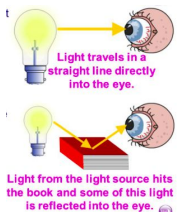
Science AT PLECKGATE
YEAR 7 LEARNING JOURNEY

YEAR 8

End of topic test : UNIT 4

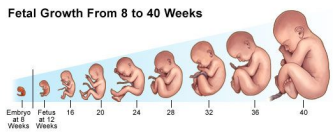
How do we see luminous and non-luminous objects?



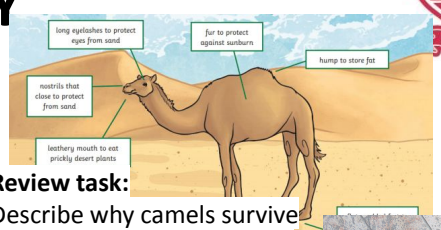
How is our reflection formed?

End of topic test : UNIT 10

How does a fetus develop?



Review task: Describe why camels survive well in the desert but would die in the arctic?

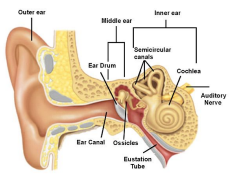


UNIT 4: Waves (Sound & Light)

UNIT 10: Genes (Variation & Human Reproduction)

Why do some siblings look alike and other different?

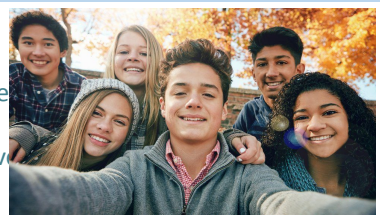
Review task: Describe how we hear sound.



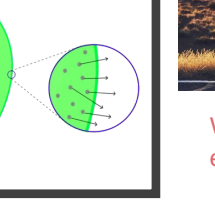
Why does a white t-shirt appear to change colour under different coloured light?

How can the shape of sound waves change what we hear?

What are the differences between the male and female reproductive systems ?



What changes happen to boy and girls during adolescence?



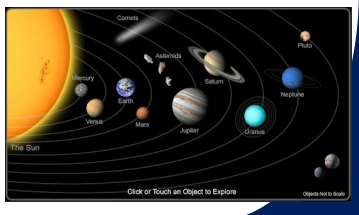
End of Year 7 exam: First week of summer term

Is the Earth hollow?

What celestial objects can you see in the night sky?

Review task: Describe how rocks are formed using the rock cycle

What is in our Solar system?



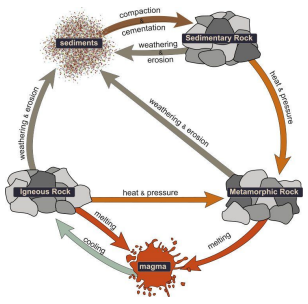
UNIT 7: Earth (Earth and structure; & Universe

End of topic test : UNIT 7

Why does the Moon appear to change shape

How do we use our energy while we sleep?

End of topic test : UNIT 6



What are the three types of rock called that make up the rock cycle?

Why do some electrical devices at home cost more to run than others?

How is energy transferred in a light bulb?

Review task: Describe the pattern found in predator-prey populations graphs

What do food chains and webs tell us?

End of topic test : UNIT 6

Review task: How can the reactivity series be used to work out the identity of a mystery metal?

Review task: Calculate the the power of different appliances using the energy they transfer and the time they are operational.

UNIT 3: Energy (Energy cost & Energy Transfer)

UNIT 9: Ecosystems (Independence & plant reproduction)

UNIT 6: Reactions (Acids and Alkalis; Metals and Non-metals

Who needs more energy a professional long distance runner or a toddler?

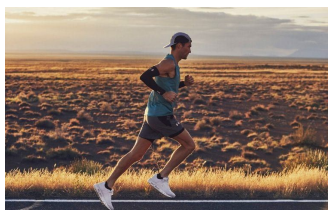
Which foods store the most chemical energy?

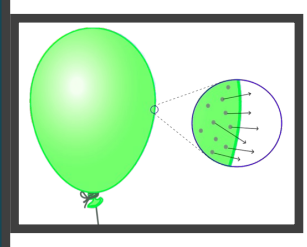
End of topic test : UNIT 9

How do plants spread seeds?

What is the difference between predator and prey animals?

Where are metals and non-metals found on the periodic table?

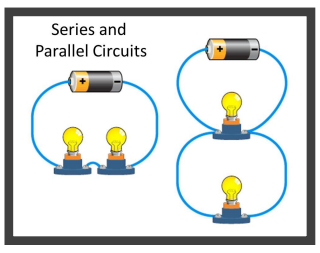




Why might a balloon explode on a hot day?

HSW: How do we test scientific questions?

HSW: How do we write a scientific method for others to follow?



What is the difference between a series and parallel circuit?

How can we test if a substance is an acid or an alkalis?

Why are acids and alkalis dangerous?

What do substance spread out? (link to unit 8)

UNIT 0: Enquiry processes

UNIT 2: Electromagnetism (Potential Difference, Resistance, & Current)

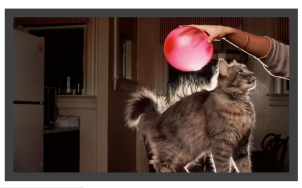
End of topic test : UNIT 2

Why do substances change state?

Review task: How do particles in a solid behave differently to those in a liquid or gas?

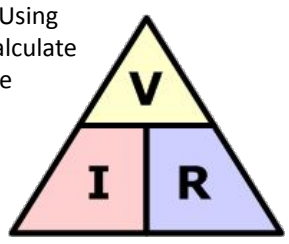
End of topic test : UNIT 5

What is flowing inside electrical cables?



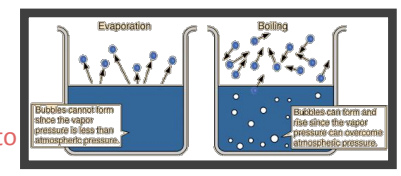
Why does your hair stand on end when you rub it with a balloon?

Review task: Using Ohm's law to calculate Resistance



UNIT 5: Matter: (Particle model & Separating mixtures)

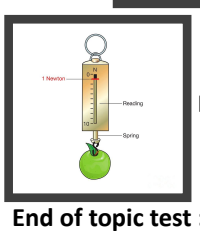
What happens to liquid particles to make them boil into a gas?



End of topic test : UNIT 1

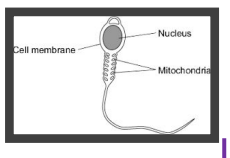
Review task: Describe a car's motion from a distance-time graph?

HSW: How do we measure forces?



End of topic test : UNIT 8

Review task: How are sperm cells adapted to carry out their function?



HSW: How can we observe cells?

UNIT 1: Forces (Speed & Gravity)

How is the human body organised

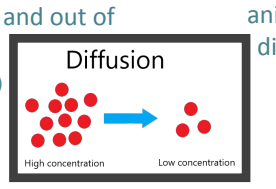
UNIT 8: Organisms (Movement & Cells)

Why are astronauts weightless in space?

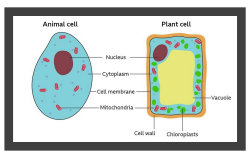
Who is fastest? Usain Bolt or a cheetah?

What will happen to an object that has balanced / unbalanced forces?

How do substances move into and out of our cells? (link to Unit 5)



How are plant and animal cells different?

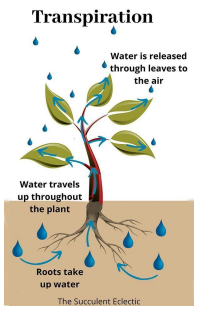


Why can we mo

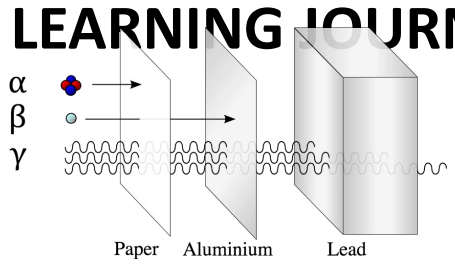
Science AT PLECKGATE
YEAR 8 LEARNING JOURNEY

How to write a scientific method?

C9 crude oil and fuels: What are hydrocarbons and why are they useful to us?



B4 organising animals and plants: How do our Heart and lungs work together? How do plants function to get the water and Carbon dioxide they need to photosynthesise?



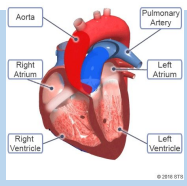
P7 Radioactivity : Describe properties of alpha, beta and gamma radiation and calculate a half-life from a graph.

How to draw a results table and plot the correct graph

What is a hypothesis? How is a prediction different?

End of Year 8 exam: 2nd week of summer term

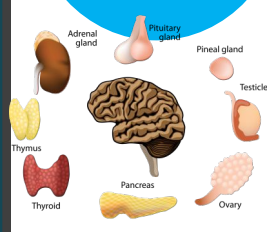
YEAR 9



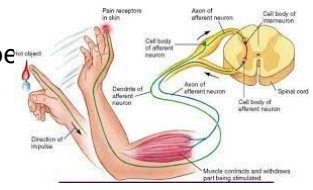
GCSE bridging topics

UNIT 0: Enquiry processes

Recall the electromagnetic spectrum waves & which are the most harmful.



B11 hormonal coordination: How does the endocrine system work in the body and what is insulin for?

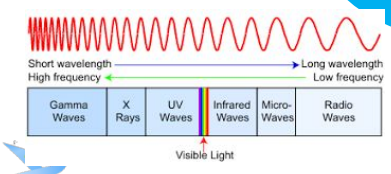


B10 human nervous system: How does CNS work?

How do you analysis results?

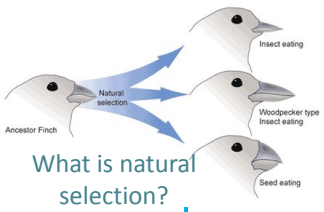
End of topic test : UNIT 4

Review task:
Plan, carry out, analyse and write up a full scientific experiment experiment .



UNIT 4: Waves (Wave effects & Wave properties)

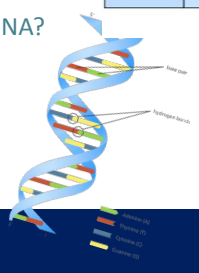
End of topic test : UNIT 7



What is natural selection?

What is meant by an extinct species and an endangered species?

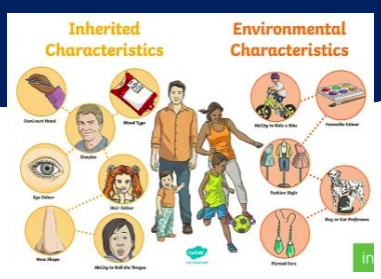
What is DNA?



End of topic test : UNIT 10

Describe why recycling is important

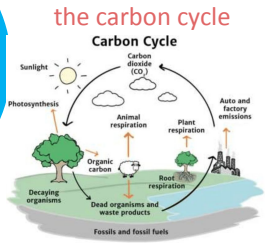
UNIT 10: Genes (Evolution & Inheritance)



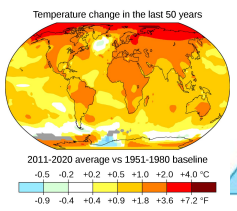
Describe the differences between longitudinal and transverse waves

Describe the effects of climate change on the `Earth ?

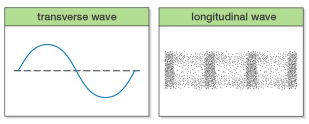
Review task Describe the carbon cycle



Who was Charles Darwin?



Review task Describe which characteristics are inherited and which are environmental?

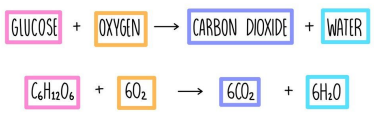


UNIT 7: Earth (Climate & Earth resources)

Describe what global warming is and which gases make it worse

Use an equation to calculate the work done by an object using the force applied and distance moved.

Review task: Describe how leaves are adapted to maximise photosynthesis



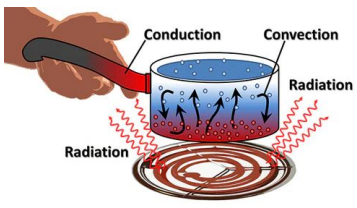
Describe how fermentation is used to make bread and brew beer?

Recall the equations for aerobic and anaerobic respiration?

End of topic test : UNIT 3

UNIT 3: Energy (Work & Heating and Cooling)

UNIT 9: Ecosystems (Respiration & Photosynthesis)



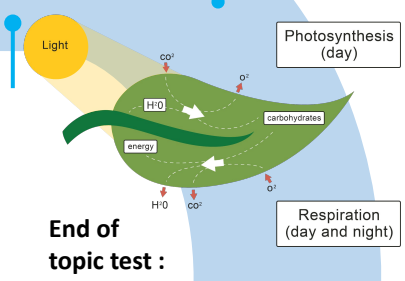
Review task Describe how transfer thermal energy via conduction, convection and radiation

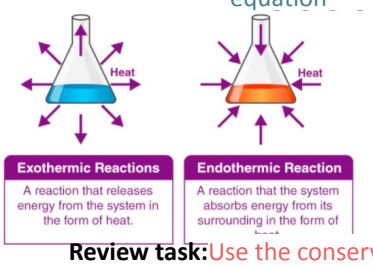
Explain why objects increase in temperature. Describe how temperature and thermal energy differ.

End of topic test : UNIT 9

How do plants spread seeds?

Recall the photosynthesis equation





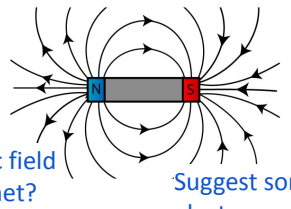
End of topic test : UNIT 6

How do exothermic & endothermic reactions differ?

Suggest why it can be damaging for the developing fetus for a mother to smoke, drink alcohol or take drugs during pregnancy.

Review task: How does our digestive system work? What role do enzymes have in it?

Draw the magnetic field around a bar magnet?



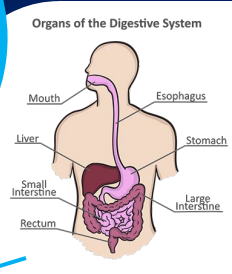
Suggest some uses of electromagnets?

Review task: Use the conservation of mass to calculate the amount of product make in a chemical reaction.

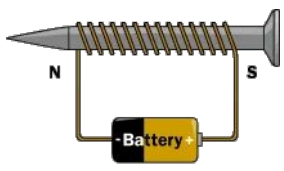
UNIT 2: Electromagnetism: (Magnetism & Electromagnetism)

UNIT 6: Reactions (Types of reaction & chemical energy)

Recall the dangers associated with taking drugs, smoking and drinking alcohol.



End of topic test : UNIT 8



Review task: Describe how to test the strength of an electromagnet

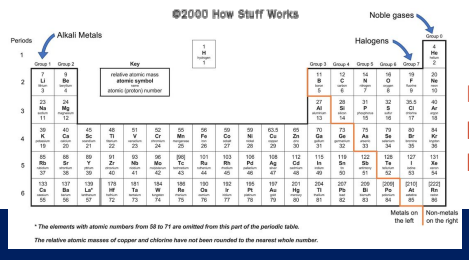
End of topic test : UNIT 2

Use word equations to describe chemical reactions

Recall a variety of chemical reactions ,such as combustion, thermal decomposition, etc.

What is a healthy diet? What can happen if you have an unhealthy diet?

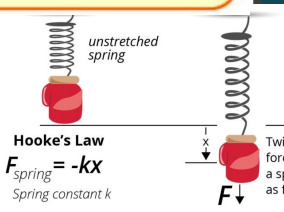
Review task: Describe properties of the group 1, 7 and 0 elements



Identify groups and periods on the periodic table.

End of topic test : UNIT 1

HSW: Use Hooke's law to prove that force is directly proportional to extension



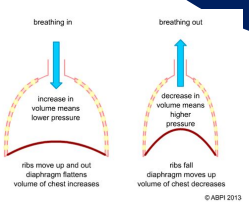
UNIT 8: Organisms (Breathing & digestion)

UNIT 5: Matter (elements & periodic table)

Which forces limit the top speed of racing cars?

UNIT 1: Forces: (contact forces & pressure)

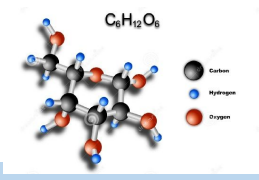
Review task: Describe how inhale and exhale?



Describe how inhaled and exhaled air are different.

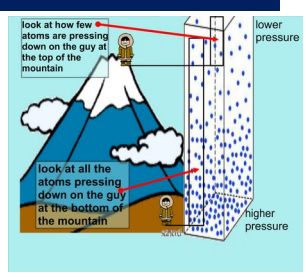
End of topic test : UNIT 5

Use chemical formulae to represent chemical compounds



How do we define elements and how are they different to compounds?

Review task: Explain what happens to the pressure divers feel as the dive deeper in water?



How does atmospheric pressure change with increasing altitude ?

Science AT PLECKGATE
YEAR 9 LEARNING JOURNEY

End of Year 9 exam: 4th week of summer term

YEAR 10

B5 Communicable diseases: Introduction

P5 electricity in the home: Introduction

End of topic test: P4

Describes series & parallel circuits.

Describes what is meant by potential difference and resistance.

Describes the transfer of charge & how to show electric circuits as diagrams.

P4 electric circuits

Review Task: P4

Required practical: Use circuit diagrams to investigate the factors affecting the resistance of electrical circuits.

Required practical: Use circuit diagrams to construct appropriate circuits to investigate the I–V characteristics of a variety of circuit elements.

End of topic test: C4

Describe how to balance symbol equations.

C4 chemical calculations

Describe relative atomic mass.

Describe how to express the concentration of a solution.

Review Task: C4

End of topic test: B4

Describe how substances are transported in plants & factors that affect the rate of transpiration.

Describe how the roots, stem, and leaves of a plant form a plant organ system.

Describe the human gas exchange system.

Describe the structure and functions of the heart & how the heart maintains a rhythm

Describe how blood flows around the body and the different types of blood vessels.

Describe the components of blood and its role as a transport system.

B4 Organising animals & plants

Review Task: B4

End of topic test: P3

Describe the energy resources we use everyday.

Describe the effects that different ways of generating power have on the environment

Describe the issues with electricity supply and demand

P3 Energy resources

Review Task: P3

Describe solar energy and geothermal energy.

Describe how power is generated from wind and waves.

End of topic test: C3

Describe the properties of substances with giant covalent structures, fullerenes and graphene.

Describe how ionic compounds are held together & what properties they have .

C3 Structure & bonding

Describe how covalent bonds are formed & how to represent them.

Describe bonding in metals and how that links to the properties of metals.

Describes the advantages and disadvantages of nanoparticles.

Describe the three states of matter & the changes between them.

Review Task: C3

End of topic test: B3

Describe the roles of HCl & bile in making the process of digestion efficient.

Describe the factors that affect the rates of enzyme-catalysed reactions.

Required practical: Investigate the effect of pH on the rate of reaction of amylase enzyme.

Describe how enzymes work as biological catalysts.

Review Task: B3

Describes how food you eat is digested.

B3 Organisation & the digestive system

Required practical: Use qualitative reagents to test for a range of carbohydrates, lipids and proteins.

Describe how cells are organised into tissues, and tissues are organised into organs.

End of topic test: P2

Required practical : investigating thermal insulators . (HT)

Describe infrared radiation and how it transfers energy.

Describe the trends in reactivity within groups in the periodic table.

Describe the properties and reactions of the alkali metals, halogen and the transition elements.

P2 Energy transfer by heating

Review Task: P2

Describe how homes are heated and how to reduce the rate of energy transfer from a home.

Required practical: Determine the specific heat capacity of one or more materials.

Describe the absorption and emission of infrared radiation.

Describe energy transfer by conduction.

C2 The periodic table

Review Task: C2

End of topic test: C2

Describe how atomic structure is linked to the position of an element in the periodic table.

Describe the development of the periodic table over time.

Describe the function of stem cells & how they could be used.

B2 Cell division

End of topic test: B2

Describe the problems & ethics of using stem cells in medicine & research.

Describe differentiation & growth in plant & animal cells

End of topic test: P1

Describe the division of cells by mitosis.

Review Task: B2

Review Task: P1

Describe how energy is supplied to your home.

Describe what is meant by power.

Describe the ways that energy can be stored & transferred.

Describe what work means & how to calculate the work done by a force.

Describe , gravitational potential, kinetic and elastic stores of energy.

P1 Conservation & dissipation of energy,

End of topic test: C1

Describe the conservation of energy.

Describe how to find the efficiency of energy transfers.

Use sub-atomic particles to describe the structure of the atom.

Describe the arrangement of electrons in an atom and how to represent electronic structures.

Describe ions, representing atoms, and isotopes.

Describe the movement of substances by diffusion, osmosis and active transport

Review Task: B1

Required practical: Looking at cells.

C1 Atomic structure

What are eukaryotic & prokaryotic cells?

B1 Cell structure & transport.

Describe how to calculate magnification and the differences between light and electron microscopes.

Describe the similarities and differences between animal and plant cells.

Describe the specialisation of cells within multicellular organisms, specifically animals and plants.

End of topic test: B1

Describe the differences between atoms, elements, & compounds.

Describe how to separate mixtures by filtration, simple distillation, crystallisation, Fractional distillation & chromatography.

Review Task: C1

Required practical: Investigating plant tissue in sugar and salt solution

Combined Science AT PLECKGATE
YEAR 10 LEARNING JOURNEY

YEAR 11

P9 motion

- Describe how to analyse motion graphs and make calculations using the information.
- Describe drawing and interpreting speed–time graphs & velocity–time graphs.

C9 crude oil and fuels

- Describe the separation of different size hydrocarbons by fractional distillation.
- Describe the combustion of hydrocarbons.
- Describe what a hydrocarbon is.
- Describe how & why we crack hydrocarbons.

B10 the human nervous system

- Describe the structure and function of the human nervous system.
- Describe what reflex reactions are and why they are important.
- Describe the importance of being able to control the internal environment of your body.

Required practical: Investigation into the effect of a factor on human reaction time.

P8 forces in balance

- Describe forces acting on objects, how to represent them & how to calculate resultant forces
- Describe the centre of mass and how to determine it.
- Describe using parallelograms of forces to calculate components of forces & how to resolve forces into components.
- Describe the differences between vectors & scalars.

C8 rates & equilibrium

- Describe how changing the pressure and temperature affects reversible reactions.
- Describe the effect of surface area , temperature , concentration & catalysts on a chemical reaction.
- Describe what happens in energy transfers in reversible reactions & how they can be at equilibrium.
- Describe what a reversible reaction is and how to represent it.
- Describe what is meant by rate of a chemical reaction.

Required practical :Investigating the effect of concentration on rate of reaction.

B9 respiration

- Describe anaerobic respiration.
- Describe how the body responds to the increased demands of the body during exercise.
- Describe aerobic respiration in animals and plants.

B8 photosynthesis

- Describe how plants use the glucose made during photosynthesis.
- Describe the factors that affect the rate of photosynthesis.
- Describe how plants produce energy through photosynthesis.
- **Required Practical :** Investigating the effect of light intensity on the rate of photosynthesis

P7 radioactivity

- Describe different models of the atom and the discovery of the nucleus.
- **Review Task:** P7
- Describe what is meant by half-life & calculating count rates.
- Describe what a radioactive substance is & the types of radiation emitted.
- Describe the penetrating power and dangers of alpha, beta, and gamma radiation.
- Describe changes in the nucleus that lead to radioactive decay.

C7 energy changes

- Describe how to calculate the transfer of energy during a reaction by completing bond calculations.
- Describe how to draw simple reaction profiles and how to interpret them.
- **Review Task:** C7
- **Required practical** :Investigating the effect of temperature changes on reacting solutions
- Describe the differences between endothermic & exothermic reactions.
- Describe the transfer of energy in endothermic and exothermic reactions.

B7 non-communicable disease

- **Review Task:** B7
- Describe what cancer is and how it spreads.
- Describe the effect of diet & exercise on the development of various non-communicable diseases.
- Describe the effect of smoking on the risk of developing lung disease and cardiovascular disease.
- Describe how alcohol can affect the body.
- Describe what a non-communicable disease is and factors that affect the incidence of non-communicable disease.

P6 molecules and matter

- Describe the specific latent heat of fusion & vaporisation & how to use specific latent heat in calculations.
- Describe the changes of state between solids, liquids, and gases
- Describe how temperature affects the internal energy of a substance.
- Describe how the volume of a gas depends on its temperature.
- Describe the different states of matter and their properties.
- **Review Task:** P6
- **Required practical:** calculating densities
- Describe how density is defined and measured.

C6 electrolysis

- **Review Task:** C6
- Describe the extraction of aluminium using electrolysis.
- **Required practical** :Investigate the electrolysis of a solution.
- Describe what happens to ions during electrolysis.
- Describe what happens in electrolysis.

C5 chemical changes

- Describe why solutions are acidic or alkaline and the pH scale.
- Describe the reactions of acids and alkalis and acids and carbonates.
- **Review Task:** C5
- Describe the reactions of metals with acids to form salts.
- Describe the reactions of bases with acids to form salts.
- Describe the terms weak, strong, dilute, and concentrated.
- **Required practical :** Prepare a salt from an insoluble metal carbonate or oxide.
- Describe how to use the reactivity series to identify suitable extraction methods.
- Describe displacement reactions.
- Describe the relative reactivity of different elements.

P5 electricity in the home

- Describe how power and energy are related and how to calculate the electrical power of a device.
- Describe how to calculate the efficiency of electric devices.
- Describe plugs, sockets, and cables.
- Describe the difference between direct and alternating current & what the National Grid is.
- Describe how to calculate the flow of electric charge and how it transfers energy.
- **Review Task:** P5

B6 preventing and treating disease

- Describe how your immune system works and how vaccinations protect you against disease.
- Describe how some drugs have been discovered and developed.
- Describe the stages of developing, testing, and trialling new drugs.
- **Review Task:** B6
- Describe how some medicines work and the difference between treating the cause and symptoms of a disease.

B5 Communicable diseases

- Describe some examples of diseases affecting plants and animals that are caused by viruses, bacteria fungi & protists
- Describe what health is.
- Describe the prevention of infections.
- **Review Task:** B5
- Describe how your body stops pathogens getting into the body.
- Describe how pathogens can cause disease.

P4 electric circuits

- **Required practical:** Use circuit diagrams to investigate the factors affecting the resistance of electrical circuits.
- Describes the transfer of charge & how to show electric circuits as diagrams.
- Describes series & parallel circuits.
- **Review Task:** P4
- **Required practical:** Use circuit diagrams to construct appropriate circuits to investigate the I–V characteristics of a variety of circuit elements.
- Describes what is meant by potential difference & resistance.

C4 chemical calculations

- **Review Task:** C4
- Describe how to balance symbol equations.
- Describe relative atomic mass.
- Describe how to express the concentration of a solution.

Combined Science AT PLECKGATE
YEAR 11 LEARNING JOURNEY

REVIEW
BIOLOGY REVIEW
CHEM REVIEW
PHYSICS REVIEW

FINAL GCSE EXAM

B18 Biodiversity and ecosystems

Review Task: B18

Describe how biodiversity can be maintained.

Describe what is meant by global warming

Describe deforestation and its effects

Describes the formation of acid rain and its effects.

Describe how human activities pollute the land and water.

Describe biodiversity and why it is important

P15 electromagnetism

Review Task: P15

Describe the pattern of magnetic fields around a current-carrying wire.

Describe magnetic fields and field lines.

Describe how to change the size and direction of the force on a current-carrying wire in a magnetic field.

C14 the Earth's resources

Review Task: C14

Describe how to decrease environmental impact by reducing, reusing, and recycling

Describe how to extract metals using biological methods.

Required practical: analyse the purification of water samples from different sources.

Describe how to carry out Life Cycle Assessments.

Describe how waste water is treated to make it safe to release into the environment.

Describe distillation and how potable water is made.

Describe how to distinguish between finite and renewable resources.

Mock Exam Week:
1st week of HT
(Paper 2 exam)

B17 organising an ecosystem

Review Task: B17

Describe the carbon cycle.

Describe how materials are cycled in a community.

Describe feeding relationships in communities

P13 electromagnetic waves

Review Task: P13

Describe the differences between ultraviolet and visible light waves, and the uses of X-rays and gamma rays.

Describe radio waves & what they are used for.

Describe the parts of the electromagnetic spectrum.

Describe the medical uses of X-rays.

Describe the uses of light waves, infrared, microwaves, and radio waves.

Required practical: investigate how the amount of infrared radiation absorbed or radiated by a surface depends on the nature of that surface.

B16 adap., interdep. & compet.

Review Task: B16

Describe how organisms are adapted for survive

Describe what resources plant compete for.

Describe some examples of adaptation in animals

Describe why animals compete.

Describe the relationships between communities and ecosystems

Describe how to measure the distribution of living things in the environment.

Describe factors that affect communities.

Required practical: measure the population size of a common species in a habitat.

P12 wave properties

Review Task: P12

Required practical: measure the speed of waves passing through a liquid and a solid.

Describe patterns of reflection & refraction.

Describe what is meant by amplitude, frequency and wavelength and the relationships between them.

Describe the difference between transverse and longitudinal waves.

C13 the Earth's atmosphere

Review Task: C13

Describe pollution from fuels.

Describe the greenhouse effect.

Describe how actions can limit the greenhouse effect and the emissions of carbon dioxide and methane.

Describe a theory of how our atmosphere developed.

Describe changes in the atmosphere over time.

Mock Exam Weeks:
5th & 6th week of HT 2
(Paper 1 exam)

B15 genetics and evolution

Describe classification and the binomial naming system.

Describe how antibiotic resistance can arise in bacteria.

Describe how an event or environmental change can cause extinction.

Describe what fossils can tell us about how organisms change over time.

Describe evidence for the origins of life and how fossils are formed.

B14 variation and evolution

Review Task: B14

Describe how natural selection works.

Describe what selective breeding is and its benefits and risks.

Describe how genetic engineering is carried out.

Describe the difference between genetic and environmental variation.

Describe some of the concerns surrounding new genetic technologies.

P10 forces and motion

Review Task: P10

Describe how the acceleration of an object depends on the size of the resultant force acting on it.

Describe what is meant when an object is called elastic.

Describe the differences between weight and mass, and what terminal velocity is.

Required practical: investigate the relationship between force and extension for a spring.

Describe how to calculate momentum.

Describe the forces that oppose the driving force of a vehicle

Required practical : investigate the effect of varying force, mass and acceleration.

C12 chemical analysis

Review Task: C12

Required practical: investigate how paper chromatography can be used to separate and tell the difference between coloured substances.

Describe how to test for carbon dioxide, oxygen, hydrogen, and chlorine gas.

Describe purity and how to identify if a substance is pure or a mixture

Describe how sex is inherited and how to use family trees.

B13 Reproduction

Review Task: B13

Describe how the human genetic disorders polydactyly and cystic fibrosis are inherited.

Describe the effect meiosis and fertilisation have on chromosome number.

Describe the process of embryo screening, and the issues associated with these screening processes.

Describe what a genome is and the benefits of studying the human genome.

Describe the main differences between asexual and sexual reproduction.

B11 hormonal coordination

Review Task: B11

Describe different methods of hormonal and non-hormonal contraception

Describe the differences in the way type 1 and type 2 diabetes are treated.

Describe how the level of glucose in the blood is controlled.

Describe the role of hormones in human reproduction.

Describe how hormones can be used to treat infertility.

Describe the role of negative feedback in the control of hormones in the body.

Describe the role of hormones in the menstrual cycle.

Describes what a hormone is and the main organs of the endocrine system.

REVIEW & CATCH UP

P9 CATCH UP

C8 CATCH UP

C9 CATCH UP