GCSE PHYSICS

Physics Equations

Learn these equations.

1	weight = mass × gravitational field strength (g)	$W = m\,g$
2	work done = force × distance (along the line of action of the force)	$W = F\,s$
3	force applied to a spring = spring constant × extension	$F = k\,e$
4	moment of a force = force × distance (normal to direction of force)	$M = F\,d$
5	pressure = $\dfrac{\text{force normal to a surface}}{\text{area of that surface}}$	$p = \dfrac{F}{A}$
6	distance travelled = speed × time	$s = v\,t$
7	acceleration = $\dfrac{\text{change in velocity}}{\text{time taken}}$	$a = \dfrac{\Delta v}{t}$
8	resultant force = mass × acceleration	$F = m\,a$
9 (HT)	**momentum = mass × velocity**	$\mathbf{p = m\,v}$
10	kinetic energy = 0.5 × mass × speed ^{2}	$E_k = \tfrac{1}{2} m\,v^2$
11	gravitational potential energy = mass × gravitational field strength g × height	$E_p = m\,g\,h$
12	power = $\dfrac{\text{energy transferred}}{\text{time}}$	$P = \dfrac{E}{t}$
13	power = $\dfrac{\text{work done}}{\text{time}}$	$P = \dfrac{W}{t}$
14	efficiency = $\dfrac{\text{useful output energy transfer}}{\text{total input energy transfer}}$	
15	efficiency = $\dfrac{\text{useful power output}}{\text{total power input}}$	
16	wave speed = frequency × wavelength	$v = f\,\lambda$
17	charge flow = current × time	$Q = I\,t$
18	potential difference = current × resistance	$V = I\,R$
19	power = potential difference × current	$P = V\,I$
20	power = current ^{2} × resistance	$P = I^2\,R$
21	energy transferred = power × time	$E = P\,t$
22	energy transferred = charge flow × potential difference	$E = Q\,V$
23	density = $\dfrac{\text{mass}}{\text{volume}}$	$\rho = \dfrac{m}{V}$

You will be **given** these equations

1 (HT)	**pressure due to a column of liquid = height of column × density of liquid × gravitational field strength (g)**	$\mathbf{p = h\,\rho\,g}$
2	final velocity ^{2} – initial velocity ^{2} = 2 × acceleration × distance	$v^2 - u^2 = 2\,a\,s$
3(HT)	**force = $\dfrac{\text{change in momentum}}{\text{time taken}}$**	$\mathbf{F = \dfrac{m\,\Delta v}{\Delta t}}$
4	elastic potential energy = 0.5 × spring constant × extension ^{2}	$E_e = \tfrac{1}{2} k\,e^2$
5	change in thermal energy = mass × specific heat capacity × temperature change	$\Delta E = m\,c\,\Delta \theta$
6	period = $\dfrac{1}{\text{frequency}}$	
7	magnification = $\dfrac{\text{image height}}{\text{object height}}$	
8 (HT)	**force on a conductor (at right angles to a magnetic field carrying a current) = magnetic flux density × current × length**	$\mathbf{F = B\,I\,L}$
9	thermal energy for a change of state = mass × specific latent heat	$E = m\,L$
10(HT)	**$\dfrac{\text{potential difference across primary coil}}{\text{potential difference across secondary coil}} = \dfrac{\text{number of turns in primary coil}}{\text{number of turns in secondary coil}}$**	$\dfrac{V_p}{V_s} = \dfrac{n_p}{n_s}$
11(HT)	**potential difference across primary coil × current in primary coil = potential difference across secondary coil × current in secondary coil**	$V_s\,I_s = V_p\,I_p$
12	For gases: pressure × volume = constant	$p\,V = \text{constant}$

GCSE Separate Sciences

Summer 2019

Paper 1

▨ = Higher tier only

Biology 1			Chemistry 1			Physics 1		
Tues 14 May 2019 pm 1 hr 45 mins 70 marks	AQA ref	Revised	Thurs 16 May 2019 am 1 hr 45 mins 70 marks	AQA ref	Revised	Wed 22 May 2019 pm 1 hr 45 mins 70 marks	AQA ref	Revised
Cells			Atoms			Energy stores		
Microscopes			Elements			Conservation of energy		
Cell differentiation & Specialisation			Compounds			Kinetic & potential energy		
Chromosomes & Mitosis			Chemical equations			Heat transfer		
Stem Cells	B1		Mixtures			Specific heat capacity		
Diffusion			Chromatography			Power		
Osmosis			Separation techniques			Conservation of energy and power	P1	
Active transport			Distillation	C1		Efficiency		
Exchanging substances			History of the atom			Energy resources		
Cell organisation			Electronic structure			Wind, solar & geothermal		
Enzymes			Periodic table - development			Hydro, waves and tides		
Enzymes in digestion			Periodic table			Bio-fuels and non-renewables		
Food tests			Metals & non-metals			Trends in energy use		
The Lungs			Group 1 elements			Current & circuit symbols		
The heart			Group 7 elements			Resistance and V = I R		
Blood vessels			Group 0 elements			Resistance		
Blood	B2		Formation of ions			I-V characteristics		
Cardiovascular disease			Ionic bonding			Circuit devices		
Health & disease			Ionic compounds			Series circuits		
Health risk factors			Covalent bonding			Parallel circuits	P2	
Cancer			Simple substances	C2		Investigating circuits		
Plant cell organisation			Polymers & giant structures			Electricity in the home		
Transpiration & translocation			Carbon			Power of appliances		
Stomata			Metallic bonding			The National Grid		
Communicable disease			States of matter			Static electricity		
Bacterial diseases			Changing state			Electric fields		
Viral diseases			Relative formula mass			Model of gases		
Fungal & protest diseases	B3		The mole			Density		
Fighting disease			Conservation of mass			Internal energy and changes of state	P3	
Vaccinations			Limiting reactants	C3		Specific latent heat		
Drugs			Concentrations			Particle motion in gases		
Developing new drugs			Acids and bases			Gas pressure and volume		
Photosynthesis			Reactions of acids			The atom & discovery of the nucleus		
Rate of photosynthesis			Separating metals from metal oxides			Isotopes and nuclear radiation		
Respiration and metabolism	B4		Reactivity series			Nuclear equations		
Aerobic & anaerobic respiration			Redox	C4		Half-life		
Exercise			Reactions of metals			Irradiation & contamination	P4	
			Electrolysis			Background radiation		
			Electrolysis in solution			Medical uses of nuclear radiation		
			Exothermic & endothermic			Nuclear fission and fusion		
			Energy changes	C5		Nuclear Issues		
			Reaction profiles					

GCSE Separate Sciences

Summer 2019

Paper 2

☐ = Higher tier only

Biology 2			Chemistry 2			Physics 2		
Fri 7 June pm 1 hr 45 mins 70 marks	AQA ref	Revised	**Wed 12 June am** 1 hr 45 mins 70 marks	AQA ref	Revised	**Fri 14 June am** 1 hr 45 mins 70 marks	AQA ref	Revised
Homeostasis	B5		Rates of reaction	C6		Contact & non-contact forces	P5	
Nervous system			Factors affecting rates			Weight, mass and gravity		
Synapses and reflexes			Measuring rates			Resultant forces and work done		
Reaction time			Graphs and rates			Scalar and vector quantities		
The endocrine (hormone) system			Working out rates			Resolving forces		
Controlling blood glucose			Reversible reactions			Forces and elasticity		
Puberty & menstruation			Le Chatelier's Principle			Investigating springs		
Controlling fertility			Hydrocarbons	C7		Moments and gears		
DNA	B6		Crude oil			Pressure		
Adrenaline & thyroxine			Fractional distillation			Fluid pressure		
Reproduction			Cracking			Upthrust		
Meiosis			Purity and formulations	C8		Atmospheric pressure		
X & Y chromosomes			Paper chromatography			Distance, displacement & speed		
Genetic diagrams			Using chromatograms			Acceleration		
Inherited disorders			Tests for gases			Distance-time graphs		
Embryo screening			Evolution of the atmosphere	C9		Velocity-time graphs		
Variation			Greenhouse gases			Terminal velocity		
Evolution			Carbon footprint			Newton's First and Second Laws		
Antibiotic resistance			Air pollution			Inertia and Newton's Third Law		
Selective breeding			Finite & renewable resources			Investigating motion		
Genetic engineering			Reuse and recycling			Stopping distances		
Fossils			Life cycle assessments			Braking distance		
Classification			Potable water			Reaction time /thinking distances		
Competition			Desalination			Momentum		
Abiotic and biotic factors			Waste water management			Changes in momentum		
Adaptations						Impact forces		
Food chains						Transverse and longitudinal waves	P6	
Using quadrats						Frequency, period & wave speed		
Using transects						Investigating waves		
Water cycle						Reflection & Refraction water waves		
Carbon cycle						Sound waves		
Biodiversity& waste management						Ultrasound		
Global warming						Seismic waves		
Deforestation and land use						Electromagnetic (EM) waves		
Conservation						Uses of EM waves		
						Radio waves and communications		
						Medical uses of X rays		
						Dangers of EM waves		
						Reflection and refraction of light		
						Light and colour		
						Lenses		
						Infrared radiation and temperature		
						Black body radiation		
						Uses of convex lenses and ray diagrams		
						Concave lenses and magnification		
						Investigating IR radiation and absorption		
						Permanent and induced magnets	P7	
						Electromagnetism		
						Motor effect		
						Electronic motors		
						A.C.generator (alternator)		
						Dynamo (D.C. generator)		
						Transformers		
						Life cycle of stars	P8	
						The solar system and orbits		
						Red Shift and the big bang		

GCSE BIOLOGY

Required Practicals

Nº	Exam	Title
		Biology
1	Paper 1	Use a light microscope to observe, draw and label a selection of plant and animal cells. A magnification scale must be included. https://www.youtube.com/watch?v=jBVxo5T-ZQM
2		Investigate the effect of antiseptics or antibiotics on bacterial growth using agar plates and measuring zones of inhibition. https://www.youtube.com/watch?v=BkbLl2mAMP8
3		Investigate the effect of a range of concentrations of salt or sugar solutions on the mass of plant tissue. https://www.youtube.com/watch?v=ef2Ts2AKhq8
4		Use qualitative reagents to test for a range of carbohydrates, lipids and proteins. To include: Benedict's test for sugars; iodine test for starch; and Biuret reagent for protein. https://www.youtube.com/watch?v=zbZxFxXN6m4
5		Investigate the effect of pH on the rate of reaction of amylase enzyme. https://www.youtube.com/watch?v=JyXXoevEWc8
6		Investigate the effect of light intensity on the rate of photosynthesis using an aquatic organism such as pondweed. https://www.youtube.com/watch?v=cBCKedXdFeE
7	Paper 2	Plan and carry out an investigation into the effect of a factor on human reaction time. https://www.youtube.com/watch?v=Fm02i4vEi5Q
8		Investigate the effect of light or gravity on the growth of newly germinated seedlings. Record results both as length measurements and as accurate, labelled biological drawings to show the effects. https://www.youtube.com/watch?v=fEo21LbnJJM
9		Measure the population size of a common species in a habitat. Use sampling techniques to investigate the effect of a factor on the distribution of this species. https://www.youtube.com/watch?v=yLHz2Ea10Mg
10		Investigate the effect of temperature on the rate of decay of fresh milk by measuring pH change. https://www.youtube.com/watch?v=LeH5FUKSPzU

Link to specification:

http://filestore.aqa.org.uk/resources/biology/specifications/AQA-8461-SP-2016.PDF

GCSE Chemistry
Required Practicals

№	Exam	Title
		Chemistry
1	Paper 1	Preparation of a pure, dry sample of a soluble salt from an insoluble oxide or carbonate, using a Bunsen burner to heat dilute acid and a water bath or electric heater to evaporate the solution. https://www.youtube.com/watch?v=9GH95172Js8
2		Determination of the reacting volumes of solutions of a strong acid and a strong alkali by titration. **(HT only) determination of the concentration of one of the solutions in mol/dm³ and g/dm³ from the reacting volumes and the known concentration of the other solution.** https://www.youtube.com/watch?v=saRBT5oZfh8
3		Investigate what happens when aqueous solutions are electrolysed using inert electrodes. This should be an investigation involving developing a hypothesis. https://www.youtube.com/watch?v=ukbtTTG1Kew
4		Investigate the variables that affect temperature changes in reacting solutions such as, eg acid plus metals, acid plus carbonates, neutralisations, displacement of metals. https://www.youtube.com/watch?v=rdI7xEq4Ew8
5	Paper 2	Investigate how changes in concentration affect the rates of reactions by a method involving measuring the volume of a gas produced and a method involving a change in colour or turbidity. This should be an investigation involving developing a hypothesis. https://www.youtube.com/watch?v=N5p06i9iImo
6		Investigate how paper chromatography can be used to separate and tell the difference between coloured substances. Students should calculate Rf values. https://www.youtube.com/watch?v=P8i4QYncQxI
7		Use of chemical tests to identify the ions in unknown single ionic compounds covering the ions from sections Flame tests through to Sulfates. https://www.youtube.com/watch?v=4iZRs4XlJOE
8		Analysis and purification of water samples from different sources, including pH, dissolved solids and distillation. https://www.youtube.com/watch?v=DikcEq2wg8g

Link to specification:

http://filestore.aqa.org.uk/resources/chemistry/specifications/AQA-8462-SP-2016.PDF

GCSE Physics
Required Practicals

Nº	Exam	Title
		Physics
1		An investigation to determine the specific heat capacity of one or more materials. The investigation will involve linking the decrease of one energy store (or work done) to the increase in temperature and subsequent increase in thermal energy stored. https://www.youtube.com/watch?v=HAPmwu7byGM
2		Investigate the effectiveness of different materials as thermal insulators and the factors that may affect the thermal insulation properties of a material. https://www.youtube.com/watch?v=ILH45loyPUA
3	Paper 1	Use circuit diagrams to set up and check appropriate circuits to investigate the factors affecting the resistance of electrical circuits. This should include: • the length of a wire at constant temperature • combinations of resistors in series and parallel. https://www.youtube.com/watch?v=YsZeZotYVag
4		Use circuit diagrams to construct appropriate circuits to investigate the I–V characteristics of variety of circuit elements including a filament lamp, a diode and a resistor at constant temperature. https://www.youtube.com/watch?v=A1SyKvdHogY
5		Use appropriate apparatus to make and record the measurements needed to determine the densities of regular and irregular solid objects and liquids. Volume should be determined from the dimensions of regularly shaped objects and by a displacement technique for irregularly shaped objects. Dimensions to be measured using appropriate apparatus such as a ruler, micrometer or Vernier callipers. https://www.youtube.com/watch?v=ScXOp8Zph28
6		Investigate the relationship between force and extension for a spring. https://www.youtube.com/watch?v=jQAt3e6Bz7U
7		Investigate the effect of varying the force on the acceleration of an object of constant mass and the effect of varying the mass of an object on the acceleration produced by a constant force. https://www.youtube.com/watch?v=wI-VkxEeIxw
8	Paper 2	Make observations to identify the suitability of apparatus to measure the frequency, wavelength and speed of waves in a ripple tank and waves in a solid and take appropriate measurements. https://www.youtube.com/watch?v=UNmv6H-f180 https://www.youtube.com/watch?v=ZXAmiRC0GBo
9		Investigate the reflection of light by different types of surface and the refraction of light by different substances. https://www.youtube.com/watch?v=2fN_jvf4fw8
10		Investigate how the amount of infrared radiation absorbed or radiated by a surface depends on the nature of that surface. https://www.youtube.com/watch?v=eE7OPL7pesA

Link to specification:

http://filestore.aqa.org.uk/resources/physics/specifications/AQA-8463-SP-2016.PDF

GCSE Science - Trilogy

Summer 2019

Paper 1

| | = Higher tier only

Biology 1			Chemistry 1			Physics 1		
Tues 14 May 2019 pm 1 hr 15 mins 70 marks	AQA ref	Revised	Thurs 16 May 2019 am 1 hr 15 mins 70 marks	AQA ref	Revised	Wed 22 May 2019 pm 1 hr 15 mins 70 marks	AQA ref	Revised
Cells			Atoms			Energy stores		
Microscopes			Elements			Conservation of energy		
Cell differentiation & Specialisation			Compounds			Kinetic & potential energy		
Chromosomes & Mitosis			Chemical equations			Heating		
Stem Cells	B1		Mixtures			Specific heat capacity		
Diffusion			Chromatography			Power		
Osmosis			Separation techniques			Reducing energy wastage	P1	
Active transport			Distillation	C1		Efficiency		
Exchanging substances			History of the atom			Energy resources		
Cell organisation			Electronic structure			Wind, solar & geothermal		
Enzymes			Periodic table - development			Hydro, waves and tides		
Enzymes in digestion			Periodic table			Bio-fuels and non-renewables		
Food tests			Metals & non-metals			Trends in energy use		
The Lungs			Group 1 elements			Current & circuit symbols		
The heart			Group 7 elements			Resistance and V = I R		
Blood vessels			Group 0 elements			Resistance		
Blood	B2		Formation of ions			I-V characteristics		
Cardiovascular disease			Ionic bonding			Circuit devices		
Health & disease			Ionic compounds			Series circuits	P2	
Health risk factors			Covalent bonding			Parallel circuits		
Cancer			Simple substances	C2		Investigating circuits		
Plant cell organisation			Polymers & giant structures			Electricity in the home		
Transpiration & translocation			Carbon			Power of appliances		
Stomata			Metallic bonding			The National Grid		
Communicable disease			States of matter			Model of gases		
Bacterial diseases			Changing state			Density	P3	
Viral diseases			Relative formula mass			Internal energy and state		
Fungal & protest diseases	B3		The mole			Specific latent heat		
Fighting disease			Conservation of mass	C3		The atom		
Vaccinations			Limiting reactants			Isotopes and nuclear radiation		
Drugs			Concentrations			Nuclear equations	P4	
Developing new drugs			Acids and bases			Half-life		
Photosynthesis			Reactions of acids			Irradiation & contamination		
Rate of photosynthesis			Separating metals from metal oxides					
Respiration and metabolism	B4		Reactivity series					
Aerobic & anaerobic respiration			Redox	C4				
Exercise			Reactions of metals					
			Electrolysis					
			Electrolysis in solution					
			Exothermic & endothermic					
			Energy changes	C5				
			Reaction profiles					

GCSE Science - Trilogy

Summer 2019

Paper 2

☐ = Higher tier only

Biology 2			Chemistry 2			Physics 2		
Fri 7 June 2018 pm 1 hr 15 mins 70 marks	AQA ref	Revised	Wed 12 June am 1 hr 15 mins 70 marks	AQA ref	Revised	Fri 14 June am 1 hr 45 mins 70 marks	AQA ref	Revised
Homeostasis	B5		Rates of reaction	C6		Contact & non-contact forces	P5	
Nervous system			Factors affecting rates			Weight, mass and gravity		
Synapses and reflexes			Measuring rates			Resultant forces and work done		
Reaction time			Graphs and rates			Forces and elasticity		
The endocrine (hormone) system			Working out rates			Springs		
Controlling blood glucose			Reversible reactions			Distance, displacement and speed		
Puberty & menstruation			Le Chatelier's Principle			Acceleration		
Controlling fertility			Hydrocarbons	C7		Distance-time graphs		
DNA	B6		Crude oil			Velocity-time graphs		
Adrenaline & thyroxine			Fractional distillation			Terminal velocity		
Reproduction			Cracking			Newton's First and Second Laws		
Meiosis			Purity and formulations	C8		Newton's Third Law		
X & Y chromosomes			Paper chromatography			Investigating motion		
Genetic diagrams			Using chromatograms			Stopping and thinking distances		
Inherited disorders			Tests for gases			Braking distance		
Embryo screening			Evolution of the atmosphere	C9		Reaction times		
Variation			Greenhouse gases			Momentum		
Evolution			Carbon footprint			Transverse and longitudinal waves	P6	
Antibiotic resistance			Air pollution			Frequency, period and wave speed		
Selective breeding			Finite & renewable resources	C10		Investigating waves		
Genetic engineering			Reuse and recycling			Refraction		
Fossils			Life cycle assessments			Radio waves		
Classification			Potable water			Electromagnetic (EM) waves		
Competition	B7		Desalination			Uses of EM waves		
Abiotic and biotic factors			Waste water management			Investigating IR radiation		
Adaptations						Investigating IR absorption		
Food chains						Dangers of EM waves		
Using quadrats						Permanent and induced magnets	P7	
Using transects						Electromagnetism		
Water cycle						Motor effect		
Carbon cycle						Electronic motors		
Biodiversity & waste management								
Global warming								
Deforestation and land use								
Conservation								

Educake - https://www.educake.co.uk/   Seneca Learning - https://app.senecalearning.com/login

GCSE Combined Science: Trilogy
Physics Equations

Learn these equations.

1	weight = mass × gravitational field strength (g)	$W = m\,g$
2	work done = force × distance (along the line of action of the force)	$W = F\,s$
3	force applied to a spring = spring constant × extension	$F = k\,e$
4	distance travelled = speed × time	$s = v\,t$
5	acceleration = $\dfrac{\text{change in velocity}}{\text{time taken}}$	$a = \dfrac{\Delta v}{t}$
6	resultant force = mass × acceleration	$F = m\,a$
7 (HT)	**momentum = mass × velocity**	$\mathbf{p = m\,v}$
8	kinetic energy = 0.5 × mass × speed ^{2}	$E_k = \tfrac{1}{2}\,m\,v^2$
9	gravitational potential energy = mass × gravitational field strength g × height	$E_p = m\,g\,h$
10	power = $\dfrac{\text{energy transferred}}{\text{time}}$	$P = \dfrac{E}{t}$
11	power = $\dfrac{\text{work done}}{\text{time}}$	$P = \dfrac{W}{t}$
12	efficiency = $\dfrac{\text{useful output energy transfer}}{\text{total input energy transfer}}$	
13	efficiency = $\dfrac{\text{useful power output}}{\text{total power input}}$	
14	wave speed = frequency × wavelength	$v = f\,\lambda$
15	charge flow = current × time	$Q = I\,t$
16	potential difference = current × resistance	$V = I\,R$
17	power = potential difference × current	$P = V\,I$
18	power = current ^{2} × resistance	$P = I^2\,R$
19	energy transferred = power × time	$E = P\,t$
20	energy transferred = charge flow × potential difference	$E = Q\,V$
21	density = $\dfrac{\text{mass}}{\text{volume}}$	$\rho = \dfrac{m}{V}$

You will be **given** these equations

1	final velocity ^{2} – initial velocity ^{2} = 2 × acceleration × distance	$v^2 - u^2 = 2\,a\,s$
2	elastic potential energy = 0.5 × spring constant × extension ^{2}	$E_e = \tfrac{1}{2}\,k\,e^2$
3	change in thermal energy = mass × specific heat capacity × temperature change	$\Delta E = m\,c\,\Delta\theta$
4	period = $\dfrac{1}{\text{frequency}}$	
5 (HT)	**force on a conductor (at right angles to a magnetic field carrying a current) = magnetic flux density × current × length**	$\mathbf{F = B\,I\,L}$
6	thermal energy for a change of state = mass × specific latent heat	$E = m\,L$
7 (HT)	**potential difference across primary coil × current in primary coil = potential difference across secondary coil × current in secondary coil**	$\mathbf{V_s\,I_s = V_p\,I_p}$

GCSE SCIENCE: TRILOGY
Required Practicals

Nº	Exam	Title
		Biology
1		Use a light microscope to observe, draw and label a selection of plant and animal cells. A magnification scale must be included. https://www.youtube.com/watch?v=jBVxo5T-ZQM
2		Investigate the effect of a range of concentrations of salt or sugar solutions on the mass of plant tissue. https://www.youtube.com/watch?v=ef2Ts2AKhq8
3	Paper 1	Use qualitative reagents to test for a range of carbohydrates, lipids and proteins. To include: Benedict's test for sugars; iodine test for starch; and Biuret reagent for protein. https://www.youtube.com/watch?v=zbZxFxXN6m4
4		Investigate the effect of pH on the rate of reaction of amylase enzyme. https://www.youtube.com/watch?v=JyXXoevEWc8
5		Investigate the effect of light intensity on the rate of photosynthesis using an aquatic organism such as pondweed. https://www.youtube.com/watch?v=cBCKedXdFeE
6	Paper 2	Plan and carry out an investigation into the effect of a factor on human reaction time. https://www.youtube.com/watch?v=Fm02i4vEi5Q
7		Measure the population size of a common species in a habitat. Use sampling techniques to investigate the effect of a factor on the distribution of this species. https://www.youtube.com/watch?v=yLHz2Ea10Mg
		Chemistry
8		Preparation of a pure, dry sample of a soluble salt from an insoluble oxide or carbonate, using a Bunsen burner to heat dilute acid and a water bath or electric heater to evaporate the solution. https://www.youtube.com/watch?v=9GH95172Js8
9	Paper 1	Investigate what happens when aqueous solutions are electrolysed using inert electrodes. This should be an investigation involving developing a hypothesis. https://www.youtube.com/watch?v=ukbtTTG1Kew
10		Investigate the variables that affect temperature changes in reacting solutions such as, eg acid plus metals, acid plus carbonates, neutralisations, displacement of metals. https://www.youtube.com/watch?v=rdI7xEq4Ew8
11	Paper 2	Investigate how changes in concentration affect the rates of reactions by a method involving measuring the volume of a gas produced and a method involving a change in colour or turbidity. This should be an investigation involving developing a hypothesis. https://www.youtube.com/watch?v=N5p06i9iImo
12		Investigate how paper chromatography can be used to separate and tell the difference between coloured substances. Students should calculate Rf values. https://www.youtube.com/watch?v=P8i4QYncQxI
13		Analysis and purification of water samples from different sources, including pH, dissolved solids and distillation. https://www.youtube.com/watch?v=DikcEq2wg8g
		Physics
14		An investigation to determine the specific heat capacity of one or more materials. The investigation will involve linking the decrease of one energy store (or work done) to the increase in temperature and subsequent increase in thermal energy stored. https://www.youtube.com/watch?v=HAPmwu7byGM
15	Paper 1	Use circuit diagrams to set up and check appropriate circuits to investigate the factors affecting the resistance of electrical circuits. This should include: • the length of a wire at constant temperature • combinations of resistors in series and parallel. https://www.youtube.com/watch?v=YsZeZotYVag
16		Use circuit diagrams to construct appropriate circuits to investigate the I–V characteristics of variety of circuit elements including a filament lamp, a diode and a resistor at constant temperature. https://www.youtube.com/watch?v=A1SyKvdHoqY
17		Use appropriate apparatus to make and record the measurements needed to determine the densities of regular and irregular solid objects and liquids. Volume should be determined from the dimensions of regularly shaped objects and by a displacement technique for irregularly shaped objects. Dimensions to be measured using appropriate apparatus such as a ruler, micrometer or Vernier callipers. https://www.youtube.com/watch?v=ScXOp8Zph28
18		Investigate the relationship between force and extension for a spring. https://www.youtube.com/watch?v=jQAt3e6Bz7U
19	Paper 2	Investigate the effect of varying the force on the acceleration of an object of constant mass and the effect of varying the mass of an object on the acceleration produced by a constant force. https://www.youtube.com/watch?v=wI-VkxEeIxw
20		Make observations to identify the suitability of apparatus to measure the frequency, wavelength and speed of waves in a ripple tank and waves in a solid and take appropriate measurements. https://www.youtube.com/watch?v=UNmv6H-f180 https://www.youtube.com/watch?v=ZXAmiRC0GBo
21		Investigate how the amount of infrared radiation absorbed or radiated by a surface depends on the nature of that surface. https://www.youtube.com/watch?v=eE7OPL7pesA

http://filestore.aqa.org.uk/resources/science/specifications/AQA-8464-SP-2016.PDF