

Year 9 Revision Support Guide

Name:

Tutor group:



Each subject has provided you with a list of content which needs to be covered for revision.

The list is a series of 'I can...' statements. You need to tick the box next to each statement once you have covered it. You should aim to cover each statement at least 3 times.

Some subjects have provided a list of key terms. It is your job to write in the definitions. The use of the key words enables you to achieve higher marks in assessments as it shows the examiner that you are aware of the subject specific language.

You will also find a section for 'memorisation' for a majority of subjects. This is the information you are expected to know off by heart for each exam. You should make this a key focus of your revision.

Mathematics: Foundation

Science has proved that pathways between neurons in your brain can be strengthened over time.

Simple repetition – practising retrieving a memory over and over again – is the best form of consolidating information. You need to try and revise each ‘I can statement...’ at least three times.

Remember all areas of maths could be tested in a standard question that makes it obvious what maths is needed or through problem solving where you may need to interpret and think carefully about the maths needed to be able to solve the problem.

	Revision content	MathsWatch Clip References	1	2	3
	I can add, subtract, multiply and divide integers using written methods	17, 18, 19, 20			
	I can add, subtract, multiply and divide decimals using written methods	17, 18, 66, 67			
	I can apply BODMAS correctly	75			
	I can solve worded number problems				
	I can solve problems involving money and time both with and without a calculator	22			
	I can estimate a calculation by rounding to the nearest 10	91			
	I can prove a number statement				
	I can solve best value problems	41			
	I can interpret inequalities				
	I can put a number into and take a number out of standard form	83			
Place Value and Integers, Powers and Roots	I can write a number written in words in digits and vice versa	1, 92			
	I can put positive and negative numbers in order (integers and decimals)	2, 3			
	I can find powers and roots of numbers with and without a calculator	29, 81			
	I can round a number to 1, 2 or 3 decimal places	32			
	I can list the first 15 prime numbers	28			
	I can list the factors or multiples of a number	28			
	I can write a number as a product of its prime factors	78			
	I can find the upper and lower bound of a measurement	155			
Fractions, Decimals and Percentages	I can convert between fractions, decimals and percentages	85			
	I can compare fractions	70			
	I can find the fraction of two numbers	24			
	I can find fractions of amounts	72			
	I can add, subtract, multiply and divide fractions (including with whole and mixed numbers)	71, 73, 74			
	I can find a percentage of an amount	86, 87			
Ratio	I can find the ratio of two numbers	38			
	I can simplify a ratio	38			
	I can share a ratio into a given amount	106			
	I can solve a problem involving ratio	106, 107			
	I can convert between ratio and fractions	38, 107			
Probability	I can place an event on a probability scale	14			
	I can find the probability of an event using fractions, decimals or percentages	59			
	I can solve problems involving probability				
	I can complete and find probabilities from a sample space diagrams or list	58, 126			
	I can complete a frequency tree and use this to calculate probability	57			
	I can calculate probabilities from a frequency tree	57			

Expressions, Equations and Formulae	I can interpret expressions	7			
	I can simplify algebraic expressions	33, 34, 35			
	I can multiply a term over a single bracket (and simplify if required)	134a			
	I can expand double brackets	134b			
	I can solve an equation with an unknown on one side	135			
	I can solve an equation with an unknown on both sides	135			
	I can form an equation or formula	137			
	I can rearrange an equation or formulae	136			
	I can solve simultaneous equations	162			
	I can substitute into a formulae	95			
	I can solve different types of problems involving algebra (e.g. area, angles, probability)				
Coordinates and	I can plot a coordinate	8			
	I can plot a straight line graph from an equation	96			
	I can draw a straight line graph from a table of values	96			
Data and Statistics	I can draw and interpret a bar chart	64			
	I can draw and interpret a pictogram	16			
	I can draw and interpret a pie chart	128a			
	I can draw and interpret a scatter graphs and its line of best fit and correlation	129			
	I can draw and interpret a distance time graph	143			
	I can find the mode, median, mean and range from a set of numbers or simple chart	62			
	I can find the mode, median, mean and range from a grouped frequency table	130a, 130b			
Angles and Shapes	I can find missing angles on a straight line, round a point or in a triangle	45, 121			
	I can use the angle rules on parallel line	120			
	I can use 3 figure bearings	124			
	I can find the interior/exterior angles of polygons or the number of sides given one of the angles	123			
	I can recognise and name 2d shapes				
	I can recall and describe the properties of different shapes	122			
	I can draw or label the parts of a circle	116			
	I can interpret plans and elevations	51			
	I can use congruence and similarity of triangles to find missing sides and angles	166, 144			
Area, Volume and Surface	I can find the perimeter and area of rectangles, triangles, parallelograms and trapezium (including shapes made from these shapes)	53, 54, 55, 56			
	I can find the area of a circle, including leaving my answer as π	117, 118			
	I can apply the area rules in reverse				
	I can find the volume and surface area of a cuboid or prism	114, 115, 119			
	I can find the volume and surface area of a cylinder	119			
Sequence	I can recognise arithmetic and geometric sequences				
Units and Measure	I can convert between metric units, including time	112			
	I can convert between metric and imperial units (conversions are given)				
	I can use scales on a map	38			
	I can use compass directions and three figure bearings				
	I can use the rules for distance, speed and time	142			

	I can use the rules for mass, density and volume	142			
Pythagoras and	I can carry out Pythagoras theorem	150			
	I can use trigonometry to find a missing side	168			

Memorisation

There are key elements of each examination course that need to be fully memorised in order for you to obtain the highest marks possible in the exam. The information below should be a priority for memorising as part of your revision.

There is so much to memorise and use in maths that the best way to revise is to practice, practice and practice some more, do not just sit and read your exercise book.

Find lots of questions which give you the opportunity to practice the skills learnt, especially when the question is not straight forward and you need to unpick what all the words are actually asking you to do.

Use your memorisation skills learnt in Spanish to help you memorise all the formulae needed for maths, below is just a flavour of what you may need.

- BIDMAS – Brackets, Indices, Division/Multiplication, Addition/Subtraction
- Know the location and how to use the key buttons on your calculator for creating; powers, roots, negative numbers, fractions
- Rules for area and perimeter:
 - Area of a rectangle or square = length x width
 - Perimeter of a rectangle or square = (length + width) x 2
 - Area of a triangle = $\frac{1}{2}$ x base x height
 - Area of a parallelogram or rhombus = base x height
 - Area of a trapezium = $\frac{1}{2}$ (top + bottom) x height
 - Area of a circle = πr^2
 - Circumference of a circle = πd
- Rules for finding the volume:
 - Volume of cube or cuboid = length x width x depth
 - Volume of a prism = area of the cross section x depth
(use the rules above for area to find the area of the cross section – the shape that goes all the way through the prism)
 - Volume of a cylinder = πr^2 x depth
- Probabilities can only be given using fractions, percentages or decimals
- Probabilities add up to 1
- The probability of something happening (p) and not happening ($1-p$) add up to 1
- If you are asked to estimate or approximate an answer round everything to 1 significant figure
- Metric conversions e.g. grams to kilograms
- Angle Facts
 - Angles on a straight line equal 180°
 - Angles in a triangle equal 180°
 - Corresponding angles are equal / Alternate angles are equal / Supplementary angles equal 180°
 - Angles around a point equal 360°
 - Opposite angles are equal

History

Science has proved that pathways between neurons in your brain can be strengthened over time. Simple repetition – practising retrieving a memory over and over again – is the best form of

Topic	1	2	3
Topic: The Middle Ages			
The influence of the Christian church.			
The influence of the government.			
Surgery: types, problems and methods.			
Topic: The Renaissance			
John Hunter, his ideas about surgery.			
Surgery and the Renaissance.			
Topic: Surgery			
The problem of pain: anaesthetics, Davy, Liston, Simpson.			
The development of Local and General anaesthetics for heart and brain surgery.			
Topic: Fighting Disease			
Vaccination: smallpox and the work of Edward Jenner, opposition and government involvement.			
Louis Pasteur and the Germ theory, vaccinations and government involvement.			
Robert Koch, the dying and identifying bacteria and government involvement.			
Penicillin: its discovery and development, Fleming, Florey and Chain and the impact of factors.			
Topic: Public Health			
Laissez Faire attitude and early Public Health			
Cholera: Causes, John Snow and government prevention.			
The 1842 and 1875 Public Health Acts.			
The NHS: opposition, the role of Aneurin Bevan, how and why it was set up.			
Topic: Factors x 2 examples from different time periods per factor!			
Science and technology			
Chance and Luck			
Government			
War			
Religion			
The role of the individual			
Communication			

consolidating information. You need to try and revise each 'I can statement...' at least three times.

Key term and definitions

Using subject specific terminology in your exam answers increases your chances of being awarded higher grades.

Complete the table below to give the definition of each of the key terms provided

Key term	Definition
Anaesthetics	
Cholera	
Disease	
Germ Theory	
Laissez Faire	
NHS	
Penicillin	
Public Health	
Smallpox	
Surgery	
Vaccination	

Memorisation

What did the following people contribute to Medicine:

Aneurin Bevan

Chain

Davy

Robert Koch

Fleming

Florey

John Hunter

Jenner

Liston

Louis Pasteur

Simpson

Snow

Philosophy and Ethics Full Course

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Topic	Content that you should revise Unit 2: Muslim Practices	1	2	3
The 5 Pillars of Islam	Names in English and translated form Arabic			
	Importance of the 5 pillars of Islam			
	10 Obligatory Acts in Shi'a Islam			
Shahadah Faith	What is it? (Quote)			
	What does it show about belief in Allah and belief in Muhammad			
Salah Prayer	How Muslims pray, preparation for prayer, ra'kah, ablution/wudu, times, directions, movements, recitations.			
	In the home and Mosque worship. Public Jummah prayer and private Du'a prayers.			
	The importance of prayer.			
Sawm Fasting	What is fasting and how is it performed. The origins, duties, benefits and those excused			
	Importance of fasting and Ramadan			
	The Night of Power (Surah 96:1-4).			
Zakah Charity	Origins, why it is given, Khums in Shi'a Islam.			
	Role and significance of giving alms			
Hajj Pilgrimage	Origins of Hajj			
	How hajj is performed			
	Significance of hajj and it's role in Islam			
Jihad	Greater and Lesser			
	Origins, influences, conditions and declaration of lesser			
	The last 4 of the 10 obligatory acts			
Festivals	Id-ul-Adha,			
	Id-ul-Fitr			
	Ashura (not on exam)			
	Theme E: Crime and Punishment			
Key Concepts	Religion and rules, right and wrong in Islam, Christianity, Islam and Sikhism, conscience.			
Crime	Types of crime, what are the worst crimes? Causes of crime, Where does evil come from?			
Punishment	James Bulger Case study, Religious attitudes to suffering, aims of punishment, treatment of criminals, different attitudes to criminals and forgiveness			
Prison	Does it work? Alternatives, community service			
Corporal Punishment	What is it? Examples, arguments and religious arguments for and against.			
Capital Punishment	What is it? Examples, arguments and religious arguments for and against.			
Contrasting Beliefs	Contrasting Beliefs on Forgiveness, Corporal punishment and capital punishment.			

Key terms and definitions

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Complete the table below to give the definition of each of the key terms provided

Key term	Definition
The 5 pillars of Islam (Shahadah, Salah, Zakah, Sawm and Hajj)	
10 Obligatory Acts	
Wuzu/Wudu	
Topi/Hijab	
Rak'ah	
Jumu'ah	
Du'as	
Ramadan	
Ka'aba	
Jihad (greater and lesser)	
Eid ul-Fitr	
Eid ul-Adha	
Ashura	
Capital punishment	

Community service order	
Conscience	
Corporal punishment	
Crime	
Deterrence	
Duty	
Evil	
Forgiveness	
Hate Crime	
Imprisonment	
Justice	
Law	
Order	
Parole	
Probation order	
Protection	
Reformation	

Reparation	
Retribution	
Victim	
Vindication	
Young offenders	

Memorisation

There are key elements of each examination course that need to be fully memorised in order for you to obtain the highest marks possible in the exam. The information below should be a priority for memorising as part of your revision.

You must memorise...

The names of the 5 pillars of Islam in English and the translation from Arabic

The 10 Obligatory Acts

Words of the Shahadah

At least 2 teachings for each of the 5 pillars, Jihad and Festivals.

Teachings

Aims of punishment

Contrasting Beliefs on Forgiveness, Corporal punishment and capital punishment.

Key terms

Music

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Revision content	1	2	3
I can read notes from the treble clef.			
I can read notes from the bass clef.			
I can complete a major circle of fifths.			
I can complete a minor circle of fifths.			
I can write major/minor scales up to 4 flats or sharps using circle of fifths.			
I can remember the rhyme for knowing the order of the flats and sharps.			
I can identify intervals by listening.			
I can understand what DR SMITTTTH means.			
I can understand key words for Dynamics.			
I can understand key words for Rhythm.			
I can understand key words for Structure.			
I can understand key words for Melody.			
I can understand key words for Instrumentation.			
I can understand key words for Tempo.			
I can understand key words for Texture.			
I can understand key words for Tonality.			
I can understand key words for Harmony.			
I can plan essay questions before I write them.			
I can remember the set works for GCSE music.			

consolidating information. You need to try and revise each 'I can statement...' at least three times.

Key terms and definitions

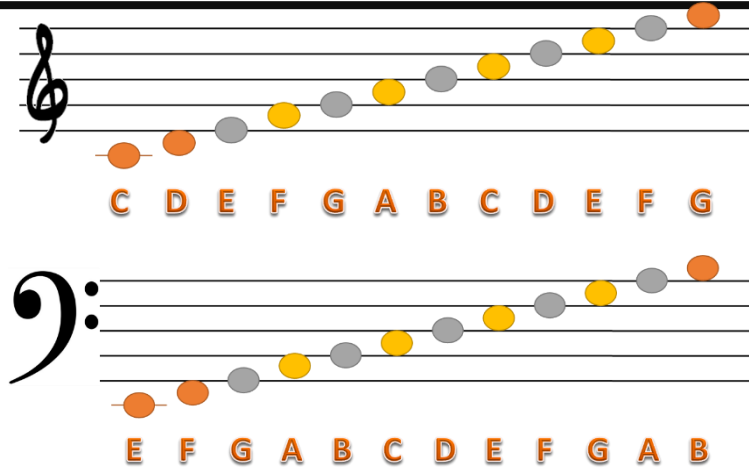
Using subject specific terminology in your exam answers increases your chances of being awarded higher grades.

Complete the table below to give the definition of each of the key terms provided

Key term	Definition
Dynamics	
Rhythm	
Structure	
Melody	
Instrumentation	
Tempo	
Tonality	
Texture	
Harmony	

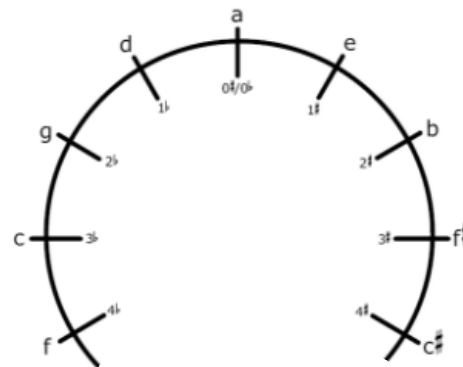
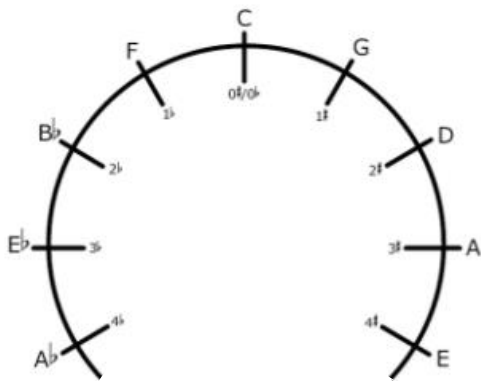
Memorisation

There are key elements of each examination course that need to be fully memorised in order for you to obtain the highest marks possible in the exam. The information below should be a priority for memorising as part of your revision.



Major Circle of Fifths

Minor Circle of Fifths



Spanish

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Revision content	1	2	3
<i>I can say and write the phrases in Spanish from the following sections of module 1 (holidays), module 2 (school) and module 3 (my people) vocabulary:</i>			
Module 1 - Where do you live, what do you do in summer and how often?			
Module 1 - What's the weather like, what do you like doing and where did you go on holiday?			
Module 1 - What did you do, how was it and what was the hotel like?			
Module 1 - What was the town/village like and I would like to book			
Module 1 - I want to complain and my disastrous holiday			
Module 2 - Are you interested in and how are your studies?			
Module 2 - What is your school like and school rules			
Module 2 - What is your school day like and what are you going to do?			
Module 2 - Extracurricular activities			
Module 3 - What apps do you use and what are you doing?			
Module 3 - What do you like reading, how often do you read and what is better – reading paper books or online?			
Module 3 - Family and what is he/she like and what is he/she like as a person?			
Module 3 - Do you get on well with your family and what is a good friend like?			

Memorisation

There are key elements of each examination course that need to be fully memorised in order for you to obtain the highest marks possible in the speaking & writing exams.

The information below should be a priority for memorising as part of your revision, as well as your speaking presentation, questions and answers.

Key phrase to memorise	Definition
Soy adicto/a a mi móvil	I am addicted to my mobile phone
No hago deporte muy a menudo	I don't do sport very often
Los sábados	On Saturdays
Vemos una película	We watch a film
Prefiero	I prefer
Es más fácil de usar que...	It's easier to use than...
El fin de semana pasado	Last weekend
Aprendí a hacer vela	I learned to sail
Prefiero quedarme en un hotel	I prefer to stay in a hotel
Este verano, voy a ir a Francia	This summer, I am going to go to France
¿Cómo viajas allí normalmente?	How do you travel there normally?
Suelo viajar allí en avión	I usually travel there by plane
¿Qué tiempo hace hoy?	What's the weather like today?
HIGHER ONLY (Target grade 6+)...	
Voy al colegio desde hace cinco años	I have been going to my school for 5 years
No aprendo nada	I don't learn anything
Tengo que hacer	I have to do
Cada día	Each/every day
Toqué el piano	I played the piano
Me interesa la música	I'm interested in music
Había	There were
Poco/a(s)	Very few
Si hace sol	If it's sunny
Participaré en un partido	I will take part in a match
¿Cómo son tus amigos?	What are your friends like?
¿Cual aspecto de personalidad prefieres en un amigo?	What personality trait do you prefer in a friend?
¿Con quién te llevas mejor en tu familia?	Who do you get on best with in your family?
Me llevo mejor con mi madre ya que es...	I get on best with my Mum because she is...
¿Qué hiciste con tu familia anoche?	What did you do with your family last night?
Lo más importante para mí es...	The most important thing for me is

English

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Revision content	1	2	3
I can respond to an unseen fiction extract			
I can select and retrieve information			
I can infer and deduce meanings			
I can recognise effect of structure and layout on meaning			
I can work out and explore a writer's intention			
I can recognise effects on the reader			
I can write using the P.E.E. structure			
I can explain in detail			
I can write a narrative text			
I can use vocabulary for effect			
I can use a range of punctuation accurately			
I can use connectives to organise ideas			
I can structure a text by using a variety of sentence types and paragraphs			

Key terms and definitions

Using subject specific terminology in your exam answers increases your chances of being awarded higher grades.

Complete the table below to give the definition of each of the key terms provided

Key term	Definition
Audience	
Purpose	
Noun	
Verb	
Adverb	
Adjective	
Pronoun	
Simile	
Metaphor	
Alliteration	
Narrator	
Conveys	
Implies	

Geography

Science has proved that pathways between neurons in your brain can be strengthened over time. Simple repetition – practising retrieving a memory over and over again – is the best form of consolidating information. You need to try and revise each ‘I can statement...’ at least three times.

Revision content	1	2	3
I can describe the global pattern of urban change			
I can explain the factors which have influenced the rate of urbanisation			
I can describe the features of urban sustainable living			
I can give an example of how an area has tried to conserve water			
I can give an example of how an area has tried to improve waste recycling			
I can give an example of how an area has tried to create green space			
I can give an example of how urban transport areas are being used to reduce congestion in an urban area			
I can define the term LIC			
I can define the term NEE			
I can recognise the characteristics of a LIC			
I can recognise the characteristics of a NEE			
I can compare the characteristics of LIC and NEE			
I can explain why Brazil is important internationally			
I can explain why Rio is important to the rest of Brazil			
I can explain the social opportunities that urban growth provides			
I can explain the economic opportunities that urban growth provides			
I can describe the problems caused by urban growth			
I can explain the methods which are used to overcome the issues caused by urban growth			
I can describe the problems that arise in squatter settlements			
I can explain how squatter settlements can be improved			
I can describe the environmental impacts of urban growth			
I can explain how crime can be reduced in a NEE city			
I can explain how traffic congestion can be reduced in a city			
I can define an ecosystem			
I can describe the features of a small scale ecosystem			
I can explain how different elements of an ecosystem are interlinked			
I can explain the impact of a change on an ecosystem			
I can describe the distribution of different ecosystems			
I can define the term ‘tropical rainforest’			
I can describe the characteristics of rainforest plants			
I can explain how plants and animals adapt to survive in the rainforest			
I explain how nutrients are cycled within a rainforest			
I can explain how water moves through an ecosystem			
I can identify the layers of the rainforest			
I can explain the causes of deforestation			
I can explain the impacts of deforestation			
I can explain the different approaches which can be taken to manage a forest			

I can describe the difference between constructive and destructive waves			
I can describe how longshore drift works			
I can explain how caves, arches, stacks and stumps form			
I can explain how bars and spits form			
I can explain how sand dunes form			
I can explain how headlands and bays form			
I can describe soft engineering methods which prevent coastal flooding			
I can describe hard engineering methods which prevent coastal flooding			
I can define the term 'globalisation'			
I can define the term 'interdependence'			
I can define the term 'industrialisation'			
I can define the term 'de-industrialisation'			
I can explain the UK's economy is split into primary, secondary, tertiary and quaternary employment			
I can explain how the UK's economy has changed over time			
I can explain how government policy has led to economic change over time in the UK			
I can explain how Science parks work			
I can use the example of Quorum business park to show how industrial development can be sustainable			
I can define the term 'counter-urbanisation'			
I can explain the meaning of the term 'North/south divide'			
I can explain why there is a 'North/south divide'			
I can describe the strategies used to reduce the 'North/south divide'			
I can explain how the EU impacts the UK's economy			

Key terms and definitions

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Complete the table below to give the definition of each of the key terms provided

Key term	Definition
Urbanisation	
Urban	
Rate	
Trend	
Mega-cities	
Sustainable	
Conservation	
Recycling	
Congestion	
Lower Income Countries	
Newly Emerging Economies	
Social	
Economic	
Environmental	

Squatter settlement	
Crime	
Traffic Congestion	
Sustainable	
Self-help scheme	
Urban Industrial Areas	
Air pollution	
Stimulus	
Opportunities	
Challenges	
Ecosystem	
abiotic	
biotic	
decomposers	
biome	
habitat	
adaptations	

producers	
consumers	
food chain	
food web	
scavengers	
nutrient cycling	
climate	
tropical rainforest	
stratification	
canopy	
biomass	
biodiversity	
deforestation	

GCSE PE

Science has proved that pathways between neurons in your brain can be strengthened over time. Simple repetition – practising retrieving a memory over and over again – is the best form of consolidating information. You need to try and revise each ‘I can statement...’ at least three times.

	Revision content	Clip References	1	2	3
The Body in Action	Skeletal Structure and Function <ul style="list-style-type: none"> - Location of the major bones - Functions of the skeleton 	<ul style="list-style-type: none"> • GCSE PE Blue Folder • CGP GCSE PE Revision Guide • Back of student planner 			
	Synovial Joints <ul style="list-style-type: none"> - Types - Components of Joints (ligaments, cartilage, tendons) 	<ul style="list-style-type: none"> • A1 GCSE PE Poster (0.26) • http://www.bbc.co.uk/education/guides/zkpv4wx/revision 			
	Movements at Joints <ul style="list-style-type: none"> - Ball and Socket Movements - Hinge Movements 	<ul style="list-style-type: none"> • http://www.bbc.co.uk/education/guides/zkpv4wx/revision/3 • http://www.bbc.co.uk/education/guides/z8n39j6/revision/1 			
	Names & Functions of Muscles <ul style="list-style-type: none"> - Location of major muscle groups 	<ul style="list-style-type: none"> • http://www.bbc.co.uk/education/guides/z8n39j6/revision/3 			
	Muscles in Action <ul style="list-style-type: none"> - Roles of muscles in actions - Antagonist, agonist, fixator 	<ul style="list-style-type: none"> • http://www.bbc.co.uk/schools/gcsebitesize/design/systemscontrol/mechanismsrev1.shtml • http://www.slideshare.net/klharrison/biomechanics-1-levels-and-planes-axes 			
	Levers <ul style="list-style-type: none"> - 1st class, 2nd class, 3rd class levers - Definition of mechanical advantage 				
	Planes and Axes <ul style="list-style-type: none"> - Frontal, Transverse and Sagittal Planes - Frontal, Transverse and Longitudinal Axes 				
	Cardiovascular System <ul style="list-style-type: none"> - Pulmonary and Systemic circulatory systems - Blood vessels (arteries, veins and capillaries) - Pathway of blood through the heart - Definitions of heart rate, stroke volume and cardiac output - Role of red blood cells 				

Memorisation

You must memorise...

Names of the bones

Functions of the skeleton

Names and locations of the 11 key muscle groups

6 movements at ball and socket joints and 2 movements at hinge joints

3 types of levers

Planes and axes locations, with examples

Cardiovascular system structure and function, whilst exercising

Respiratory system structure and function, whilst exercising

Short and long term effects of exercise

Health and Skill related components of fitness

Application of all, to specific sporting actions/practical examples

Biology

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Revision content	1	2	3
Identify different kinds of cells			
Use a microscope to observe and draw cells			
Describe the structure and function of different organelles			
Compare the different types of microscope			
Calculate magnification			
Compare prokaryotic and eukaryotic cells			
Describe the structure and function of specialised cells and how they became specialised			
Explain how cells form tissues, organs and organ systems			
Define diffusion			
Describe where diffusion occurs in the body and its importance			
Explain the factors that affect the rate of diffusion			
Calculate and compare surface area to volume ratios			
Explain how exchange surfaces are adapted for diffusion			
Define osmosis			
Investigate the effect of concentration of solution on mass of plant tissue			
Define active transport			
Explain the importance of active transport			
Compare diffusion, osmosis and active transport			
Recall the equation for photosynthesis			
Explain the effect of temperature, light intensity and carbon dioxide concentration on photosynthesis			
Describe what is meant by a limiting factor			
Describe how glucose can be used in a plant			
Describe the differences between aerobic and anaerobic respiration			
Recall the equation for aerobic respiration and anaerobic respiration			
Describe the word equation for anaerobic respiration in plants and yeast cells			
Explain the economic importance of fermentation in terms of manufacturing bread and alcoholic drinks			
Describe how the human body reacts to an increase in demand for energy from exercise			
Describe what is meant by an oxygen debt and explain how it is repaid			
Describe what is meant by metabolism			
Explain where the energy for metabolism is from and how it is used			
Describe the stages of mitosis			
Describe the stage of meiosis and why it's important			
Explain what stem cells are and where they're found			
Describe how stem cells can be used in medicine and what they are used for			

Key terms and definitions

Using subject specific terminology in your exam answers increases your chances of being awarded higher grades.

Complete the table below to give the definition of each of the key terms provided

Key term	Definition
CELLS	
MICROSCOPE	
MAGNIFICATION	
ORGANELLES	
PROKARYOTES	
EUKARYOTES	
CELL DIFFERENTIATION	
CELL SPECIALISATION	
TISSUES	
ORGANS	
ORGAN SYSTEMS	
YEAST	
BACTERIA	
DIFFUSION	
OSMOSIS	
ACTIVE TRANSPORT	
GAS EXCHANGE	
SURFACE AREA	
ADAPTATION	
MITOSIS	
MEIOSIS	

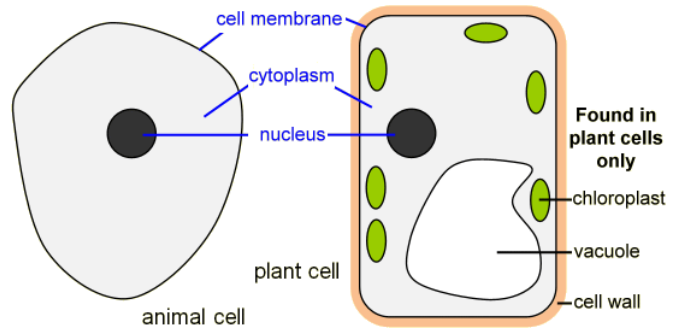
AEROBIC RESPIRATION	
ANAEROBIC RESPIRATION	
OXYGEN DEBT	
METABOLISM	
CHLOROPHYLL	
GLUCOSE	

Memorisation

There are key elements of each examination course that need to be fully memorised in order for you to obtain the highest marks possible in the exam. The information below should be a priority for memorising as part of your revision.

Function of cells which animal and plant cells have in common

Part	Function
Nucleus	Contains genetic material, which controls the activities of the cell
Cytoplasm	Most chemical processes take place here, controlled by enzymes
Cell membrane	Controls the movement of substances into and out of the cell
Mitochondria	Most energy is released by respiration here
Ribosomes	Protein synthesis happens here



Extra parts of plant cells

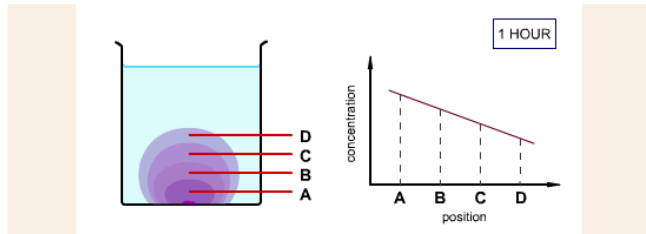
Part	Function
Cell wall	Strengthens the cell
Chloroplasts	Contain chlorophyll, which absorbs light energy for photosynthesis
Permanent vacuole	Filled with cell sap to help keep the cell <i>turgid</i>

Cell	Function	Adaption
Leaf cell	Absorbs light energy for photosynthesis	Packed with chloroplasts. Regular shaped, closely packed cells form a continuous layer for efficient absorption of sunlight.
Root hair cell	Absorbs water and mineral ions from the soil	Long 'finger-like' process with very thin wall, which gives a large surface area.
Sperm cell	Fertilises an egg cell - female gamete	The head contains genetic information and an enzyme to help penetrate the egg cell membrane. The middle section is packed with mitochondria for energy. The tail moves the sperm to the egg.
Red blood cells	Contains haemoglobin to carry oxygen to the cells.	Thin outer membrane to let oxygen diffuse through easily. Shape increases the surface area to allow more oxygen to be absorbed efficiently. No nucleus, so the whole cell is full of haemoglobin.

Diffusion

Dissolved substances have to pass through the cell membrane to get into or out of a cell. Diffusion is one of the processes that allows this to happen.

Diffusion occurs when particles spread. They move from a region where they are in high concentration to a region where they are in low concentration. Diffusion happens when the particles are free to move. This is true in gases and for particles dissolved in solutions. Particles diffuse down a concentration gradient, from an area of high concentration to an area of low concentration. This is how the smell of cooking travels around the house from the kitchen, for example.

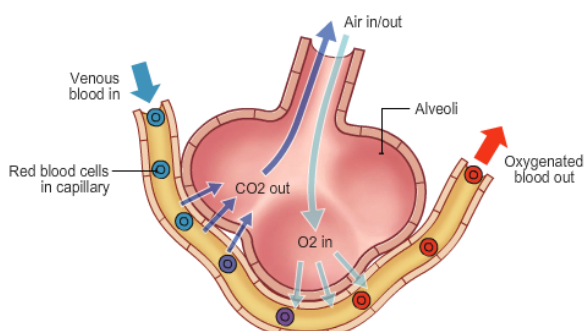


Two examples of diffusion down concentration gradients

Location	Particles move	From	To
Gut	Digested food products	Gut cavity	Blood in capillary of villus
Lungs	Oxygen	Alveolar air space	Blood circulating around the lungs

Remember, particles continue to move from a high to a low concentration while there is a **concentration gradient**.

In the lungs, the blood will continue to take in oxygen from the alveolar air spaces provided the concentration of oxygen there is greater than in the blood. Oxygen diffuses across the alveolar walls into the blood, and the circulation takes the oxygen-rich blood away.

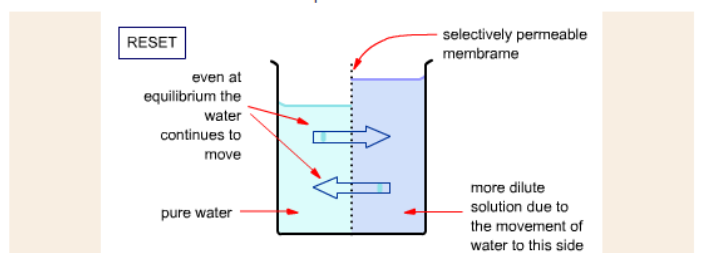


Osmosis

Water can move across cell membranes because of osmosis. For osmosis to happen you need:

- two solutions with different concentrations
- a partially permeable membrane to separate them

Partially permeable membranes let some substances pass through them, but not others. The animation shows an example of osmosis.

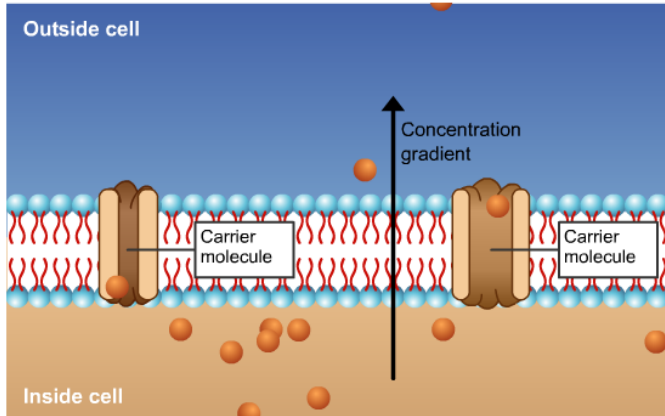


Osmosis is the movement of water from a less concentrated solution to a more concentrated solution through a partially permeable membrane.

Active transport - Higher

Active transport is the process by which dissolved molecules move across a cell **membrane** from a lower to a higher concentration. In active transport, particles move **against** the concentration gradient - and therefore require an input of **energy** from the cell.

Sometimes dissolved molecules are at a higher concentration inside the cell than outside, but, because the organism needs these molecules, they still have to be absorbed. Carrier proteins pick up **specific molecules** and take them through the cell membrane against the concentration gradient.



In humans, active transport takes place during the **digestion** of food in the small intestine. Carbohydrates are broken down into simple sugars such as glucose. The glucose is absorbed by active transport into the villi, to be passed into the bloodstream and taken around the body.

DNA

DNA (deoxyribose nucleic acid) molecules are large and complex. They carry the genetic code that determines the characteristics of a living thing.

Except for identical twins, each person's DNA is unique. This is why people can be identified using DNA fingerprinting. DNA can be cut up and separated, forming a sort of 'bar code' that is different from one person to the next.

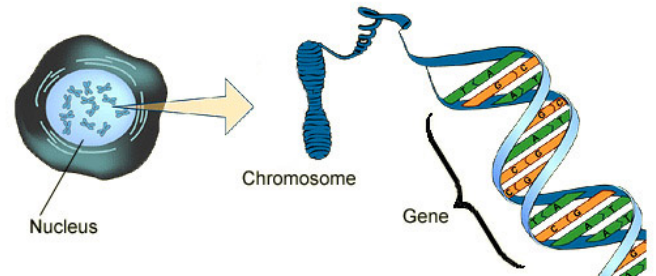
Genes

A **gene** is a short section of DNA. Each gene codes for a specific protein by specifying the order in which amino acids must be joined together.

Chromosomes

The cell's nucleus contains **chromosomes** made from long DNA molecules.

The diagram shows the relationship between the cell, its nucleus, chromosomes in the nucleus, and genes.

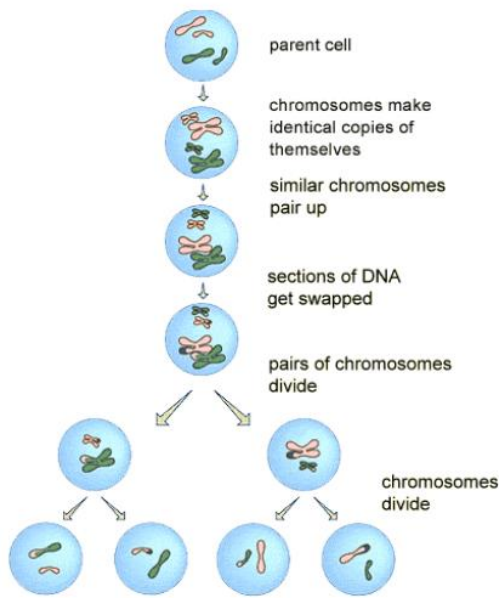


Meiosis - Higher tier

A cell divides by meiosis to form gametes. When this happens:

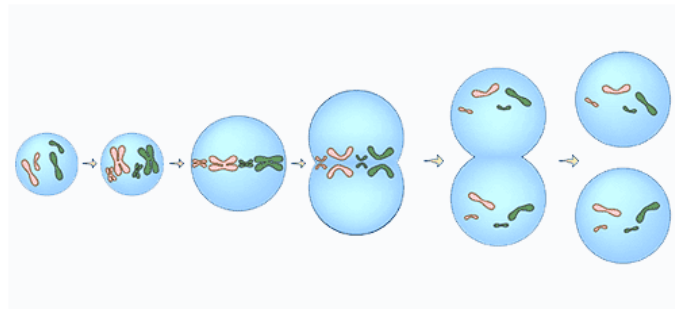
1. Copies of the genetic information are made
2. The cell divides twice to form four gametes

Each gamete has a single set of chromosomes.



Mitosis

The chromosomes contain the cell's genetic information. They are normally found in pairs in body cells. Body cells divide by a process called **mitosis**.

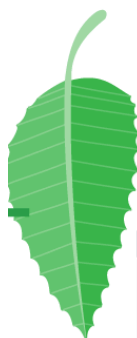
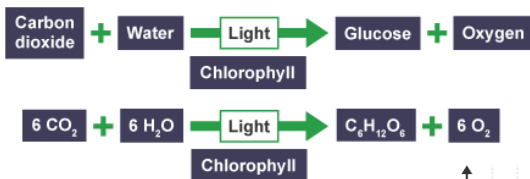


When a body cell divides by mitosis:

1. The genetic material is copied
2. The cell divides once to form two genetically identical body cells

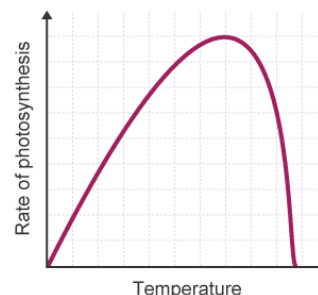
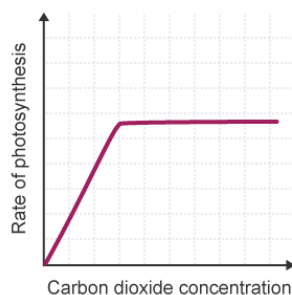
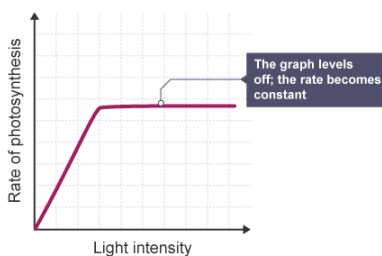
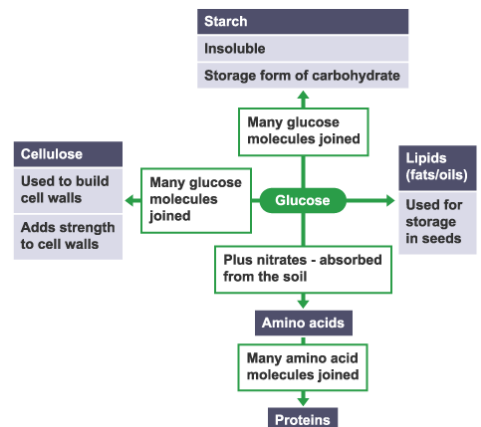
Mitosis occurs during growth or to produce replacement cells.

Photosynthesis



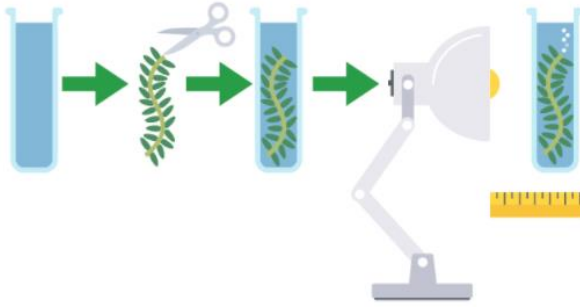
Chlorophyll

Chlorophyll is green because the green part of the spectrum is reflected



Aim

To investigate the effect of light intensity on the rate of photosynthesis.



The word equation for aerobic respiration is:

glucose + oxygen → carbon dioxide + water + energy released

You need to be able to recognise the chemical symbols:

$C_6H_{12}O_6 + 6O_2 \rightarrow 6CO_2 + 6H_2O + \text{energy released}$

Anaerobic respiration

glucose → lactic acid + energy released

	Aerobic	Anaerobic
Presence of oxygen	Present.	Absent or in short supply.
Oxidation of glucose	Complete	Incomplete. The products of respiration still contain energy.
Products of respiration	Carbon dioxide and water. The products do not contain stored chemical energy.	Mammalian muscle: lactic acid. Yeast: ethanol and carbon dioxide. Some plants: ethanol and carbon dioxide. The products still contain stored chemical energy.
Amount of energy released	Relatively large amount.	Small amount, but quickly.

Glucose in yeast cells is converted to carbon dioxide and **ethanol**, which we refer to simply as 'alcohol':

glucose → ethanol + carbon dioxide + energy released

Physics

Revision content	1	2	3
I can list different energy resources and identify them as renewable/ non-renewable			
I can explain which resources can be used in different situations			
I can explain how energy resources can be used together to meet demand.			
I can explain the environmental impact of using some energy resources (e.g acid rain and climate change) and what can be done to limit their impact.			
I can name all types of energy and where they can be found.			
I can describe changes of energy in a system and identify energy as useful/ wasted.			
I can recall the principle of conservation of energy and apply it.			
I can recall, rearrange and apply the Kinetic Energy Formula			
I can recall, rearrange and apply the GPE Formula			
I can explain how changes in GPE can affect KE in different situations.			
I can describe situations where elastic potential energy is stored.			
I can recognise, rearrange and apply the EPE formula			
I can combine energy calculations to show how a change in one quantity will lead to a change in another quantity			
I can recall, rearrange and apply the power equation.			
I can write a definition for power.			
I can recall, rearrange and apply the efficiency equations			
I can evaluate the benefits of using higher efficiency devices.			
I can explain how efficiency can be determines practically			
I can explain the effect of wasted energy on a system and its surroundings.			
I can draw the particle arrangement of a solid, liquid and gas			
I can define density and explain in relation to the particle model.			
I can recall, rearrange and apply the density equation			
I can explain how the density can be calculated for regular and irregular shaped objects.			
I can describe the changes of state and identify them on a graph			
I can describe changes of state in terms of the particle model and intermolecular bonding			
I can explain the difference between a chemical and a physical change			
I can define internal energy			
I can explain potential energy and kinetic energy in relation to particles and explain how these change with temperature and state changes.			
I can recognise, rearrange and apply the specific heat capacity equation			
I can define the specific heat capacity of a material.			
I can define the term latent heat			
I can recognise, rearrange and use the latent heat formula			
I can use a cooling curve to describe energy changes and calculate latent heat and specific latent heat			
I can describe the motion of particles in a gas			
I can explain how pressure is caused in a container and how changing the temperature will change the pressure.			

Science has proved that pathways between neurons in your brain can be strengthened over time. Simple repetition – practising retrieving a memory over and over again – is the best form of consolidating information. You need to try and revise each ‘I can statement...’ at least three times.

Key terms and definitions

Using subject specific terminology in your exam answers increases your chances of being awarded higher grades.

Complete the table below to give the definition of each of the key terms provided

Key term	Definition
ENERGY	
KINETIC ENERGY	
GRAVITATIONAL POTENTIAL ENERGY	
CHEMICAL ENERGY	
ELECTRICAL ENERGY	
THERMAL ENERGY	
ELESTIC POTENTIAL ENERGY	
POWER	
EFFICIENCY	
RENEWABLE	
NON-RENEWABLE	
ENERGY DEMAND	
CLIMATE CHANGE	
PARTICLE MODEL	
DENSITY	
INTERMOLECULAR BONDING	
STATE CHANGES	
SPECIFIC HEAT CAPACITY	
LATENT HEAT	
PARTICLE MOTION	

Memorisation

There are key elements of each examination course that need to be fully memorised in order for you to obtain the highest marks possible in the exam. The information below should be a priority for memorising as part of your revision.

$$E_k = 0.5mv^2$$

$$E_p = mgh$$

$$P = \frac{E}{t}$$

$$\rho = \frac{m}{V}$$

$$\text{efficiency} = \frac{\text{useful energy out}}{\text{total input energy}} \times 100$$

$$\text{efficiency} = \frac{\text{useful energy out}}{\text{total input energy}}$$

Chemistry

Revision content	1	2	3
I can state the charge and mass of a proton, neutron and electron			
I can calculate the number of protons, neutrons and electrons from the mass number and atomic number			
I can write word and symbol equations and can balance symbol equations			
I can draw the electron configuration for the first 20 compounds			
I can describe what an isotope is			
I can write a definition for an element, compound and mixture			
I can describe how the model of the atom changed over time			
I can label the groups on the periodic table			
I can describe the trends as you go down the groups in the alkali metals, halogens and noble gases			
I can compare the reactivity of the transition metals and transition metals (Chemistry only)			
I can identify if a bond is ionic, covalent or metallic.			
I can draw a dot and cross diagram to show ionic bonding			
I can draw a dot and cross diagram to show covalent bonding			
I can describe how the properties of metals relate to metallic bonding			
I can describe the different state symbols			
I can describe and explain how the different structures and bonding affect the property of a substance			
I can describe what nanoparticles are and give examples of their uses.			

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Key terms and definitions

Using subject specific terminology in your exam answers increases your chances of being awarded higher grades.

Complete the table below to give the definition of each of the key terms provided

Key term	Definition
ALKALI METALS	
ALLOYS	
ATOM	
COMPOUND	
COVALENT	
DIAMOND	
DISPLACEMENT	
ELECTRON	
ELEMENT	
FULLERENES	
GIANT COVALENT	
GRAPHENE	
GRAPHITE	
GROUP	
IONIC	
ISOTOPE	
LATTICE	
METALLIC	
MIXTURE	
NEUTRON	
NANOPARTICLE	

NOBLE GASES	
PERIOD	
PERIODICITY	
PRODUCT	
PROTON	
REACTANT	
SHELL	
TRANSITION METALS	

Science command words

These are word that give you a hint of how to answer exam questions.

Annotate – Add labelling to a graph, diagram or drawing

Apply – Use information in a new way

Calculate – Work out the value of something

Comment – Make a judgement based on a value/ data

Compare – Identify similarities and/ or differences

Describe – give an account of

Distinguish – List differences between different items

Evaluate – Judge from available evidence

Explain – give reasons

Identify – provide an answer from a number of alternatives

List – list a number of points or features (no detail required)

Measure – find value/ data for a given quantity

Predict – give a reasonable/ likely outcome

Sketch – draw approximately

Solve – Arrive at an answer using numbers or algebra

State – express in clear terms

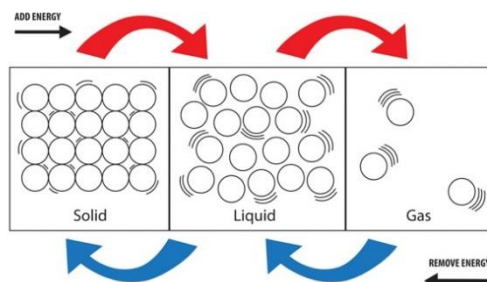
Suggest – present a possible case/ solution

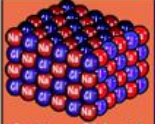
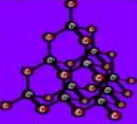
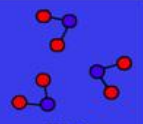
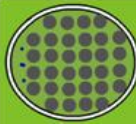
Write – recall basic knowledge possibly after a calculation

Memorisation

There are key elements of each examination course that need to be fully memorised in order for you to obtain the highest marks possible in the exam. The information below should be a priority for memorising as part of your revision.

Physical State	State Symbol
Solid	s
Liquid	l
Gas	g
Aqueous Solution	aq



Bonding	Ionic	Covalent		Metallic
Structures	Giant ionic	Giant covalent	Simple molecular	Giant metallic
Melting Pt	High	High	Low	High
Conducts electricity?	Solid X Liquid <input checked="" type="checkbox"/> Dissolved <input checked="" type="checkbox"/>	No (except graphite)	No	Yes
Example	 Sodium Chloride	 Diamond	 Water	 Iron

© Footprints-Science, 2004

A Silver (nano)

Silver in this form shows different properties:

- 1) It's antibacterial
- 2) It's antiviral
- 3) It's antifungal

B

Special socks are now available that include silver nanoparticles in order to heal conditions such as athlete's foot. Research has shown that silver can also be used to treat many diseases, from flu to HIV.

C

Nanoparticles in the washing machine ensure that the clothes are cleaned and disinfected.

D

The silver nanoparticles in this sock kills odour causing bacteria and keep the socks fresh!

E

Coating the inside of the fridge with silver nanoparticles ensures that any microbe is killed and keeps the fridge clean hygienic and safe.

F

Nanoscience involves the study and use of very small particles called Nanoparticles. They are measure in nanometres (nm). There are one **billion nanometres** in a metre. The size of a Nanoparticles can be written ($1 \times 10^{-9}m$). Nanoparticles have sizes in the range 1-100 nm

G

- Nanoparticles have been used in anti-aging industries for over 40 years.
- Fears from side effects of toxicity.
- Due to their size they can enter off-limits areas potentially ending up in the bloodstream or the brain, causing blockages.

H

Nanoparticles can also help to keep things clean. Fabrics have been developed with nano-coatings, which repel liquid and resist stains. Windows that are self-cleaning have been developed by British scientists.

I

Nanotubes have many useful properties: very high tensile strength, unique electrical properties, good heat conductance. They are use for thinner TV screens, light water proof fabrics, building material, electrical circuits

Sunscreen contains nanoparticles of **zinc oxide** and **titanium oxide**, which absorb and reflect harmful UV rays from the Sun.

J

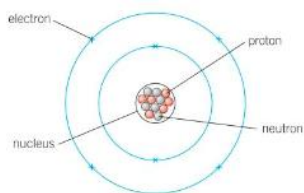
Nanotechnology can be used in medicine. They can be used to target cancer cells. By carrying the drug to the target site.

K

60 Carbons joined together like a football is called buckminsterfullerene. These have been used to make non-slip frying pans, cages it hold drug molecules, clear up toxic waste.

Some people have concerns the use of Nanoparticles in Science and the environment. More test should be done because the particles behave differently to normal sized particles. This means they can spread easily through water, air and living matter risking the environment.

M



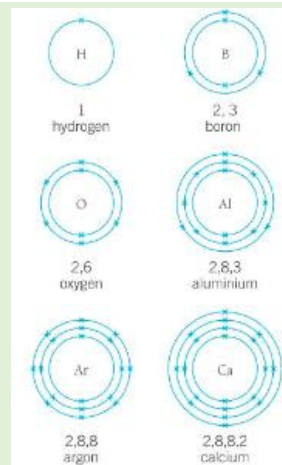
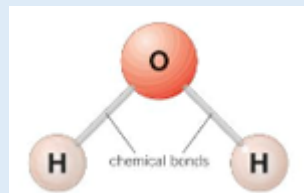
The nucleus contains protons and neutrons. Electrons are found in shells surrounding the nucleus.

The relative mass of a proton and a neutron are both 1.

Protons have a relative charge of +1, electrons have a relative charge of -1. Neutrons are neutral.

Atomic number = number of protons (= number of electrons)

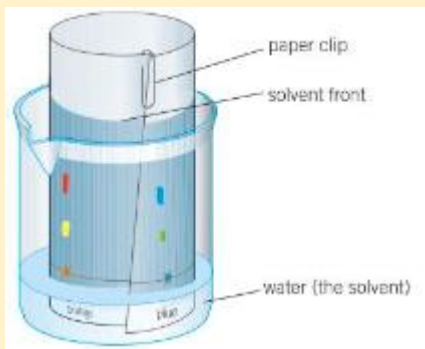
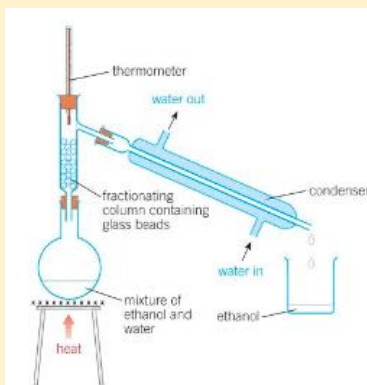
Mass number = number of protons + number of neutrons



The lowest energy shell is filled first and holds up to 2 electrons. The next two shells can hold up to 8 electrons. Ensure you fill up the 2nd shell before you move onto the 3rd.

Fractional distillation is a way of separating a mixture of liquids. This is possible because the liquids in the mixture have different boiling points.

Paper chromatography separates mixtures of substance dissolved in a solvent. The substances are separated because of their different solubilities and so some will travel further than others.



The group 1 (alkali metals) melting points and boiling points decrease as you move down the group.

The metals react with water to produce hydrogen and an alkaline solution containing the metal oxide.

They form +1 ions to make ionic compounds.

The reactivity of the metals increases as you move down the group.

7	Li
	lithium
3	
23	Na
	sodium
11	
39	K
	potassium
19	
85	Rb
	rubidium
37	
133	Cs
	caesium
55	
223	Fr
	francium
87	

Group 7 (Halogens) form ions with a single negative charge in their ionic compounds with metals.

They form covalent compounds with non-metals.

A more reactive halogen displaces a less reactive halogen.

The reactivity of halogens decreases going down the group.

19	F
	fluorine
9	
35	Cl
	chlorine
17	
80	Br
	bromine
35	
127	I
	iodine
53	
210	At
	astatine
85	

Food and Nutrition

Science has proved that pathways between neurons in your brain can be strengthened over time. Simple repetition – practising retrieving a memory over and over again – is the best form of consolidating information. You need to try and revise each 'I can statement...' at least three times.

Revision content	1	2	3
I can explain the principles of the 'eatwell' guide			
I can explain how recipes could be adapted to suit the dietary needs of a vegetarian			
I can explain how recipes could be adapted to suit the dietary needs of a person with gluten intolerance			
I can explain how recipes could be adapted to suit the dietary needs of a person with lactose intolerance			
I can use criteria to design a food product for a specified customer group (teenagers, the elderly, etc)			
I can explain why children should have a balanced diet			

Key terms and definitions

You have all been provided with a vocab book which contains all of the terms and definitions that you will require for the duration of this course. You should use it as part of the revision process.

Year 9 Assessment timetable – WC Tuesday 7th May 2018

Week 1									
Monday 7th May 2018									
Mon:Reg	Mon:1	Mon:2	Mon:3	Mon:4	Mon:5	Mon:6	Mon:7	Mon:8	Mon:9
May day									
Tuesday 8th May 2018									
Tue:Reg	Tue:1	Tue:2	Tue:3	Tue:4	Tue:5	Tue:6	Tue:7	Tue:8	Tue:9
Tutor sets	Spanish - Writing 45 minutes Main Hall			Physics 1 hour Main Hall					Study
Wednesday 9th May 2018									
Wed:Reg	Wed:1	Wed:2	Wed:3	Wed:4	Wed:5	Wed:6	Wed:7	Wed:8	Wed:9
Tutor sets	English - Reading 1 hour Main Hall			Philosophy and Ethics Short Course 45 minutes Main Hall		Maths Non-calculator 1 hour 30 mins Main Hall			Enrichment
Thursday 10th May 2018									
Thu:Reg	Thu:1	Thu:2	Thu:3	Thu:4	Thu:5	Thu:6	Thu:7	Thu:8	Thu:9
Tutor sets	Geography 1 hour 30 minutes Main Hall			Computer Science 1 hour Main Hall		Chemistry 1 hour Main Hall			Study
Friday 11th May 2018									
Fri:Reg	Fri:1	Fri:2	Fri:3	Fri:4	Fri:5	Fri:6	Fri:7		
Tutor sets	Music 1 hour Main Hall			Maths - Calculator 1 hour 30 mins Main Hall					

Week 2									
Monday 14th May 2018									
Mon:Reg	Mon:1	Mon:2	Mon:3	Mon:4	Mon:5	Mon:6	Mon:7	Mon:8	Mon:9
Tutor sets	Biology 1 hour Main Hall			Food and nutrition 1 hour Main Hall		Maths - Calculator 1 hour 30 mins Main Hall			Enrichment
Tuesday 15th May 2018									
Tue:Reg	Tue:1	Tue:2	Tue:3	Tue:4	Tue:5	Tue:6	Tue:7	Tue:8	Tue:9
Tutor sets	Philosophy and Ethics Full Course 1 hour Main Hall			Design Technology 1 hour Main Hall					Study
Wednesday 16th May 2018									
Wed:Reg	Wed:1	Wed:2	Wed:3	Wed:4	Wed:5	Wed:6	Wed:7	Wed:8	Wed:9
Tutor sets	No exams due to vaccinations								Enrichment
Thursday 17th May 2018									
Thu:Reg	Thu:1	Thu:2	Thu:3	Thu:4	Thu:5	Thu:6	Thu:7	Thu:8	Thu:9
Tutor sets	English - Writing 45 minutes Main Hall			History 1 hour 30 minutes Main Hall		PE 45 minutes Main Hall			Study

