			*			*					
Soil water and organic matter	39	*			*	*		*					
How our use of fuels has changed	40		*	*	*			*					
Forces:testing cotton reel rollers	41			*	*			*					
Forces: testing bridge designs	42			*	*			*					
Distance, time and speed	43			*		*		*					*
Boyle's Law	44			*		*		*					*
Energy:Home Insulation I	45			*		*		*					*
Energy:Home Insulation II	46			*		*		*					*
Gravity in outer space	47			*	*			*					*
Force, mass, acceleration: cars	48			*		*		*					*
Insulation: wrapping food in foil	51			*	*						*		
Insulation: keeping houses warm	52			*	*						*		
How are animals different?	66	*			*				*				
What patterns are there in animal featu	66	*			*				*				
Build a key to identify a set of mammals	67	*			*				*				
Are animals more active at day or night	67	*			*						*		
An account of bee communication	67	*			*					*			
How do birds distinguish their food?	67	*			*						*		
Why do some animals huddle in cold we	67	*			*	*					*		
What is the best SA:Volume ratio for an	68	*			*	*		*					
Why is warm water bad news for tropica	68	*			*	*					*		
What's inside the human body?	69	*			*	*						*	*
Make a key to identify the human organ	69	*			*	*			*				
Measurements of breathing	69	*			*	*					*		
How does exercise affect the pulse rate	70	*			*	*					*		
How quickly does the pulse return to no	70	*			*	*		*					
Cardiovascular system	71	*			*	*							*
How much energy do you use in a day	71	*			*	*		*					*
How much do our eyes vary?	71	*			*	*		*					
When do we grow fastest?	71	*			*	*		*					
Heart and blood posters/reports	72	*			*	*				*			
Controlling blood glucose level.	72	*			*	*	*						*
Do a survey on peoples ideas about heal	72	*			*	*			*				
Why do they put fluoride in toothpaste?	73	*			*	*		*					
Nerves	73	*			*	*	*						*
How do breakfast cereals compare?	73	*			*	*		*					
Make a key to identify breakfast cereals	73	*			*	*			*				
Do you eat the right foods?	74	*			*	*							*
Which food provides the most energy?	74	*			*	*		*					*
Measure & compare energy contents of	74	*			*	*					*		
Which bean gives most energy?	75	*			*	*		*					*
Which is the best brand of pop-corn?	75	*			*	*		*					
Are large eggs better value?	75	*			*	*		*					
How long does it take egg whites to har	75	*			*	*					*		
How long does it take for food to cook?	76	*			*	*					*		
What affects the rate of enzyme reactio	76	*			*	*					*		
How do foods vary in their water conten	76	*			*	*		*					
How do living things get food?	76	*			*	*					*		
Which leaf shape gives best SA/Vol. rati	77	*			*	*		*					*

Title	Page	AT2	AT3	AT4	KS3	KS4	16+	Spread	Datab	Word pr	Sensors	Graphics	Models
Build a key to identify different leaves	77	*			*	*			*				
How fast does water travel during osmo	78	*				*					*		
Changes in rate of photosynthesis	78	*				*					*		
Photosynthesis poster	78	*			*					*		*	
Simulating photosynthesis	78	*					*						*
How does light affect how a plant grows	78	*				*					*		
How are plants different?	79	*			*				*				
Do seeds release energy as they germina	79	*			*	*					*		
How fast do bacteria grow?	79	*				*					*		
Does yeast release energy as it respire	79	*				*					*		
Are grass cuttings still alive?	79	*			*	*					*		
Are plants better adapted to certain en	80	*			*	*		*					
What affects our reaction time?	80	*			*			*					
Do a survey of the class.	81	*			*	*		*	*				
Explore and run a nature reserve	81	*			*	*							*
Run the entire planet	81	*				*							*
Do some plants grow better than others	82	*			*			*					
Population Ecology	82	*					*						*
Waste surveys	83	*			*	*		*					
How do petrol & diesel compare as pollu	85		*		*	*		*					
Draw a pH indicator colour chart	85		*		*							*	
Electron shell diagrams	85		*		*	*						*	
Separating salt from a mixture - cut & s	86		*		*					*			
Cooling curves	86		*		*	*					*		
Writing word and symbol equations	86		*		*	*				*			
What is the formula of magnesium oxide	86		*		*	*		*					
Compare the densities of materials.	87		*		*	*		*					
How much do things expand	87		*		*	*					*		
Sorting materials into sets	87		*		*	*			*			*	
Which material would you use for..?	88		*		*				*				
What properties do metals have in comr	88		*		*	*			*				
Which material will absorb the most liqu	89		*		*	*		*					
What liquids are used to run a car?	89		*		*					*			
Build a key to identify different plastics	89		*		*	*			*				
How can we get gelatine to dissolve fas	90		*		*	*		*					*
Why do dogs pant on a hot day?	90		*		*	*					*		
Mountaineers take care to keep dry - wh	90		*		*						*		
Why is heating used batteries dangerous	90		*		*	*		*					*
How does pressure change with temp. &	91		*		*	*					*		
What is the best temp. to keep drinks f	91		*		*	*					*		
How are solids, liquids and gases differe	91		*		*	*							*
Communicating about solids, liquids & g	91		*		*					*		*	
Does temp. change steadily when ice wa	92		*		*						*		
Building molecular models.	92		*		*		*						*
Will nuclear waste stay with us forever?	92		*		*	*		*					*
What is the half life of a radioactive ma	92		*		*	*					*		
Is oxygen used up in burning?	93		*		*						*		
How long can a candle burn for?	93		*		*	*		*					*
Equilibrium	93		*		*		*						*
Which bleach is the best value for mone	93		*		*	*		*					*
Make a calibration curve	94		*		*		*	*					*
Endo- and exothermic reactions.	94		*		*	*					*		
What is the best mixture for making jan	94		*		*	*		*					*
How does cooking affect vitamin C in pe	94		*		*	*		*					
Making fertilisers	95		*		*	*							*
Making iron and steel	95		*		*	*							*
Patterns in lattice energies of alkali me	95		*		*		*	*					*
Where do metals come from?	95		*		*	*		*	*			*	
What affects the rate of reaction?	95		*		*	*							*
How does the acid concentration affect	95		*		*	*					*		
How does temperature affect rate?	96		*		*	*					*		
How does light affect rate of reaction?	96		*		*	*					*		

Title	Page	AT2	AT3	AT4	KS3	KS4	16+	Spread	Datab	Word pr	Sensors	Graphics	Models
How do catalysts affect rate of reaction	96		*			*					*		
A survey of cars and rusting	96		*		*	*		*	*				
How do strong and weak acids compare?	96		*			*	*	*			*		
Conductivity changes during pptn. react	96		*				*				*		
Various uses of IT in topics covering the atmosphere and weather.	97 - 99		*	*	*	*		*	*	*	*	*	*
Exploring electrodynamics	100			*			*						*
Exploring electrostatics	100			*			*						*
Measuring induced currents	100			*			*				*		
Explore magnetic field along axis of coil	100			*			*				*		
What affects the discharge of a capacitor?	100			*		*	*	*			*		*
Compare batteries to see how long they last	101			*	*	*					*		
Drawing circuit diagrams	101			*	*	*						*	*
How are communication signals transmitted?	101			*	*	*	*						*
How much electrical energy do you use?	102			*		*		*					*
Electricity models	102			*	*							*	*
How can we keep electricity safe?	102			*	*								*
Examine electric current effects in a wire	102			*		*	*				*		
Exploring electricity and magnetism	103			*		*	*						*
How does a thermistor behave?	103			*		*	*				*		
Effect of light on a LDR	103			*		*		*					
Ohm's law calculations	104			*		*		*					
Current change as voltage changes	104			*	*	*		*			*		*
Resistance graphs and calculations	104			*		*		*					*
Resistance of soil and contour mapping	104			*		*		*					*
How can sensors help us?	105			*	*	*					*		
Make and test a solar cooker	105			*	*						*		
Could the sun supply our electricity needs?	105			*	*	*					*		
How do water wheel designs compare?	105			*		*					*		
How do wind vane designs compare?	105			*	*	*					*		
Compare the energy use of different appliances	106			*		*		*					
How efficient is an electric immersion heater?	106			*		*					*		
Can you read your electricity meter?	106			*		*							*
How much does it cost to have a bath?	106			*	*	*		*					*
How do we generate electrical energy?	106			*		*							*
How much energy is used over the world?	107			*	*	*		*	*				
How has our use of fuels changed?	107			*	*			*					
Comparing properties and costs of fuels	107			*	*	*		*					
What is the best way to brew-up?	108			*		*		*					
Which firelighters are best value?	108			*	*	*		*					
How does heat travel through liquids?	108			*	*	*					*		
Compare the transfer of heat through materials	108			*	*	*					*		
How does heat flow in a metal bar?	109			*		*		*					*
How fast do Cu and Al gain heat?	109			*		*		*					
Heat: radiation (2 investigations)	109			*	*	*					*		
Heat: insulation (2 investigations)	109			*	*	*					*		
How 'good' is nuclear power?	110			*	*	*				*			
How do nuclear reactors work?	110			*	*	*							*
How does room temperature vary?	110			*	*						*		
Does weather affect our energy use?	110			*	*	*		*			*		*
Survey of heating and lighting in the school	110			*	*	*		*			*		*
Saving energy: double glazing (2 investigations)	111			*	*						*		
Most effective home insulation.	111			*		*		*					*
Make a poster about saving energy	111			*	*	*				*		*	
Using central heating wisely	111			*	*	*							*
Acceleration and gravity	112			*		*					*		
Which is the best car?	112			*		*		*					
What affects our braking distance?	112			*	*	*		*					*
Distance-time graphs	112			*	*	*		*					*
Make a distance-time graph	113			*		*					*		
How does load affect hot air balloon flight?	113			*	*	*		*					
Flight (3 investigations)	113			*	*	*		*					

Title	Page	AT2	AT3	AT4	KS3	KS4	16+	Spread	Datab	Word pr	Sensors	Graphics	Models
Do all materials produce heat when rubbed?	113			*	*	*					*		
Comparing the brakes on different bikes	114			*		*				*			
Surface and friction	114			*	*	*		*					*
Measure forces as they change over time	114			*	*	*					*		
Explore the effect of weightlessness	114			*	*	*		*					*
Weights compared in air and water	115			*		*		*					
Dynamics / conservation of momentum	115			*		*	*						*
Gravity calculations	115			*		*		*					*
Time and motion (3 investigations)	115			*	*	*		*			*		*
What affects the bounce of a ball?	116			*	*	*		*					*
Slope of hills and speed of vehicles	116			*	*	*					*		
Explore harmonic motion	116			*		*							*
How steady is a pendulum?	116			*	*	*	*	*			*		
How does load on a spring affect extension?	117			*	*			*					*
What properties do you expect of poles?	117			*	*			*					
Can you find the strongest concrete mix?	117			*		*		*					
Moments: the see-saw experiment	118			*	*			*					*
Measuring power and calculations	118			*		*		*					*
Do sprinters run at a steady speed in races?	118			*	*			*					
Distances between towns	118			*		*		*					*
Analyse data from a school athletics event	119			*		*		*					
Which bridge design is best?	119			*	*	*		*					*
Launch angles and catapults	119			*	*	*		*					
Colour (3 investigations)	120			*	*	*					*		*
Eye: structure and function (4 investigations)	120			*	*	*				*		*	*
Experiment with lenses and ray boxes	121			*		*		*					*
How is light reflected?	121			*	*								*
Study interference patterns	121			*		*					*		
What is found at the ends of visible spectra?	121			*		*					*		
Cyclists and colour clothing for safety	121			*	*						*		
Light intensity (3 investigations)	122			*	*			*			*		*
Sorting and classifying musical instruments	122			*	*				*				
Sound travel (2 investigations)	122			*	*	*					*		*
Investigate sound levels	123			*	*						*		
Explore waves	123			*			*						*
EARTH AND SPACE (various)	124-				*	*		*	*	*		*	*
	126												
Key to the IT tools used and what they're used for Back to top													
Spread = activity uses a spreadsheet - involving a ready-made results table, or a data handling exercise													
Data = uses a database program and involves storing, sorting and graphing the results of an investigation or survey													
Word = activity uses a word processor: writing a report or compiling a project.													
Sensor = uses sensors, tools for exploring science. They display and measure fast changes with precision.													
Graph = graphics tools, allowing pupils to illustrate their investigations with drawing programs and clip-art.													
Model = modelling tools, software such as a spreadsheet or CDROM that allows pupils to build or explore models.													
Page references refer to the relevant page in "The I.T. in Secondary Science Book" (kept in the Science Office)													
GB 30/5/96 MSW1:ITSCIENC.WKS													