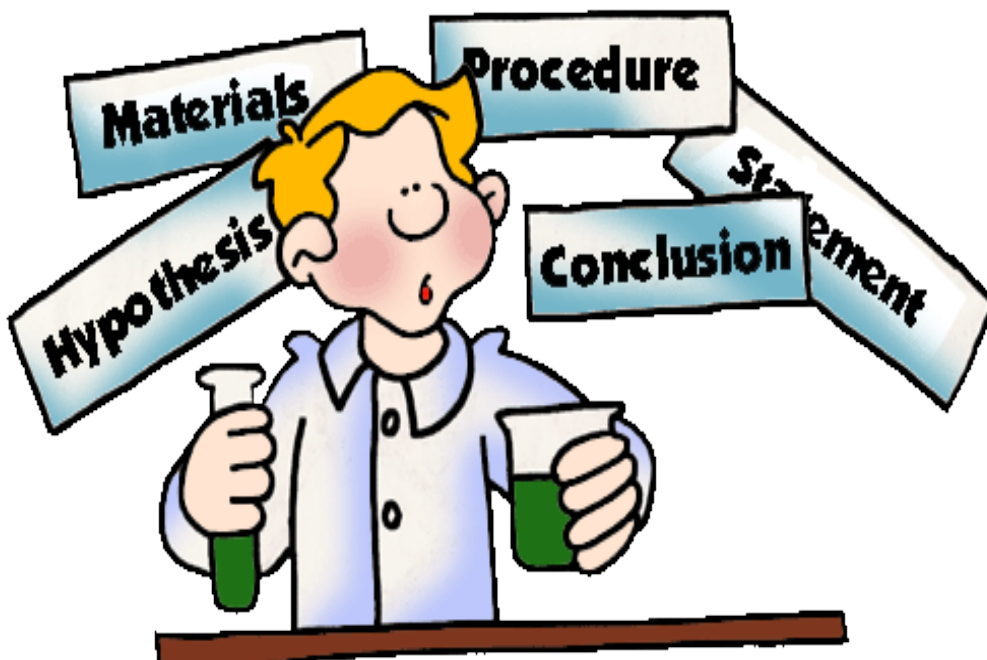


Year 8 Science Revision Booklet

Use this booklet to help you with your revision in preparation for your year 8 Science examination.

There are lots of tips and hints to make sure that the time you spend revising is effective.



Revision Top Tips

Use your exercise book
Go through the work that you have done in lessons – use your exercise book to remind yourself what you have studied.

Use your textbook

Your textbooks cover most of the work that you have done this year. Where work is not in the textbook then your exercise book or BBC Bitesize are good resources.

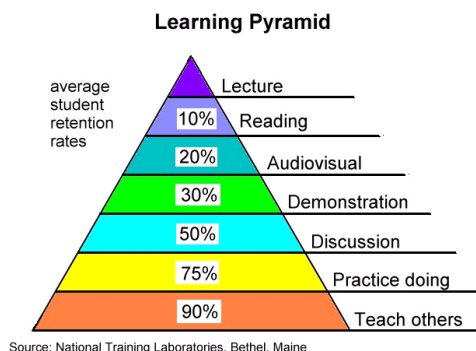
The books have great end of topic questions – try them.

KS3 BBC Bitesize

This is a good website with information, tests and quizzes covering most areas of the year 8 work.

<http://www.bbc.co.uk/bitesize/ks3/>

Remember the learning Pyramid when you do your revision.



Use the text book and revision book.

Read and write notes or draw a mind map

Condense work or notes




Write, write, write – at least then you have to engage with thinking




Test yourself

Look at the checklist




Use the checklist.

You have been given this checklist which tells you exactly what needs to be learnt and could be examined. Use it to help guide your revision plan and revision time. Just reading it and trying to learn some of the facts will help you to gain marks in the examination. If you don't understand any points then look them up in the textbook, your exercise book or ask a friend or teacher.




Experimental Techniques			
Plan an investigation to test a hypothesis			
Choose a range and number of tests for the investigation			
Carry out a risk assessment for a planned investigation and explain how to reduce risks			
Describe a method with enough detail for valid and reliable data			
Draw clear labelled diagrams of equipment			
Identify the dependent variable in an investigation			
Identify the independent variable in an investigation			
Suggest things that would ensure you conduct a fair test			
Present qualitative data			
Draw a suitable table for the results of an investigation to present quantitative data			
Manipulate data e.g. calculating a mean average from repeat readings			
Independently draw a line graph (NEVER a bar graph) to present data: <ul style="list-style-type: none"> • Write a suitable meaningful title • Draw graph bigger than $\frac{1}{2}$ a page • Use a sensible scale • Label the correct axes, with the correct units • Plot points clearly • Draw a SMOOTH line of best fit • Read off a graph to find a value that isn't in your results table 			
Draw valid conclusions using the results of the investigation			
Explain the results using scientific explanations			
Evaluate a method and suggests any improvements			
Identify anomalies in results and suggest reasons for them			
Name key pieces of equipment and chemicals - ensure you can <ul style="list-style-type: none"> • recognise and can name a Liebig condenser • recognise and can name a measuring cylinder • recognise and can name a conical flask • recognise and can name a burette • recognise and can name a heating mantle • recognise and can name a pipette 			

Elements, Mixtures and Compounds			
Give the correct symbols for the elements on the periodic table			
Explain what a group and a period are on the periodic table			




Give the names for group 1, 2, 7 and 8			
Explain that the periodic table is arranged in increasing atomic number			
List some similarities between elements in the same group			
Explain how Demitri Mendeleev worked out that elements missing on the early periodic table			
Show where the metals are on the periodic table			
Show where the non-metals are on the periodic table			
Identify the liquid elements on the periodic table			
Identify the transition elements on the periodic table			
Describe what happens when group I metals are added to water			
Describe the trend in reactivity of group I metals			
Produce a formula equation to show the reaction of group I metals in water			
Explain why group I metals are called alkali metals			
List key properties of metals in terms of melting point, boiling point, appearance, density, etc...			
List the key properties of non-metals using the same criteria as for metals			
Identify, with explanations, exceptions to the main trends of metals and non-metals			
Define the term element, with examples			
Define the term mixture, with examples			
Define the term compound, with examples			
Draw particle diagrams and show some formulae showing elements, mixtures or compounds			
Recall the experiment to make iron sulphide to show how the properties change when elements are turned into compounds			

The Air			
List the main gases in the air			
Give the % composition of the air			
Explain how fractional distillation is used to separate the gases in the air			
Describe an experiment to determine the % of oxygen in air			
Calculate the % of oxygen in the air			
Describe the test to show if oxygen is present			
Describe the test to show if hydrogen is present			
Describe the test to show if carbon dioxide is present			




Be able to explain how the Earth's atmosphere has evolved to its present form.			
Know where crude oil comes from and what we use it for			
Explain what a hydrocarbon is			
State the products produced when fossil fuels are burnt in air			
Explain what happens when fossil fuels are burnt with limited amounts of air and say why this can be a problem			
Describe what man is doing which is affecting the earth's atmosphere			
Discuss how man's actions are leading Global Warming			
Explain what we can do to reduce the effects of Global Warming			
State that the oxides of metals (eg sodium oxide) are alkaline			
State that the oxides of non-metals are acidic (eg sulphur dioxide)			
Explain that acidic oxides can dissolve in water to produce acid rain			
Explain how fractional distillation can be used to separate the different substances in crude oil			
Understand the meaning of Sustainable Development			
Understand the ethical, environmental and economic implications of sustainable development.			




Metals			
Use observations of reactions between water and acids to decide an order of reactivity			
Write a word equation to show the reaction of a metal with oxygen			
Use observations of reactions between metals and acids to decide an order of reactivity			
State a general word equation for the reaction of metals with acid (MASH)			
Give a definition of oxidation			
Give a definition of reduction			
Use the reactivity series to predict whether a metal will reduce an oxide to a pure metal			
Use the reactivity series to explain which metal will displace another metal from its solution			
Define an ore and give the name of iron ore			
Explain how iron is extracted from iron ore in the blast furnace			
Label a diagram of a blast furnace, showing the main processes			
Explain what coke is			

Explain what slag is			
Give a use for cast iron			
Explain how iron is converted to steel			
Explain how the impurities from iron can be removed			
Explain what an alloy is, with examples			
Give a use for steel			
Give the chemical name for rust			
List the conditions for rust to form			
Explain how painting can help prevent rusting			
Explain how galvanising can help prevent rusting			
Explain how oiling can help prevent rusting			
Explain how sacrificial protection can help prevent rusting			




Modes of Nutrition			
Describe the main features of different forms of nutrition			
Explain how different trophic levels are specialised to different forms of nutrition and how they depend on each other			
Explain how parasites gain nutrition			
Explain the impact of parasites on host organisms			
Explain scientifically how parasites have adapted to this form of nutrition in terms of their physical and behavioural adaptation. Compare the advantages and disadvantages of this form of nutrition			
Describe and explain how saprotrophs gain nutrition			
Explain the importance of saprotrophic nutrition in recycling of materials in ecosystem and their role in causing disease.			
Identify the main adaptations of organisms for this form of nutrition			
Describe the stages of the starch test.			
Explain the reason for the different starch distribution in a variegated leaf.			
Predict the effect of variegation on plant growth.			
Describe why plants need light			
Explain what the chloroplast does and how the plant uses the things it makes			
Predict the effect on photosynthesis of plants being exposed to different colours (wavelengths) of light			
Describe how plants take in carbon dioxide and produce oxygen during photosynthesis			
Write a word equation for photosynthesis			



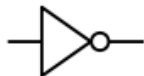
Write a balanced symbol equation for photosynthesis.			
Link photosynthesis to respiration and explain some other uses for the products of photosynthesis e.g. making cellulose			
Link plant organs and structures in the leaf to their job in photosynthesis.			
Explain how leaves are adapted for photosynthesis			
Describe and explain how different cells in a leaf are adapted for photosynthesis			
Describe how plants are used as a resource			
Explain role of plants in the ecosystem as a producer and in climate control			
Suggest consequences on the earth from deforestation and global warming			


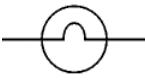


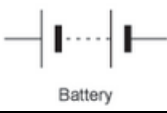

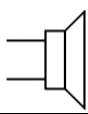


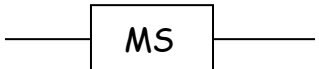

Energy in Biology			
Explain the role of different components of food in the diet			
Explain the effect of a deficiency on health			
Describe the main features of deficiency diseases			
Explain some of the causes of deficiency diseases and how they can be prevented or cured.			
Describe the evidence that supports theories stating that a disease is caused by a lack of a specific nutrient			
Describe the pathway of food through the digestive system and the main roles of the organs involved.			
Explain why large molecules must be broken down into smaller soluble ones by the process of digestion.			
Describe how food tests identify the main components in food.			
Explain why it is important to test foods.			
Explain the limitations of the food tests used in identifying food contents accurately.			
Describe how to measure the energy content in foods using simple apparatus			
Explain why different foods release more energy than others.			
Referring to the class results explain why the data produced from this investigation is not sufficiently accurate to be reliable and suggest improvements			




Respiration, Breathing and Health			
Explain what is meant by respiration and distinguish from breathing.			

Explain what is needed for respiration and what the products are using a word equation			
Use a balanced formula equation to explain respiration.			
Link respiration to the role of mitochondria in cells.			
Label a diagram of the lungs and explain the main functions			
Explain how pressure changes in the chest leads to inhalation and exhalation.			
Explain how the lungs are adapted for breathing and gas exchange.			
Describe the differences between inhaled and exhaled air and how the body delivers $O_2(g)$ and removes $CO_2(g)$			
Explain why inhaled and exhaled air is different and explain the link between breathing and respiration			
Explain how the gas exchange surfaces in lungs are adapted for efficient gas exchange			
Describe the effects of smoking on health.			
Explain how the constituents of cigarette smoke affects the respiratory system			
Understand that the effects of smoking can vary in people for a number of reasons. Explain the link between research on smoking and our understanding of the effect of smoking on health.			
Describe the features of different types of microbes			
Explain how pathogens make us ill.			
Describe how diseases are transmitted. Primary defences against disease to prevent infection			
Explain how the immune system destroys pathogens			
Explain how the immune system develops immunity			
Describe how Edward Jenner carried out his work to discover vaccination			
Explain how antibiotics work to kill bacteria but not viruses.			
Explain the differences between different types of vaccines and why it is difficult to produce vaccines for all diseases.			
Describe how antibiotics were developed and their importance for animal health.			
Explain how antibiotics work to kill bacteria but not viruses.			
Explain how resistance develops in bacteria and how this can be reduced. Explain the problems caused by antibiotic resistance.			

Statics and Electronics			
Explain that structure of the atom			




Explain that a static charge arises due to a movement of electrons			
Explain why the overall charge on an atom is neutral			
State that something with more electrons than protons is negatively charged and vice versa			
Explain that opposite charges attract and like charges repel			
Explain how a static charge can be used to paint metal objects			
State what an insulator and conductor is			
Explain that lightening occurs due to a static charge on the clouds creating an opposite charge on the ground			
Explain how a lightning conductor keeps us safe			
Define the term 'magnetic field'			
State that opposite poles attract and like poles repel			
Draw magnetic field lines round a magnet going from north to south: N → S			
Explain that the magnetic field is strongest where the field lines are closest together			
Explain how the Earth's magnetic field is similar to that of a large bar magnet			
Draw the Earth's magnetic field, showing where it is strongest			
Explain that all magnets point to the Earth's magnetic north pole			
Explain why the Earth's magnetic pole has south polarity and vice versa			
Explain how iron can be magnetised by putting it in a coil of wire connected to a power source			
State that 'soft' iron is only magnetic whilst a current is passing through it			
Define an electromagnet and give at least one use for electromagnets			
Explain how the strength of the magnet is affected when:			
The number of coils of wire is increased			
A soft iron core is added			
The electric current is increased			
Use binary inputs/outputs to describe ON/OFF signals as 1/0			
Recognise and draw an OR gate:			
Recognise and draw an AND gate:			
Recognise and draw a NOT gate:			

Recognise and draw a light dependent resistor					
Recognise and draw the symbol for a bulb					
Recognise and draw the symbol for a cell					
Recognise and draw the symbol for a battery					
Recognise and draw the symbol for a switch					
Recognise and draw a symbol for a loudspeaker					
Recognise and draw a symbol for a microphone					
Recognise and draw a symbol for a buzzer					
Use this symbol to represent a moisture sensor:					
Use this symbol to represent a temperature sensor:					
Construct circuit diagrams with logic gates to fulfil specific functions					
Draw truth tables to show the binary inputs and outputs with logic gates					

Waves			
State that light AND sound travel in straight lines			
Draw a longitudinal wave, labelling areas of compression and rarefaction http://www.bbc.co.uk/schools/gcsebitesize/science/add_gateway_pre_2011/radiation/ultrasoundrev1.shtml			
State that sound waves are longitudinal waves			
Explain why longitudinal waves cannot travel through a vacuum			
Define a transverse wave and state that all electromagnetic waves are transverse			
Draw a transverse wave and label the amplitude and the wavelength			

Draw sound waves to show what happens when a sound is made louder			
Draw sound waves to show what happens when a sound is made higher pitched			
Correctly use the units Hertz (Hz) as the unit for frequency			
Complete the exercises about sound at http://www.bbc.co.uk/schools/gcsebitesize/science/aqa/waves/soundandlightrev1.shtml			
Name and give a use for each type of electromagnetic wave			
State the speed of light in a vacuum			
Calculate the speed of light or sound using the echo method			
Draw a diagram to show how light is reflected off a surface			
Draw and label the normal on a diagram			
Draw a labelled diagram to show the path of light from the light source, to an object to our eyes			
State that the angle of incidence = the angle of reflection			
Label the angle of incidence and the angle of reflection on a diagram			
Explain what refraction means			
State that light slows down and bends towards the normal when it enters a more dense medium (substance)			
State that light speeds up and bends away from the normal when it enters a less dense medium			
Draw the path of light as it travels through a perspex block			
Draw the path of light showing total internal reflection			
Explain why an object under water is not where it appears to be when viewed from outside of the water			
Predict the actual position of an object at the bottom of a pond			
Explain, with the help of a diagram, how shadows are formed			
Explain factors that affect the size of the shadow			
Explain, with the help of a diagram, why the image in a pinhole camera is inverted			
Describe what happens when white light is shone through a prism			
List the colours of the visible spectrum			
List the primary and secondary colours of light:			
<p>The diagram is a color wheel with three primary colors: Red (bottom-left), Blue (top), and Green (bottom-right). Lines connect these primary colors to form three secondary colors: Magenta (top-left), Cyan (top-right), and Yellow (bottom). Each secondary color is labeled with its name and the primary colors it is composed of.</p>			
Explain that we see colour because the object absorbs all light			

EXCEPT the colour we see, which is reflected			
Use these ideas to predict the colour of objects in different coloured light			

Thermal Physics			
Use the units °C or K to measure temperature (not Fahrenheit)			
Explain that temperature is the average heat energy of an object or substance			
State the boiling and freezing point of pure water			
Convert degrees Celsius to Kelvin by adding 273° to the Kelvin temp.			
List the three types of heat transfer			
State that heat energy always moves from hot to cold (i.e. objects become progressively less hot, not more cold!)			
Draw a diagram showing the arrangement of particles in solids, liquids and gases			
Explain how metal objects are able to conduct heat much better than other materials			
Explain why liquids and gases cannot conduct heat as well as solids			
Draw a diagram to show convection currents in a liquid or a gas			
Use the key words dense, spread out, rise, sink, energy, fall and vibrate to explain convection currents			
Explain how a convection current causes thermals over hotter areas of land			
Explain how convection currents cause onshore breezes from the sea			
Explain what infra-red radiation is and give at least one source of it			
Name at least one insulator that will prevent heat transfer via conduction			
Name at least one insulator that will prevent heat transfer via convection			
Name at least one type of insulator that will prevent heat transfer via radiation			
State that dark colours absorb and emit Infra Red Radiation much faster than light ones			
State that white colours reflect Infra Red Radiation			
Explain why air is a good insulator			
Explain why air will not prevent heat transfer via radiation			
Explain why a vacuum is the best insulator for conduction and convection but will not affect Infra red radiation.			

